A GRCx Event: Seaport Resilience Report Deep Dive

GRCx is an interactive program series from the Boston Green Ribbon Commission designed to accelerate the implementation of the City's Climate Action Plan by providing high-quality, useful content on climate resilience and carbon mitigation to the Boston community.

GRCx | GREEN RIBBON COMMISSION Climate Action Exchange

Introductions

Bud Ris
Senior Advisor
Boston Green Ribbon Commission



Carly Foster
Urban and Community Resilience Practice Lead
Arcadis



Carole Charnow
President and CEO
Boston Children's Museum



Expanding Boston's Capacity to Build Coastal Resilience Infrastructure

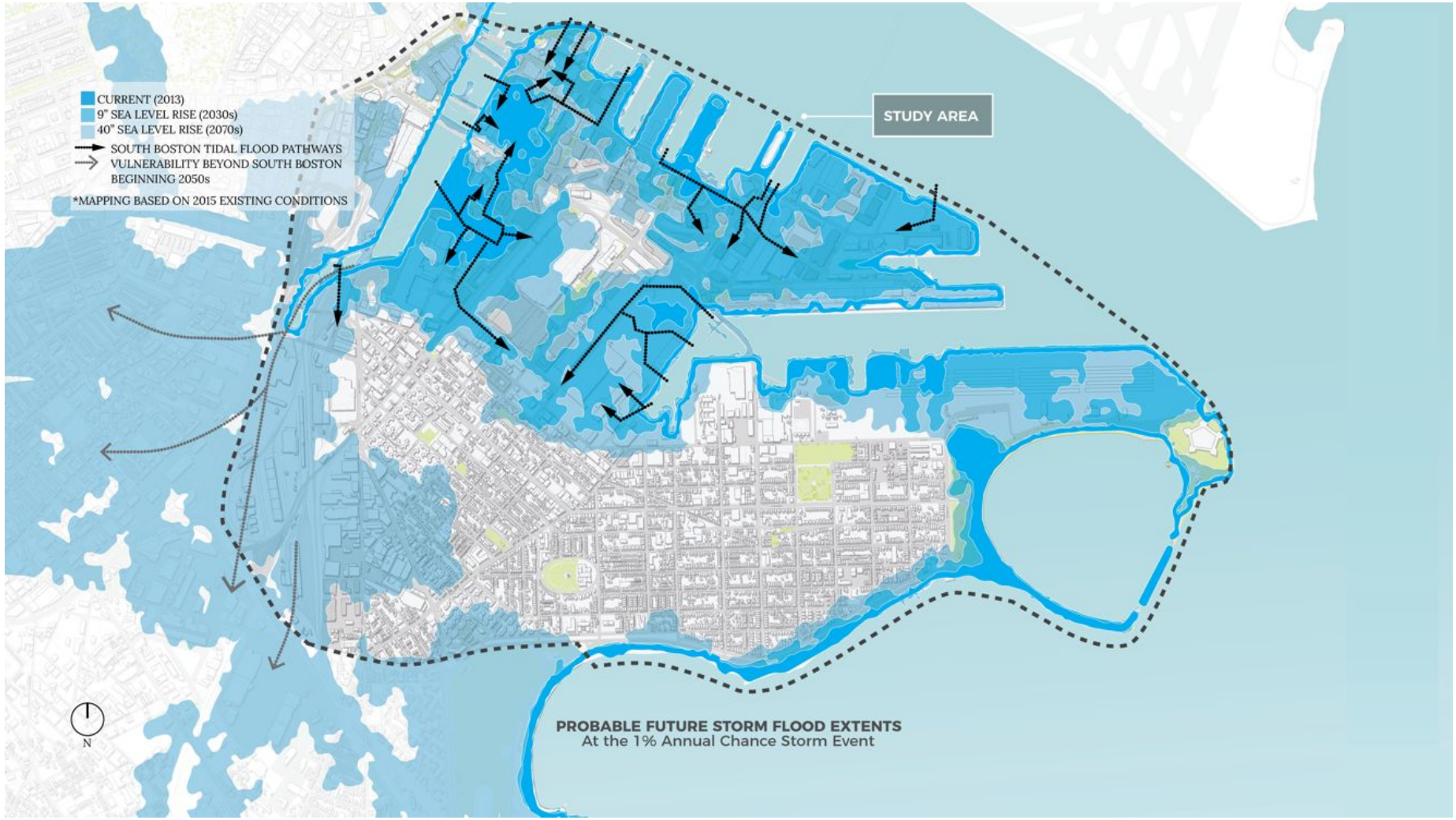
Lessons from the Seaport District



Questions That Prompted the Study

- What flood protection actions are already underway by individual property owners in the Seaport study area – following from the 2018 *Coastal Resilience Solutions for South Boston* plan?
- Where and why are there gaps?
- What governance, funding, and regulatory changes are needed to help advance individual and/or collective actions within the required timeframes?

Flood Pathways in the Seaport



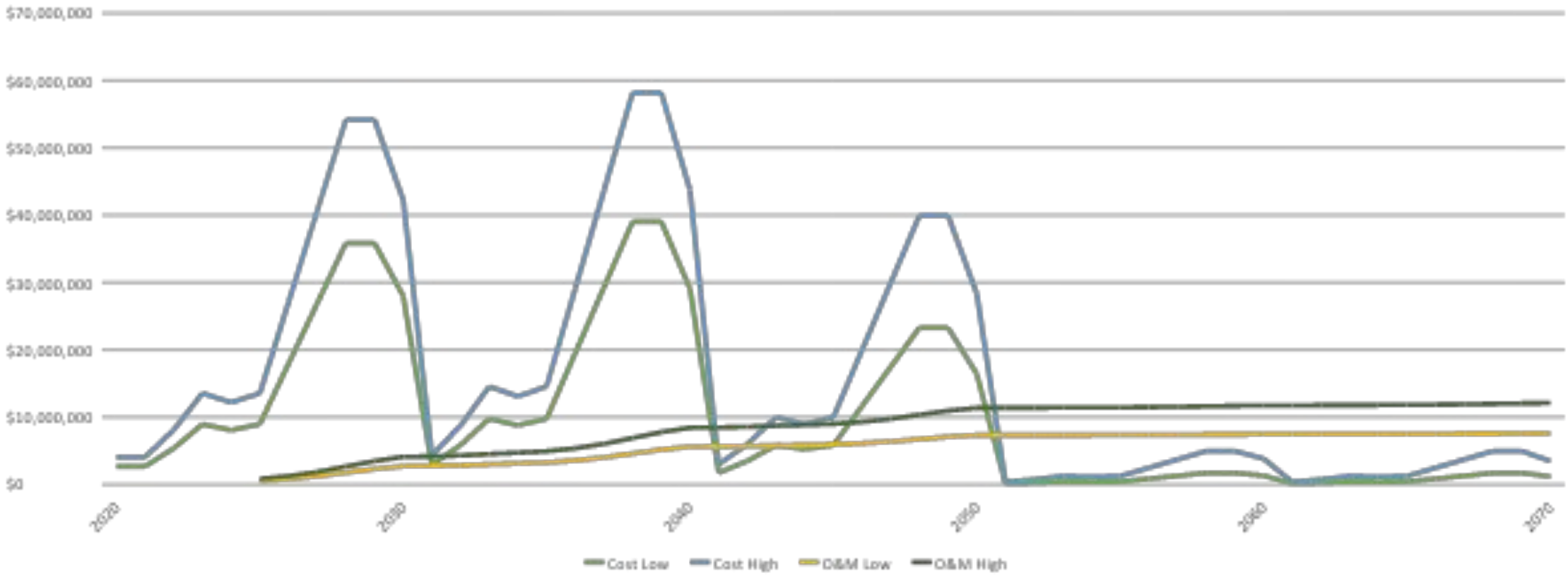
Study Focus: Seaport Areas Facing Urgent Flood Risks



