

BPDA Climate Resiliency Planning

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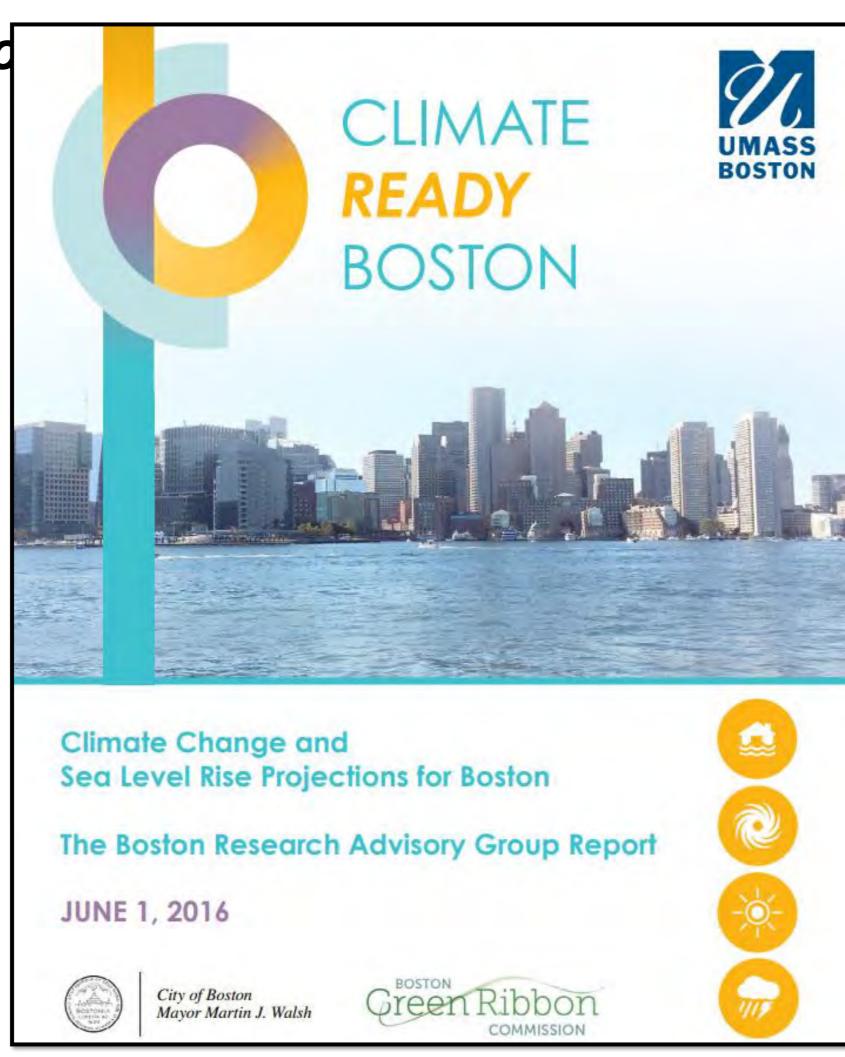
Department of Climate Change & Environmental Planning



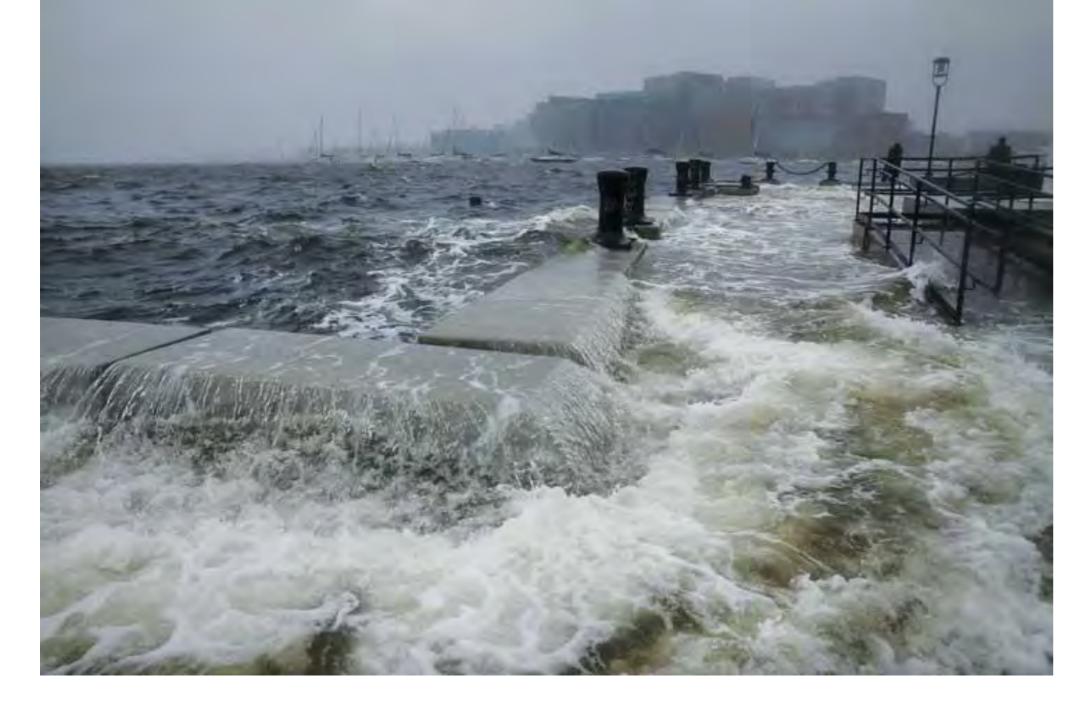
IMPACTS ARE HAPPENING

Boston Research Adviso Group:

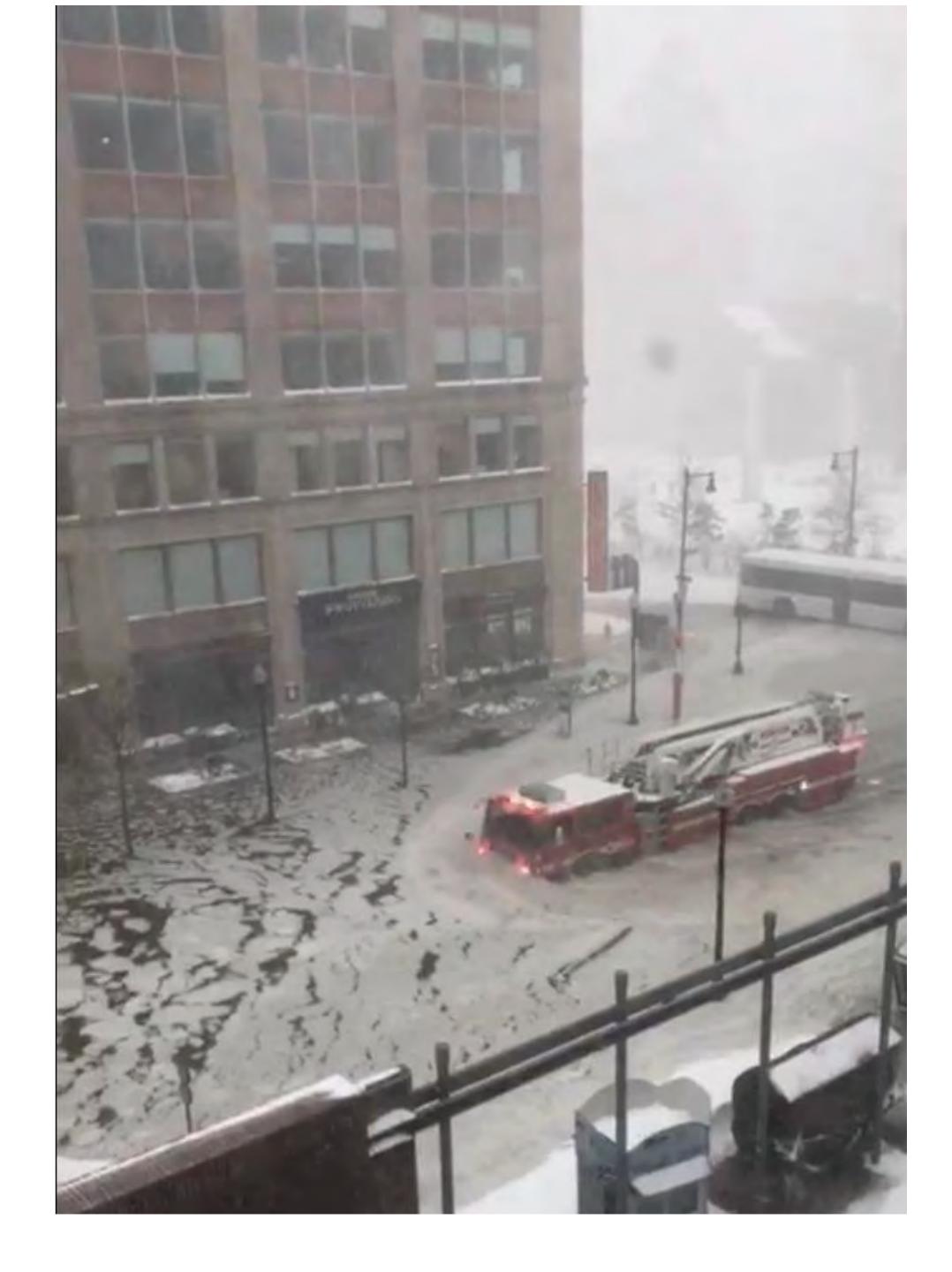
UMASS BOSTON UMASS AMHERST UMASS LOWELL HARVARD MIT BU NORTHEASTERN **TUFTS** RUTGERS CORNELL **NOAA**









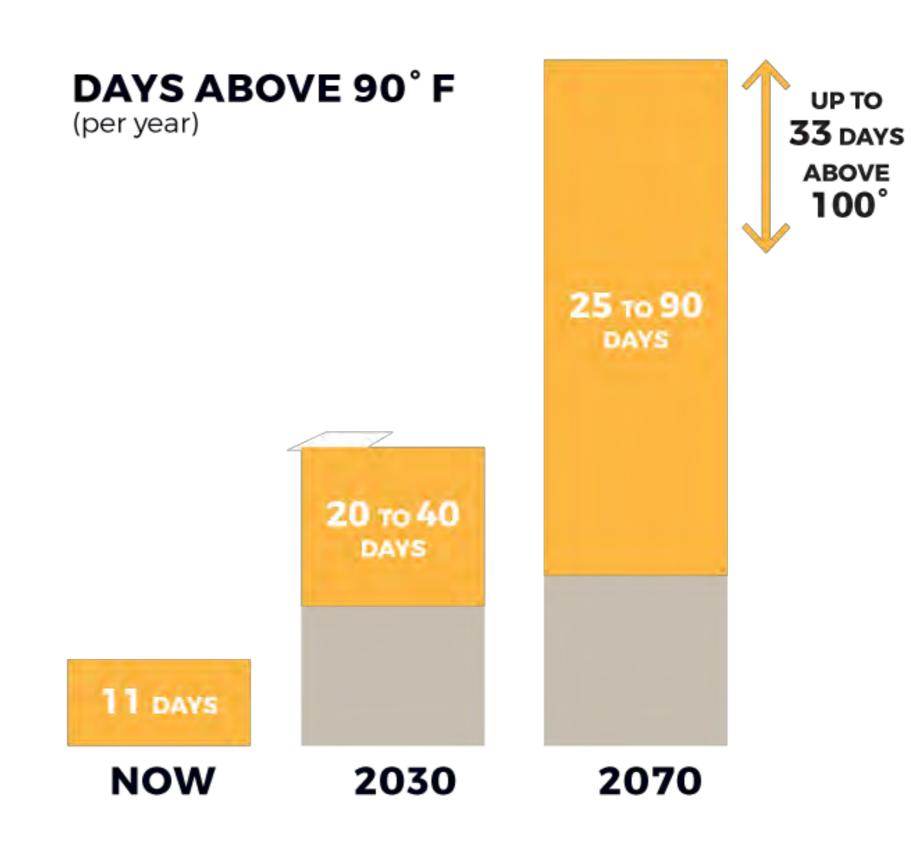




MORE HOT DAYS

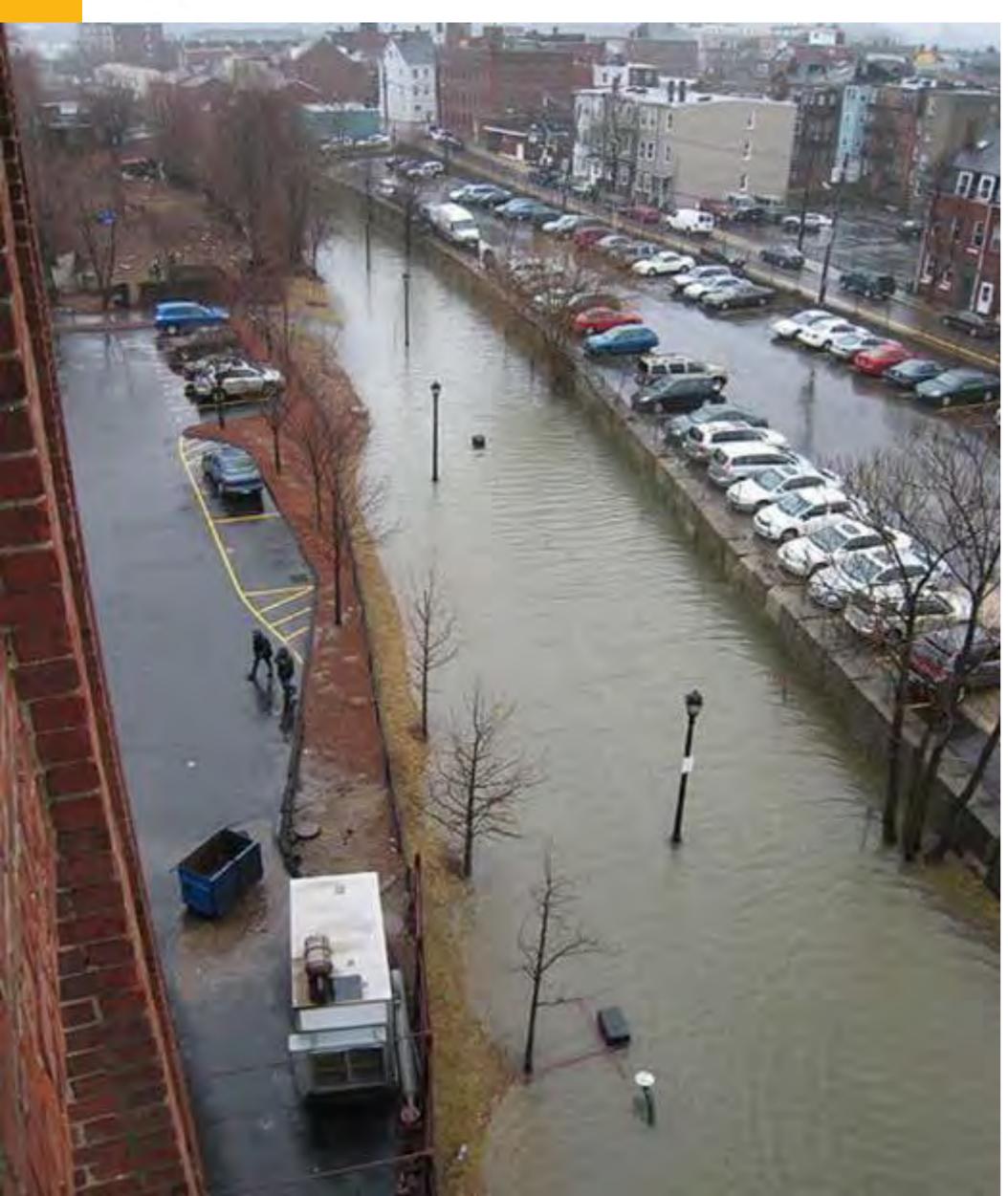


Boston's summers may be as hot as Washington, D.C's in 50 years, and like Birmingham Alabama's in 80.

