



Sea2City

DESIGN
CHALLENGE

**RISE
TO
THE
CHALLENGE**



CITY OF
VANCOUVER

COASTAL
ADAPTATION

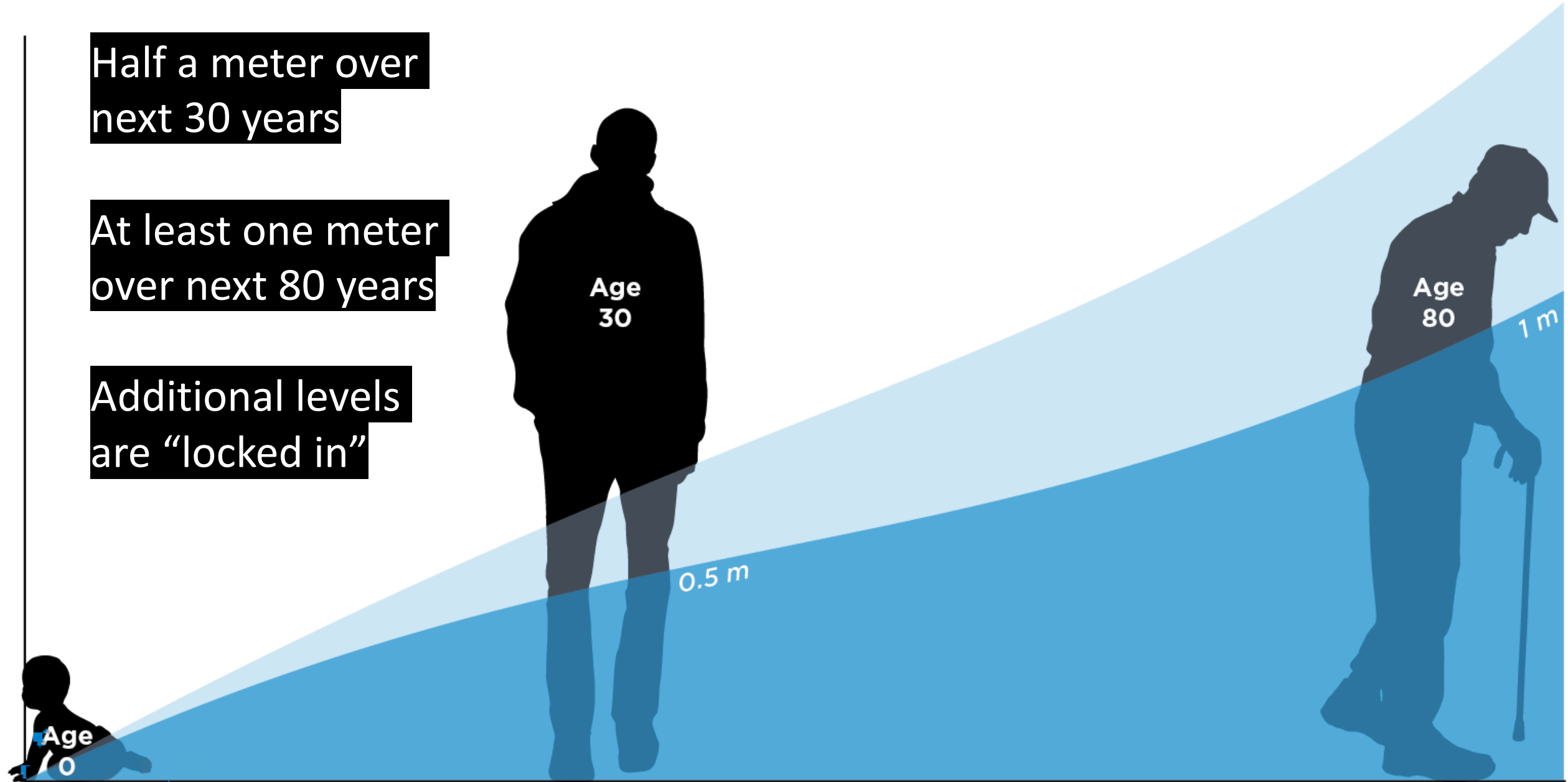
What's the Challenge?



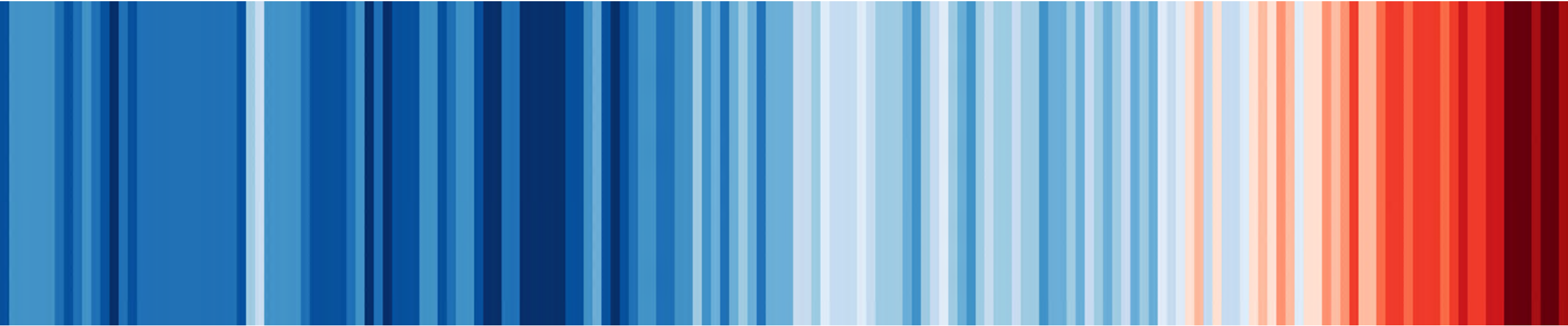
Half a meter over
next 30 years

At least one meter
over next 80 years

Additional levels
are “locked in”