$35-50 million projected costs in each area

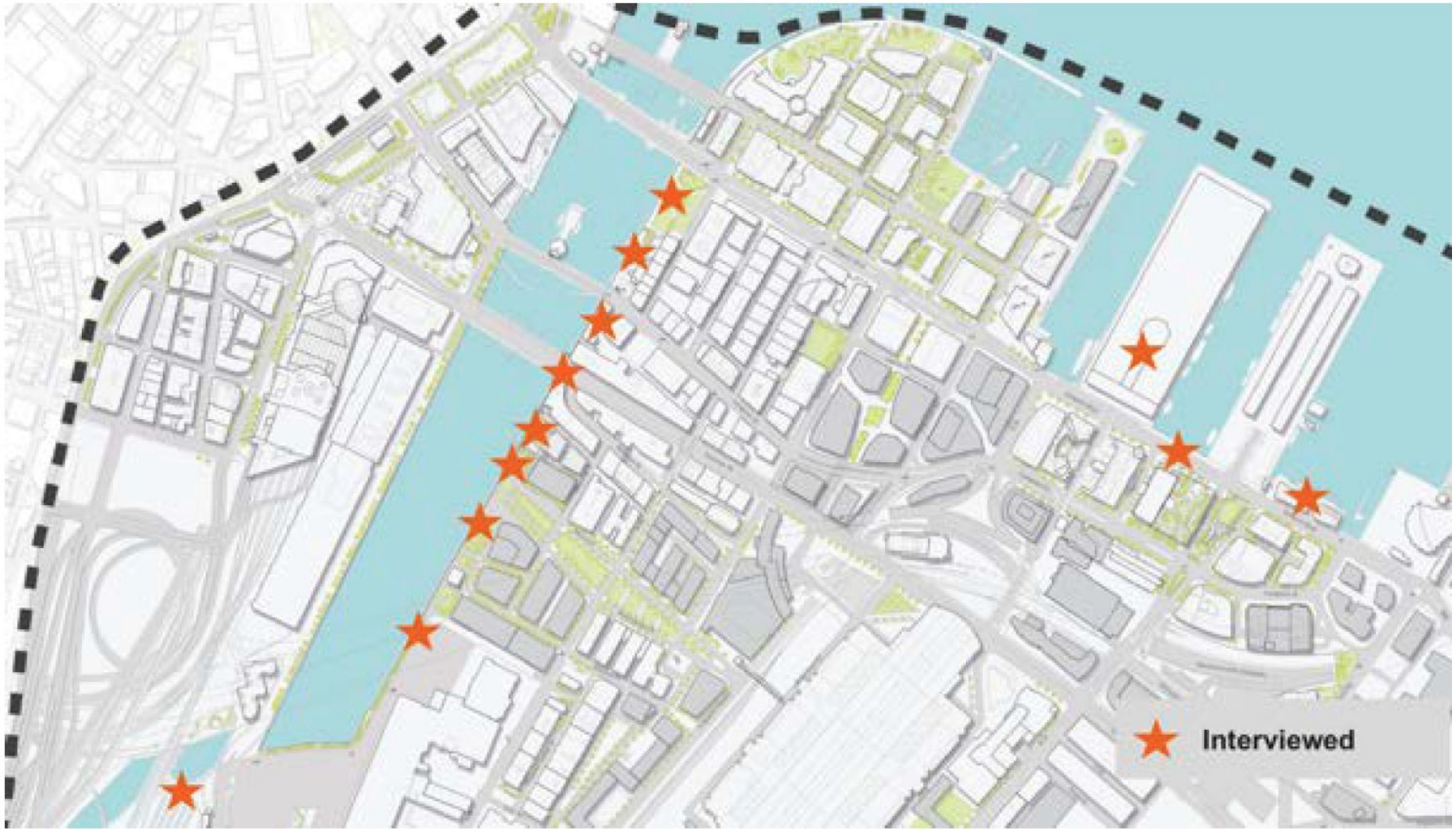


South Boston: Projected Implementation Costs Over Time

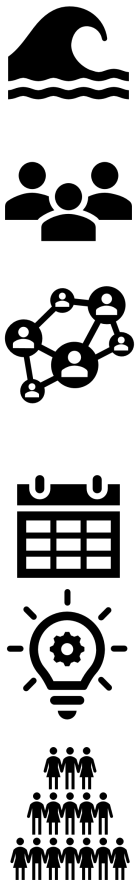


Total Capital Costs For All of South Boston Projected at $500 million to $1 billion

Property Owner Interviews and Case Studies



Key Insights From The Study:



- Property owners aware of the flood risks in the Seaport District. Several moving forward with implementation. Others "wait and see;" unclear about: status of City's resilience plans, adjacent prop owner plans, upgrades to City and State infrastructure
- Many property owners see the need for a collective governance and funding solution that is both fair and equitable. Several owners will pay for solutions on their properties.
- Nearly everyone spoke to the need for more coordination – particularly across contiguous properties. More clarity needed regarding target design elevations and "tie-ins."
- It is likely possible to deliver urgent projects (those planned for completion by 2025) along Fort Point Channel by maximizing the effectiveness of existing governance, regulatory, and funding approaches.
- New or modified approaches will be needed over the next 3-4 years to advance district-scale coordination and project delivery beyond 2025 – as the scale and complexity increases.
- The City needs additional human and financial resources to manage implementation of the City's coastal resilience strategy – at a very senior level. This is a new challenge!

Track 1 – Near Term - Recommendations

- Establish Senior Level Cabinet Position Focused on Climate Resilience Implementation – with Sufficient Resources
- Formally Adopt and Prioritize Climate Ready Boston Neighborhood Resilience Plans
- Integrate Design and Performance Standards with Existing Regulatory Mechanisms and New Flood Overlay District Zoning; target elevations and tie-ins are critical parameters
- Clarify Expectations for Private v Public Cost Sharing – Implement MOUs with Key Property Owners
- Launch ICC – Initial Focus on Joint Planning Process with MassPort
- Continue State and Federal Funding Applications to Leverage Local Funds
- Most of the Above Applicable Citywide - Beyond the Seaport!

