



DORCHESTER

SOUTH BOSTON

DOWNTOWN

EAST BOSTON



RESILIENT BOSTON HARBOR

-  = FLOOD ADAPTED BUILDINGS
-  = ELEVATED LANDSCAPES
-  = CONNECTIONS AND ACCESS



# CLIMATE READY DOWNTOWN AND NORTH END



one architecture  
new york city amsterdam



ARCADIS





# OPEN HOUSE #2

JULY 16, 2019

- Project History + Goals
- Existing Conditions/What's at Risk?
- Protection Scenarios
  - District Overview
  - Downtown and Wharf District
  - North End Waterfront
  - North End-West End
- Resiliency Toolkits
- What's Next? Implementation Timelines and Strategies



# **PROJECT HISTORY + GOALS**

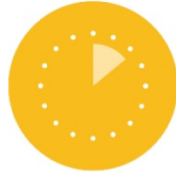


# PROJECT GOALS



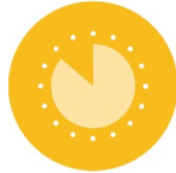
## **ENGAGEMENT**

*Engage the community and stakeholders to obtain feedback and build awareness of long-term risk and climate resilience actions*



## **SHORT-TERM SOLUTIONS**

*Develop specific short-term (early action) coastal resilience solutions*



## **LONG-TERM SOLUTIONS**

*Develop long-term district-level coastal resilience solutions*



## **IMPLEMENTATION**

*Develop implementation roadmaps to reduce risk and increase feasibility*



# PUBLIC OUTREACH TO DATE

## COMPLETED

### OPEN HOUSE I (March 12, 2019)

#### STAKEHOLDER INTERVIEWS/PRESENTATIONS

- Boston Harbor Now
- Boston Harbor Cruises
- Commercial Wharf Owners
- North End Waterfront Neighborhood Council
- Wharf District Council
- New England Aquarium
- Sydney Ashbury
- Green Ribbon Commission
- Greenway Conservancy
- Friends of Christopher Columbus Park
- Marine Transportation Workshop (July 16, 2019)

#### FOCUS GROUPS

- Utilities + Transportation (May 16, 2019)
  - MBTA, MassDOT, Utility Companies, BHC...
- Wharves + Piers (May 20, 2019)
  - Owners Representatives along waterfront

## UPCOMING

### OPEN HOUSE II



#### STAKEHOLDER INTERVIEWS/PRESENTATIONS

- USCG
- Eliot School
- DCR
- City of Boston Preservation Team
- Groundwater Conservation

#### FOCUS GROUPS

- Long Wharf
- Lovejoy Wharf



# WHAT RESILIENT SOLUTIONS ARE YOUR PRIORITY?

APPROX. 62 TOTAL PARTICIPANTS

## 1ST PRIORITY



EFFECTIVENESS



DESIGN LIFE +  
ADAPTABILITY



EQUITY

## 2ND PRIORITY



EFFECTIVENESS



DESIGN LIFE +  
ADAPTABILITY



ENVIRONMENTAL  
IMPACT

## 3RD PRIORITY



ENVIRONMENTAL  
IMPACT



FEASIBILITY

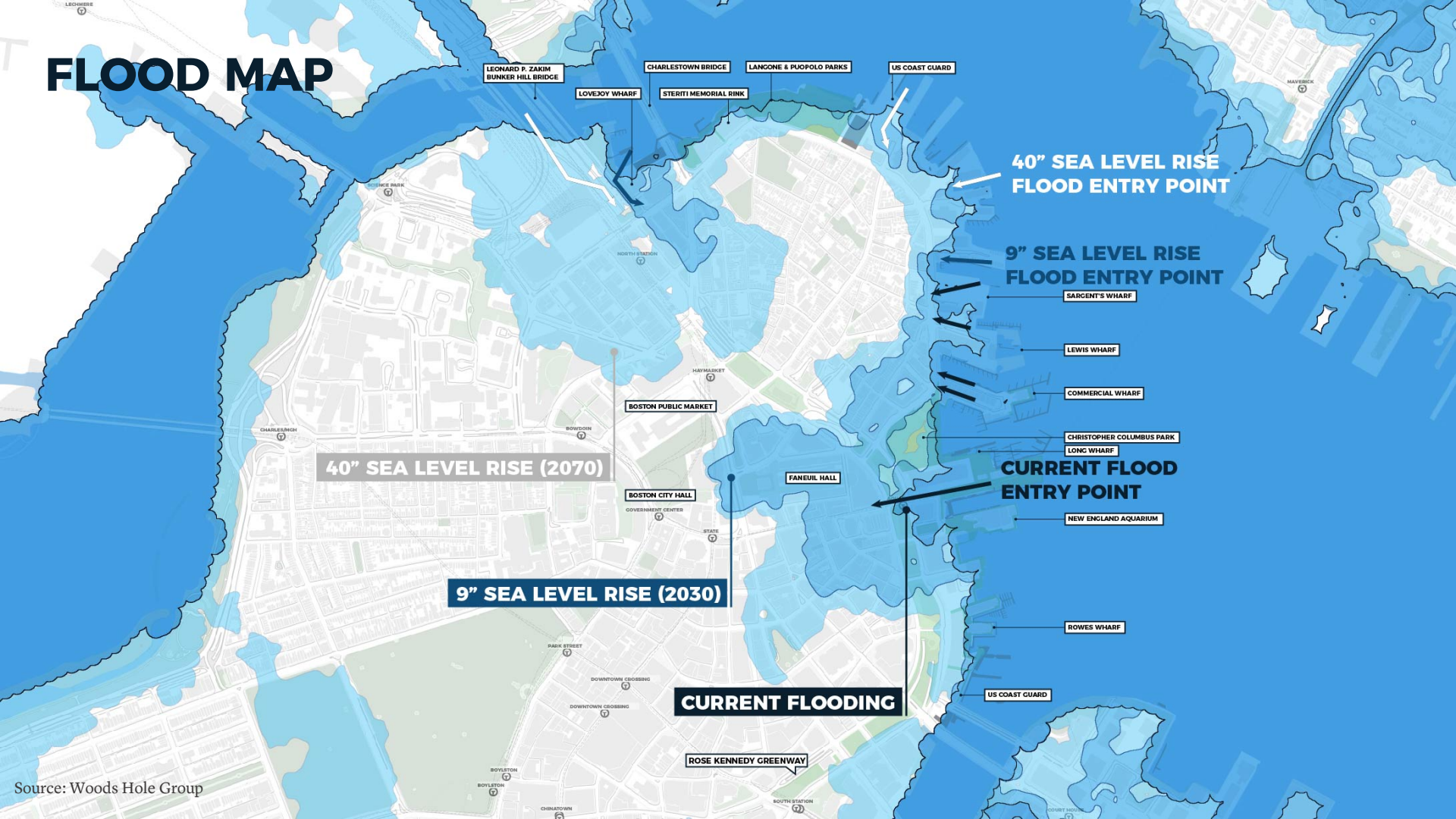


DESIGN LIFE +  
ADAPTABILITY

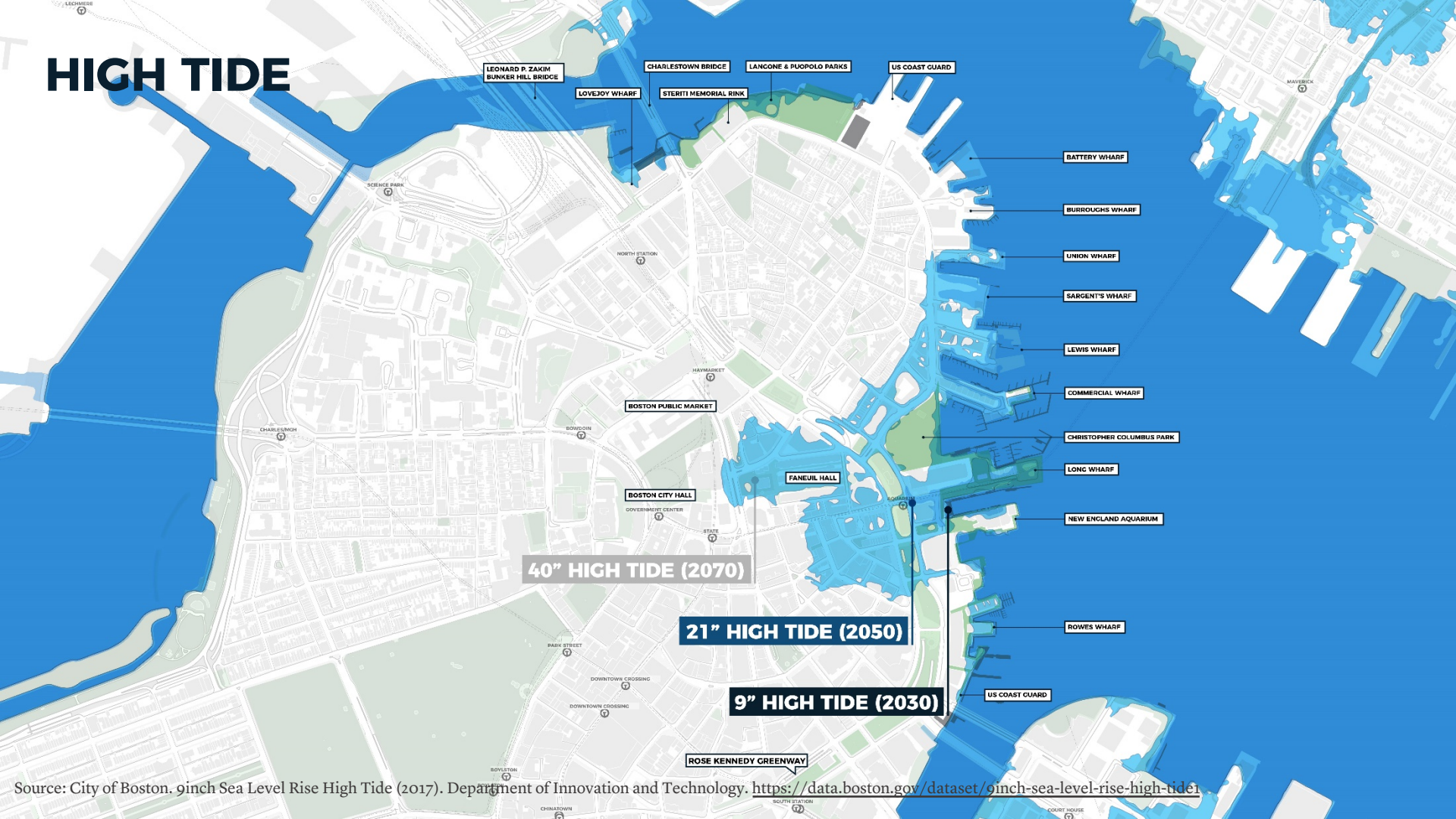
# **EXISTING CONDITIONS**



# FLOOD MAP



# HIGH TIDE



Source: City of Boston. 9inch Sea Level Rise High Tide (2017). Department of Innovation and Technology. <https://data.boston.gov/dataset/9inch-sea-level-rise-high-tide1>