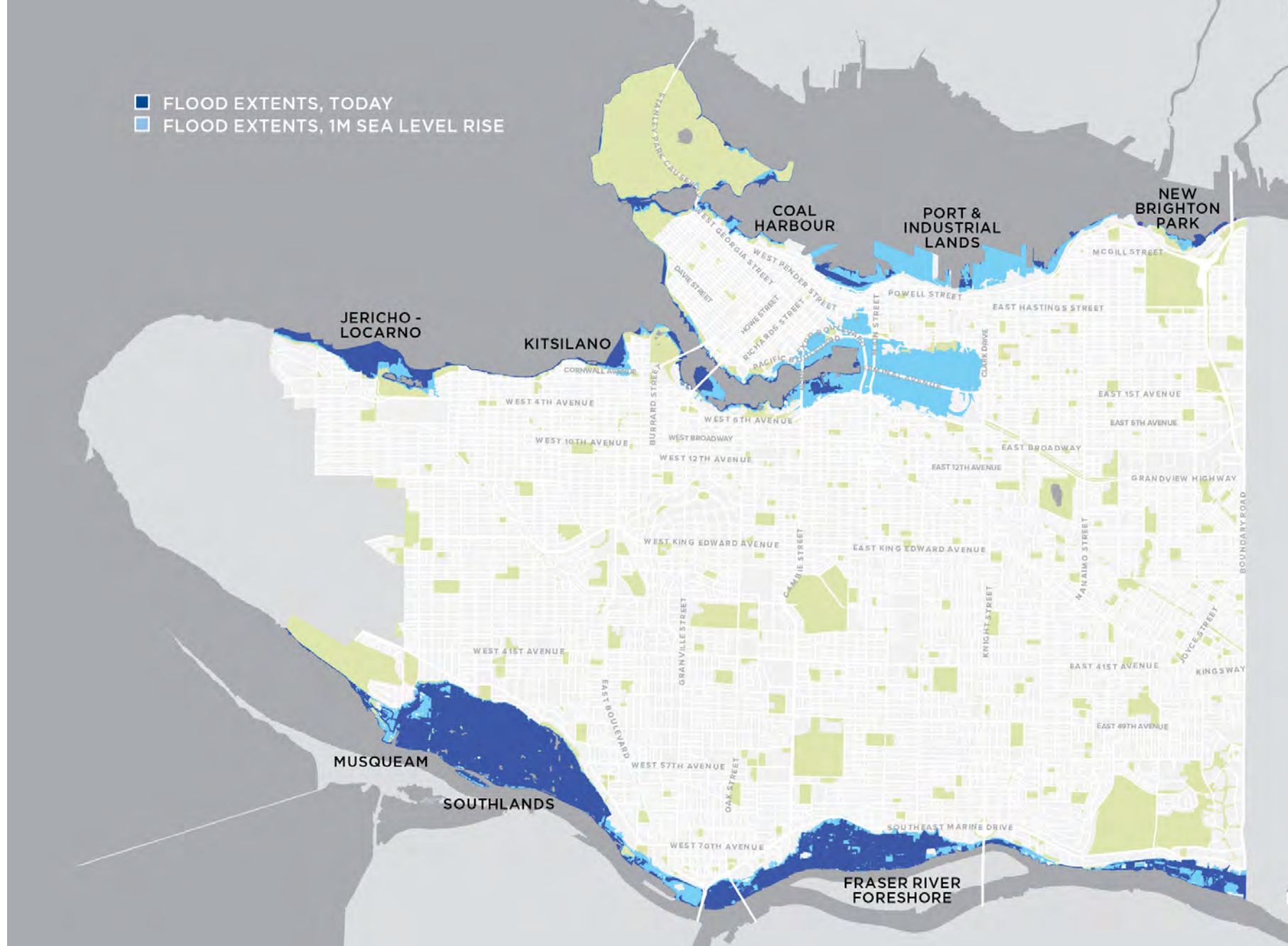
Global temperatures



Global sea levels

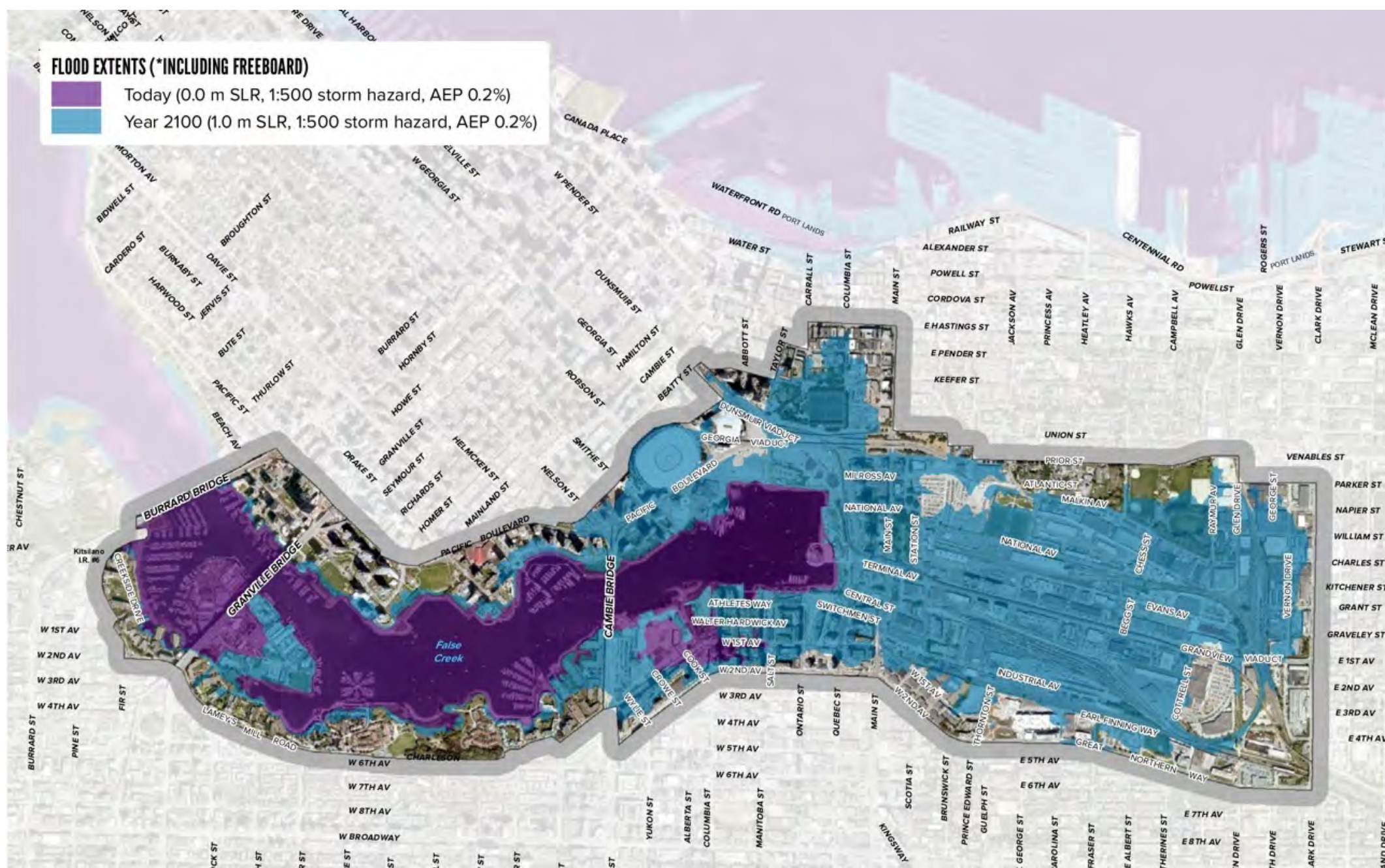


- FLOOD EXTENTS, TODAY
- FLOOD EXTENTS, 1M SEA LEVEL RISE



FLOOD EXTENTS (*INCLUDING FREEBOARD)

- Today (0.0 m SLR, 1:500 storm hazard, AEP 0.2%)
- Year 2100 (1.0 m SLR, 1:500 storm hazard, AEP 0.2%)