Senior Level Cabinet Position for Resilience Implementation

- Direct and mobilize resources that have been allocated to coastal resilience infrastructure
- Coordinate action by multiple city players from across the governmental structure
- Facilitate public private partnerships, easements, memorandums of agreements
- Coordinate project proposals and city capital improvement plans for alignment with specifications for coastal resilience infrastructure
- Enhance collaboration and partnerships with other public and quasi-public agencies outside of City purview
- Guide coastal resilience project implementation through the execution of other Track 1 recommendations
- Lead City strategy for refining and implementing Policy Track 2 recommendations

Track 2 – Longer Term Implementation – Next Steps

- Evaluate cost share methodologies
- Evaluate governance approach best suited to increasing complexity and scale of resilience implementation:
  - Community-based Public Private Partnership (CP3)
  - District for Resilience Implementation (DRI)

Cost Share Approach Explored in this Study



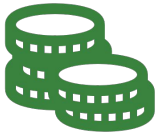
Calculate losses per flood scenario



Annualize losses per “asset” based on flood depths per asset for the 40” SLR scenario



Calculate share of RISK avoided (probability x consequence)

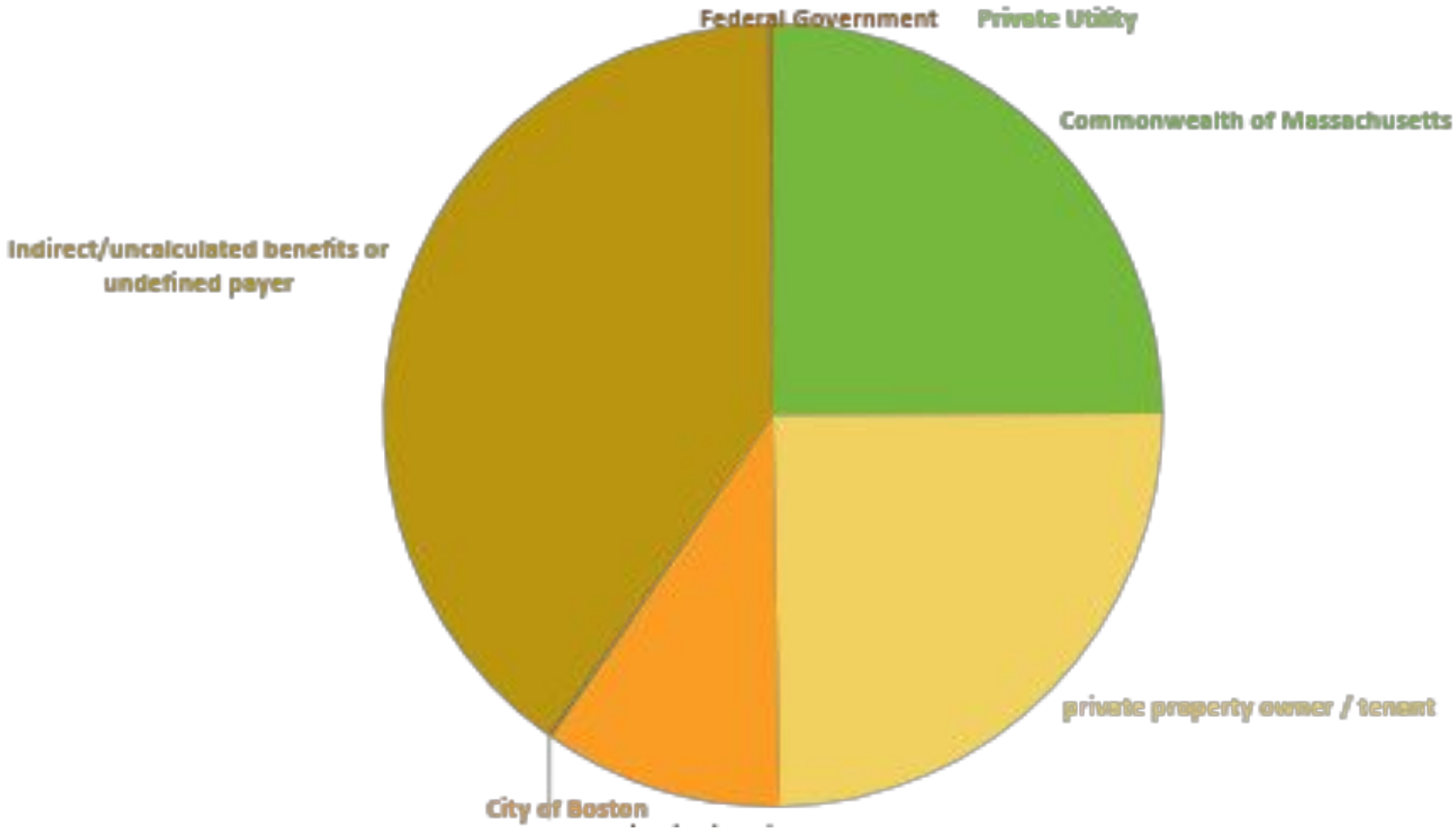


Calculate total costs to be shared

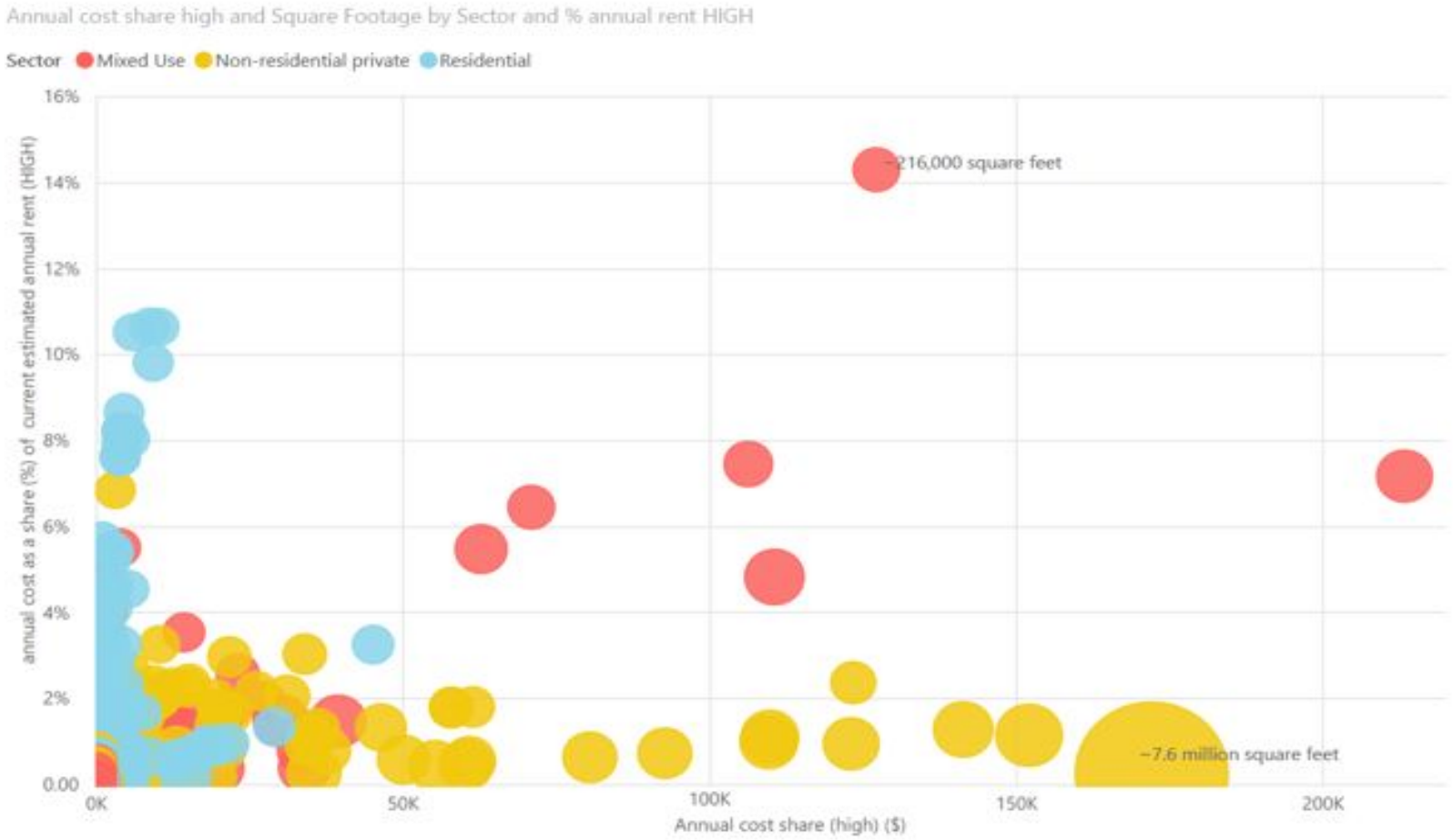


Share costs across potential “payers” based on benefits share

Example: Cost Share Results for South Boston Resilience Plan Based on Payer Type



Example: Share of Direct Benefits as a Percent of Annual Rent



Benefits of This Approach



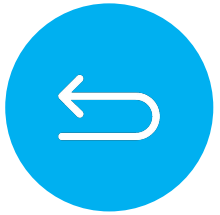
Clear rational nexus between fees and outcomes



Transparent



Provides a possible incentive to also independently reduce risk (reduced risk redistributes share)