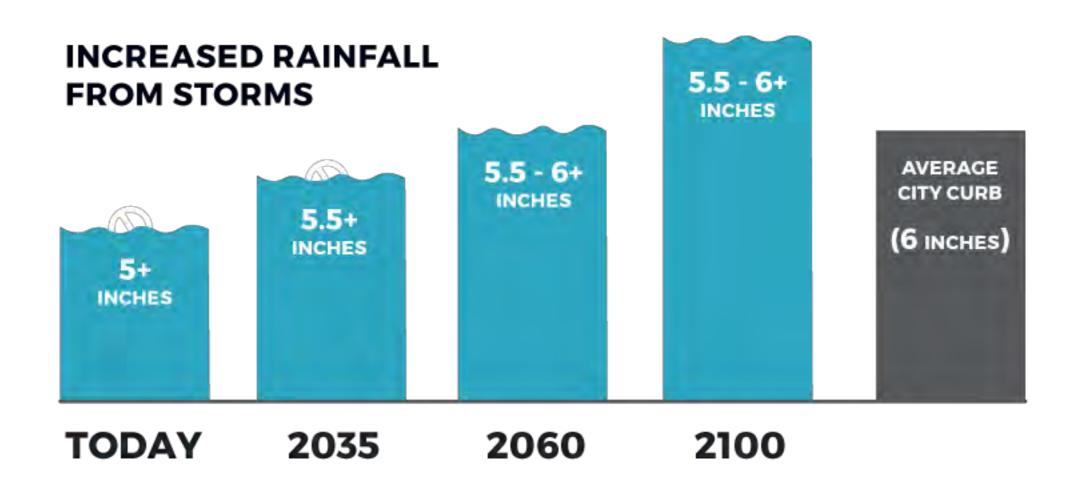




INCREASED EXTREME PRECIPITATION



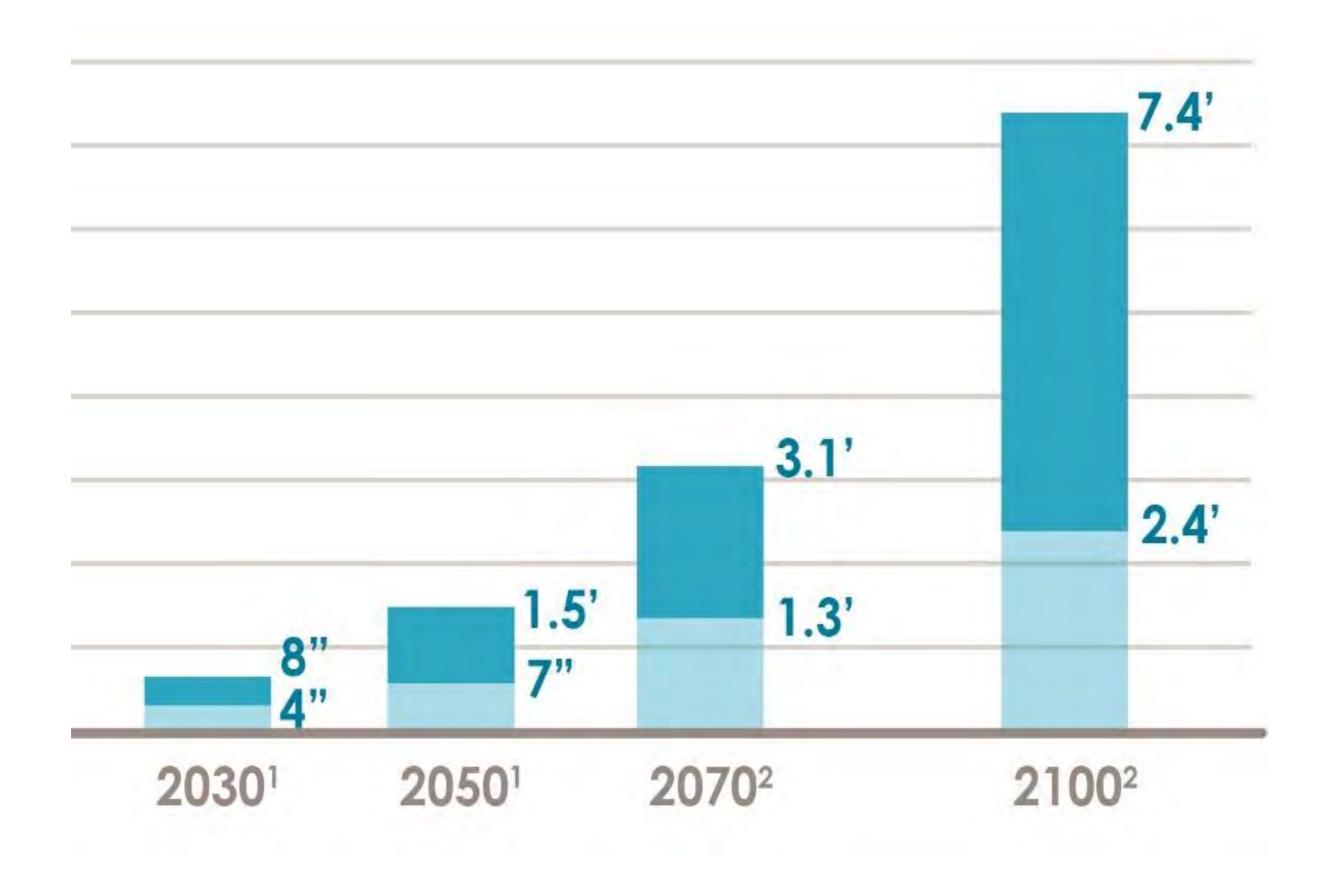
By 2060, heavy precipitation events could drop more than 6 inches of water within 24 hours, which is the height of an average city curb, and 20% more than what we get now.



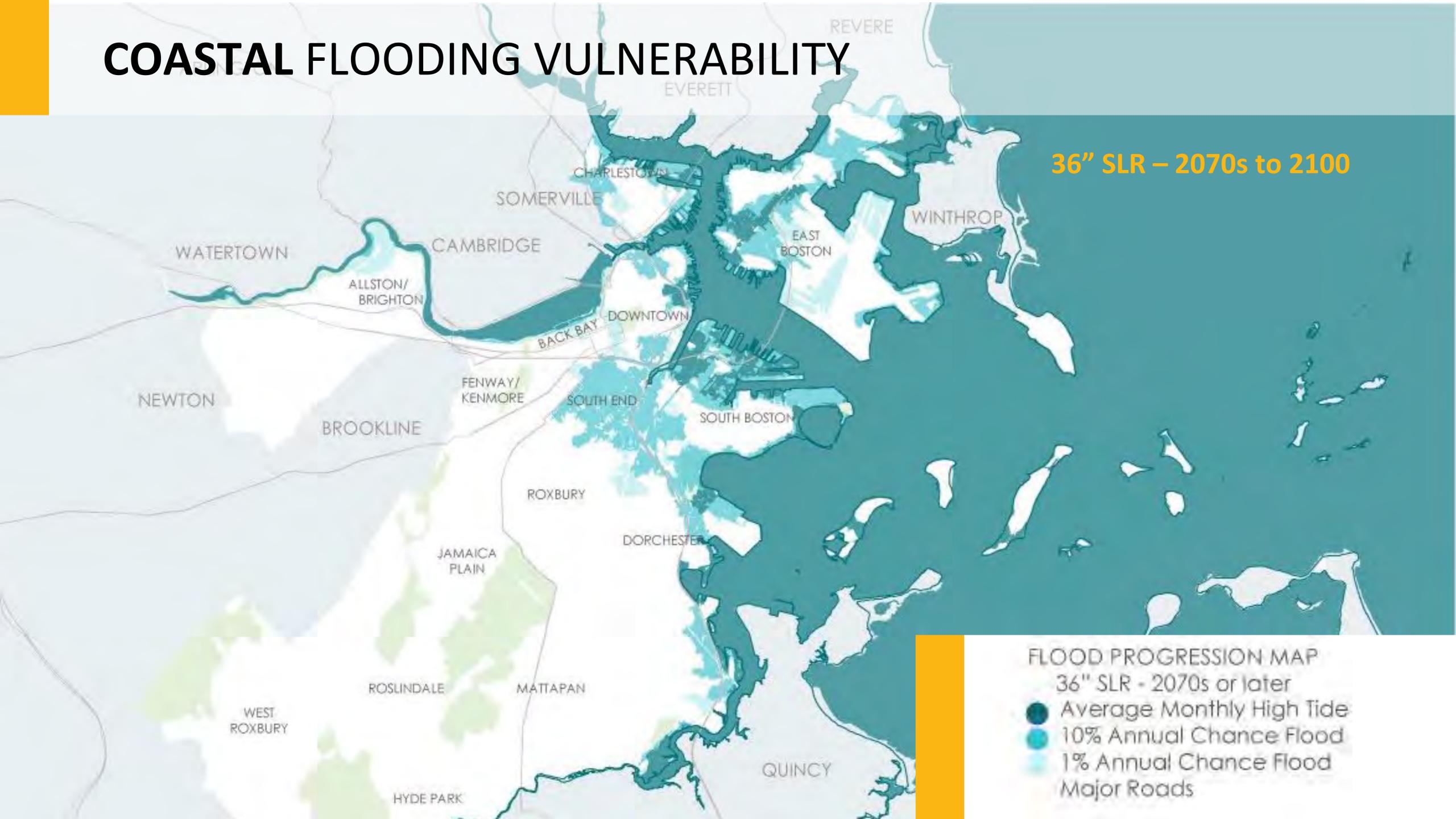


GREATER AMOUNTS OF SEA LEVEL RISE

BOSTON RELATIVE SEA-LEVEL RISE PROJECTIONS



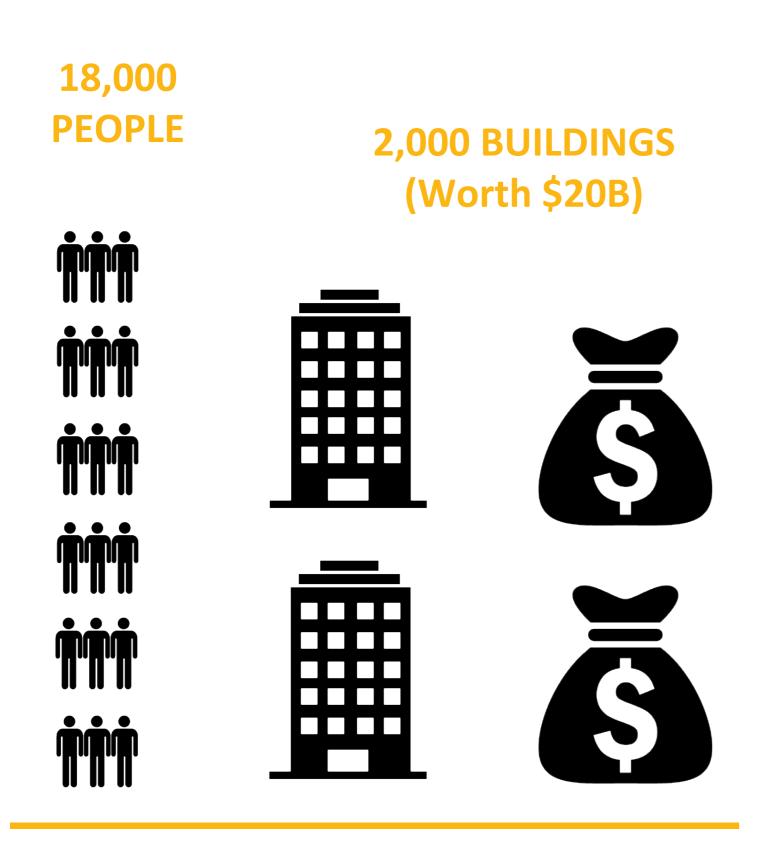
Without reducing emissions, at least **3 feet** of sea level rise is likely during the second half of the century.

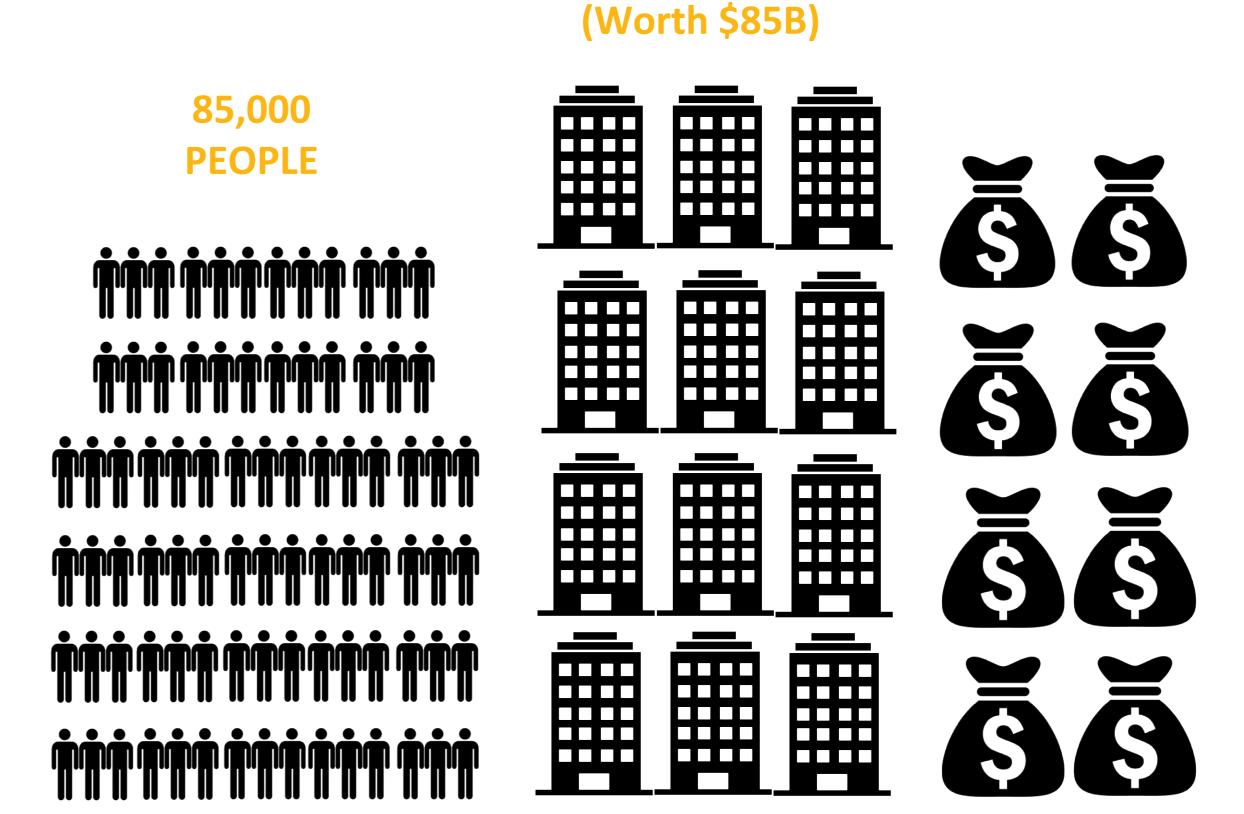


WHAT'S AT STAKE?