# WHAT'S AT STAKE?

## KEY FACTS + FIGURES



**DOWNTOWN BOSTON IS  
CURRENTLY HOME TO  
30,000 RESIDENTS**



**THERE ARE 2,900 BUILDINGS  
IN DOWNTOWN**



**\$58.9 BILLION MARKET VALUE**

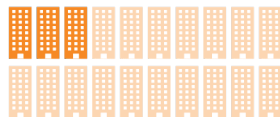


**200,000 PEOPLE EMPLOYED**

## 2030+ 1% ANNUAL STORM



**28 % OF POPULATION EXPOSED**



**13 % OF BUILDINGS EXPOSED**



**8 % OF MARKET VALUE EXPOSED**

**+ \$ 500 M  
ECONOMIC LOSSES**

## 2070+ 1% ANNUAL STORM



**85 % OF POPULATION EXPOSED**



**42 % OF BUILDINGS EXPOSED**



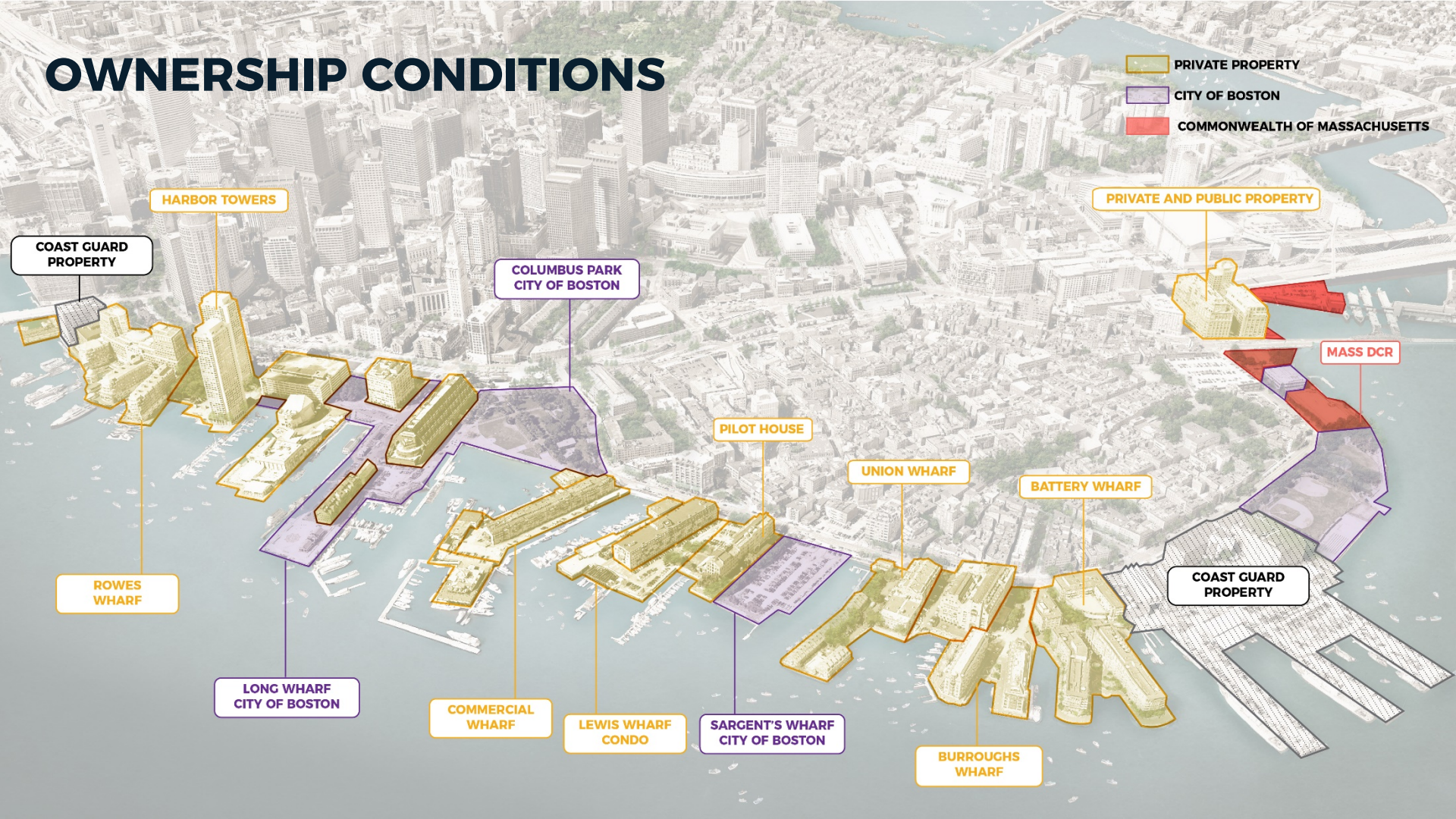
**28 % OF MARKET VALUE EXPOSED**

**+ \$ 3 B  
ECONOMIC LOSSES**

**\* PLEASE NOTE THAT NUMBERS SHOWN HERE INCLUDE CHINATOWN, NOT SHOWN ON MAP.**



# OWNERSHIP CONDITIONS



- PRIVATE PROPERTY
- CITY OF BOSTON
- COMMONWEALTH OF MASSACHUSETTS

HARBOR TOWERS

COAST GUARD  
PROPERTY

COLUMBUS PARK  
CITY OF BOSTON

PRIVATE AND PUBLIC PROPERTY

MASS DCR

ROWES  
WHARF

PILOT HOUSE

UNION WHARF

BATTERY WHARF

COAST GUARD  
PROPERTY

LONG WHARF  
CITY OF BOSTON

COMMERCIAL  
WHARF

LEWIS WHARF  
CONDO

SARGENT'S WHARF  
CITY OF BOSTON

BURROUGHS  
WHARF



# SUBSURFACE CONDITIONS

**STRUCTURAL CAPACITY**  
issues with additional weight over tunnel

**PHYSICAL LIMITATIONS**  
not much space underground for additional structures

**DEGRADED SEAWALL**

**DEGRADED SEAWALL**  
much of the seawall is in poor condition, may require rebuilding the bulkhead if needed to raise

**DEGRADED SUBSTRATE**  
poor quality fill with questionable bearing capacity limits options for wharf protection

- Big Dig Exit Ramp
- Near-term vulnerable Portals and Egress
- Groundwater Conservation
- Zone not on Bedrock (Subject to Uplift)
- Tunnel
- Tunnel Building
- Aquarium T Station
- MBTA
- Old Trolley Track
- Outfall
- Degraded Substrate

**STRUCTURAL CAPACITY**  
issues with additional weight  
over tunnel

**PHYSICAL LIMITATIONS**  
not much space underground  
for additional structures

### DEGRADED SEAWALL

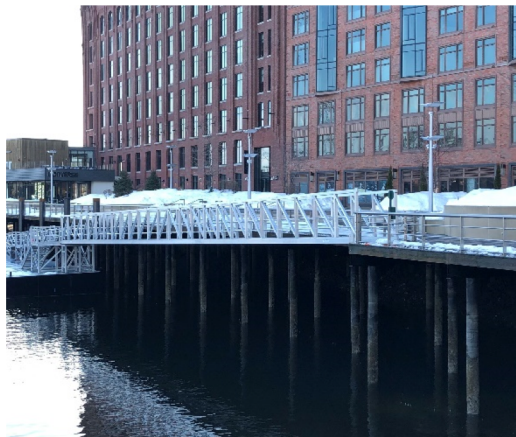
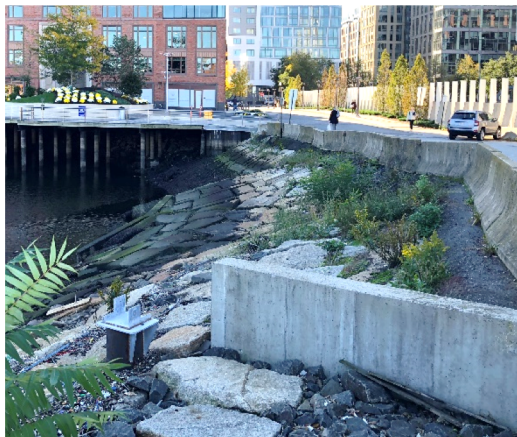
**DEGRADED SEAWALL**  
much of the seawall is in poor condition, may require rebuilding the bulkhead if needed to raise

**DEGRADED SUBSTRATE**  
poor quality fill with  
questionable bearing  
capacity limits options for  
wharf protection

- 
- Big Dig  
 Exit Ramp  
 Near-term vulnerable Portals and Egress  
 Groundwater Conservation  
 Zone not on Bedrock (Subject to Uplift)  
 Tunnel  
 Tunnel Building  
 Aquarium T Station  
 MBTA  
 Old Trolley Track  
 Outfall  
 Degraded Substrate



# BULKHEAD CONDITIONS





# **FLOOD PROTECTION SCENARIOS**

# FLOOD PROTECTION TOOLKIT



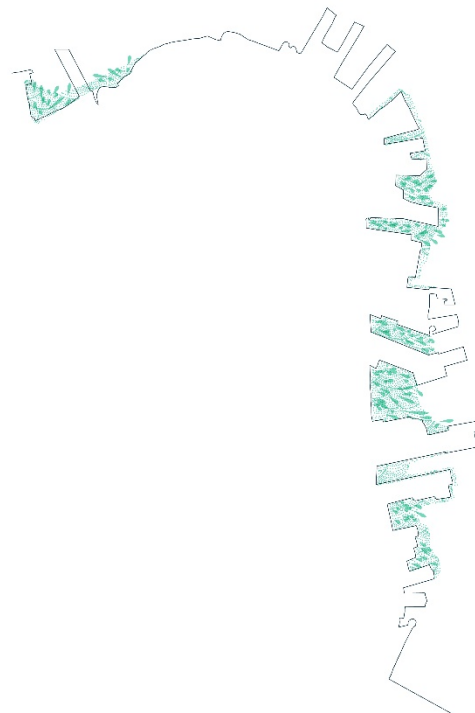
## SPINE

*Raised roads, Harborwalk, bulkheads*



## OPEN SPACES

*Parks, Harborwalk*



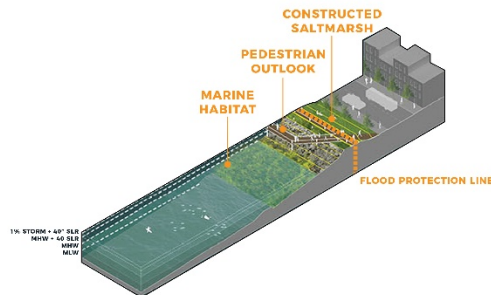
## OUTBOARD ELEMENTS

*Fill, living breakwaters, coastal marshes, floating wetlands*

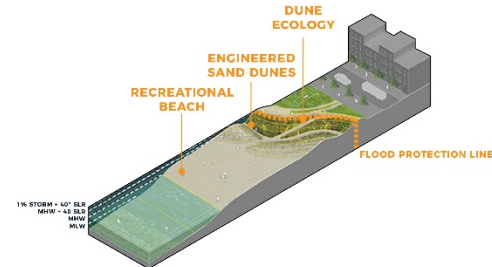
# FLOOD PROTECTION TOOLKIT (Resilient Boston Harbor)



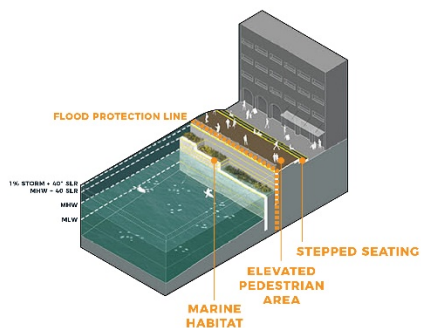
**WATERFRONT GATEWAYS**



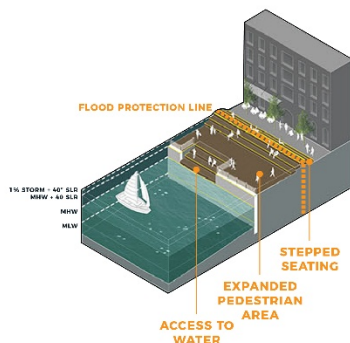
**LIVING EDGES**



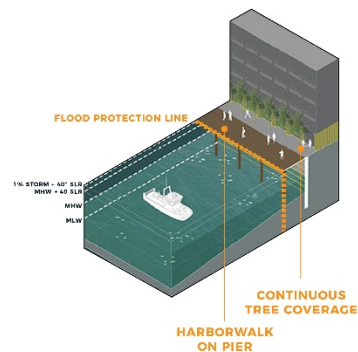
**NEIGHBORHOOD BEACHES**



**HABITAT HARBORWALK**



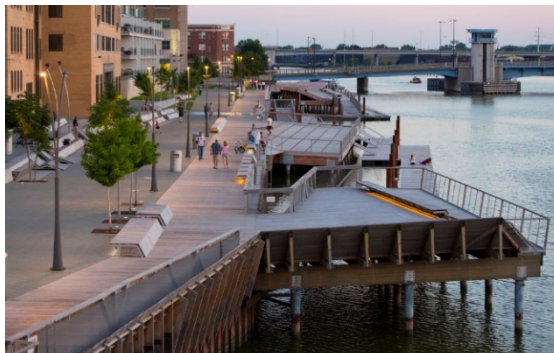
**STEPPED HARBORWALK**



**ELEVATED HARBORWALK**

\*Axons from Resilient Boston Harbor. Orange annotations have been added.