Can be actively updated



Adaptable over time



Provides a mechanism and framework to leverage multiple existing and new funding sources

Track 2 Governance Options

City continuing to act as the primary governance entity, with Community-Based P3 as implementor and operator

Establishing a new dedicated governance entity, such as the District for Resilience Improvements (DRI) that was preliminarily developed through Climate Ready South Boston

DRI Approach 2: Citywide District for Resilience Improvements

Establishment of **Districts for Resilience Improvements (DRI)** that correlate with distinctive areas of risk reduction through an agreed upon period, to be monitored and updated over time

CITYWIDE DISTRICT FOR RESILIENCE IMPROVEMENTS
(Single)

Citywide DRI plans, guides, and implements the projects, coordinates the property owners, takes on debt. Advances leasing and permitting, honors public private partnerships, and is responsible for long term maintenance

DRI levies risk adjusted utility fees and assembles other funding sources to generate a revenue stream which is allocated to projects through a pre-determined method *(i.e., district shares based on risk adjustment*)

Expanding Boston's Capacity to Build Coastal Resilience Infrastructure

Lessons from the Seaport District



Thank you Arcadis!

For Executive Summary and Full Report see:
greenribboncommission.org or
contact Bud at: risboston@gmail.com

Boston Children's Museum Waterfront Master Plan

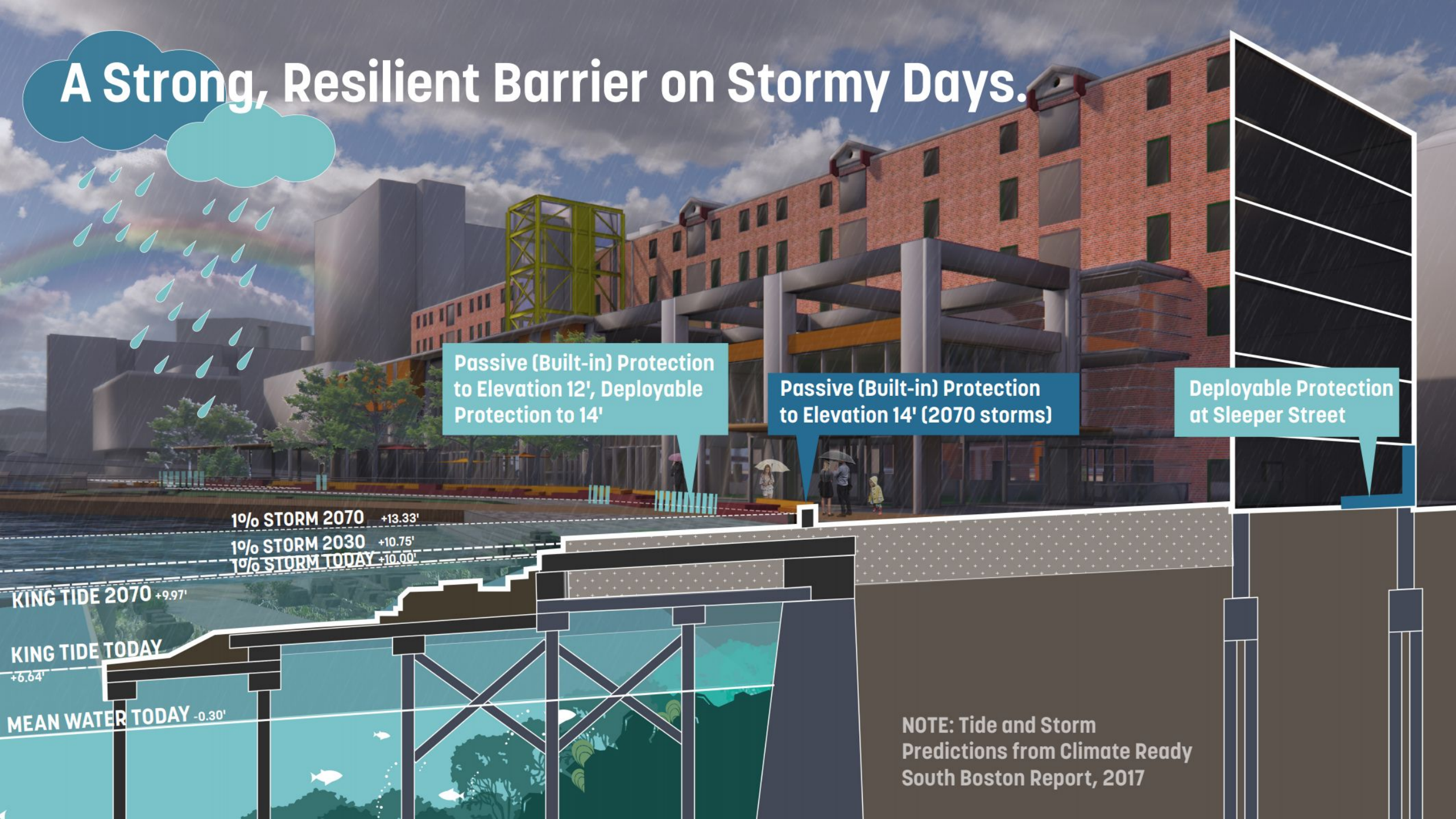


SASAKI



Winter Storm Riley (March 2, 2018) brought high tide within 4" of the Museum's Plaza and flooded Sleeper Street, briefly turning the Museum into an island.

The Museum and the greater Seaport District are increasingly **AT RISK OF FLOODING** due to sea level rise and storm surge in the Fort Point Channel.