People and Buildings Exposed to a 1% Flood Risk

Boston is the world's 8th most vulnerable city to financial loss from sea level rise, and 4th in the US.



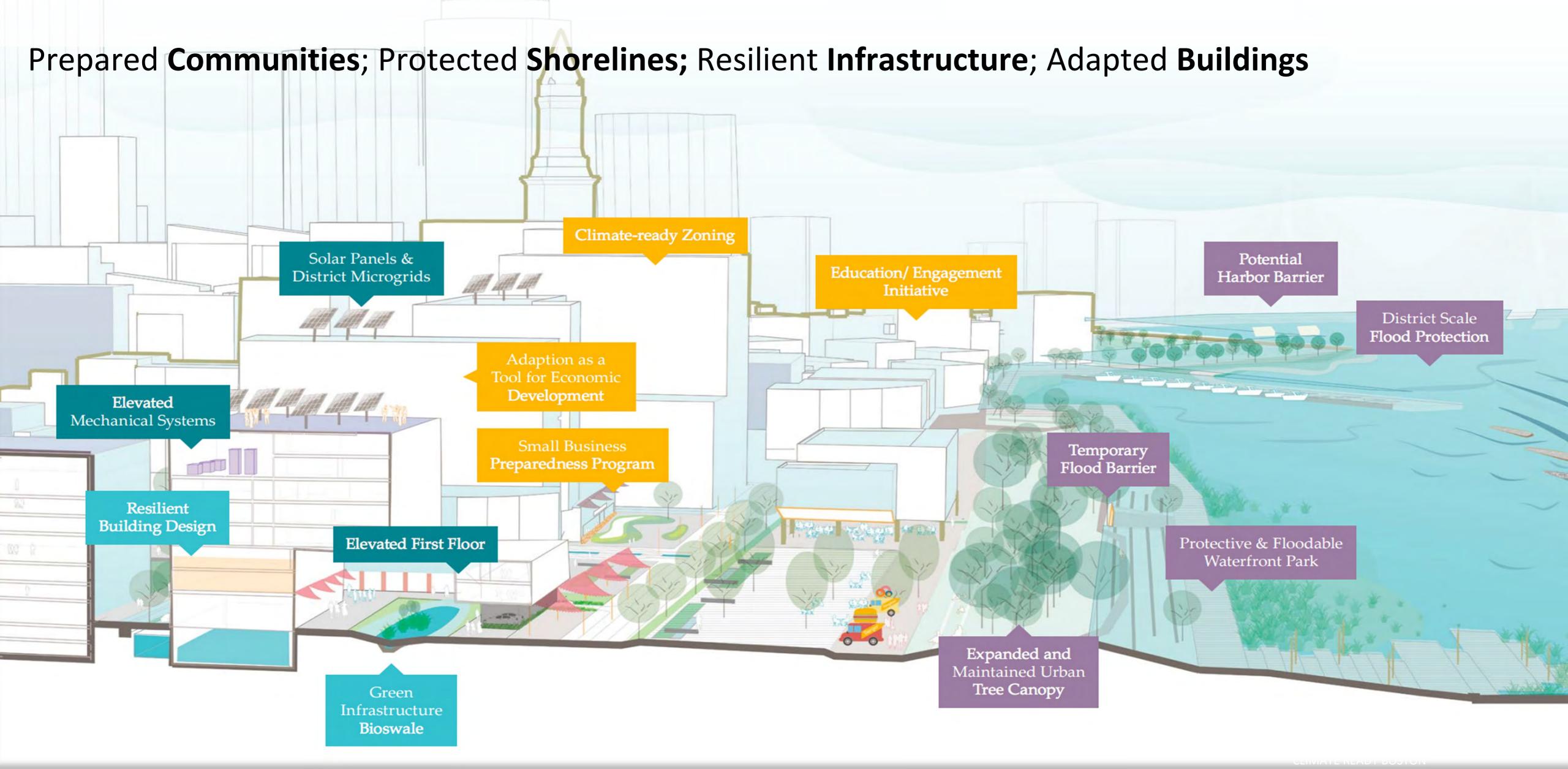


12,000 BUILDINGS

2030+

2070+

CLIMATE READY RESILIENCY INITIATIVES



Resilient Boston Harbor



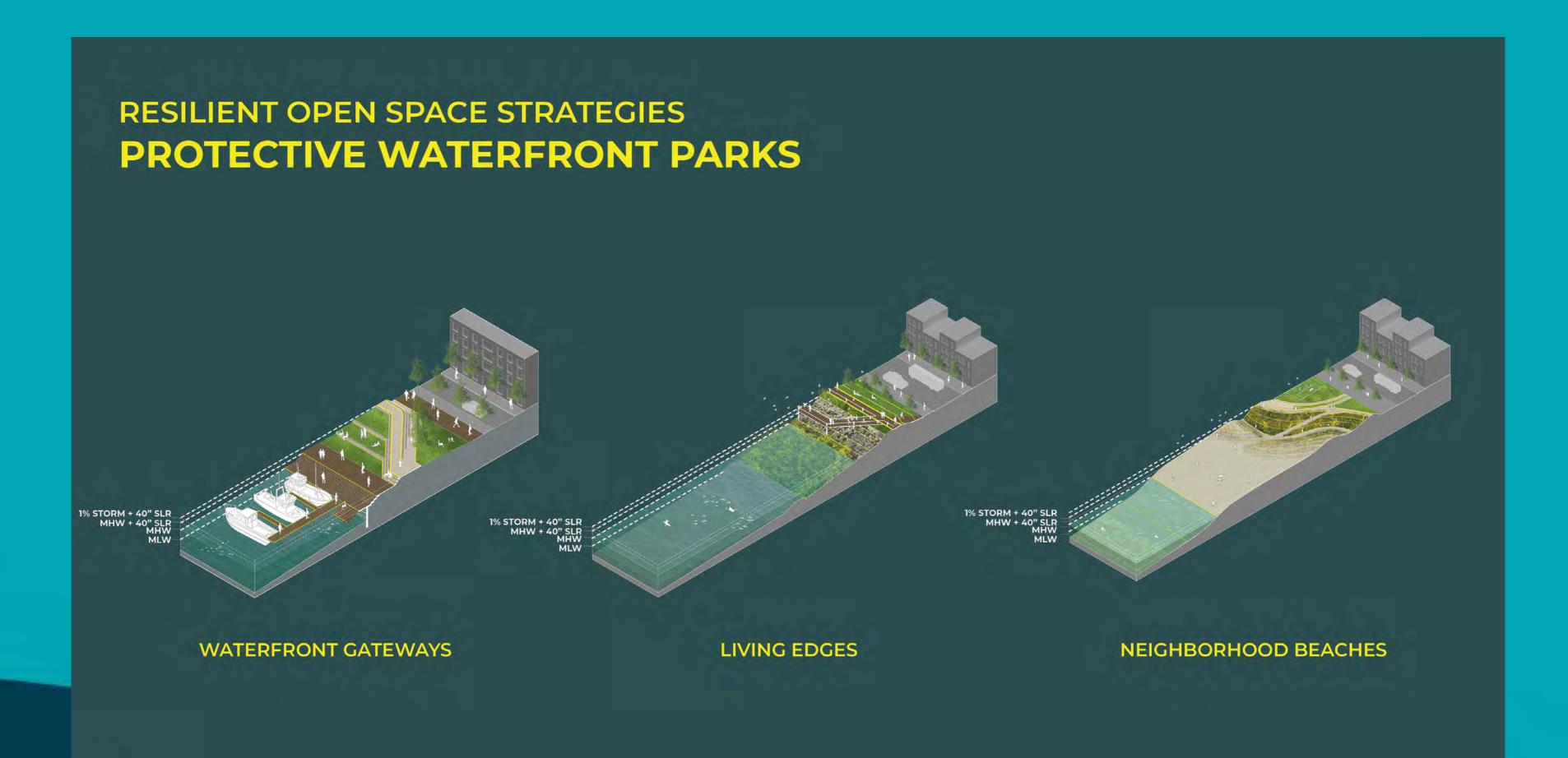


RESILIENT OPEN SPACE STRATEGIES ELEVATED HARBORWALKS







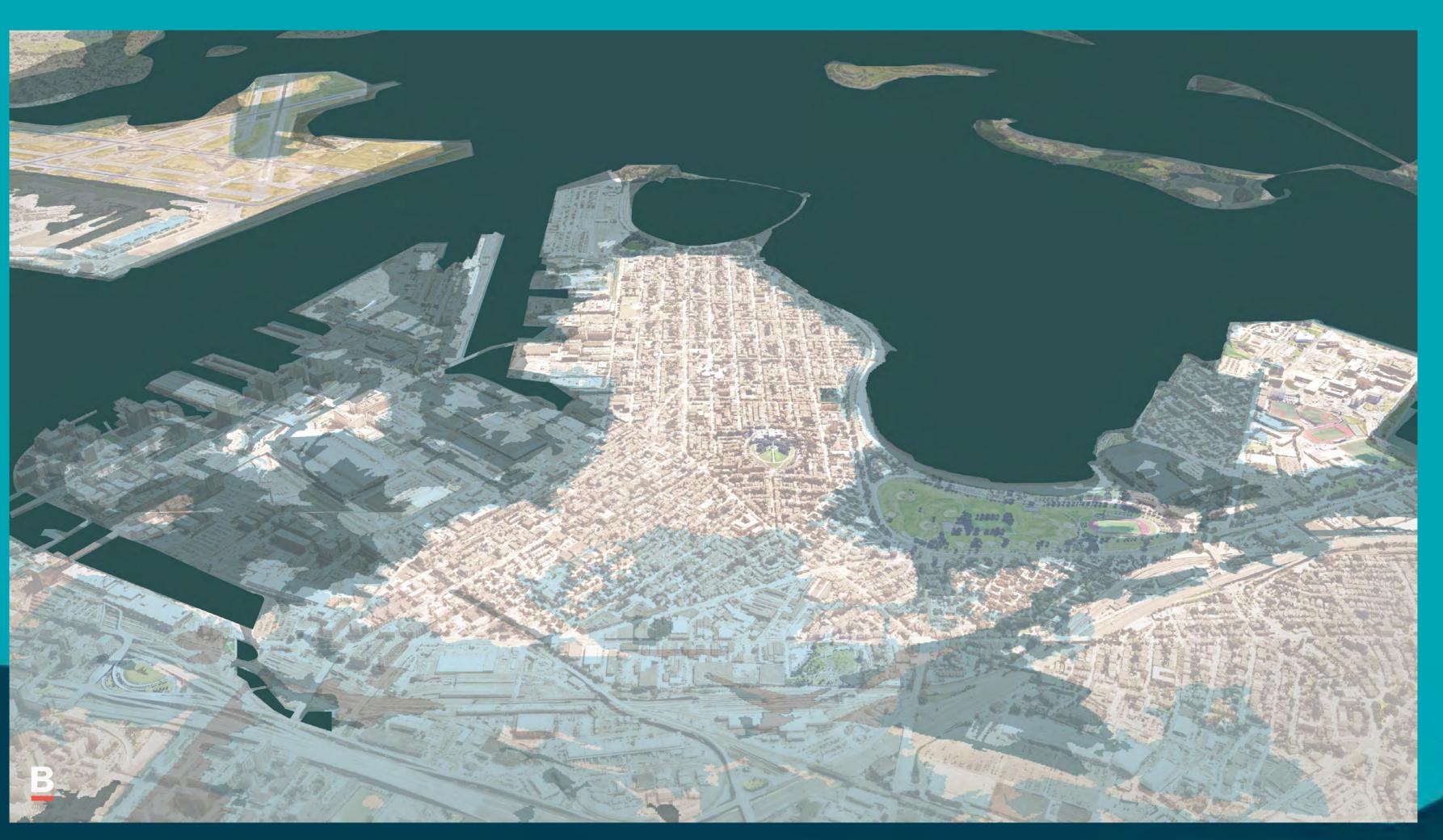


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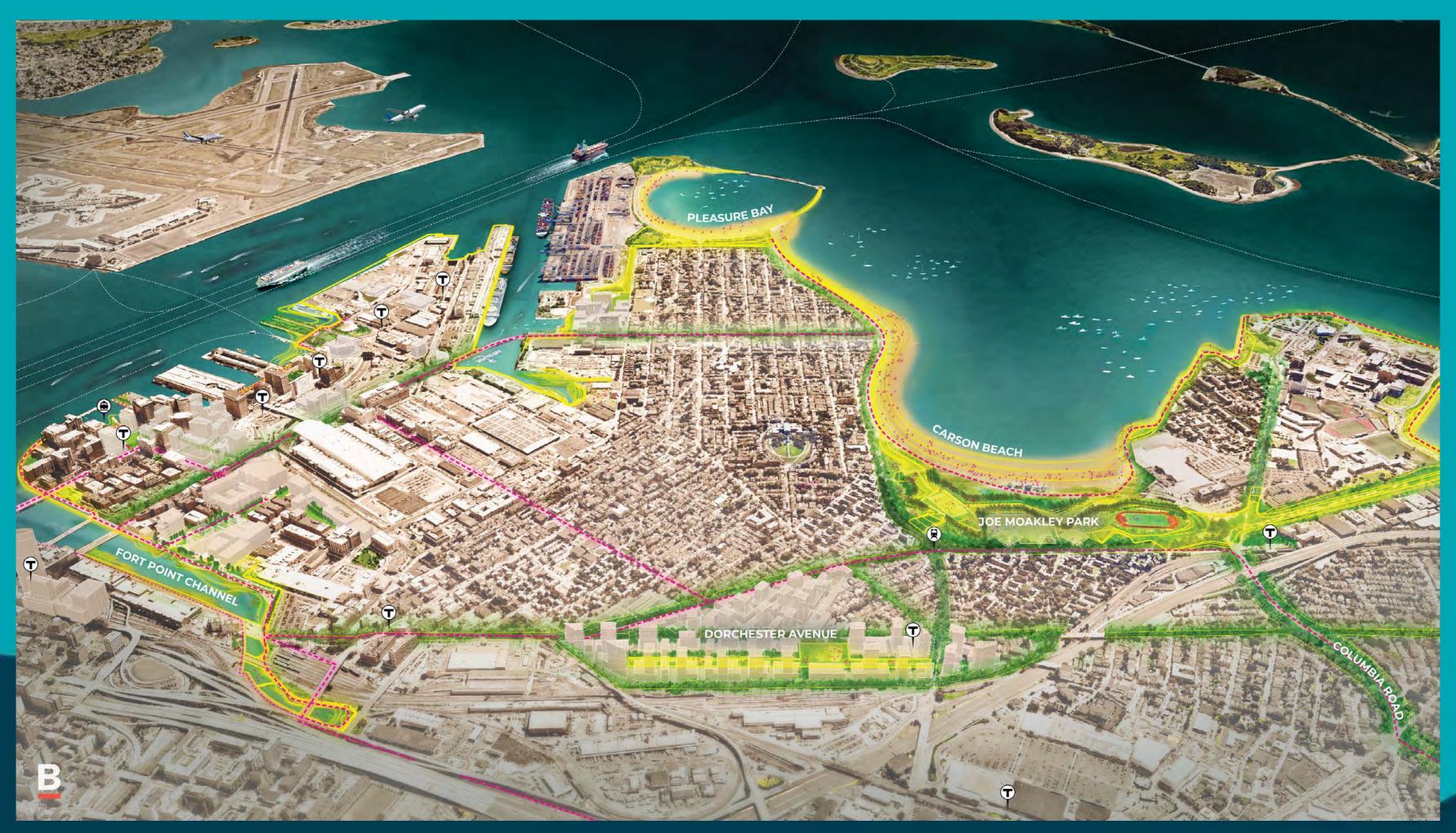