# FLOOD PROTECTION PRECEDENTS



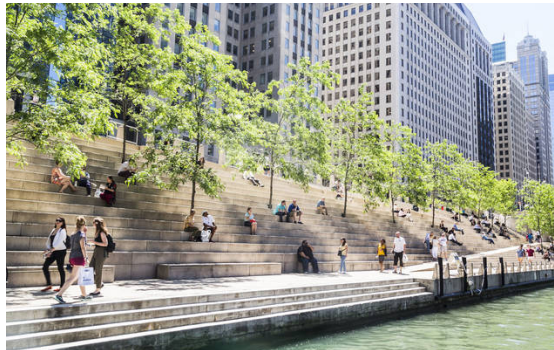
**City Deck / Green Bay, WI**  
Stoss Landscape Urbanism



**Martin's Park**  
Michael Van Valkenburgh Associates



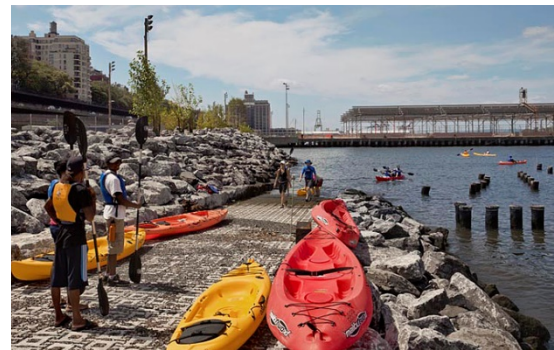
**Hunter's Point South Waterfront Park / Queens, NY**  
Thomas Balsley Associates + Weiss Manfredi



**Chicago Riverwalk / Chicago, IL**  
Sasaki



**Bronte Baths / Sydney, AUS**



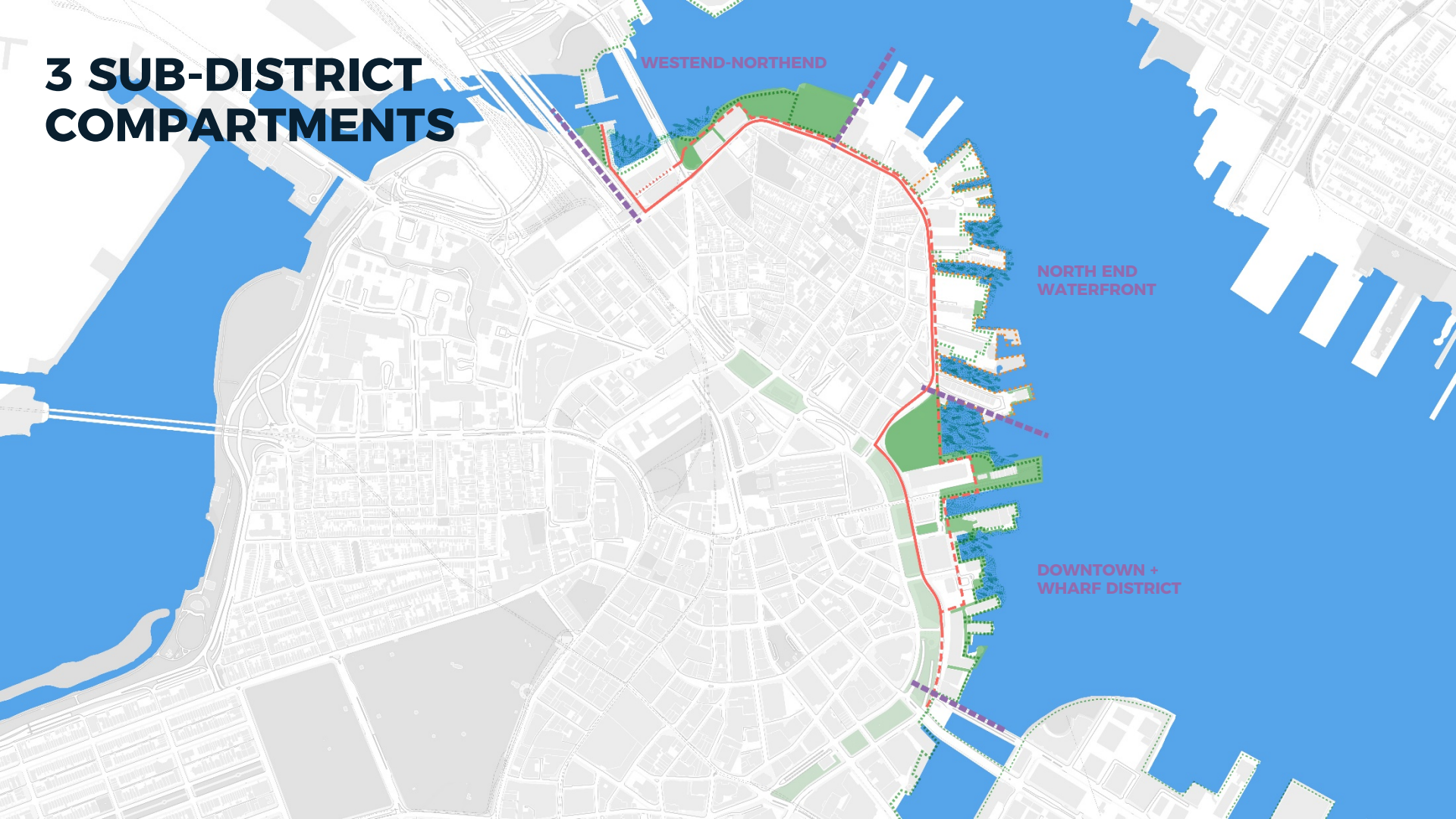
**Brooklyn Bridge Park / NYC, NY**  
MVVA



# CONCEPTUAL ALIGNMENT



# 3 SUB-DISTRICT COMPARTMENTS





# DOWNTOWN + WHARF DISTRICT

PROPERTY  
OWNERSHIP



CITY/STATE LAND



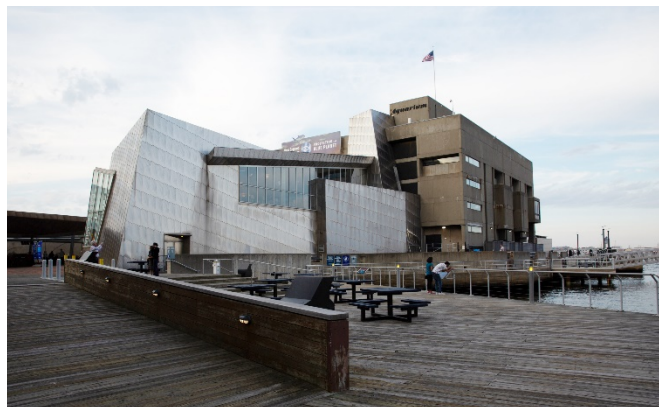
PRIVATE LAND



**Christopher Columbus Waterfront Park**



**Long Wharf**

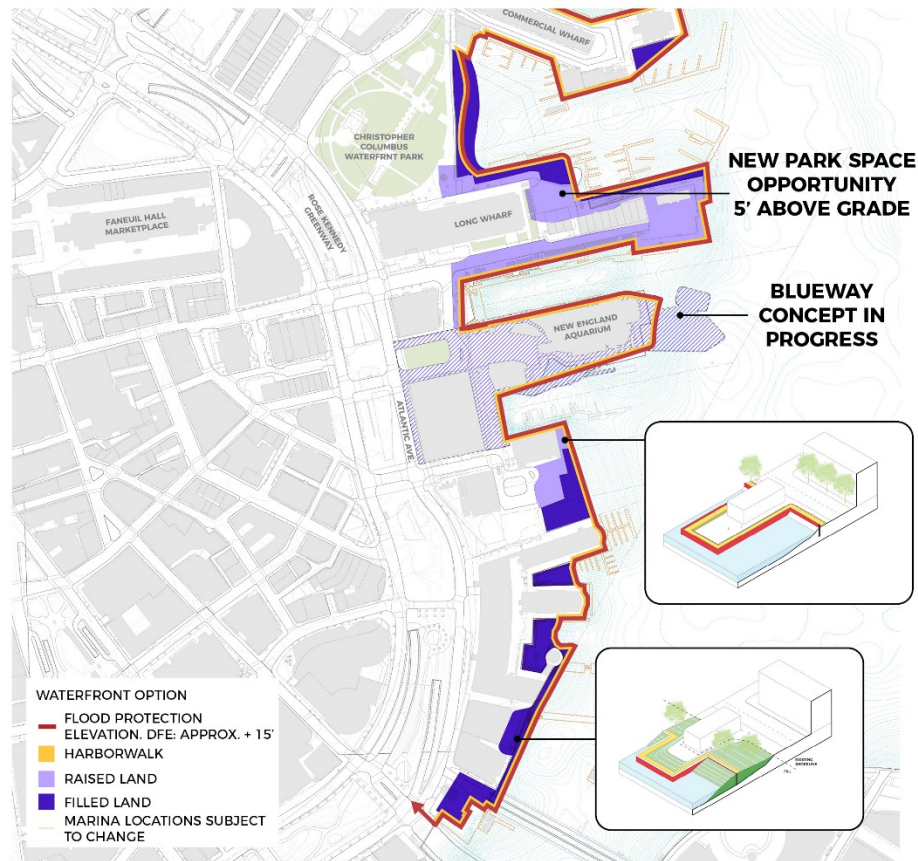
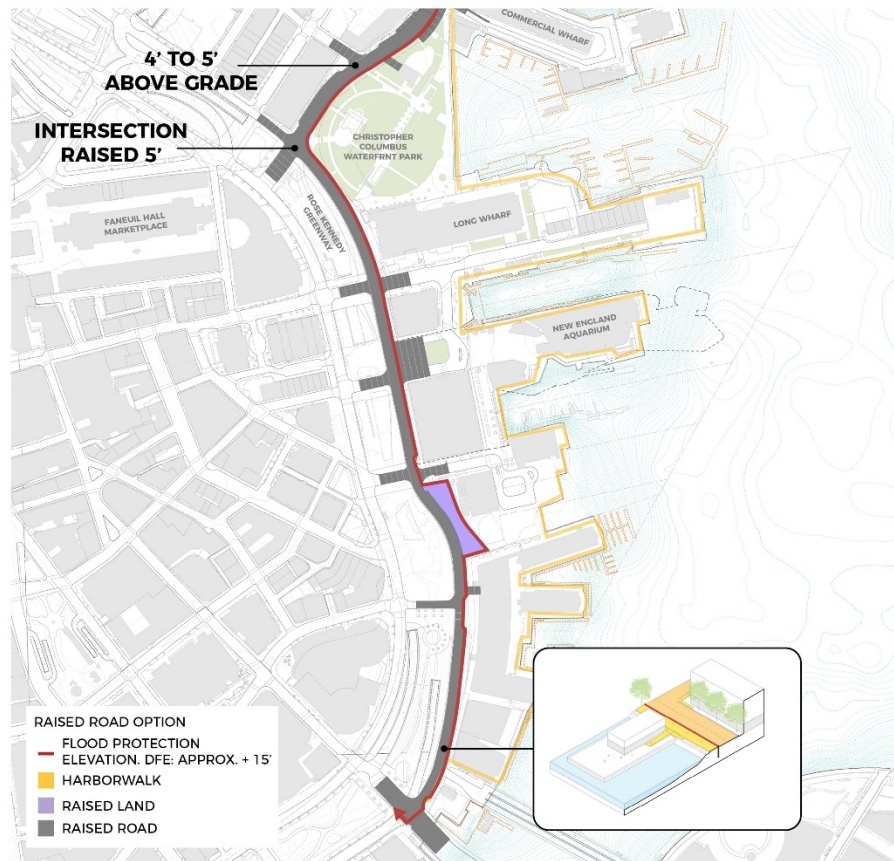