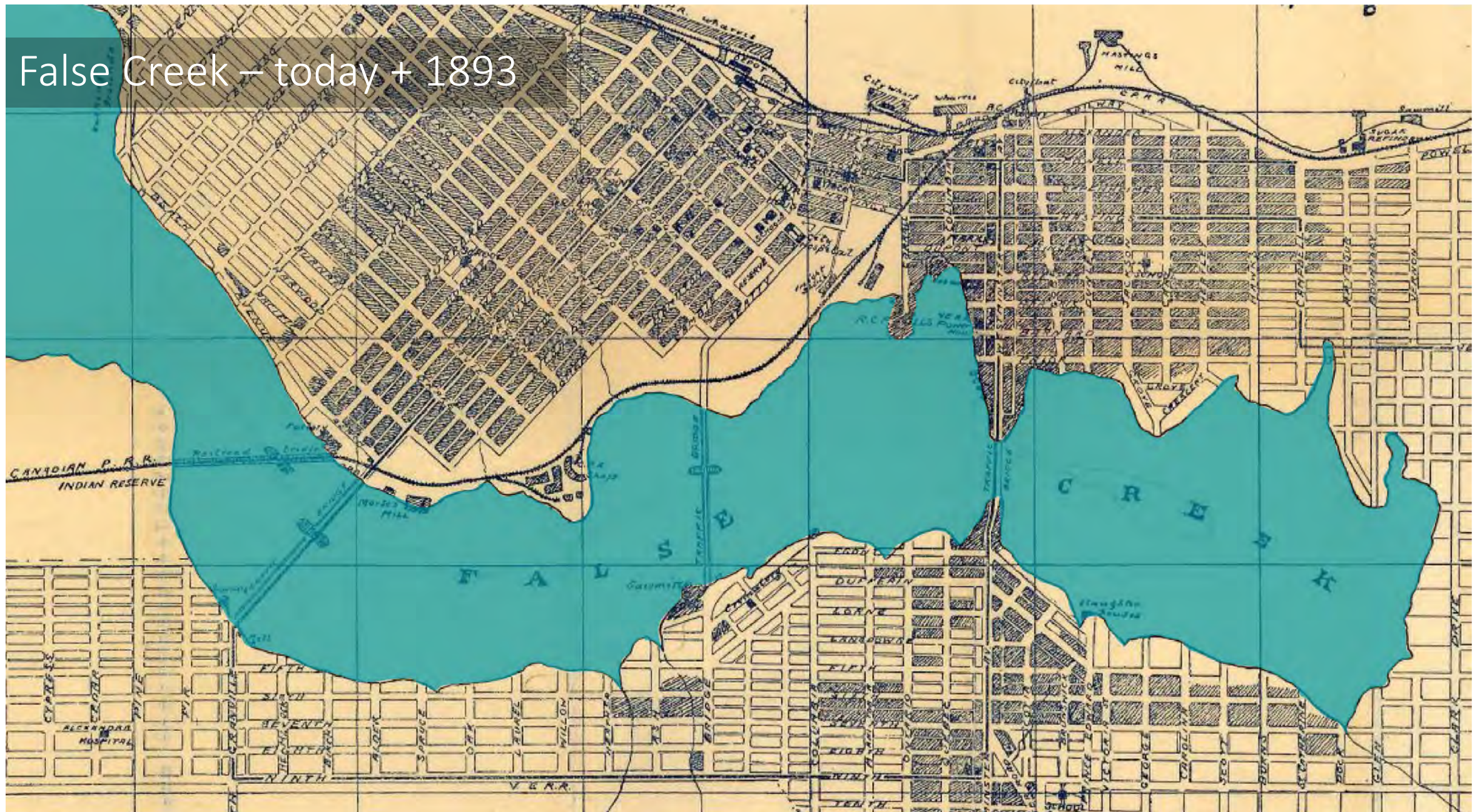
False Creek - 1890

False Creek Today

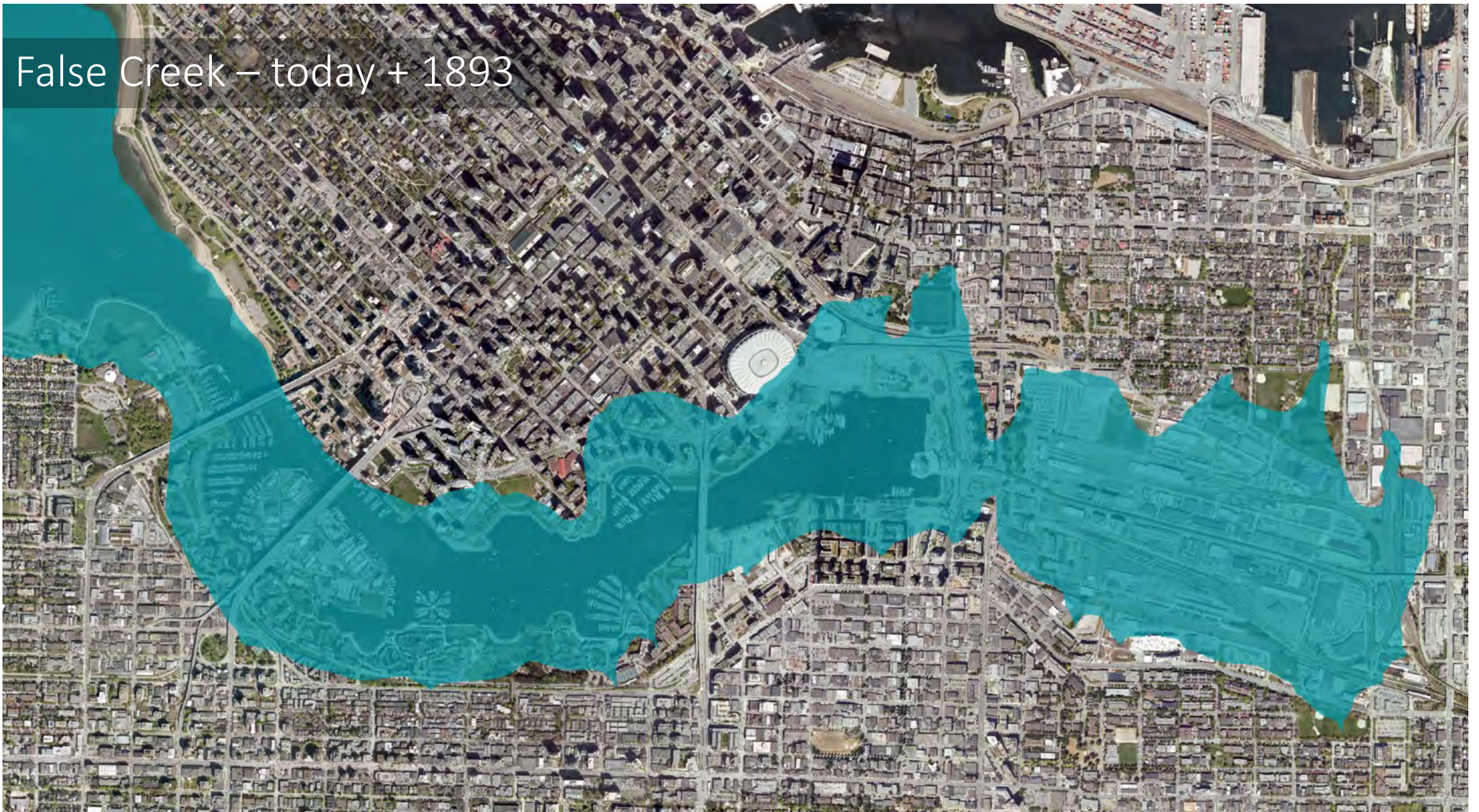
Main St.