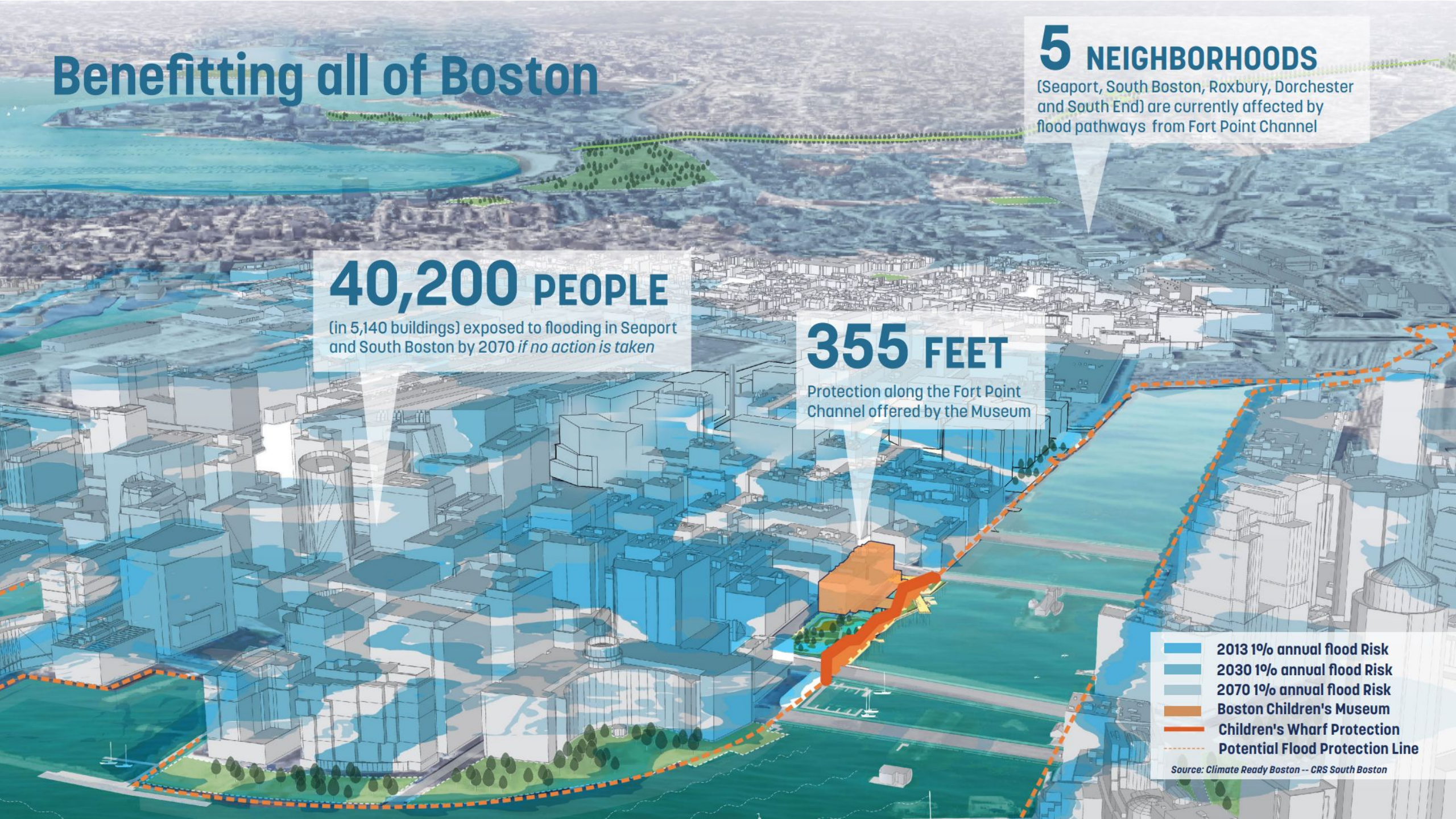

A Strong, Resilient Barrier on Stormy Days.
Passive (Built-in) Protection to Elevation 12', Deployable Protection to 14'
Passive (Built-in) Protection to Elevation 14' (2070 storms)
Deployable Protection at Sleeper Street
1% STORM 2070 +13.33'
1% STORM 2030 +10.75'
1% STORM TODAY +10.00'
KING TIDE 2070 +9.97'
KING TIDE TODAY +6.64'
MEAN WATER TODAY -0.30'
NOTE: Tide and Storm Predictions from Climate Ready South Boston Report, 2017

Benefitting all of Boston

5 NEIGHBORHOODS
(Seaport, South Boston, Roxbury, Dorchester and South End) are currently affected by flood pathways from Fort Point Channel

40,200 PEOPLE
(in 5,140 buildings) exposed to flooding in Seaport and South Boston by 2070 *if no action is taken*

355 FEET
Protection along the Fort Point Channel offered by the Museum



Analysis: Structural Condition

Granite Wall

- Generally in fair condition- no severe defects
- One large hole where 2+ granite blocks have fallen out. Hole is within tidal zone and allows fill to be washed away 2x/day. Hole should be filled before new work on Plaza.
- Short term fixes will not stop issue of fill migration
- Some void space behind wall at Martin's Park adjacent to Seaport bridge. Museum should report this to city.
- Significant additions to Harborwalk loading require further structural analysis

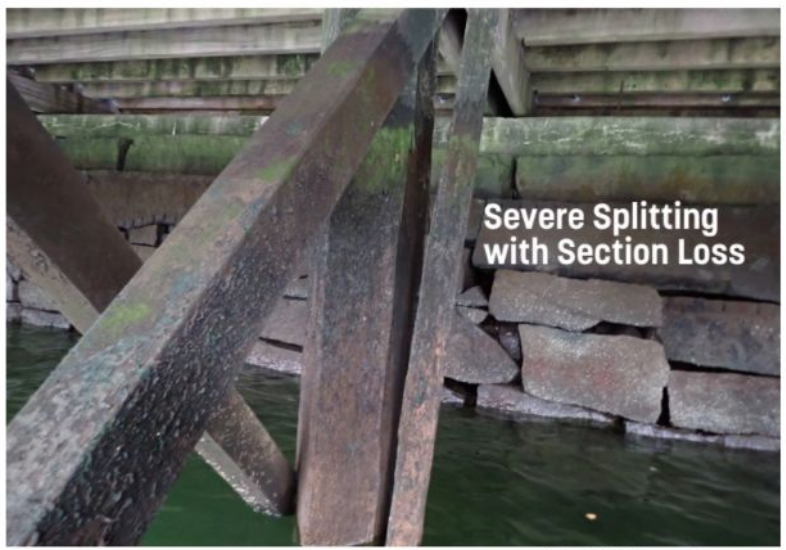
Harborwalk Structure

- The majority of support piles and pile caps are rated minor deterioration
- Some splitting from freeze thaw
- Some decay from marine borers
- 8 Piles need repairs in front of the museum (rated moderate deterioration)









M&N Dive Photos

TODAY

A Vulnerable Museum and Seaport, A Static Waterfront



40" of projected sea level rise by 2070

+4' recommended increase in flood barrier elevation

$8.1 billion expected in direct physical damages and relocation associated with flooding in Seaport by 2070

Master Plan Guiding Principles



Activating our Waterfront

Creating a welcoming front yard for the Museum that accommodates a diversity of events, programs and experiences year-round.