**New England Aquarium**



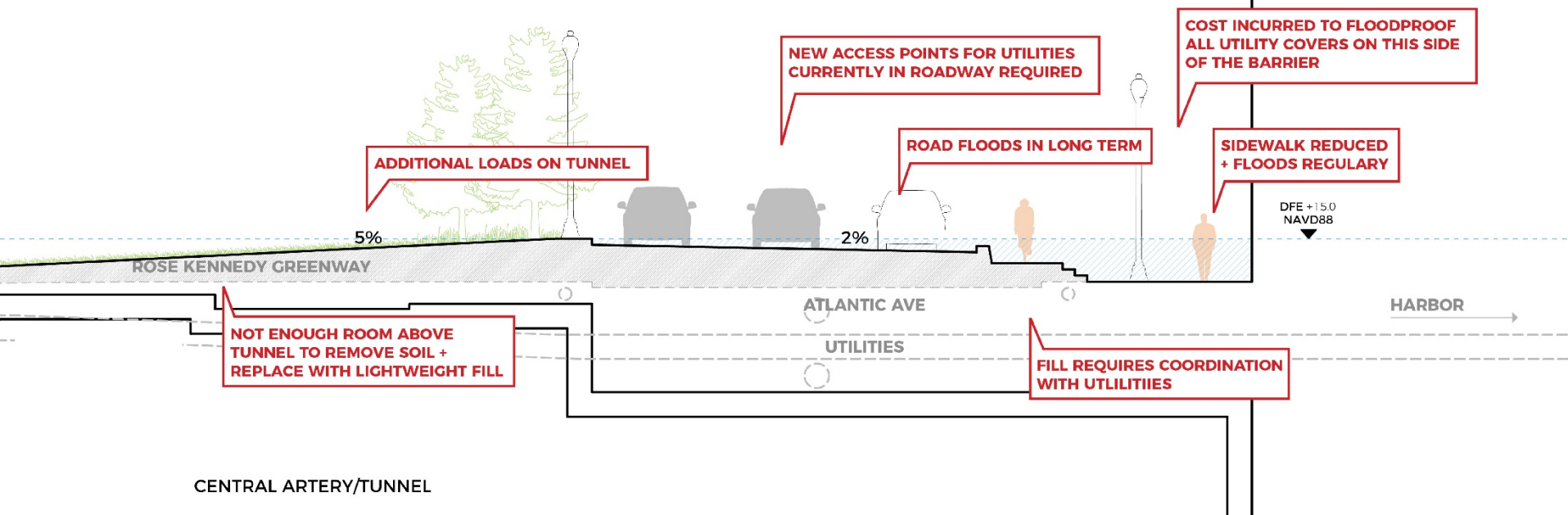
**Harborwalk**

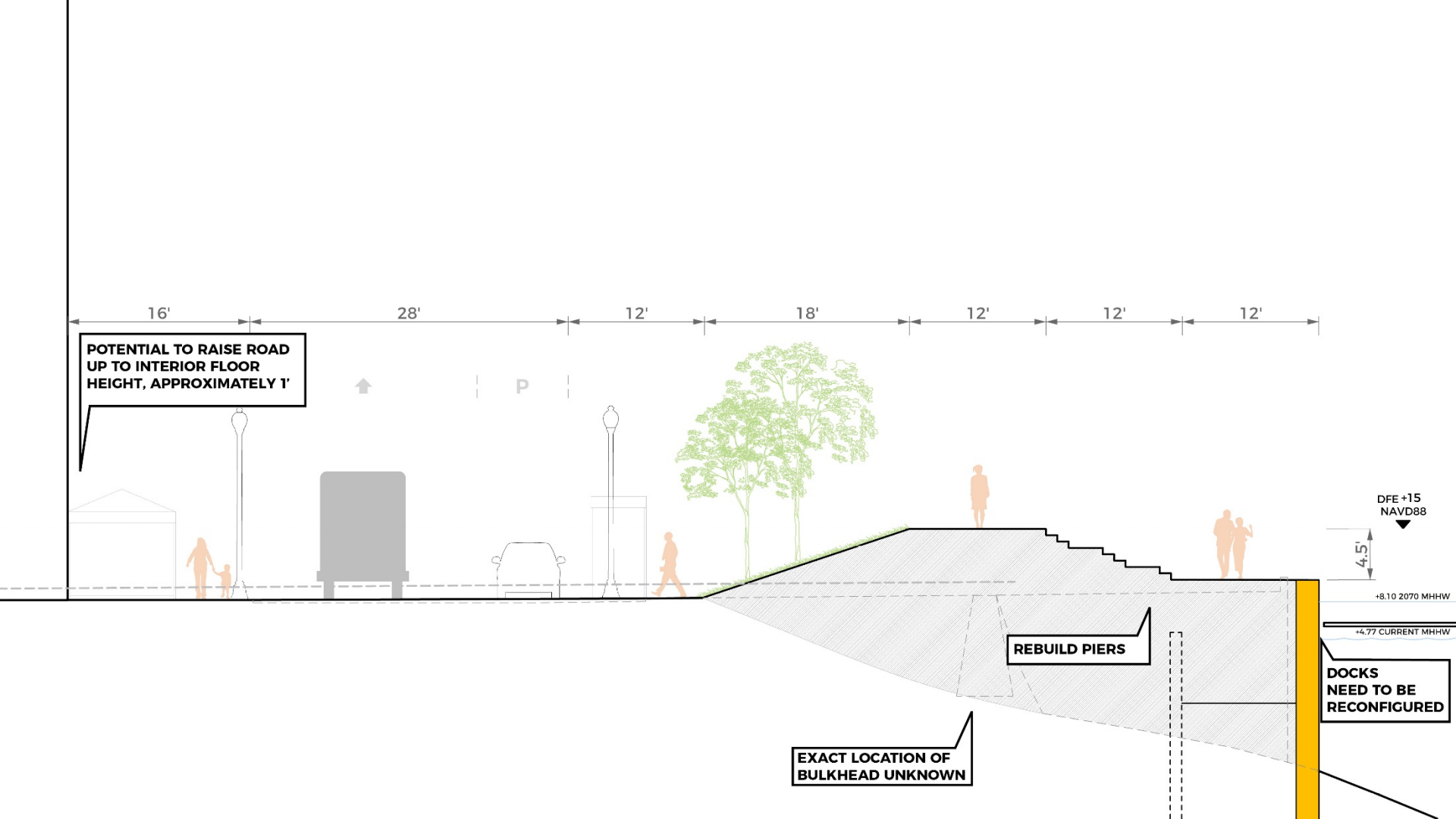
# DOWNTOWN + WHARF DISTRICT





# RAISED ROW + GREENWAY





# NORTH END WATERFRONT

PROPERTY  
OWNERSHIP



CITY/STATE LAND

PRIVATE LAND



**Sink Holes**



**Buildings Overhanging Wall**



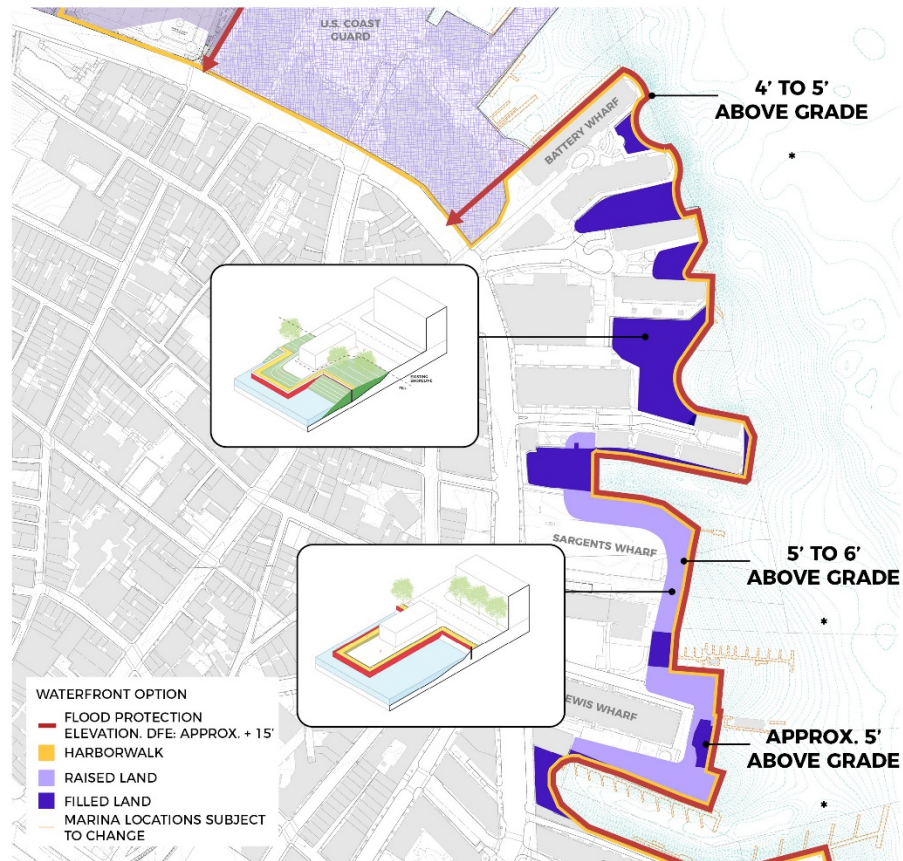
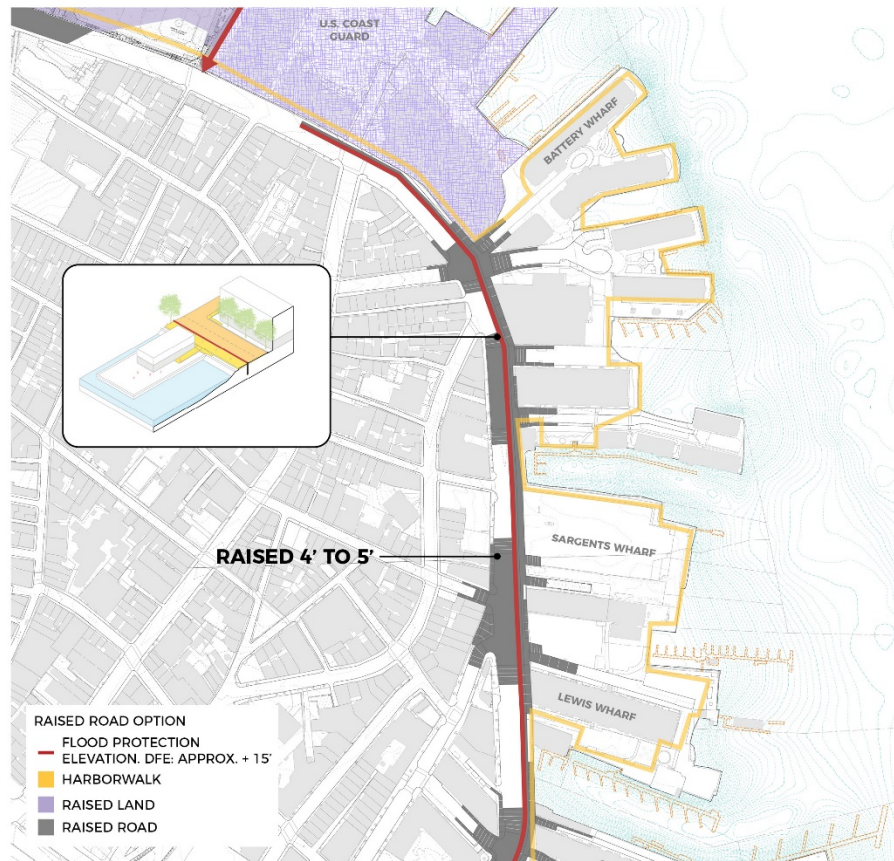
**Buildings on Piers**