7th Ave

False Creek – today + 1893



False Creek – today + 1893



False Creek – 1m SLR, 1:500 storm



What are we doing about it?



A Decade of Coastal Adaptation Planning

Public Engagement



2012+

- Mapping and flood modeling



2018

- *Coastal Adaptation Plan – Fraser River Foreshore*



2020

- *Coastal Adaptation Plan – False Creek*



A unique, community-driven design challenge

Guide urban development and ecological revitalization in False Creek

Inform next phase of Coastal Adaptation Plan

Guided by community values and design principles from earlier Coastal Adaptation Plan work



ROUND 1

Getting Started



Sep - Oct 2021

ROUND 2

Preliminary Designs



Mar - Apr 2022

ROUND 3

Final Concepts
East of Cambie Design Charrette

Jun - Jul 2022

Collaboration

City Staff

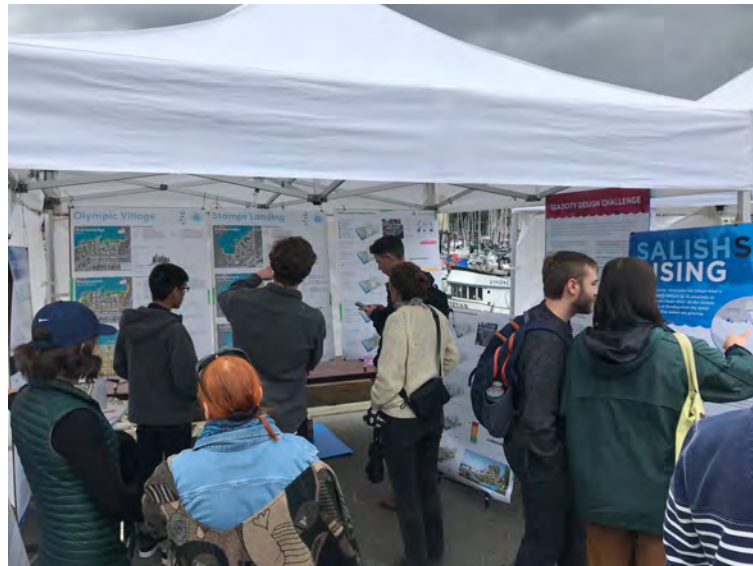
Technical Advisory Group

Community Advisory Group

Youth Adaptation Lab

Community Members

Indigenous Designers & Knowledge Holders





PWL Partnership
MVRDV
Deltares
Modern Formline Design

Mithun + One
Modern Formline Design



RISE TO THE CHALLENGE



MITHŪN

one