Engaging our Children + Families

Inviting all visitors, whether young in years or young at heart, to immerse themselves in playful discovery at the water's edge.



Leading our Community's Resilience

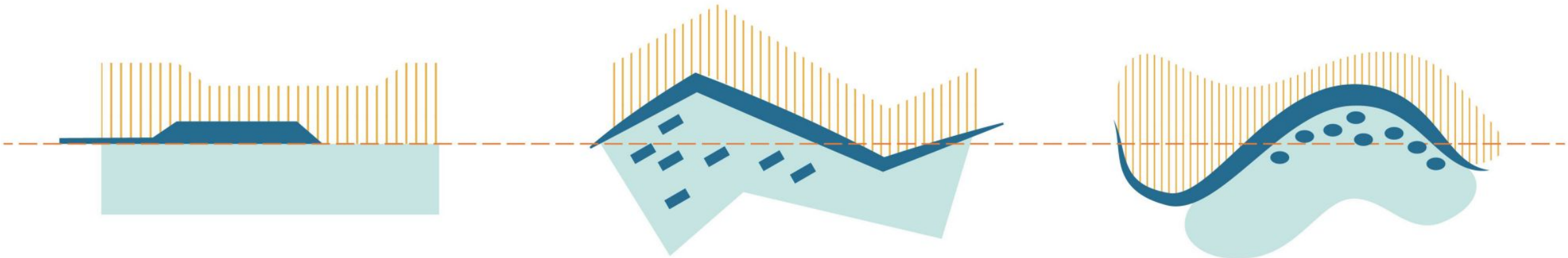
Increasing the resilience of the Museum and surrounding district to the risks of sea level rise, climate change, and other socio-environmental challenges.