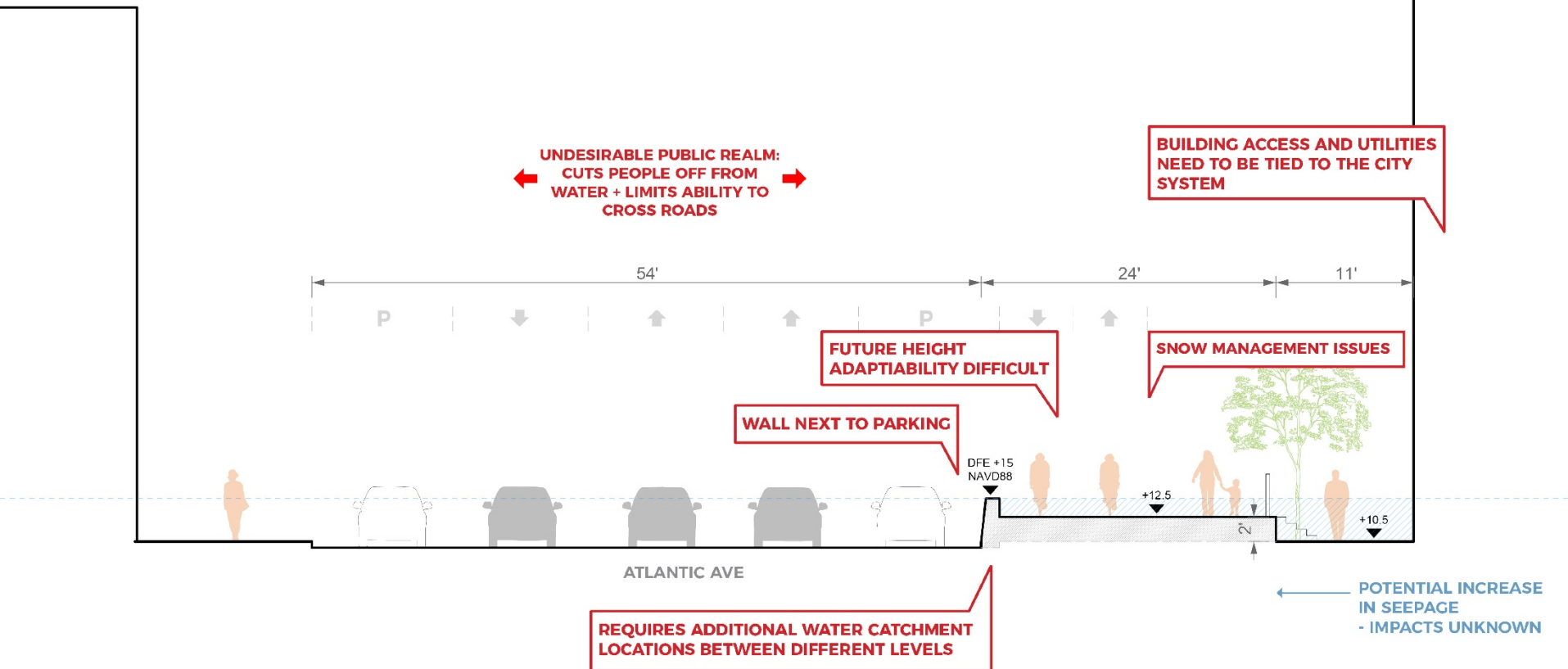
**Degraded Structures**



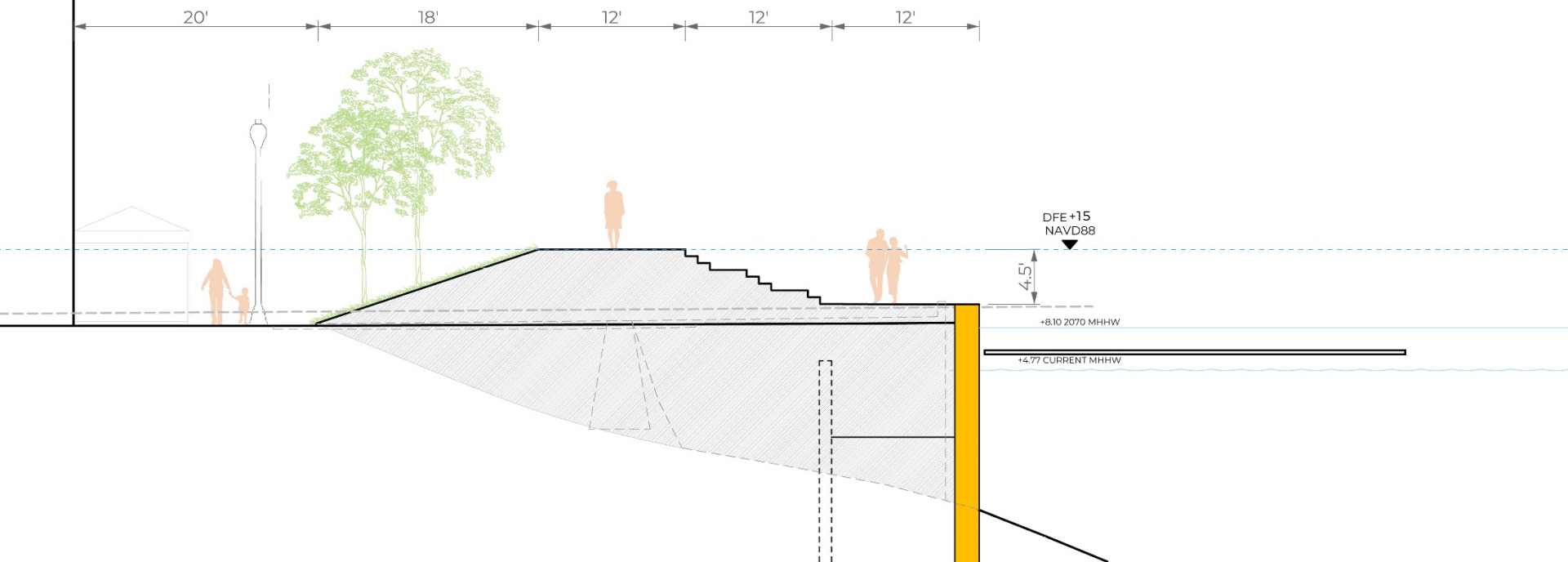
# NORTH END WATERFRONT



# RAISED BIKEWAY



# WATERFRONT





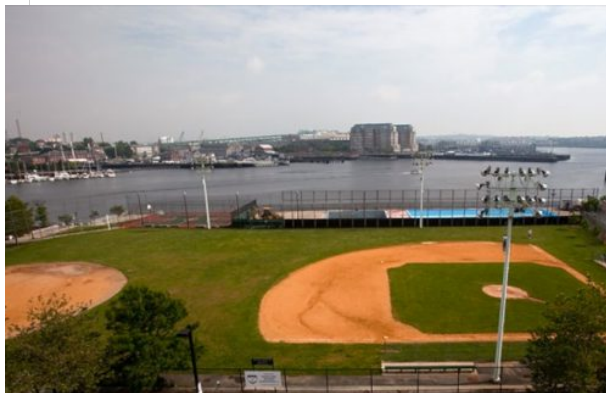
# WEST END – NORTH END

PROPERTY  
OWNERSHIP

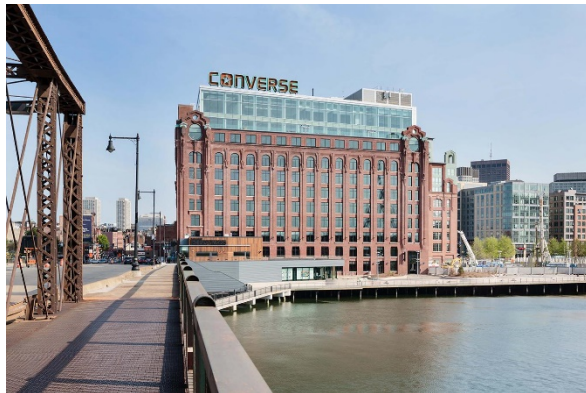


CITY/STATE LAND

PRIVATE LAND



**Langone + Puopolo Park**  
City of Boston

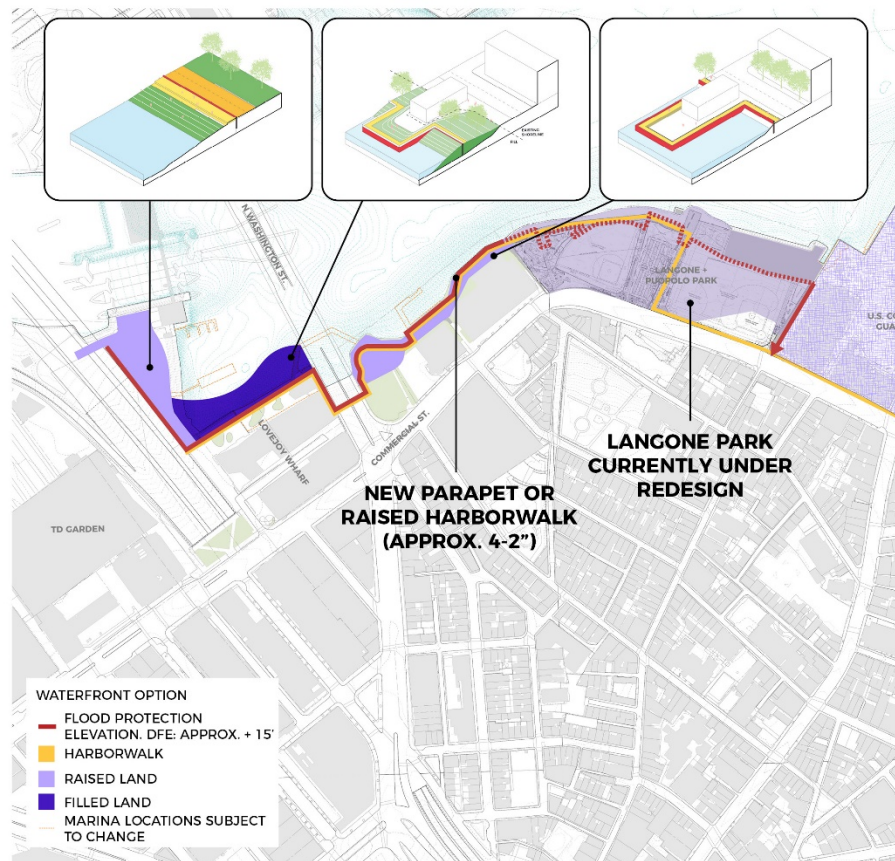
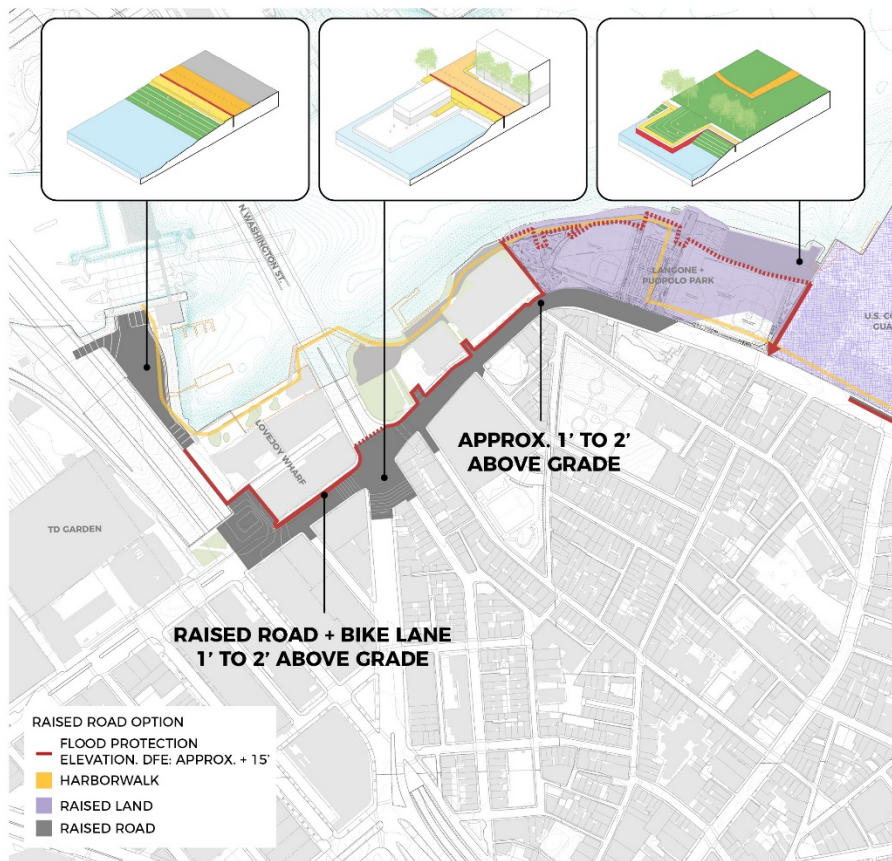