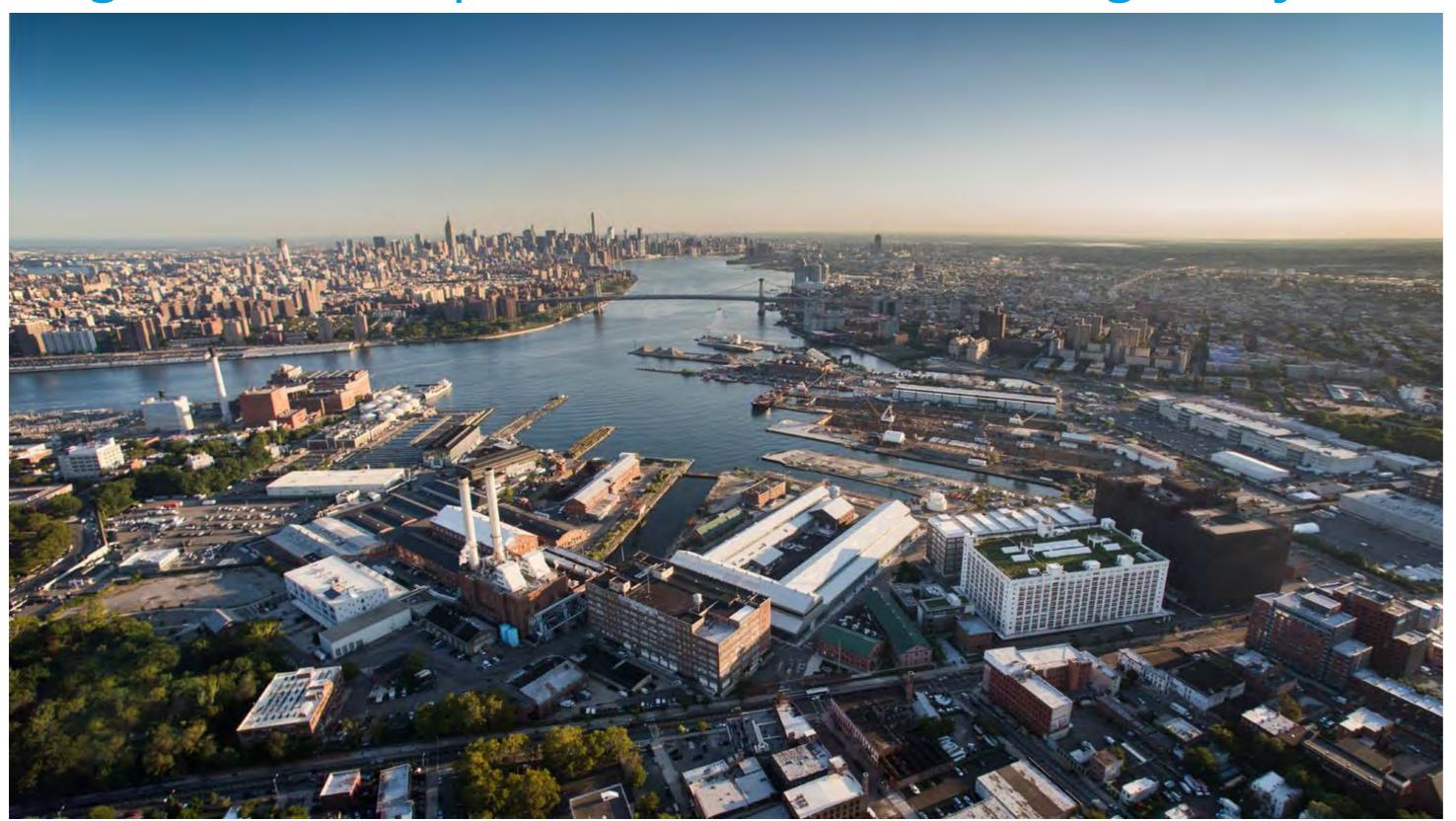






Imagine Boston 2030 Waterfront Citywide Opportunities

5. Strengthen and expand waterfront housing and job centers



"Developments on the waterfront should include both market-rate and affordable housing, especially in East and South Boston."

- Citywide Waterfront Working Group Member "Maintain marine industrial character while adding more places to visit/eat."

- East Boston residentvia online mappingcomments

Inspiration: Brooklyn Navy Yard

Imagine Boston 2030 Waterfront Citywide Opportunities

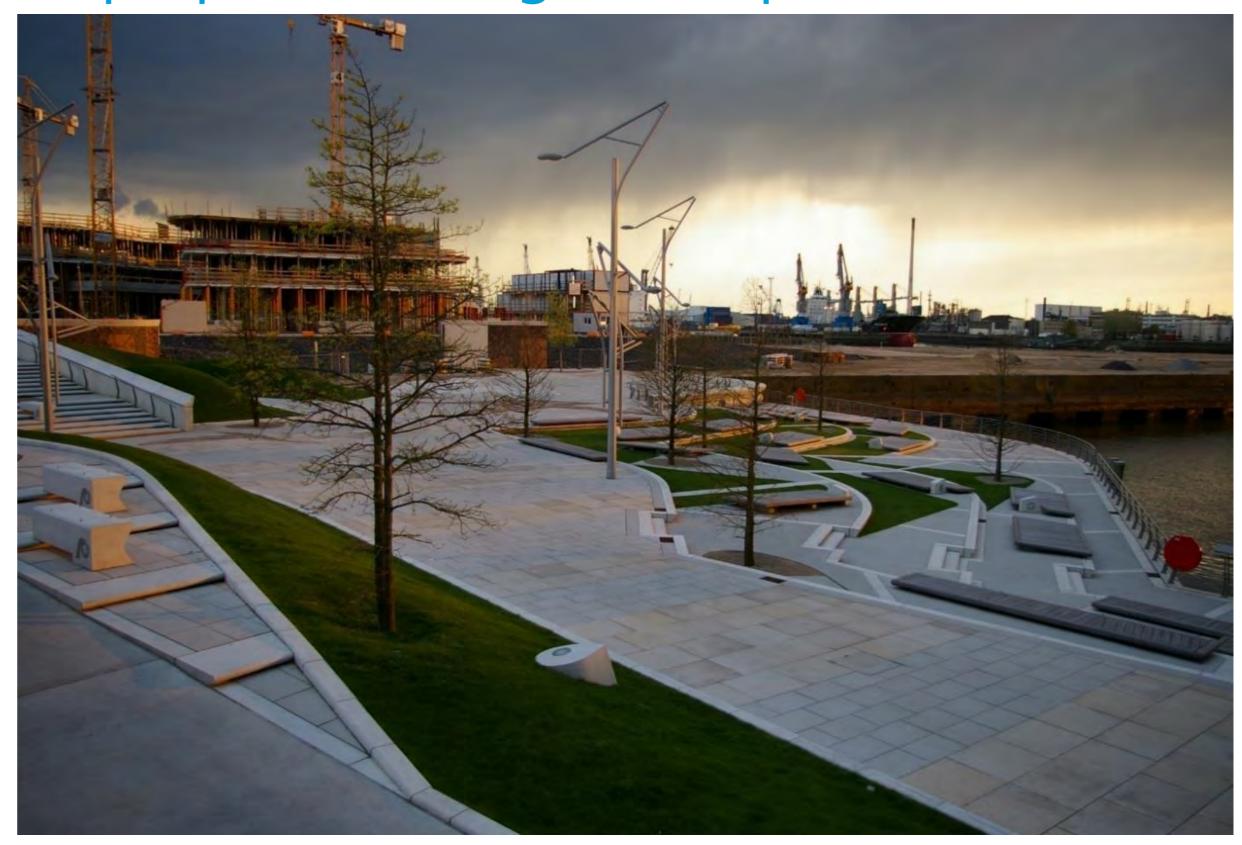
6. Develop local climate resilience plans to prepare existing and expanded

neighborhoods

"Both green and gray infrastructure are necessary. Boston has existing green assets that can be enhanced to better serve as flood protection infrastructure, such as Belle Isle Marsh and Sales Creek."

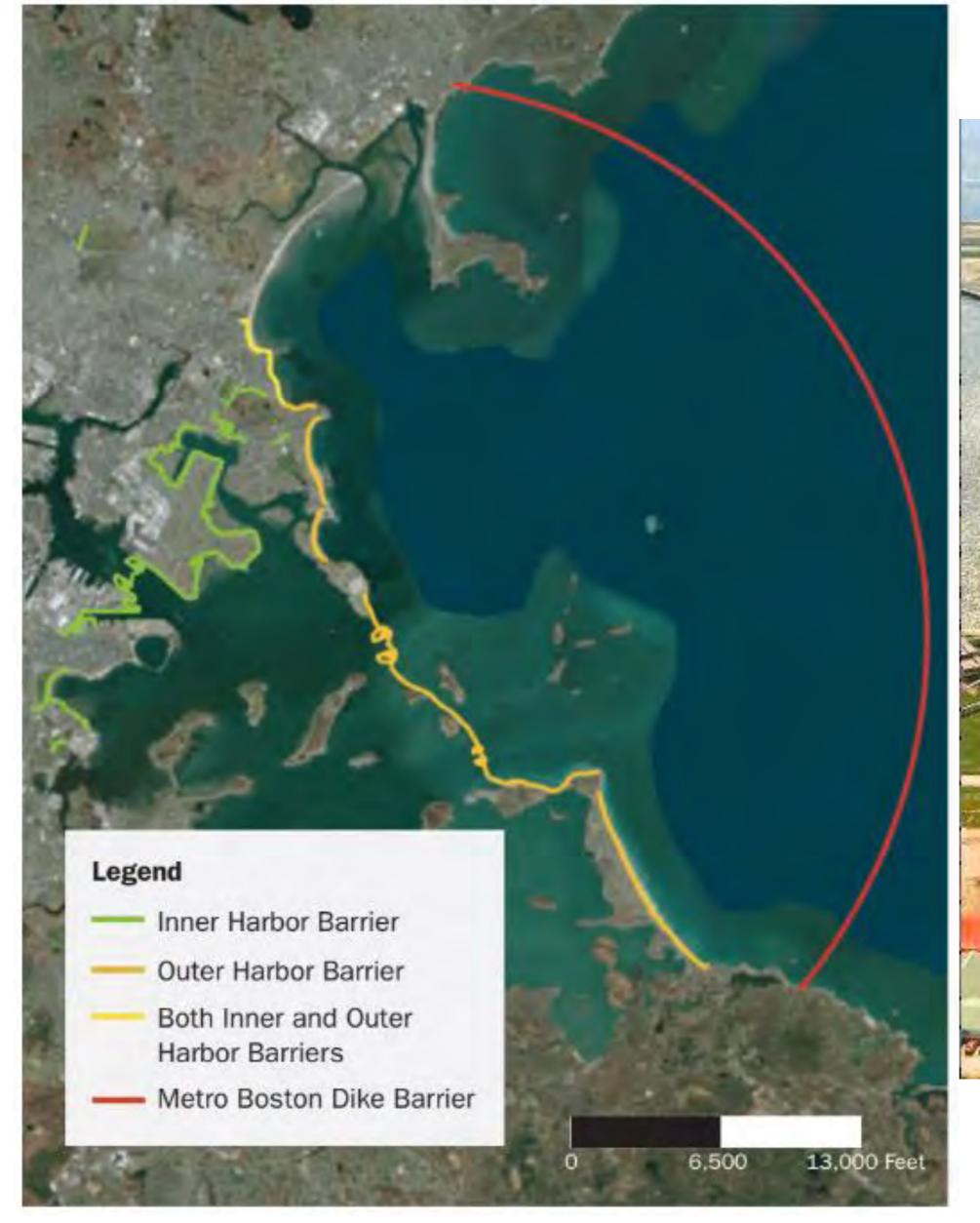
- Citywide Waterfront Working Group Member "Better prepare infrastructure for climate change-related issues."