Tomorrow's Museum Wharf

LIGHTER TOUCH

MORE IMPACT



SCHEME A

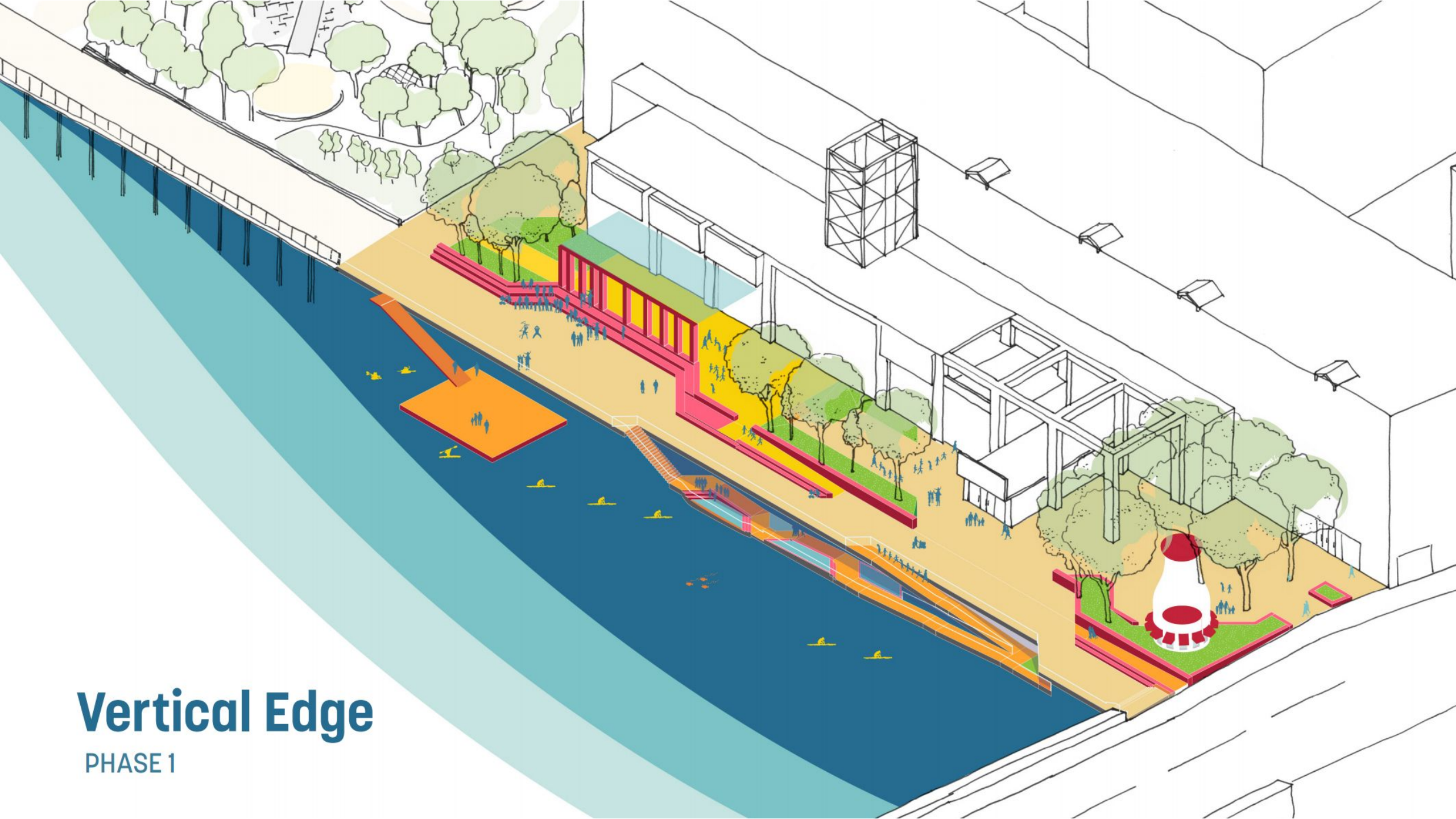
Vertical Edge

SCHEME B

The Floating Garden

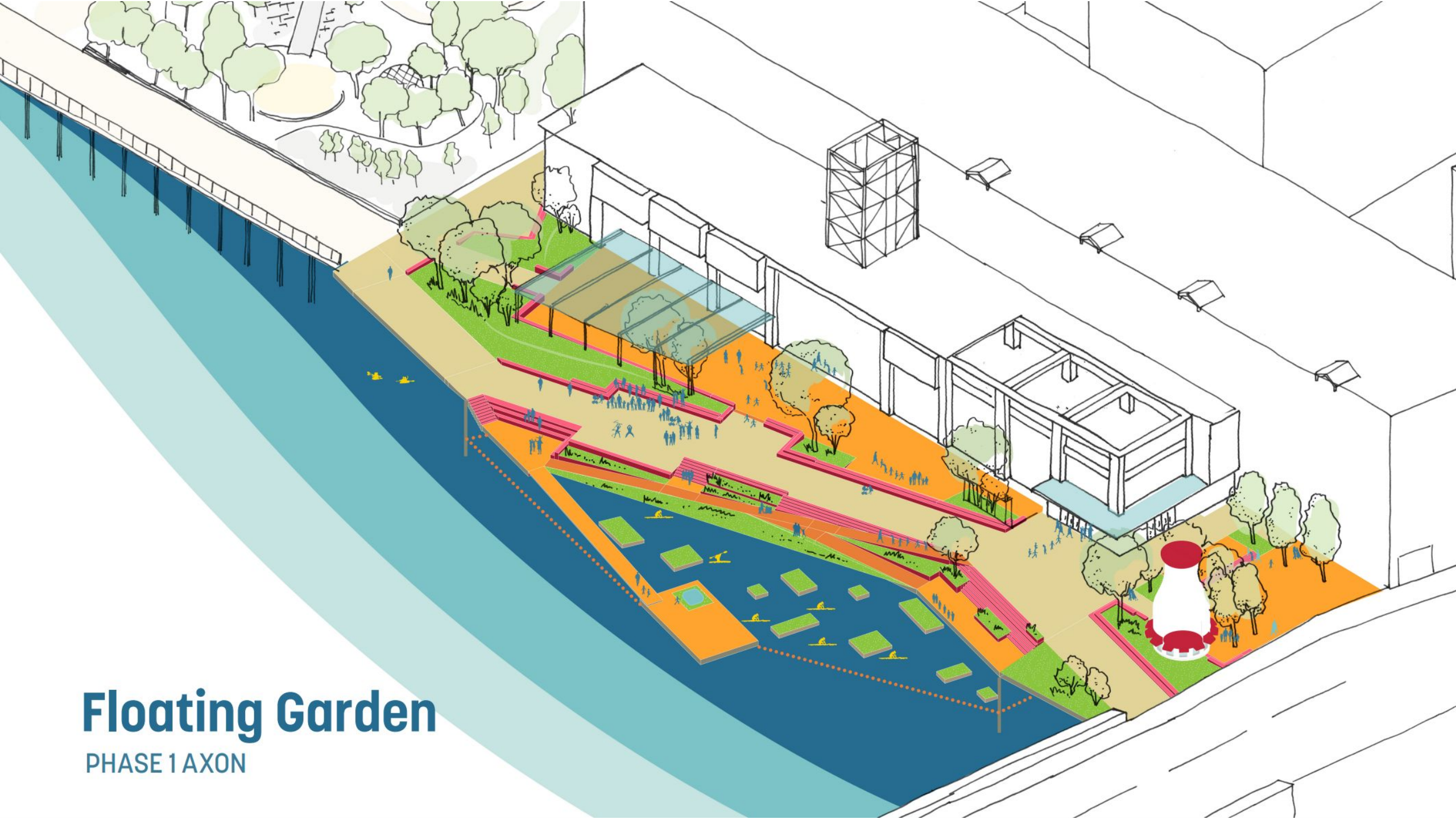
SCHEME C

Discovery Cove



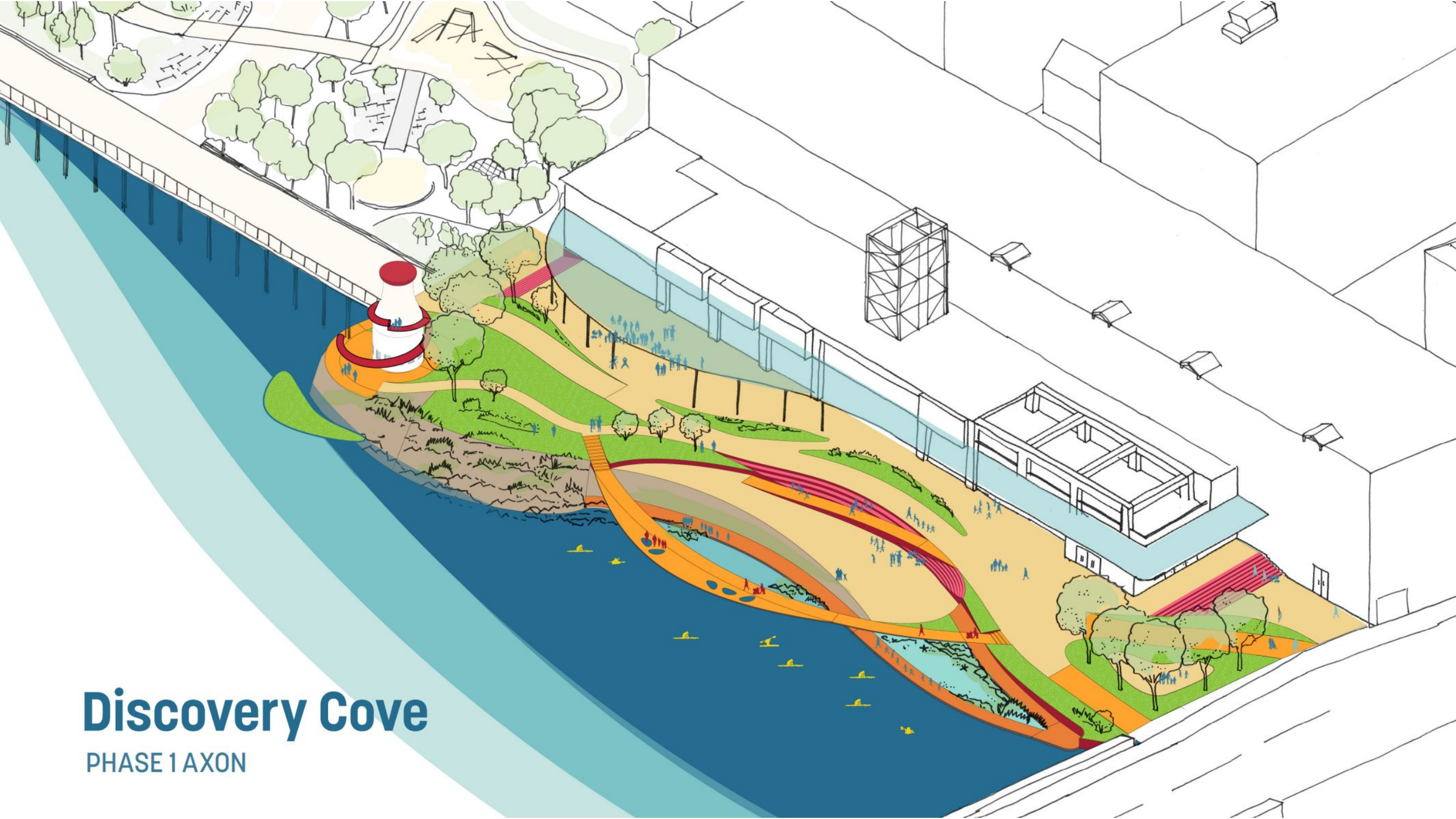
Vertical Edge

PHASE 1



Floating Garden

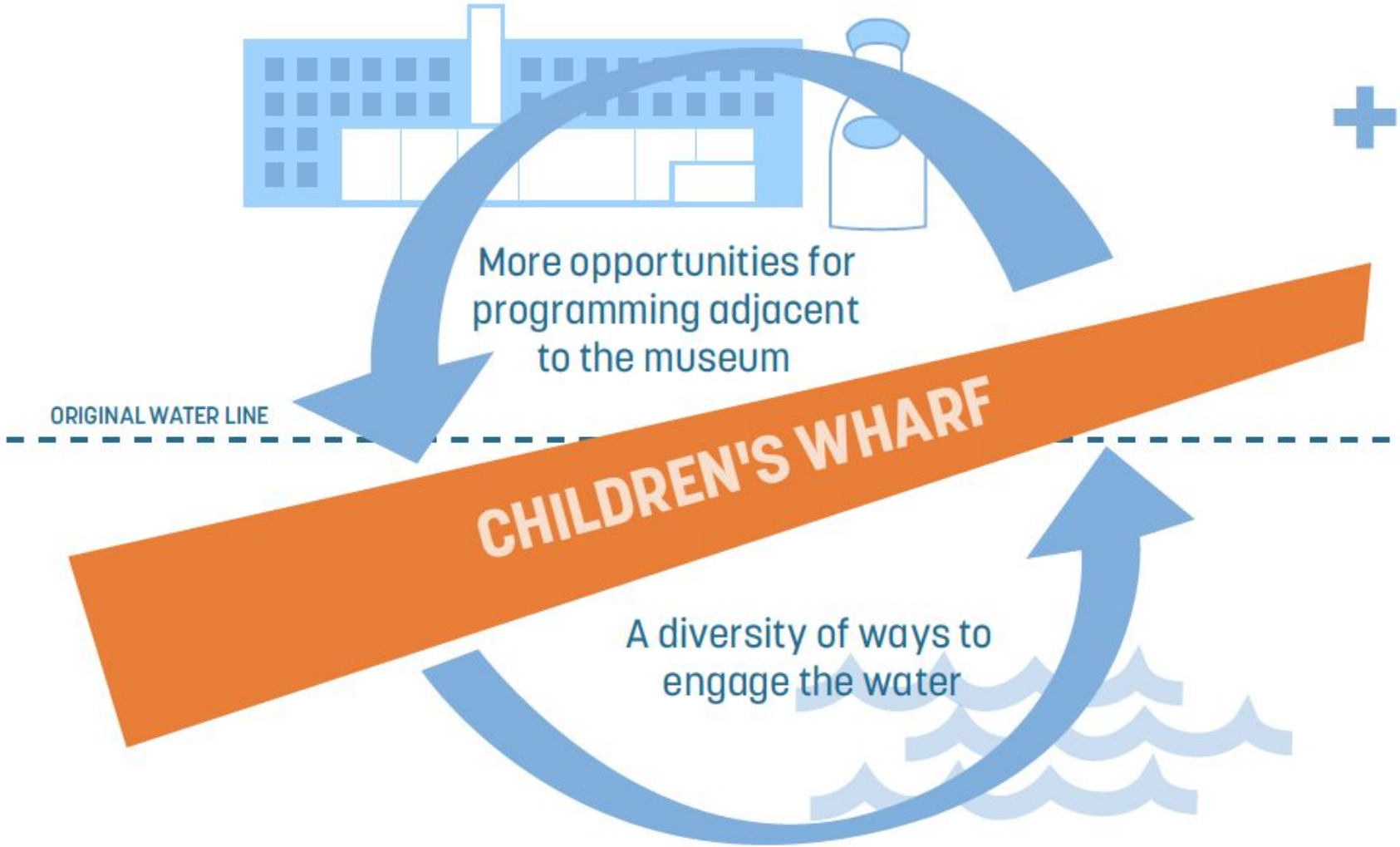
PHASE 1 AXON