**Lovejoy Wharf**  
Related Lovejoy Residential  
Boston Redevelopment Authority (BRA)



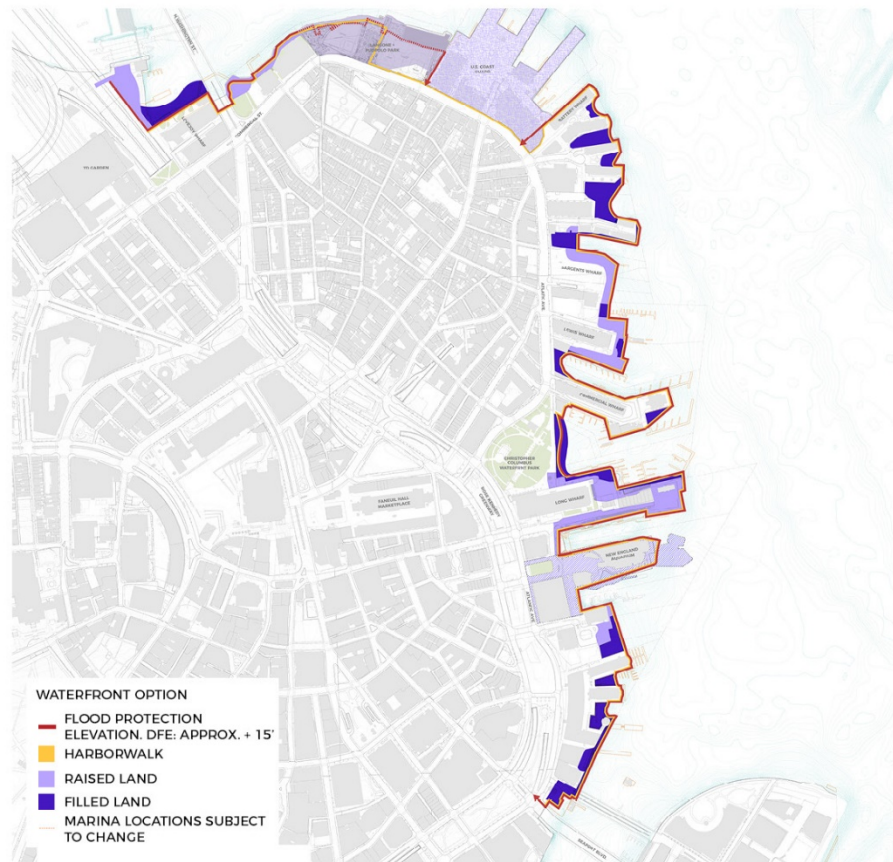
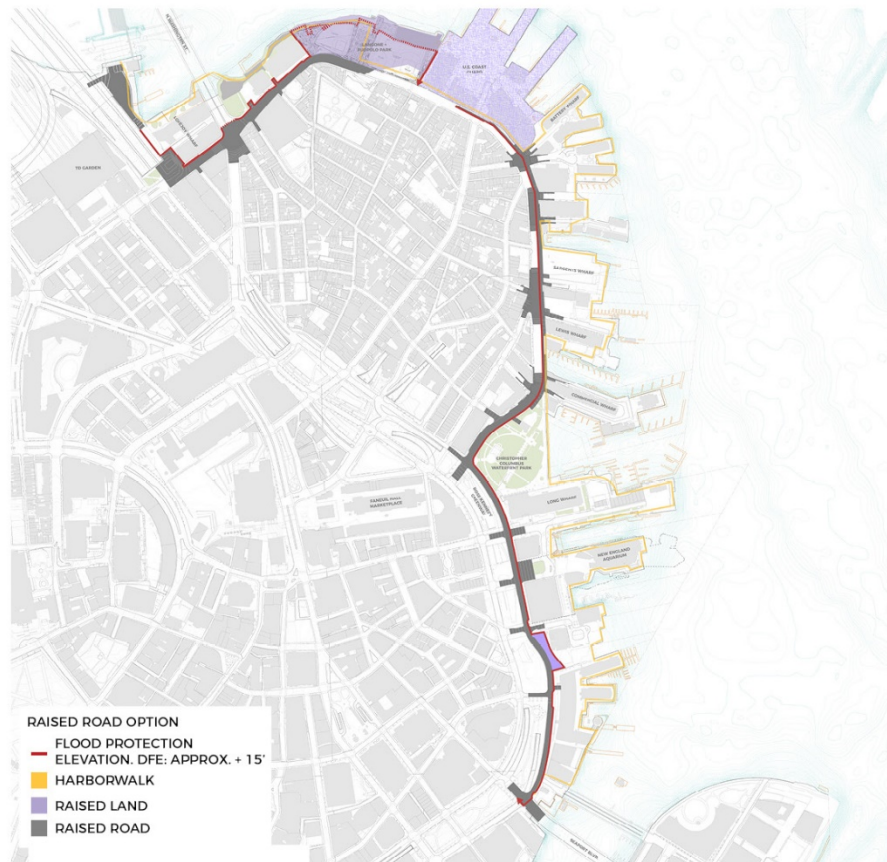
**Steriti Memorial Rink + Harborwalk Park**  
Department of Conservation and Recreation

# WEST END-NORTH END





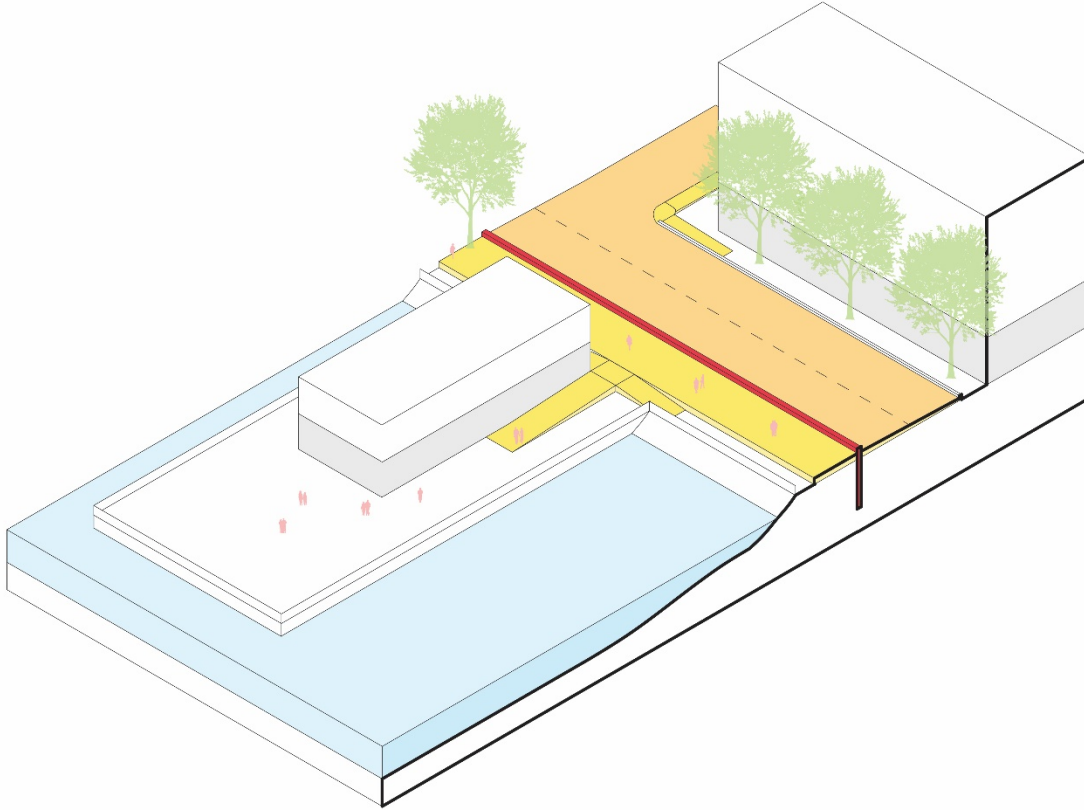
# 1 IF BY LAND, 2 IF BY SEA





# **RESILIENCY TOOLKIT**

# PUBLIC RIGHT-OF-WAY



Sunset Harbour, Miami Beach, FL

## URBAN IMPACTS

- NEGATIVE IMPACT ON PUBLIC REALM

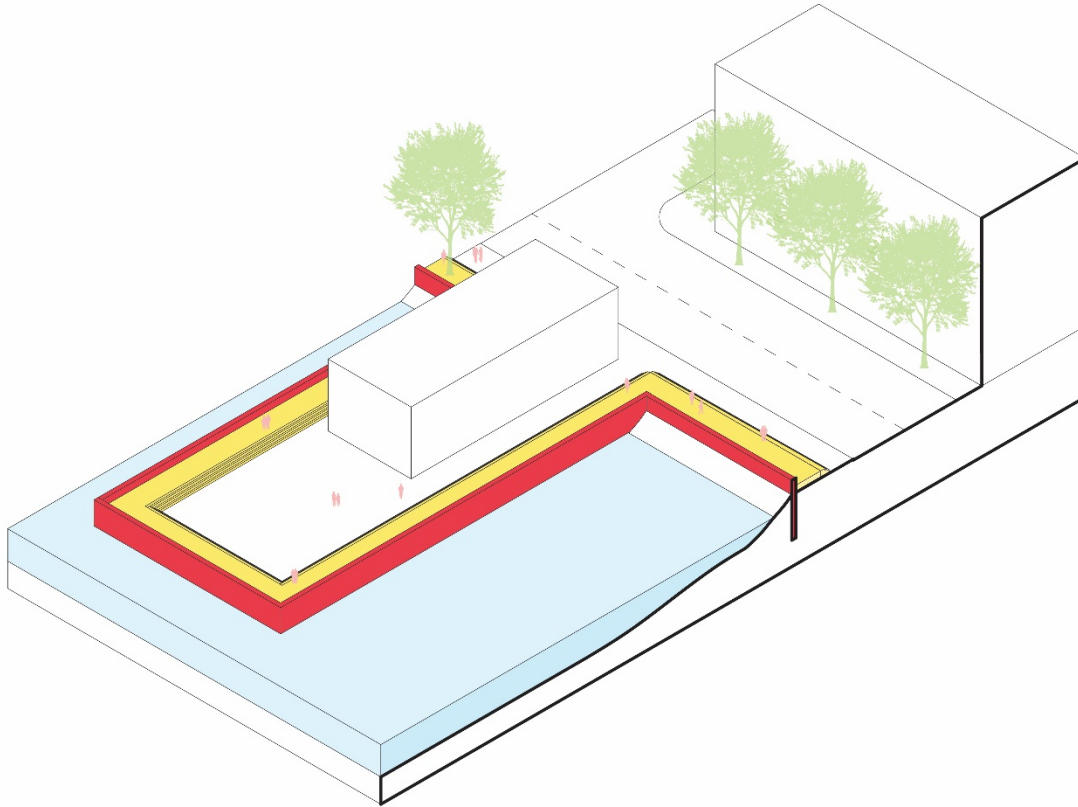
## FEASIBILITY

- COMPLEX INTERFERENCE WITH UTILITIES (BELOW COMMERCIAL)

## ADAPTIVE CAPACITY

- LIMITED ADAPTIVE CAPACITY BEYOND 40" SLR AND 1% STORM

# INTEGRATED WITH HARBORWALK



**City Deck / Green Bay, WI**  
Stoss Landscape Urbanism

## URBAN IMPACTS

- MODERATE BENEFIT TO PUBLIC REALM

## FEASIBILITY

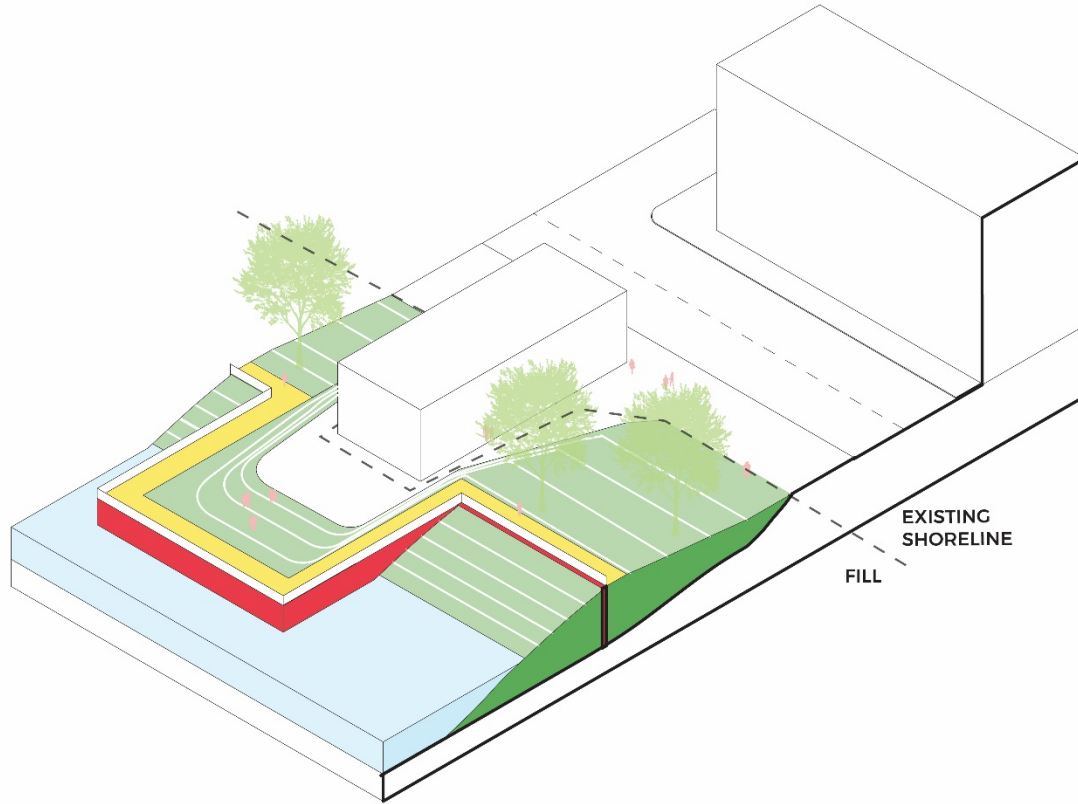
- COMPLEX INTERFERENCE WITH BULKHEADS
- LONG PERIMETER
- REQUIRES COLLABORATION BETWEEN OWNERS