Roxbury resident via text message

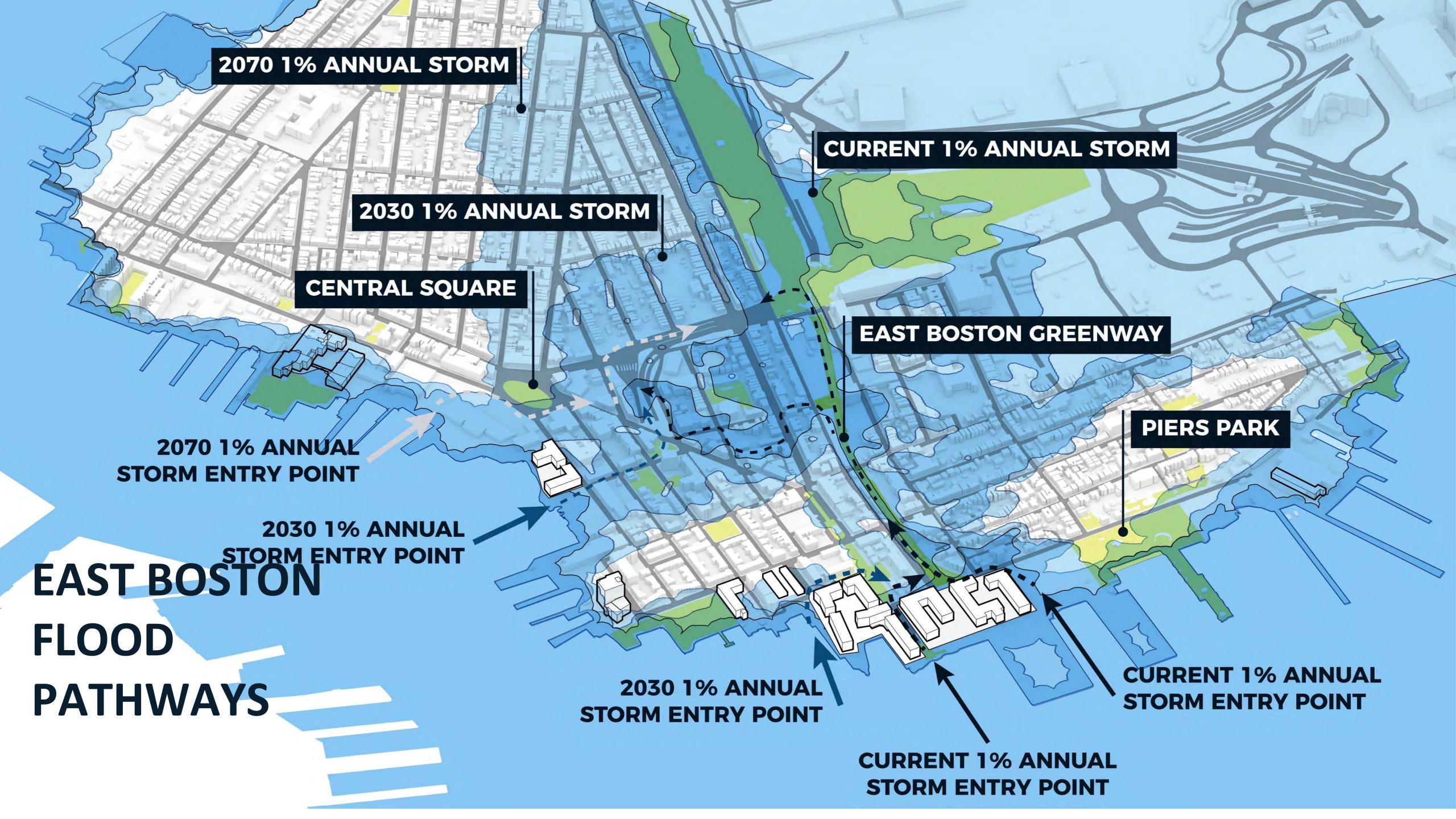


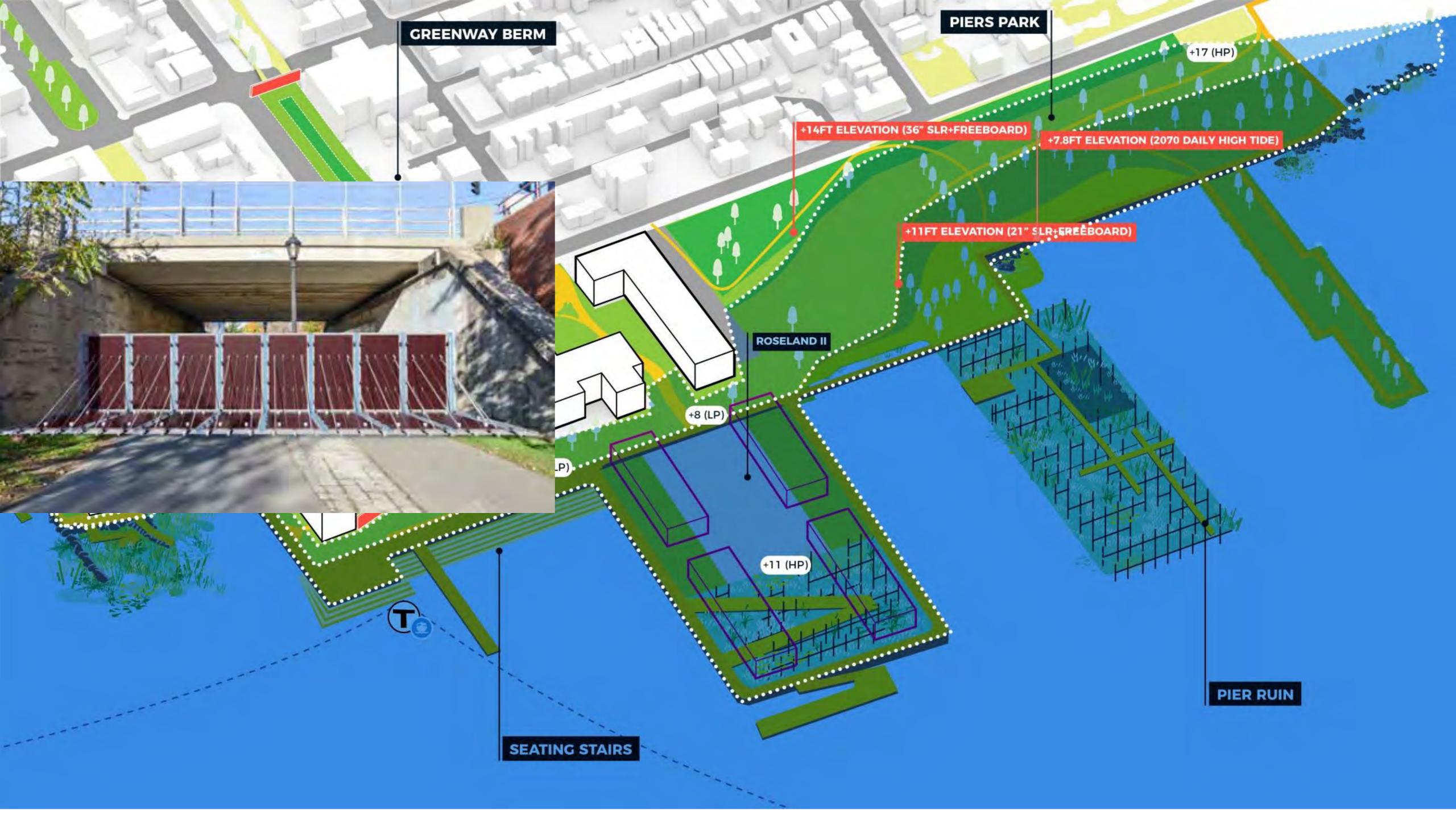
Inspiration: HafenCity, Hamburg

Barrier Alternatives in Boston Harbor

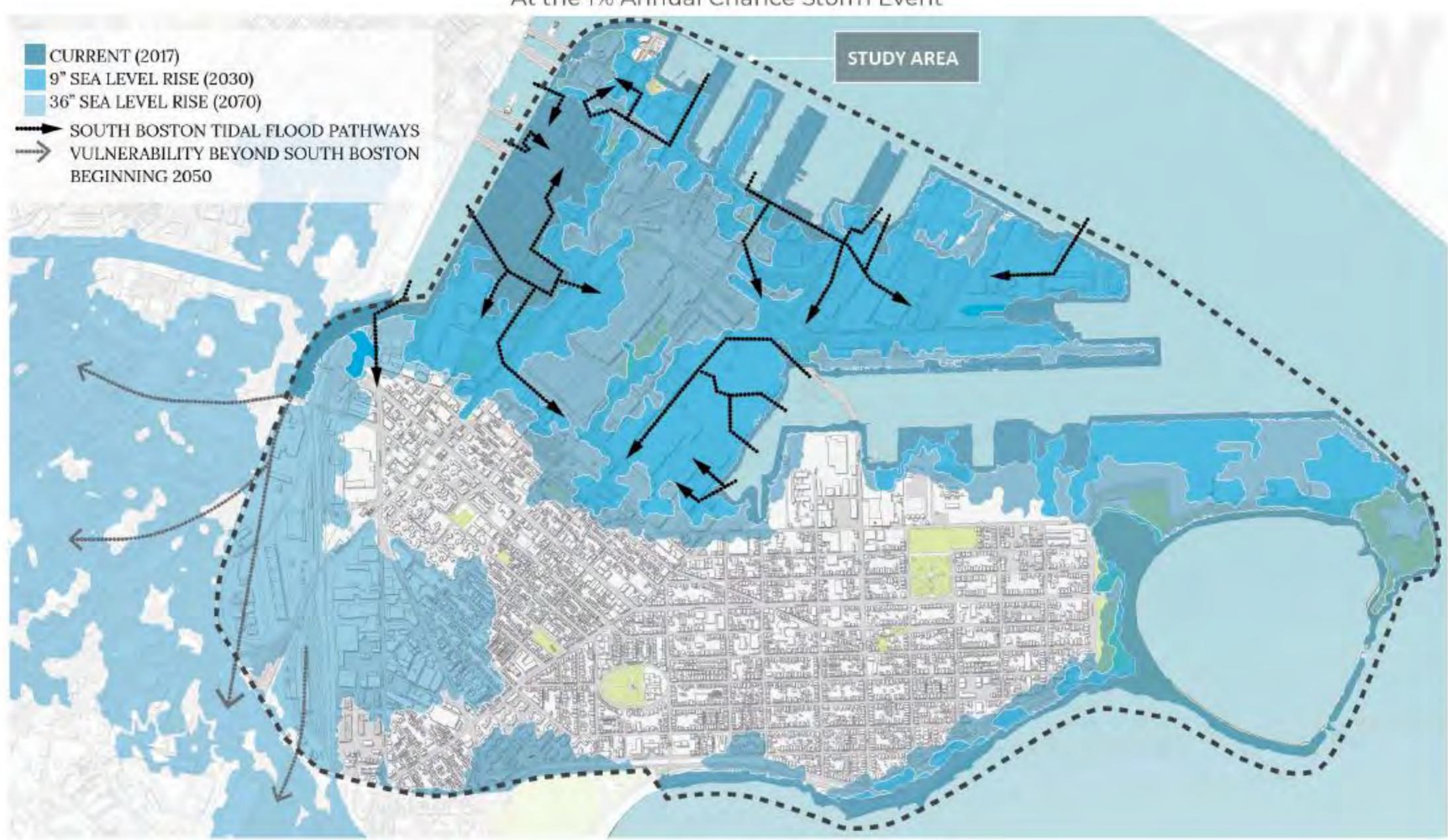


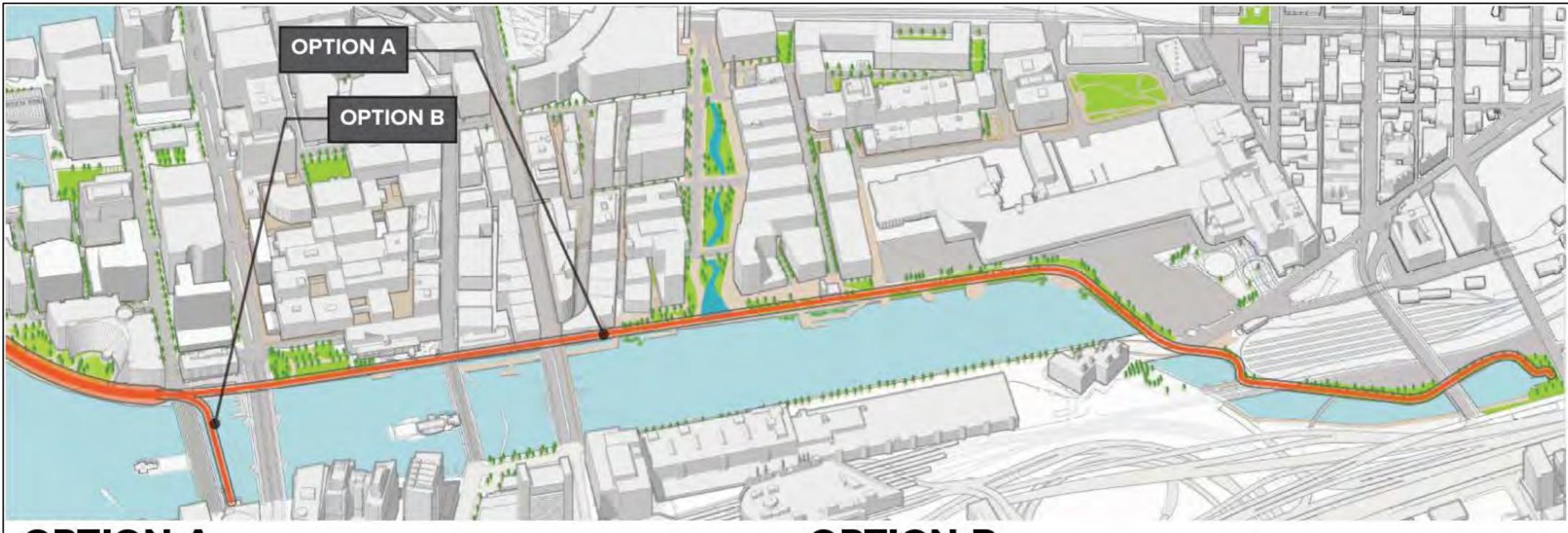






PROBABLE FUTURE STORM FLOOD EXTENTS At the 1% Annual Chance Storm Event





OPTION A

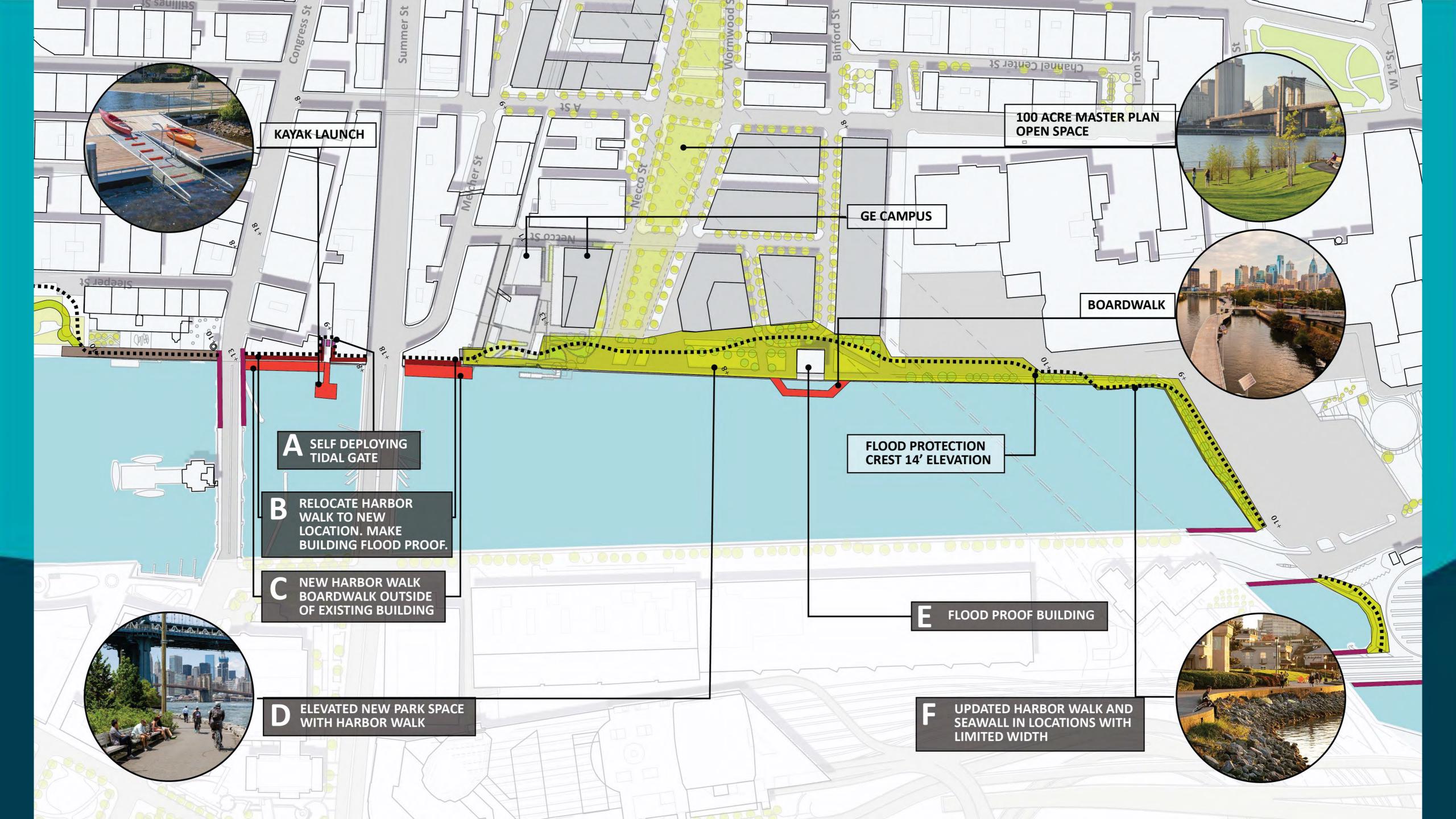
PROPOSED STORMWATER PRACEDAGE PROPOSED PR

Option A uses both planned development as well as opportunities for recreation to increase flood protection along Fort Point Channel