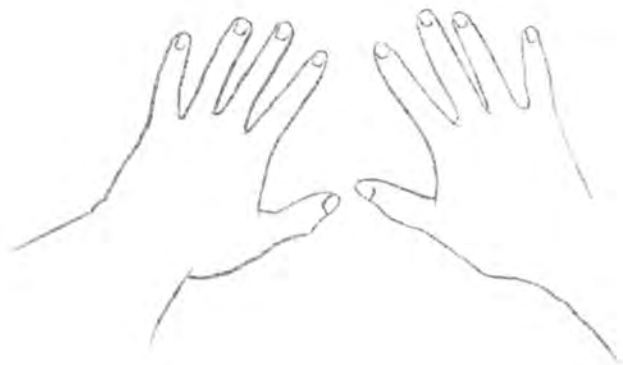
Two Eyed Seeing—



RESIST

ACCOMMODATE

MOVE/AVOID



DRAFT
FOR DISCUSSION

RESIST

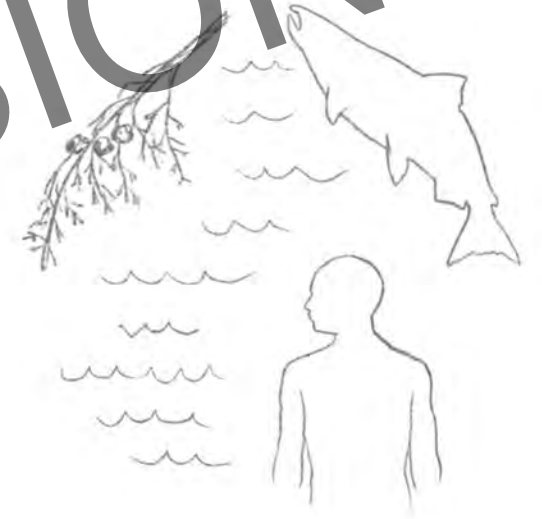
ACCOMMODATE

MOVE/AVOID

ACKNOWLEDGE

RECIPROCATATE

REPAIR



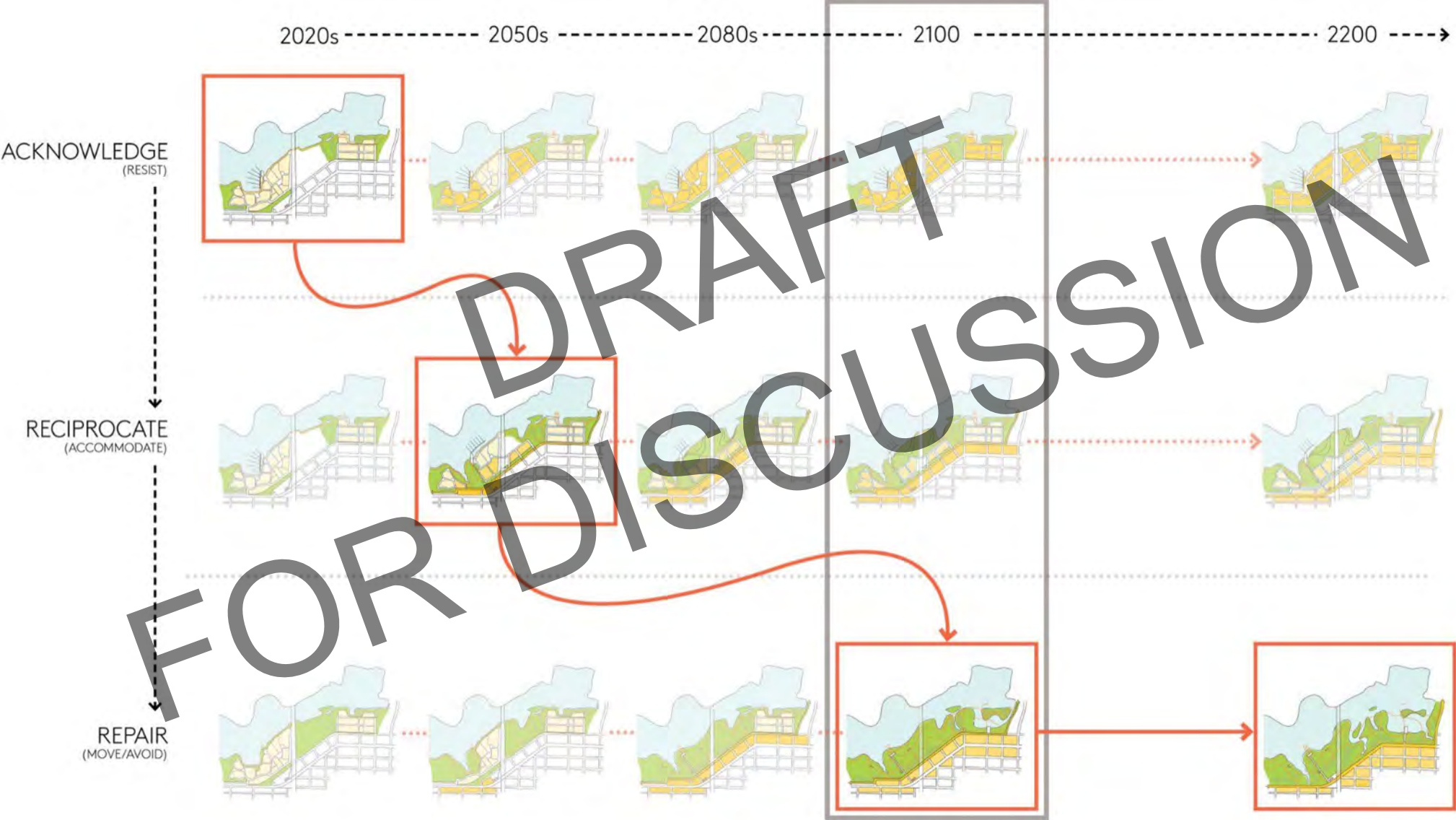
DRAFT
FOR DISCUSSION

Change Over Time

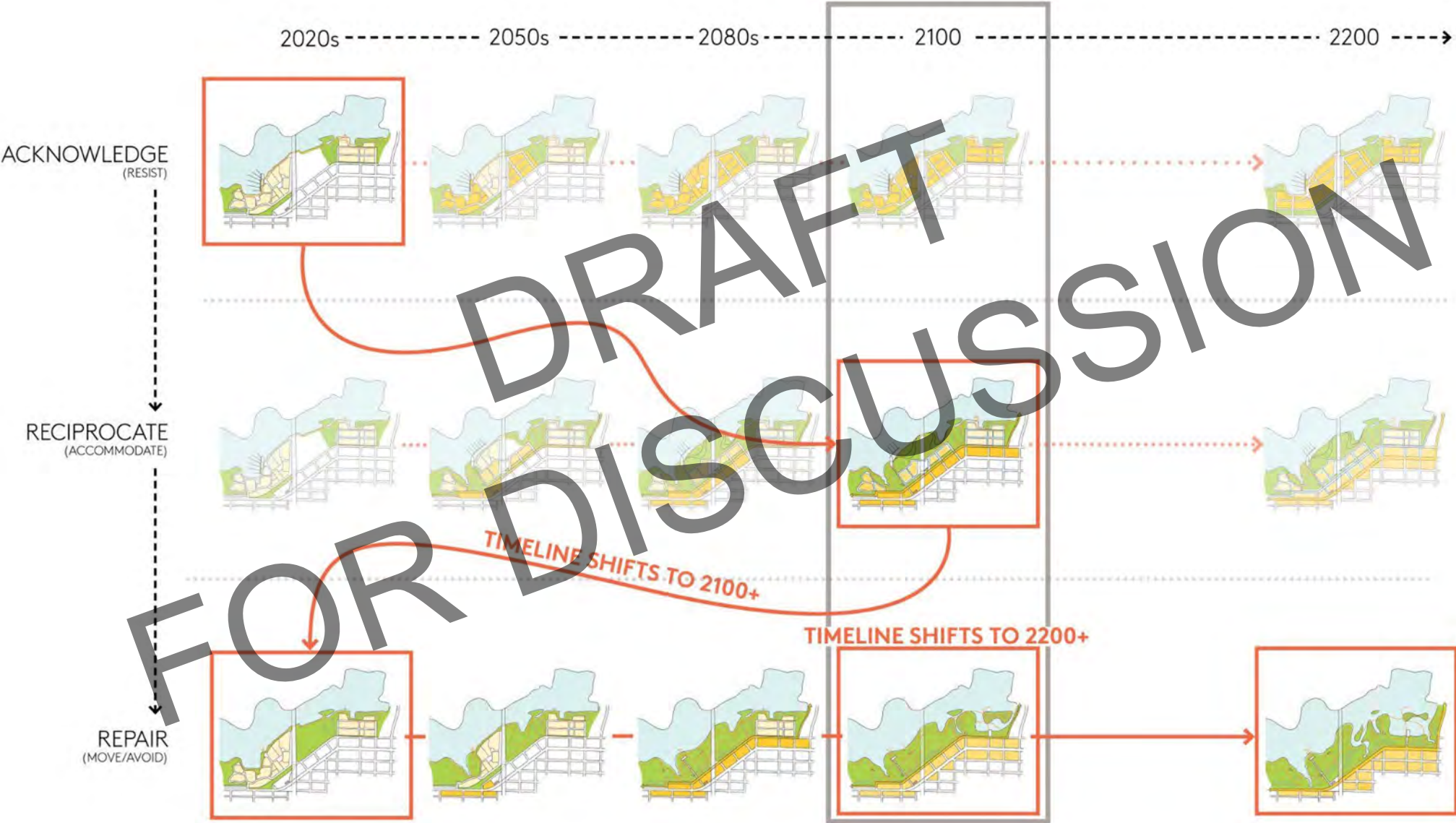


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FOR DISCUSSION

Proposed Approach



Alternative Approaches



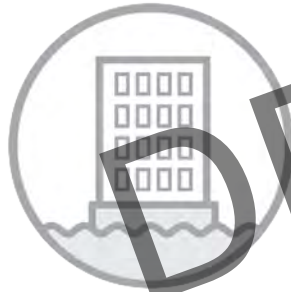
Adaptation Strategies



**FLOOD
CONTROL
SEATWALL**