## ADAPTIVE CAPACITY

- SOME ADAPTIVE CAPACITY BEYOND 40" SLR AND 1% STORM



# OUTBOARD WITH SOFT SHORE



**Hunter's Point South Waterfront Park**  
James Corner Field Operations

## URBAN IMPACTS

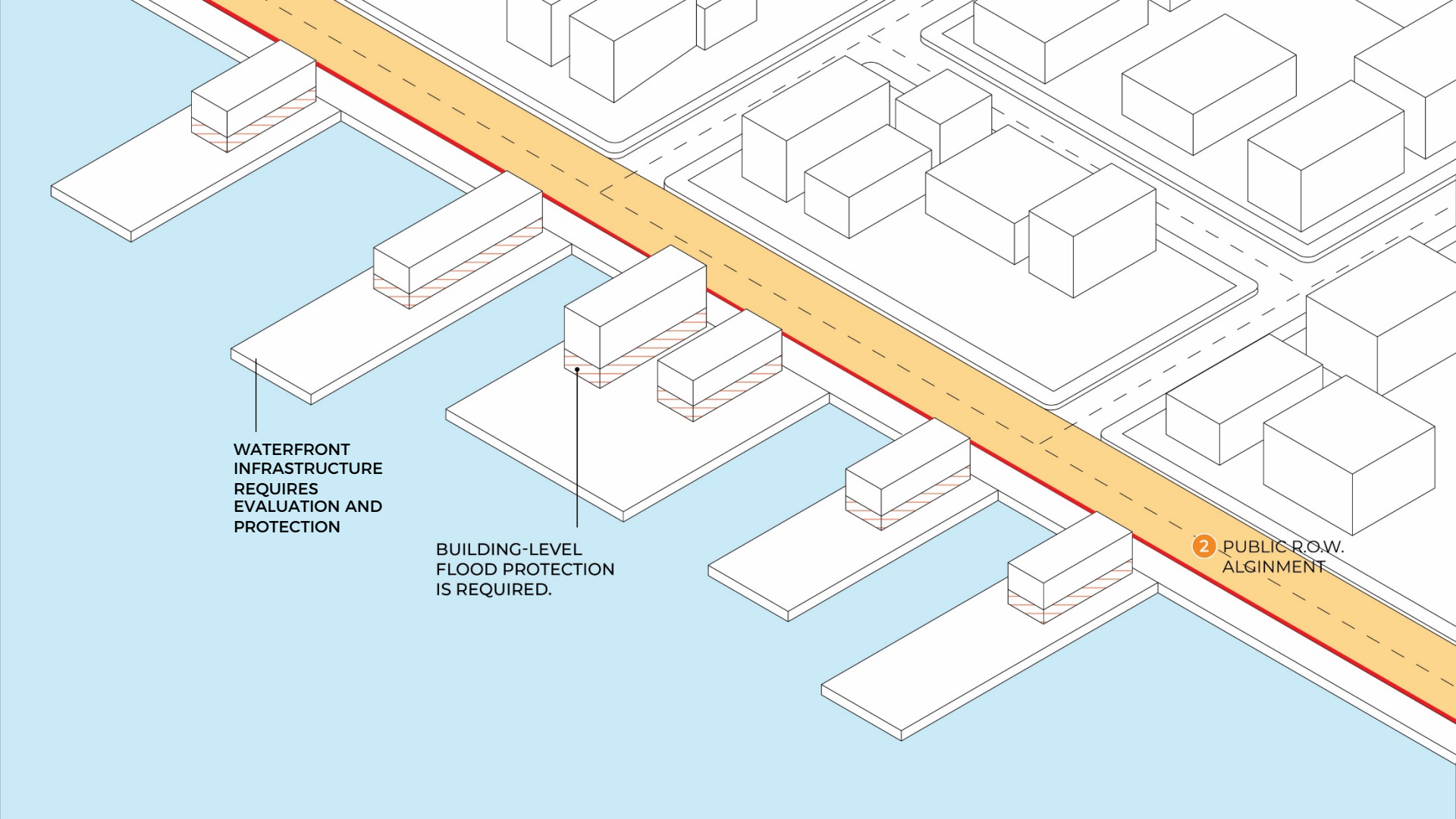
- TRANSFORMATIVE IMPACT ON PUBLIC REALM

## FEASIBILITY

- COMPLEX PERMITTING
- POSSIBILITY FOR EXPANDED FUNCTIONS
- REQUIRES COLLABORATION BETWEEN OWNERS

## ADAPTIVE CAPACITY

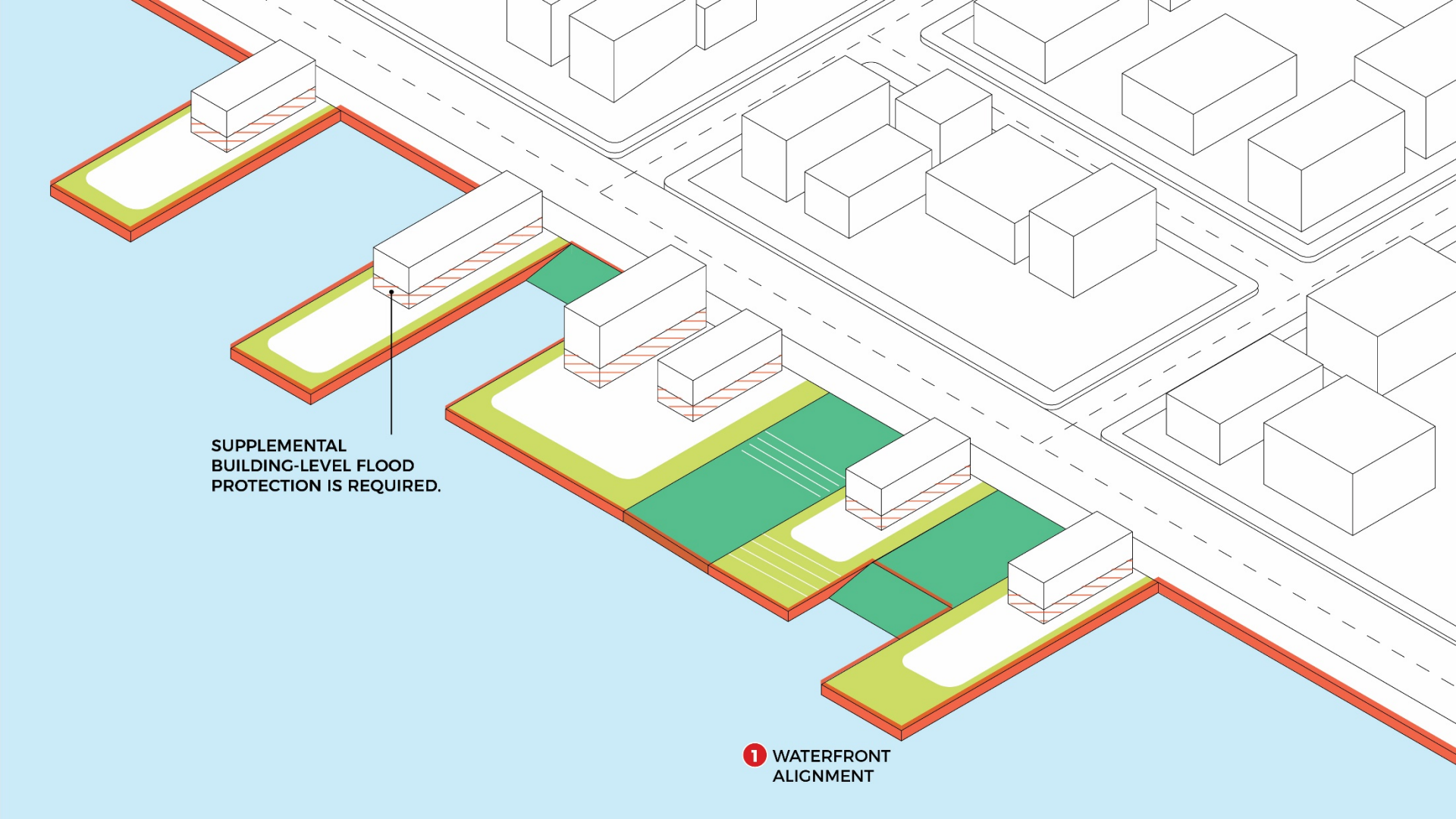
- HIGHER ADAPTIVE CAPACITY



WATERFRONT  
INFRASTRUCTURE  
REQUIRES  
EVALUATION AND  
PROTECTION

BUILDING-LEVEL  
FLOOD PROTECTION  
IS REQUIRED.

2 PUBLIC R.O.W.  
ALIGNMENT

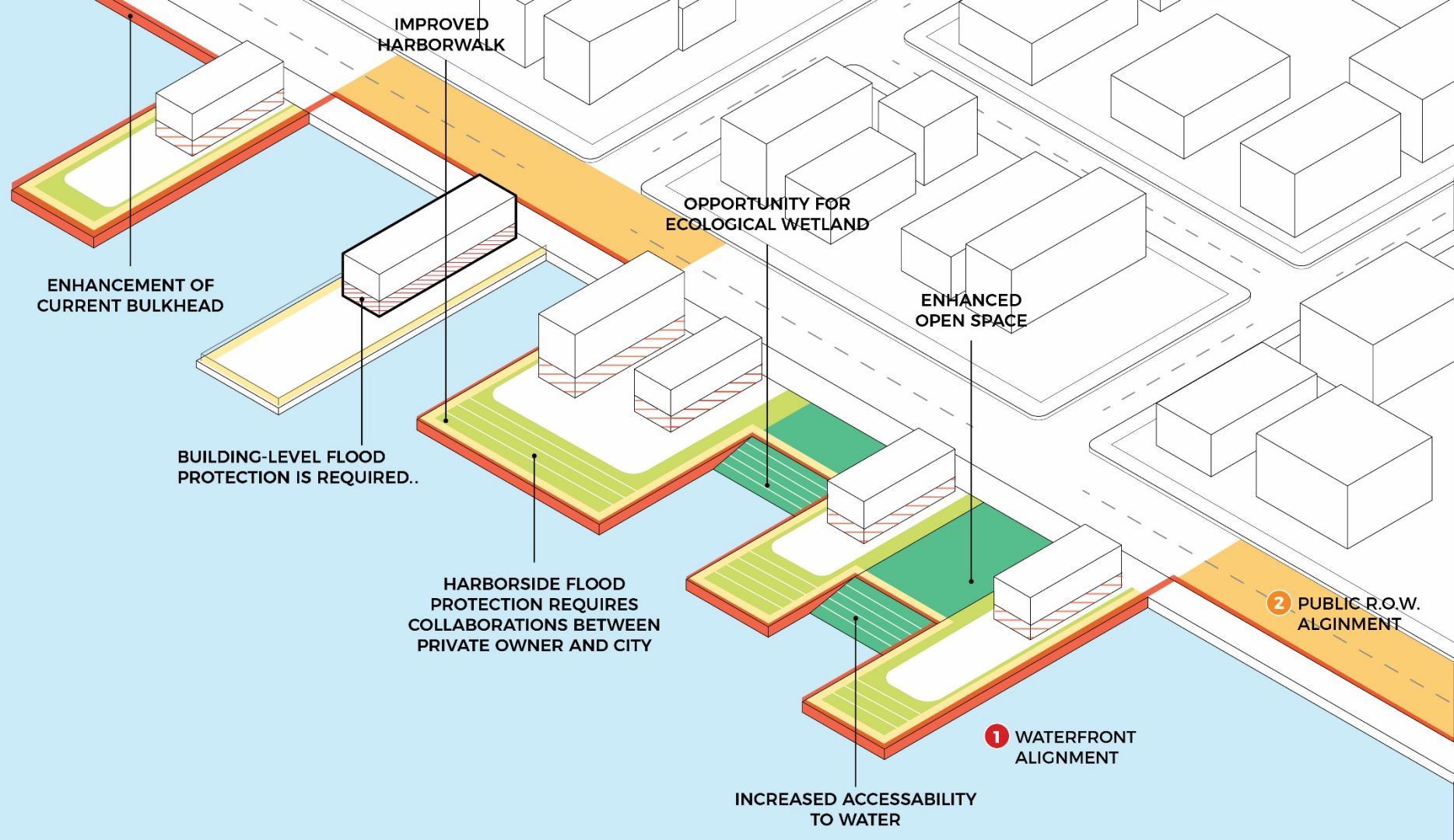


The diagram is an isometric view of a waterfront development. A light blue area at the bottom represents the water. A red line, labeled '1 WATERFRONT ALIGNMENT', runs diagonally across the scene. Along this alignment, several rectangular plots are shown. Each plot has a green base layer, a white top layer, and a red border. On top of these plots are white rectangular buildings. Some buildings have red diagonal hatching on their sides. A dashed line runs parallel to the waterfront alignment. In the background, more buildings are visible on a higher level. A text label 'SUPPLEMENTAL BUILDING-LEVEL FLOOD PROTECTION IS REQUIRED.' with a leader line points to one of the buildings.