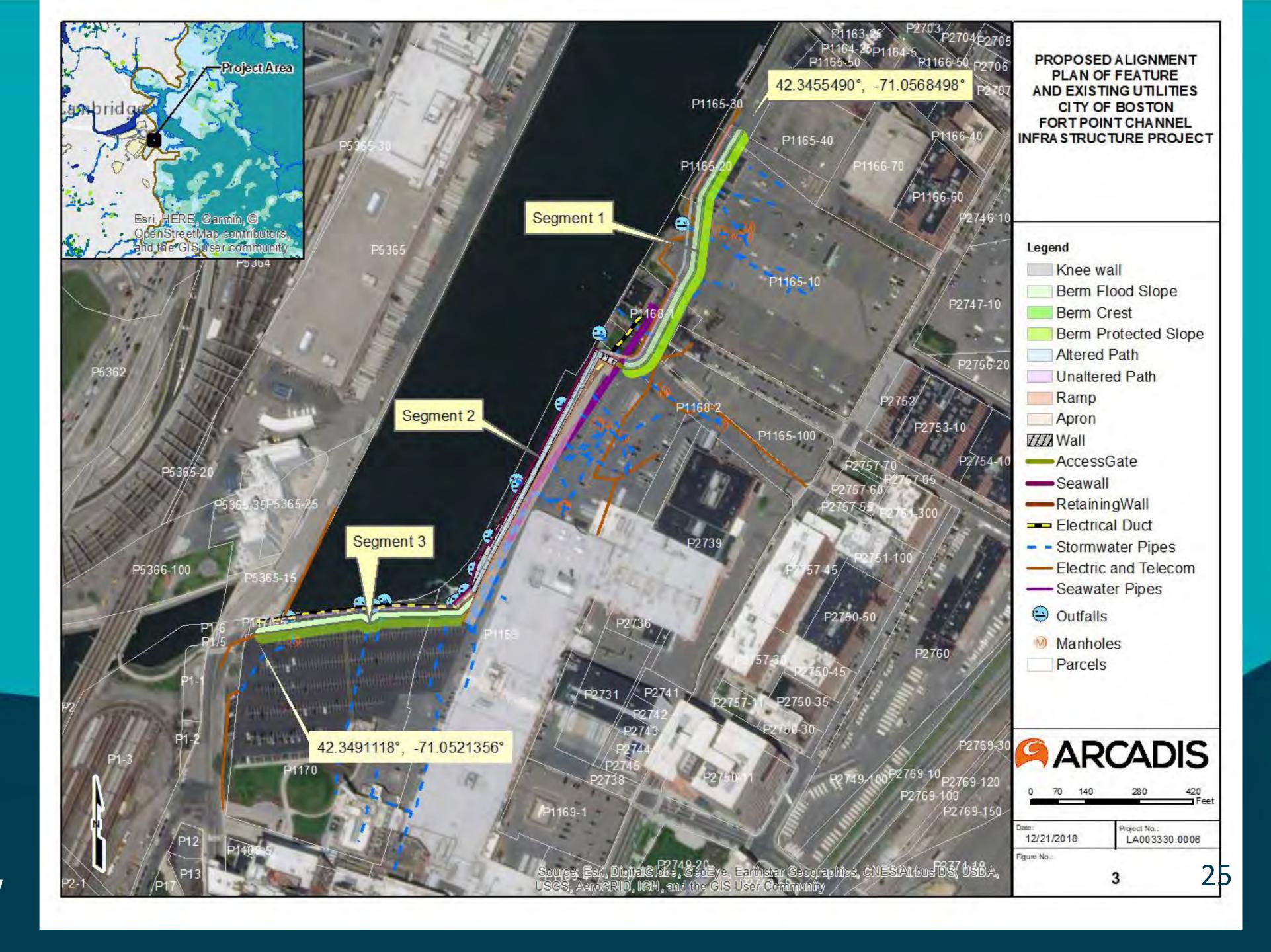
OPTION B



Option B would install a mechanical flood protection solution at the mouth of the Fort Point Channel

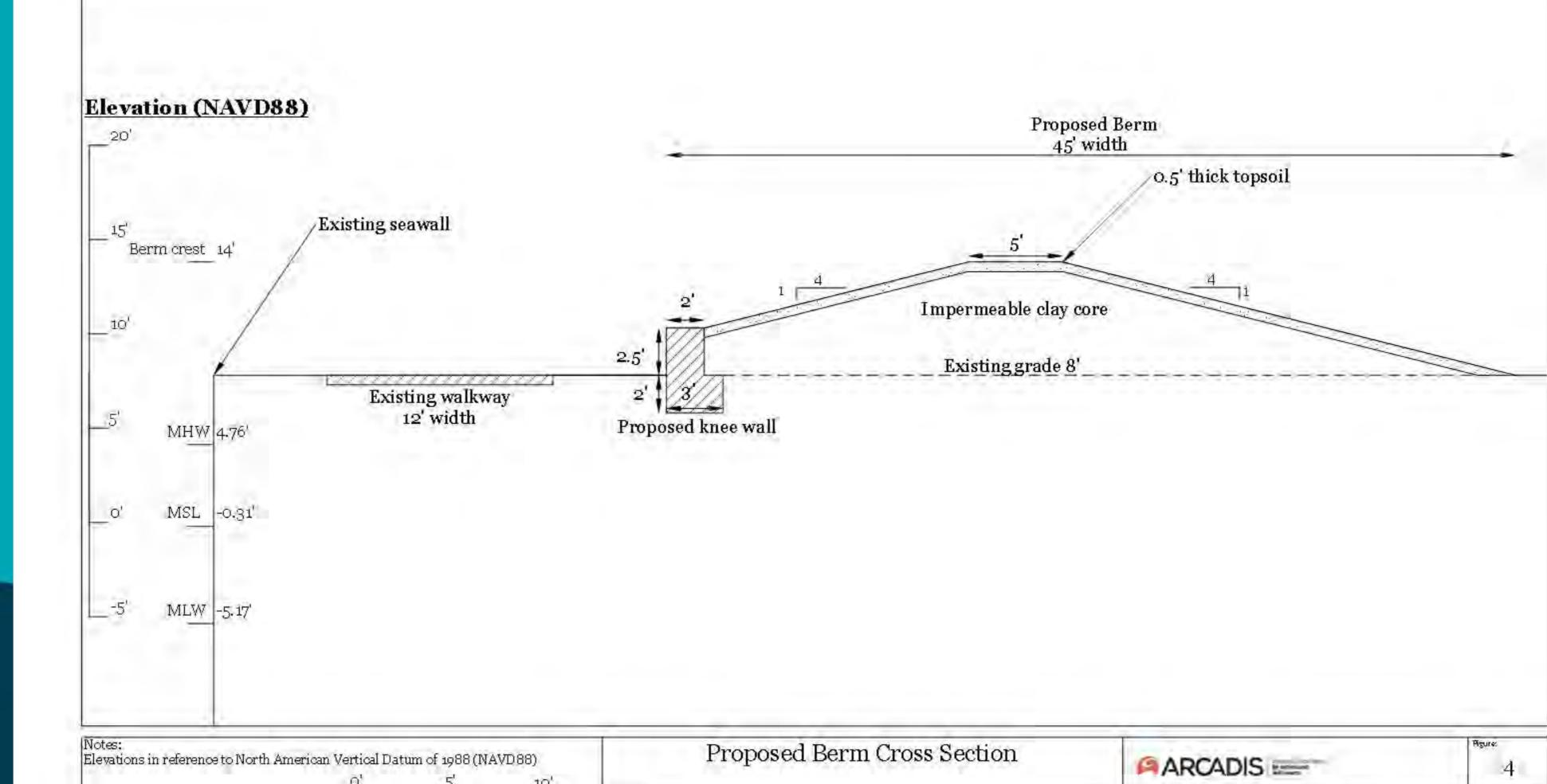


2019 FEMA GRANT





2019 FEMA GRANT



Horizontal and vertical scale

City of Boston, Fort Point Channel Infrastructure Project

Proj No: LA003330.0006

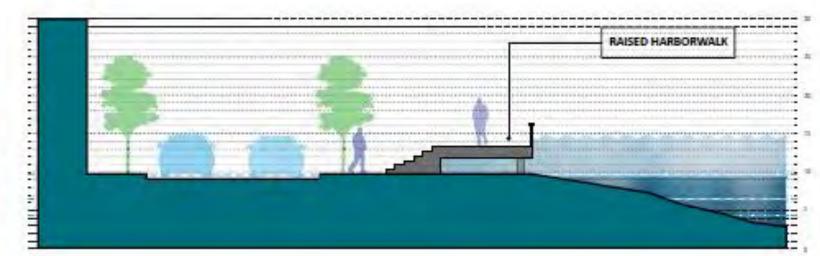
Date: 12/20/18

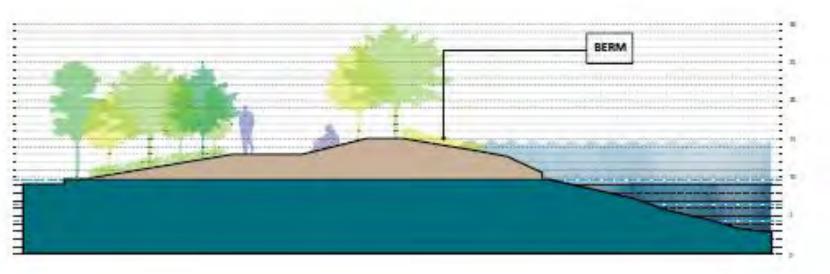












BPDA Climate Ready Initiatives

Climate Resiliency Checklist Update



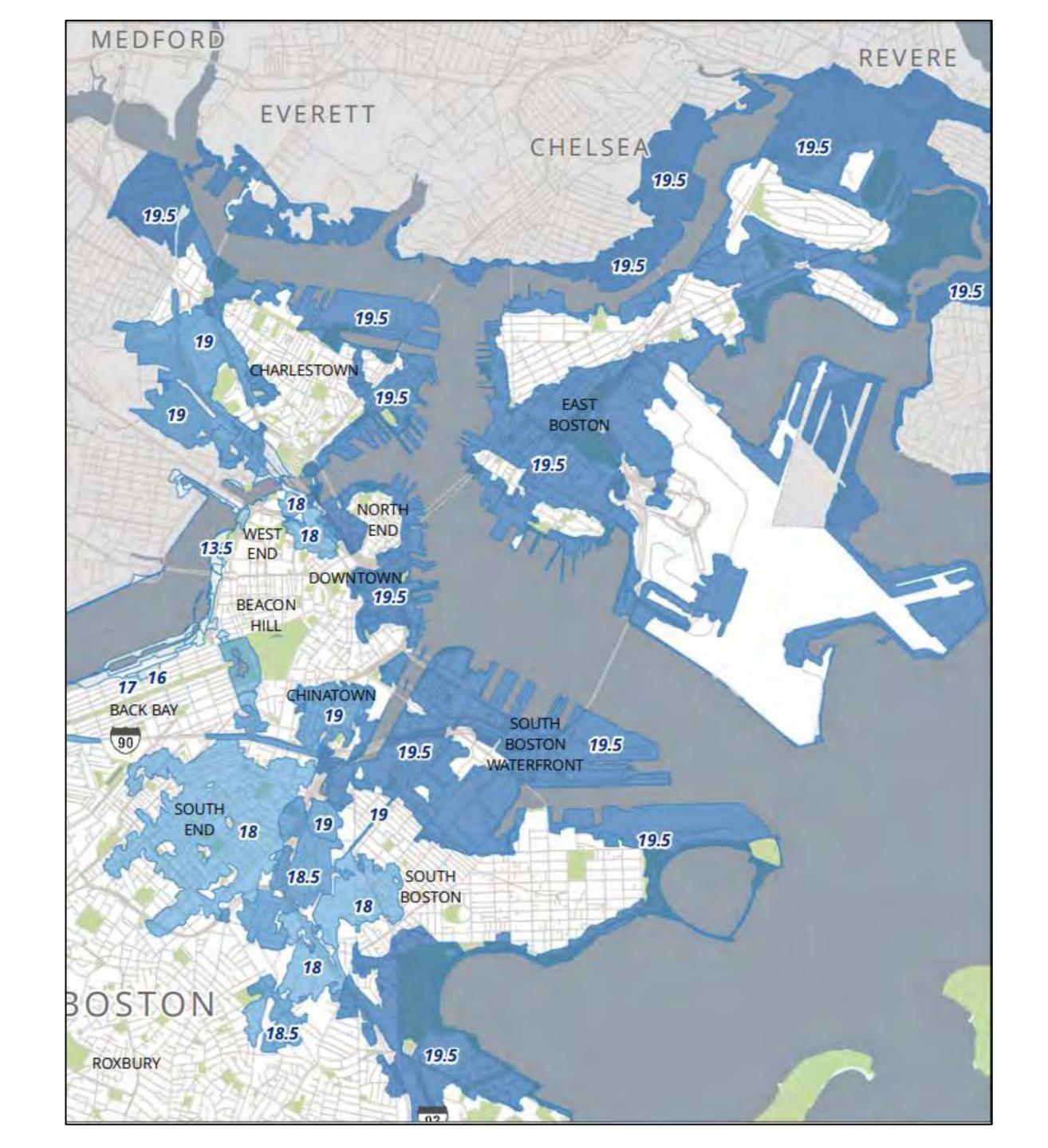
Climate Resiliency Checklist

NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

Project Name:	H				
Project Address:					
Project Address Additional:	- 1000- VIII0- 1000	and the second			
Filing Type (select)	Design / Buildir	ng Permit (pri	her substantial filing) or to final design appr Occupancy (post cons		on)
Filing Contact	Name Co	ompany	Email	Phone	
Is MEPA approval required	Yes/no		Date		
3 - Project Team					
Owner / Developer:					
Architect:					
Engineer:					
Sustainability / LEED:					
Permitting:					
i dimituig.					
Construction Management:					
Construction Management:	Conditions				
Construction Management:	Conditions				
Construction Management: 3 - Project Description and Design	Conditions				
Construction Management: 3 - Project Description and Design List the principal Building Uses:	Conditions				
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure	Conditions				
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure and or Building Uses:	Conditions	SF	Bu	iilding Area:	SF
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure and or Building Uses: Site and Building:	Conditions	SF Ft		iilding Area:	
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure and or Building Uses: Site and Building:	Conditions Ft E	Ft		ding Height:	Stories
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure and or Building Uses: Site and Building: Site Area: Building Height:		Ft BCB	Build	ding Height: tion – High:	Stories Ft BCE
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure and or Building Uses: Site and Building: Site Area: Building Height: Existing Site Elevation - Low:	Ft E	Ft BCB BCB	Existing Site Elevat	ding Height: tion – High:	Stories Ft BCB Ft BCB
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure and or Building Uses: Site and Building: Site Area: Building Height: Existing Site Elevation - Low: Proposed Site Elevation - Low:	Ft E	Ft BCB BCB	Existing Site Elevat	ding Height: tion - High: tion - High:	Stories Ft BCB Stories
Construction Management: 3 - Project Description and Design List the principal Building Uses: List the First Floor Uses: List any Critical Site Infrastructure and or Building Uses: Site and Building Site Area: Building Height: Existing Site Elevation - Low: Proposed Site Elevation - Low: Proposed First Floor Elevation:	Ft E	Ft BCB	Existing Site Elevat Proposed Site Elevat Below g	ding Height: tion - High: tion - High:	Stories Ft BCB Ft BCB