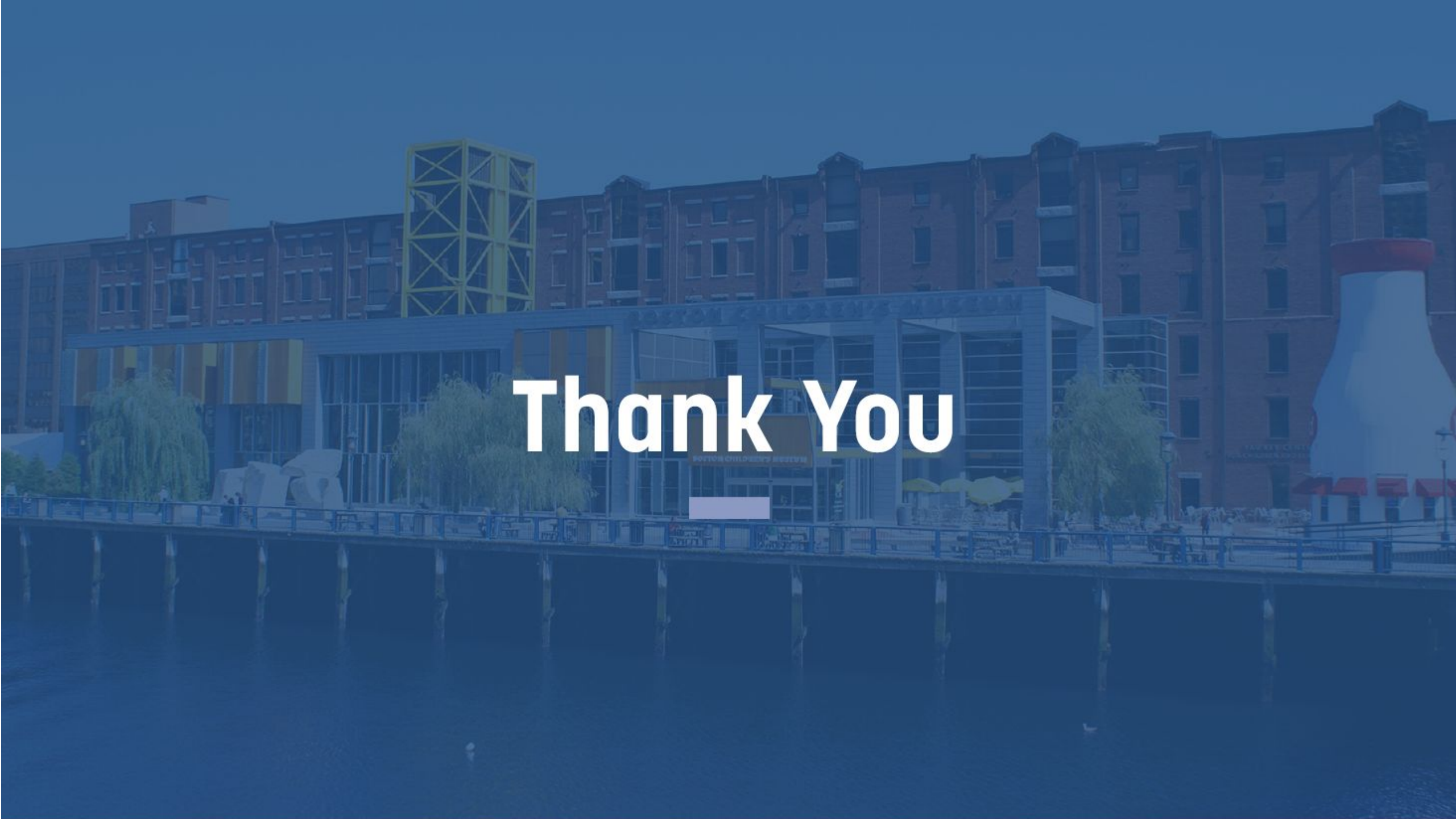
Discovery Cove

PHASE 1 AXON

A PLAYFUL NEW TWIST TO CHILDREN'S WHARF



+ Elevate landscape to provide passive flood protection


Thank You

Thank You!

Join Our Next GRCx Program:

Pricing the Impact of Climate Change on Urban Property Values

September 30, 2020, 8:30 am – 10:00am

GRCx | GREEN RIBBON COMMISSION Climate Action Exchange