**SUPPLEMENTAL  
BUILDING-LEVEL FLOOD  
PROTECTION IS REQUIRED.**

**1 WATERFRONT  
ALIGNMENT**





IMPROVED  
HARBORWALK

ENHANCEMENT OF  
CURRENT BULKHEAD

BUILDING-LEVEL FLOOD  
PROTECTION IS REQUIRED..

HARBORSIDE FLOOD  
PROTECTION REQUIRES  
COLLABORATIONS BETWEEN  
PRIVATE OWNER AND CITY

OPPORTUNITY FOR  
ECOLOGICAL WETLAND

ENHANCED  
OPEN SPACE

INCREASED ACCESSABILITY  
TO WATER

1 WATERFRONT  
ALIGNMENT

2 PUBLIC R.O.W.  
ALIGNMENT

# FLOOD PROTECTION TOOLKIT



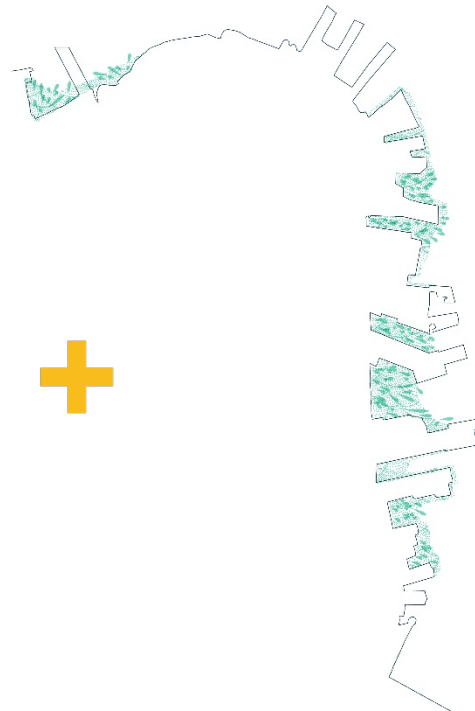
## SPINE

*Raised roads, Harborwalk, bulkheads*



## OPEN SPACES

*Parks, Harborwalk*



## OUTBOARD ELEMENTS

*Fill, living breakwaters, coastal marshes, floating wetlands*

**NEXT STEPS:  
PARTNERSHIPS + TIMELINES**

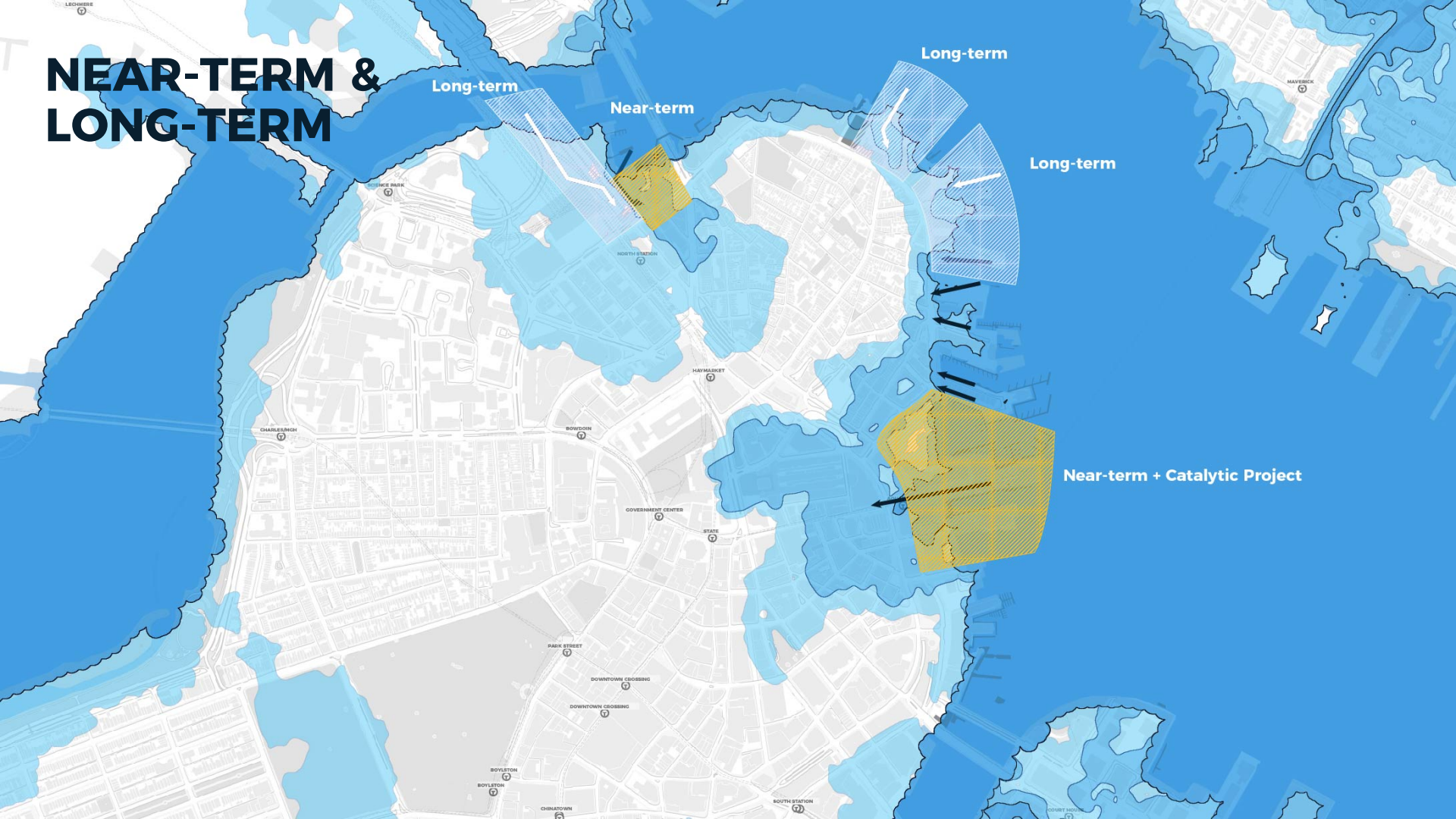


# IMMEDIATE RISK REQUIRES EARLY ACTION



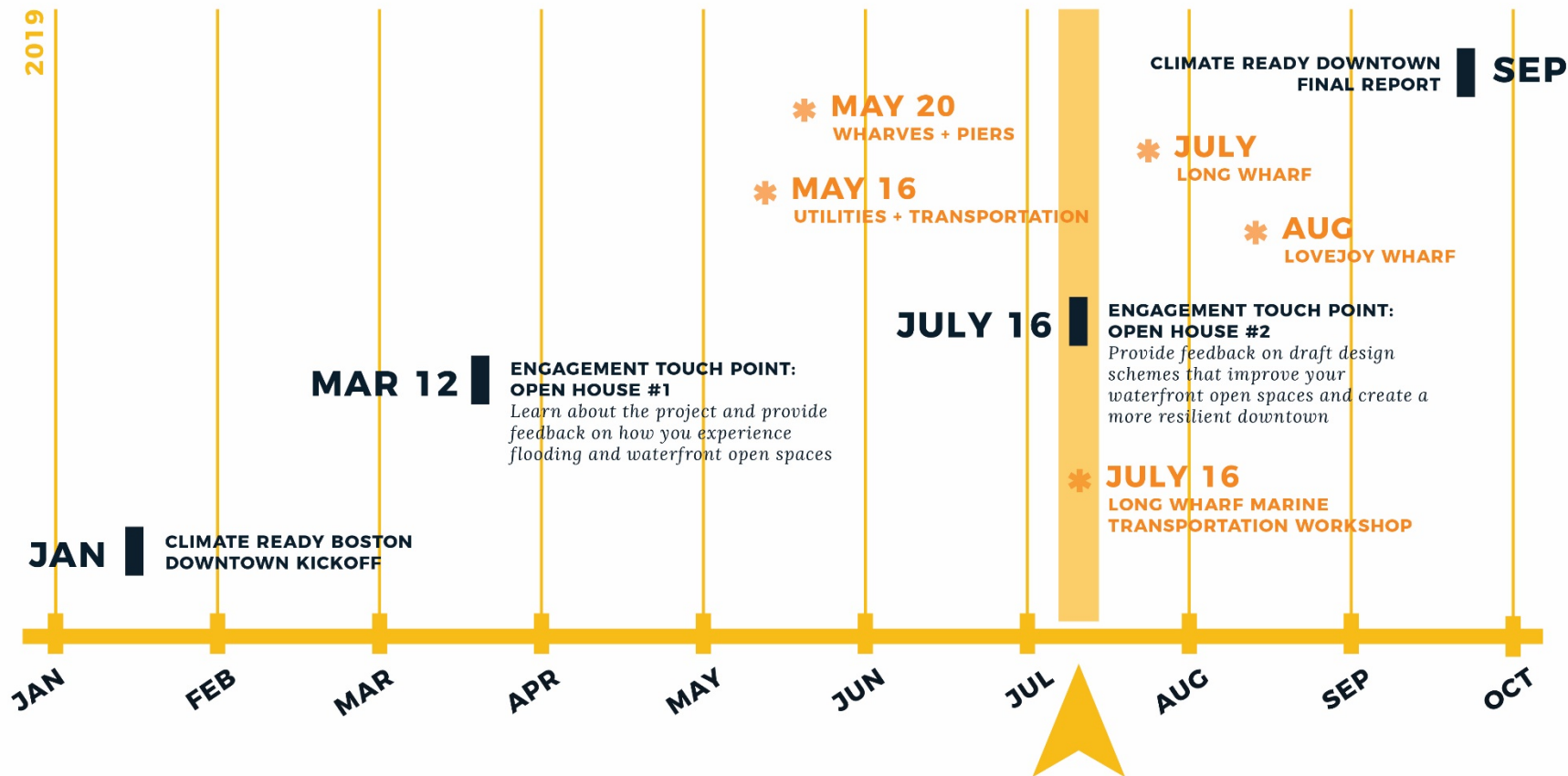


# NEAR-TERM & LONG-TERM



# CLIMATE READY DOWNTOWN AND NORTH END

\* FOCUS GROUP MEETINGS

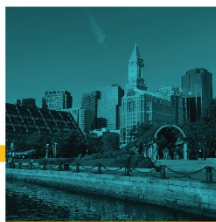




# CLIMATE READY BOSTON



**CLIMATE ACTION  
PLAN (2014)**



**CLIMATE READY  
BOSTON  
FULL REPORT (2016)**



**CLIMATE READY  
EAST BOSTON +  
CHARLESTOWN  
(2017)**



**RESILIENT BOSTON  
HARBOR (2018)**



**CLIMATE READY  
DOWNTOWN + NORTH  
END (In Progress)**

WE ARE HERE!



**CLIMATE READY  
SOUTH BOSTON (2018)**



**MOAKLEY PARK  
VISION PLAN  
(In Progress)**



**CLIMATE READY  
DORCHESTER  
(Coming Soon)**



An aerial photograph of a city harbor, likely New York City, featuring a dense skyline of skyscrapers in the background and a busy waterfront with numerous boats and piers in the foreground. The entire image is covered with a semi-transparent blue filter. The word "Questions?" is written in a large, white, sans-serif font, centered horizontally and slightly above the vertical center of the image.

**Questions?**

## LET'S HEAR FROM YOU!

## 1. LEARN ABOUT CLIMATE READY BOSTON!



## 2. FLOODING IN DOWNTOWN



### 3. WHAT WE'VE HEARD



## 4. FLOOD PROTECTION TOOLKIT



## 5. ALIGNMENT SUBDISTRICTS + SURVEY