BPDA Climate Ready Initiatives

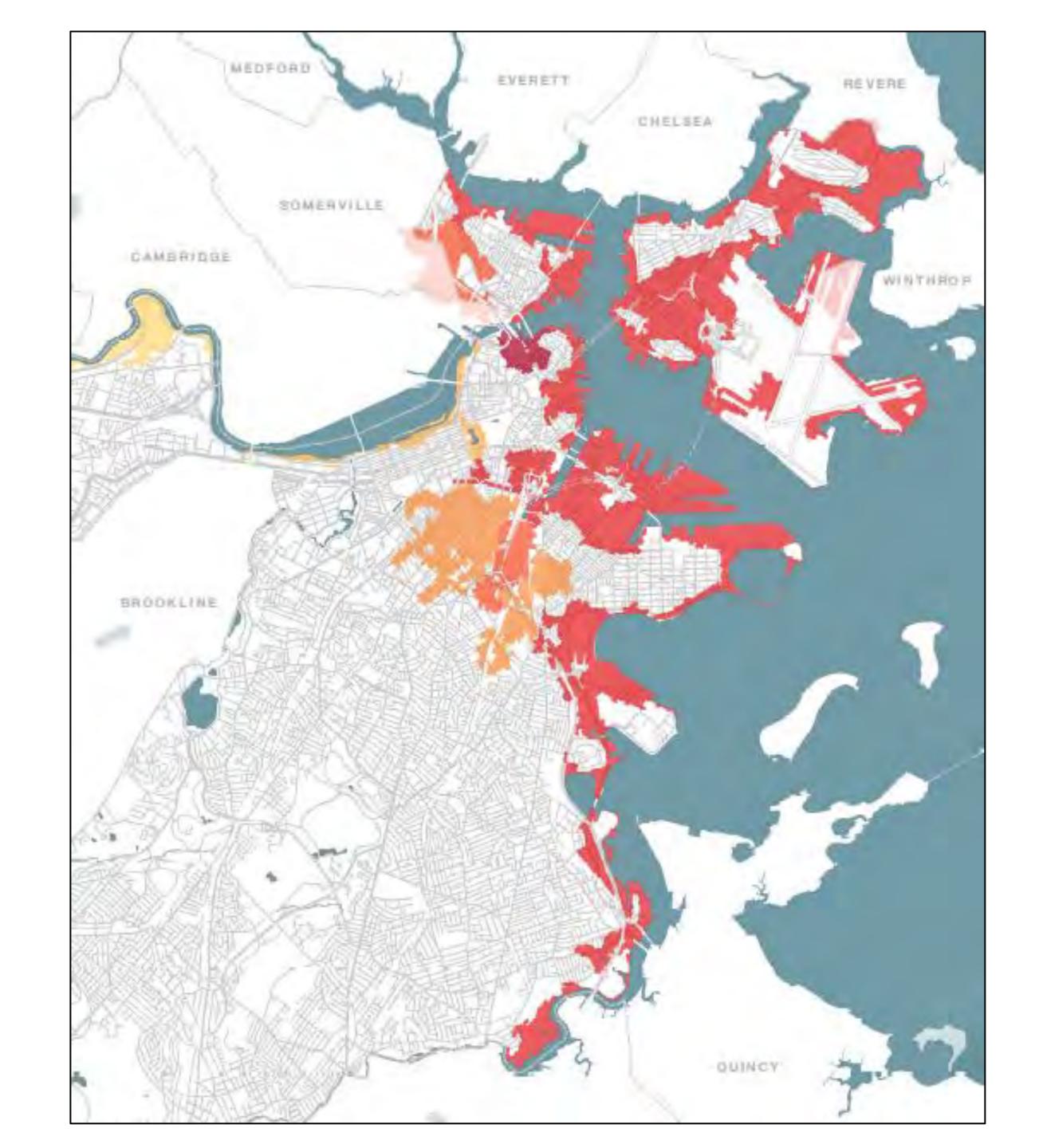
Create Future Flood Maps to Support Planning and Policy



BPDA Climate Ready Initiatives

Flood Resiliency Overlay Districts

Planning Flood Elevation for Zoning



Case Studies







Attached townhouse

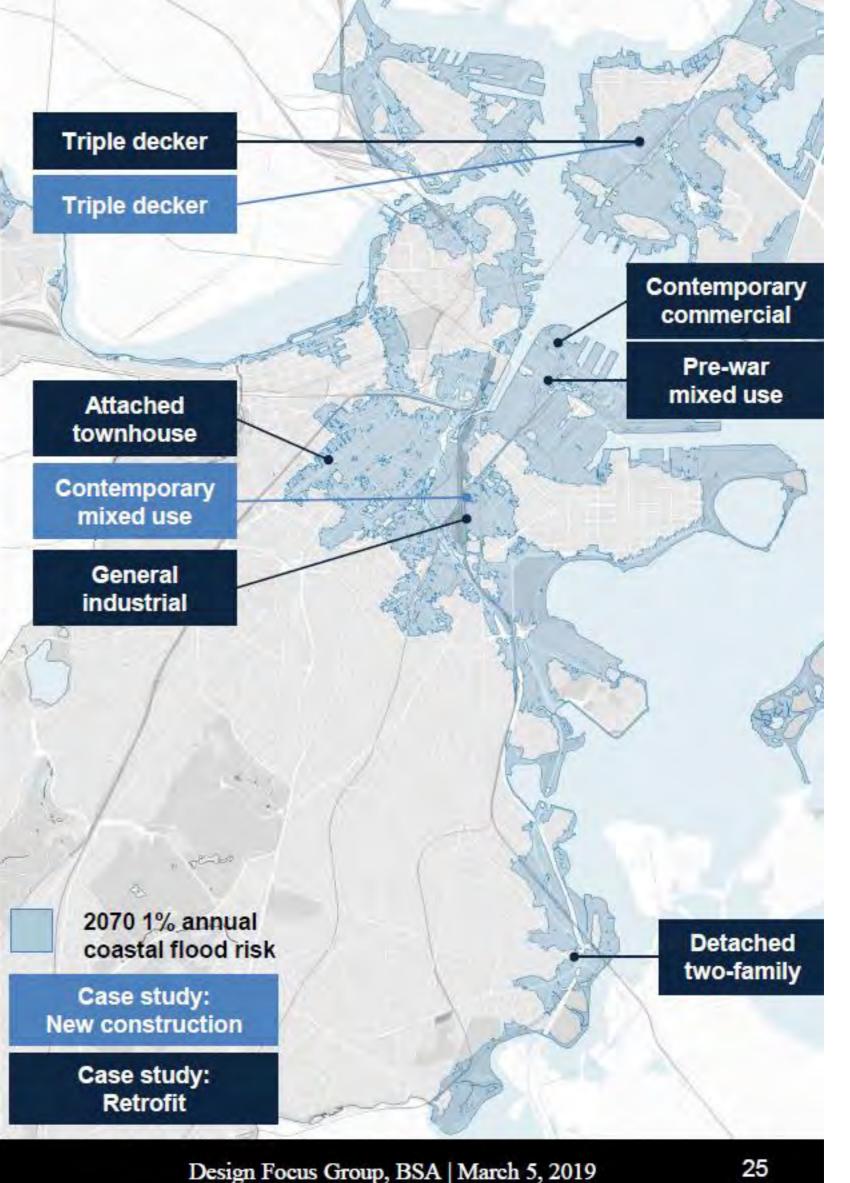
Detached two-family







Contemporary commercial

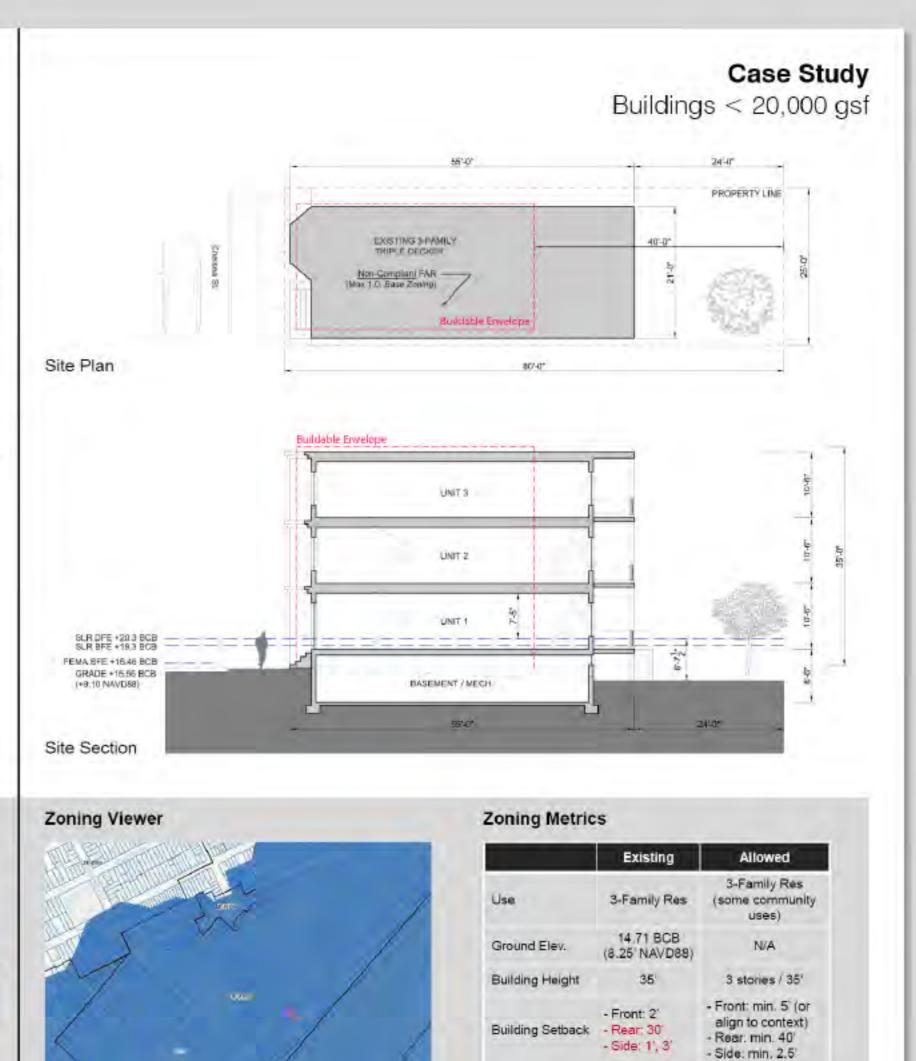


Pre-war mixed use

General industrial

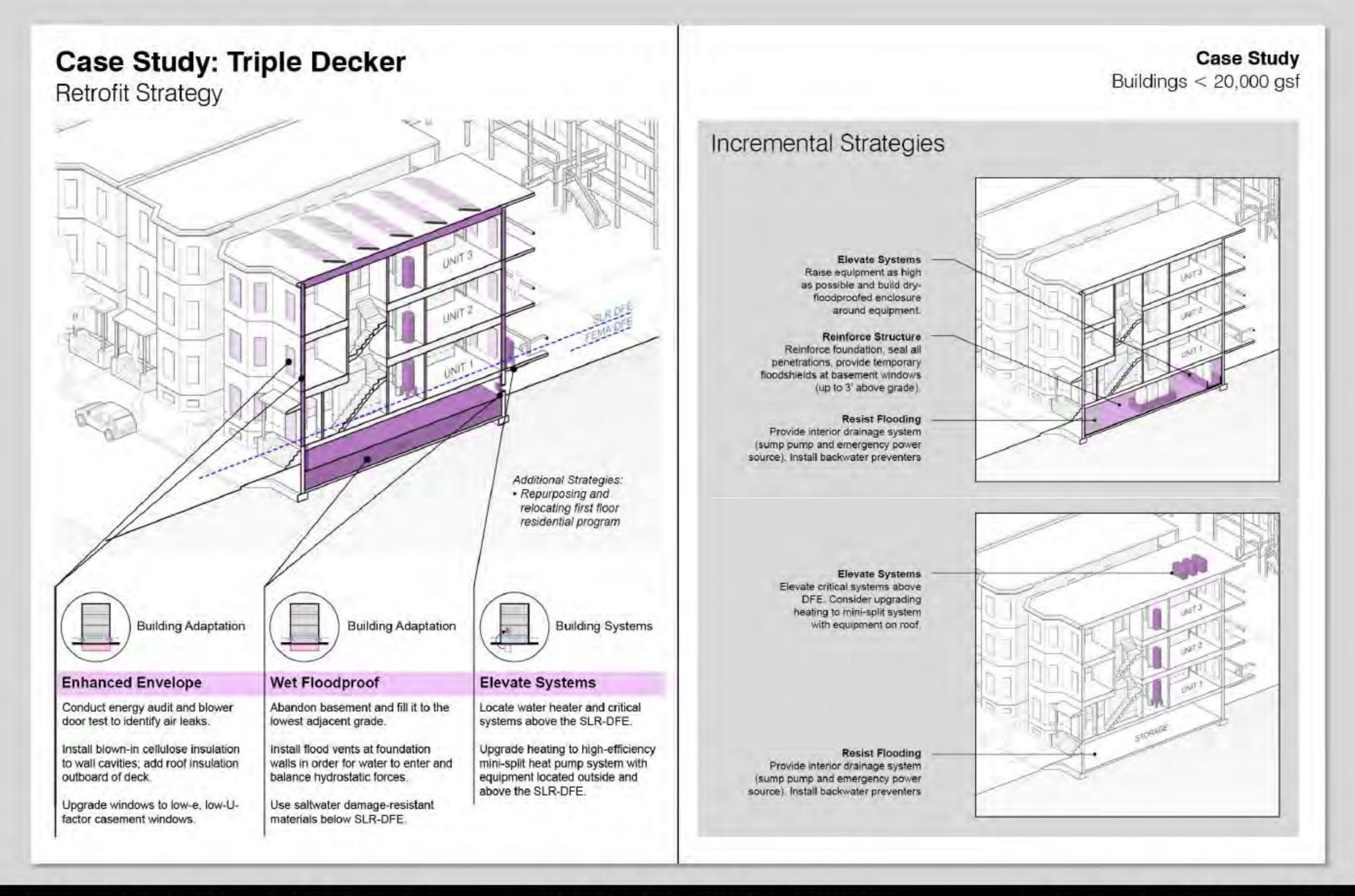
Case Study: Triple Decker Existing Conditions





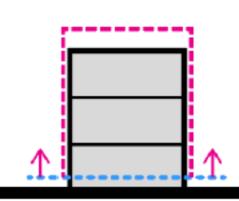
1.0

940 sf Min. 300 sf per unit



Use and Dimensional Regulations

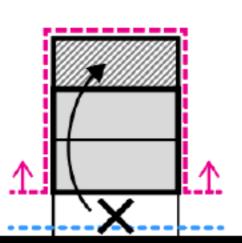
Minimum **Revised Definitions** Modify definitions of Height and Gross Floor Area, relative to SLR-DFE





"Hold Harmless"

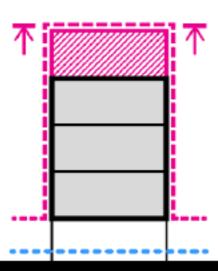
Modify by-right requirements for Height, FAR, and Yard setbacks, to allow relocation of otherwise lost FAR for non-conforming structures





Dimensional Incentives

Provide additional height and density bonuses that exceed by-right standards to preserve building value



Revised definitions:

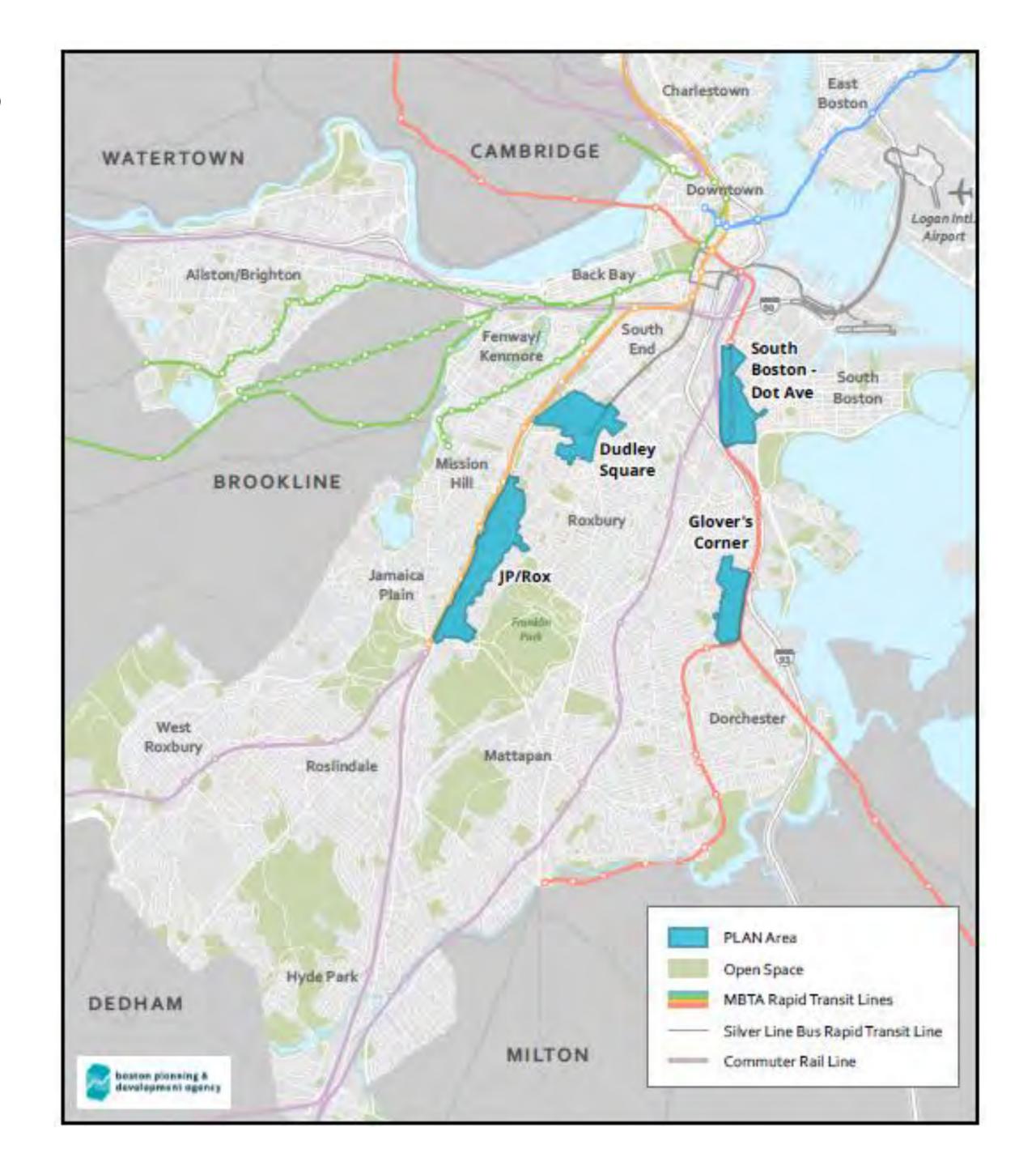
- Height
- · Gross Floor Area

Potential incentives:

- · Parking relief
- Rooftop addition
- Redefining setbacks
- Redefining height from first occupiable story
- Additional FAR
- · Re-assessment of property value after improvements

Boston Strategic Planning Areas

- Site & building design address CRB climate hazard vulnerabilities
- Passive survivability for new and renovated residential buildings
- Low Impact Design landscaping
- Vegetated roofs/cool roofs
- Options for community energy solutions





B

Mayor Walsh set a carbon neutrality goal



- Commissioned the Carbon Free
 Boston report (delivered January 2019)
- The 2019 Climate Action Plan

CARBON FREE BOSTON CONCLUSIONS



What does it take to get to carbon neutrality?

Boston needs to pursue 3 strategies simultaneously:

- Reduce demand for energy by increasing efficiency.

Convert everything that runs on fossil fuels to run on electricity.

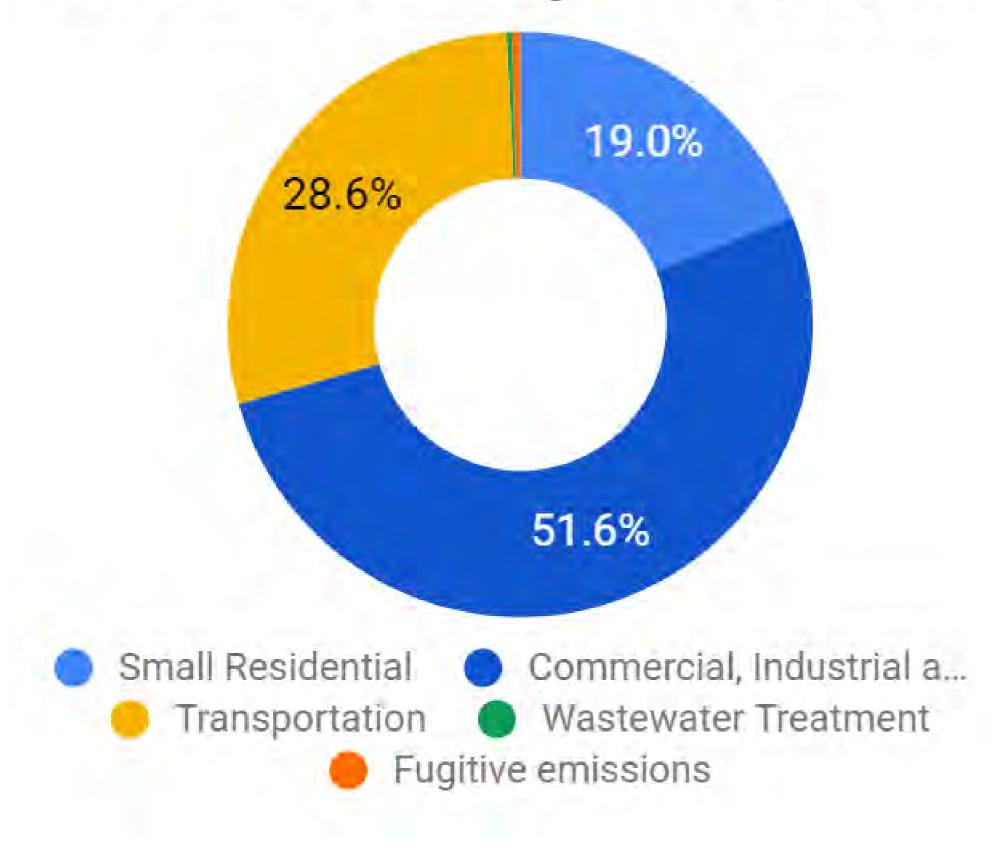
Suy 100% clean energy.

Carbon neutrality can be achieved with the technologies of today and is essential to a healthy, thriving and resilient Boston.

Boston's Carbon Footprint



GHG Emissions by Source, 2017

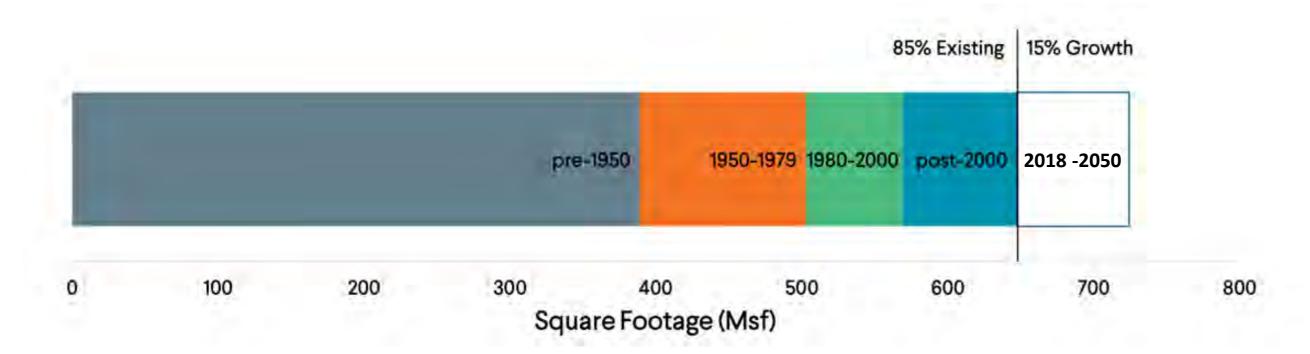


→ The 2019 Climate Action Plan Update will accelerate key actions to **decarbonize Boston's buildings and our transportation system**, identified using the Carbon Free Boston analysis and Working Group feedback.

Buildings

Current building stock

Boston's building stock is old.



- ½ of existing floor space was built before 1950.
- 85% of floor space that will exist in 2050 has already been built.



В

Carbon Free Boston Conclusions

What does it take to get to carbon neutrality?

Any new building that is not "Net-Zero" is a building we will have to retrofit

В

PFD: ZNC Standards for New Municipal Buildings

Define a design approach that considers options to meet the highest reasonable and achievable level of ZNC:

A highly efficient building with:

- ZNC Onsite Energy requirements are met by on-site renewables.
- ZNC Offsite Energy requirements are provided by offsite renewables.
- ZNC Ready No onsite fossil fuel combustion.
- **ZNC Convertible** Initially requires some onsite fossil fuels but is built so that it may be *easily* converted to electric or other fossil fuel free systems in the near future.

Executive order

- All new municipal building projects are to be designed to the appropriate ZNC standard listed above with ZNC Onsite as the highest target goal. This will be attained by using the standards required by code, in combination with a highly efficient building design.
- Minimum LEED Silver will continue to be a base minimum standard with encouragement to the higher levels of Gold or Platinum.

В

DND: ZNC guidelines for affordable housing

- Now: Develop zero net carbon guidelines for the construction of new affordable housing in Boston
 - Release guidebook for zero emissions new construction
 - Identify high-carbon materials to avoid
 - Connect with workforce development programs
- Now: Net-Zero design: "special consideration to proposals" in '19 RFP
- Fall 2020: Increase the baseline requirements for new construction to a net-zero standard
- Upcoming years: a) Net Zero requirement in RFP, b) Extend to the retrofit of existing buildings



BPDA: Strengthening green building zoning requirements to a ZNC standard

Update zoning to a Zero Net Carbon standard for new construction and major renovation.

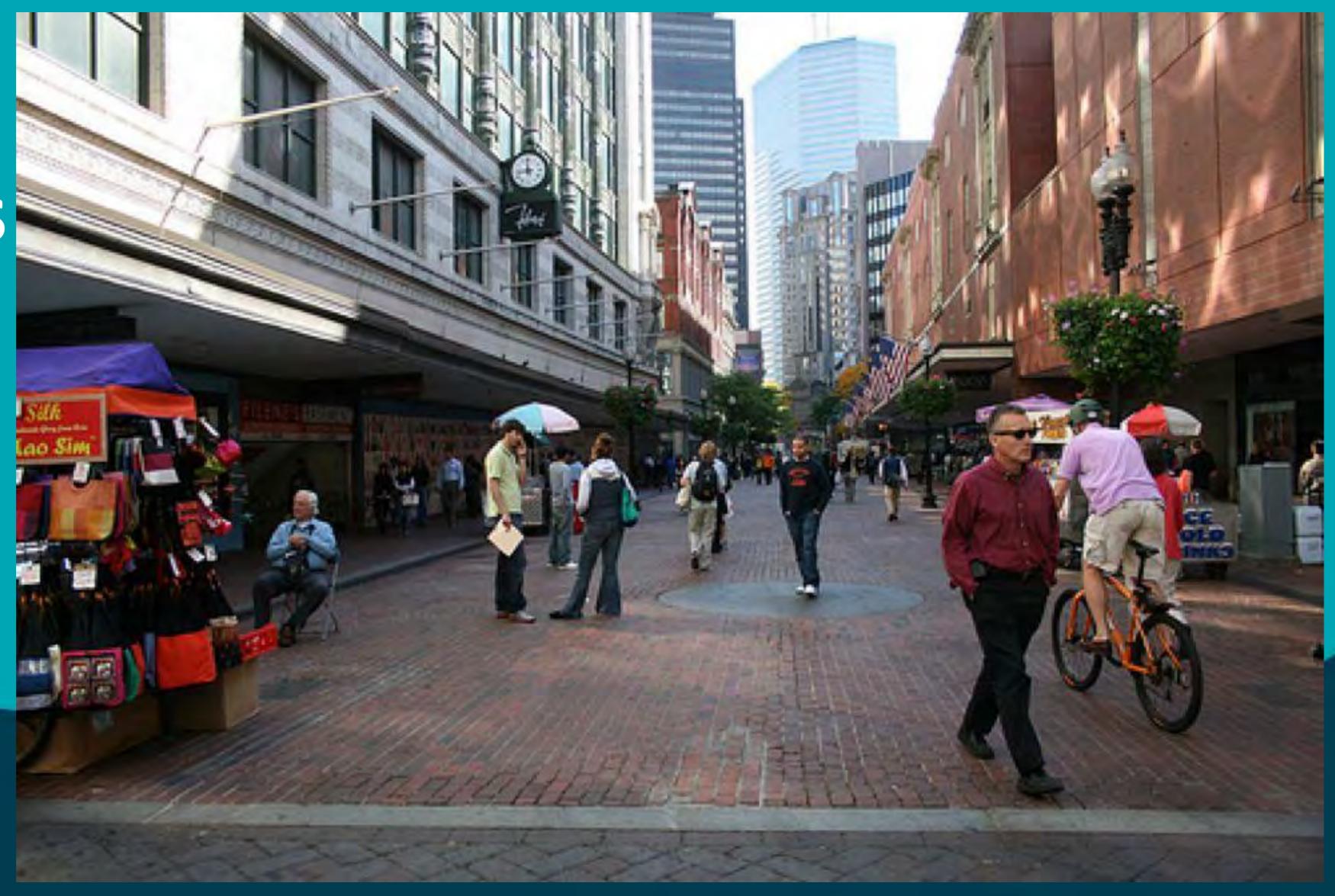
- Builds on current Article 37: buildings that go through Large Project Review must be "LEED-certifiable", asked for a net-zero assessment
- Immediate steps: engage consultants for technical analysis of standards and phasing. Launch stakeholder engagement process for ZNC zoning
 - Assess feasibility of different ZNC standards for different building types and develop a timeline for implementation
 - Develop performance standards
 - Extend requirement to Small Project Review
- Long term:
 - Work with partners (e.g.) to develop retrofit guidelines
 - Collaborate with GRC on building retrofit demonstrations for majors building types across the city

COVID-19 Planning Multi-modal Roadways





COVID-19 Planning Shared Streets





COVID-19 Planning Streeteries