**BLUE GREEN
SYSTEMS**



**FLOODPROOF
BUILDINGS**



**DEVELOP ON
HIGHER GROUND**



**TIDAL
BEACH**



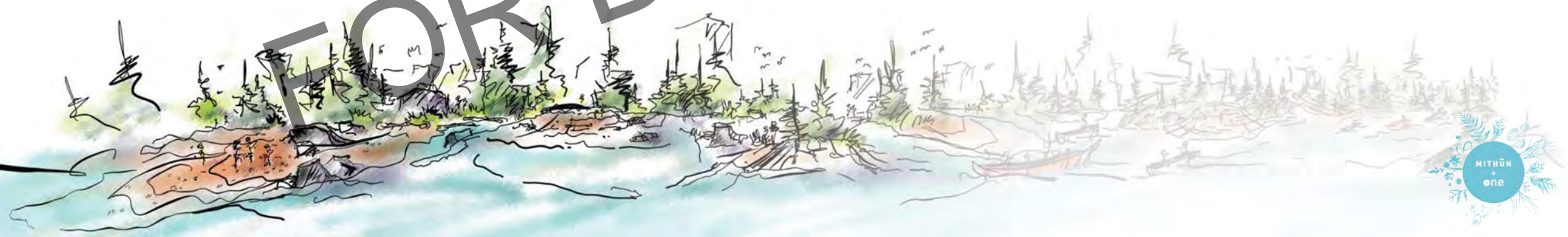
**CEDAR
WOODLAND
BERM**



**SALT MARSH
WETLAND**

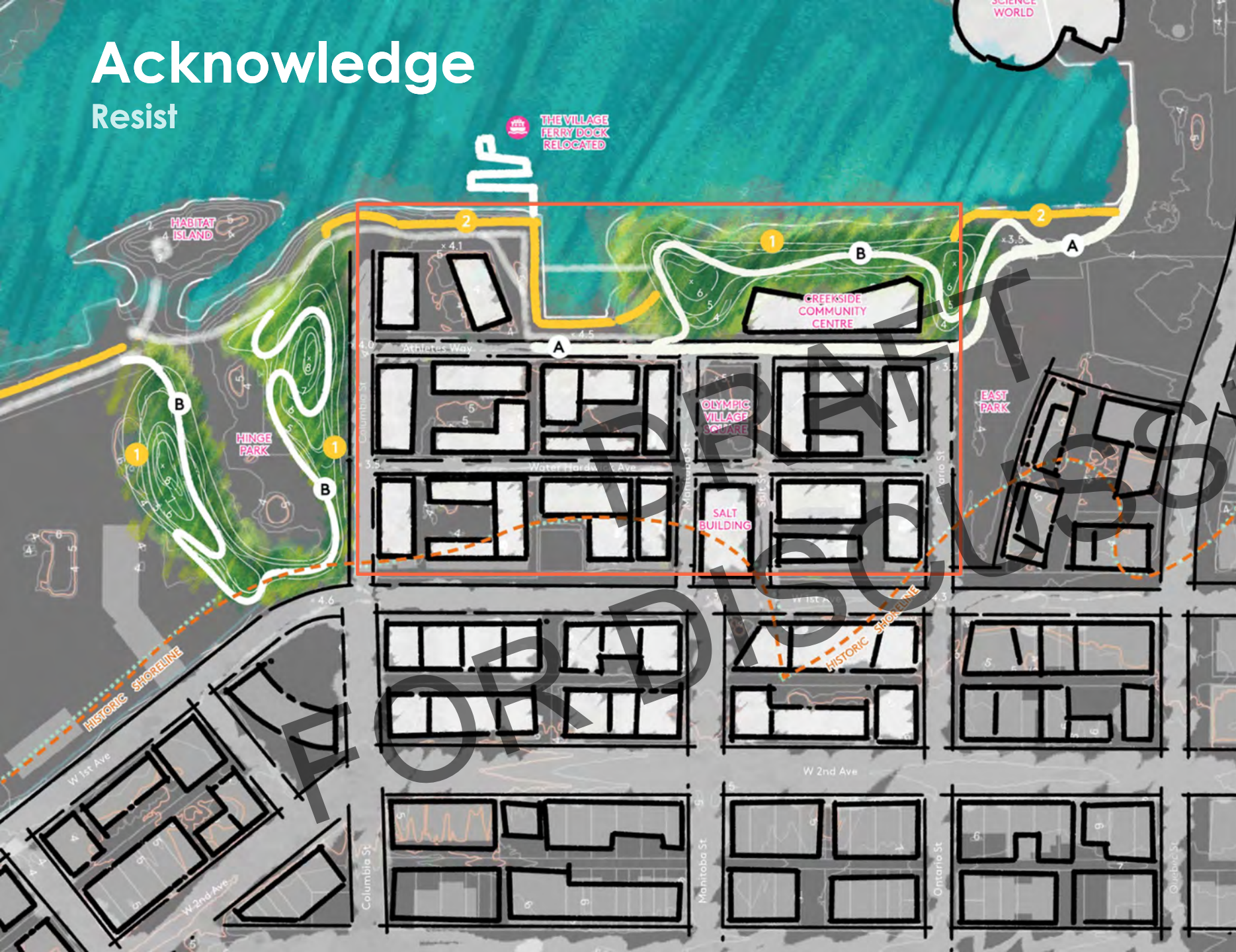
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FOR DISCUSSION

Olympic Village—



Acknowledge

Resist



Adaptation Strategies

- 1 Cedar Woodland Berm



- 2 Flood Control Seat Wall



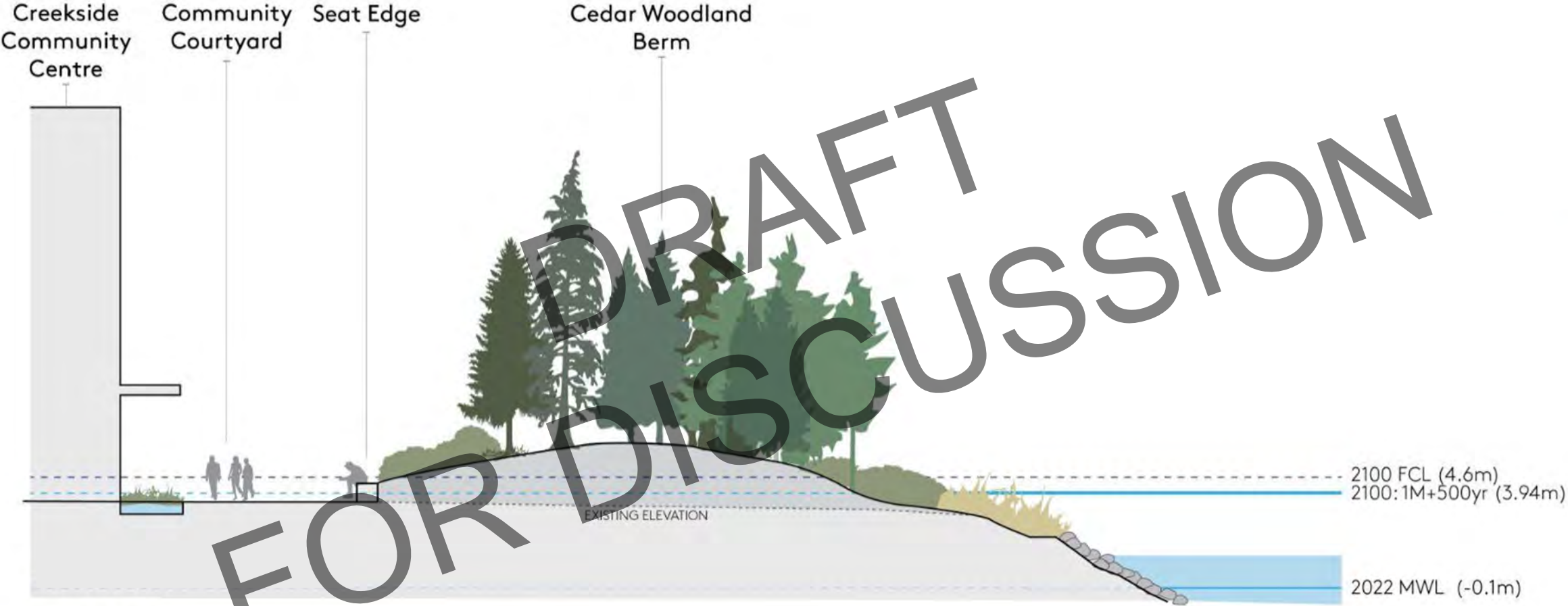
Cultural Ribbon

- A Accessible/Bike Path
B Cultural Path



Acknowledge

Resist



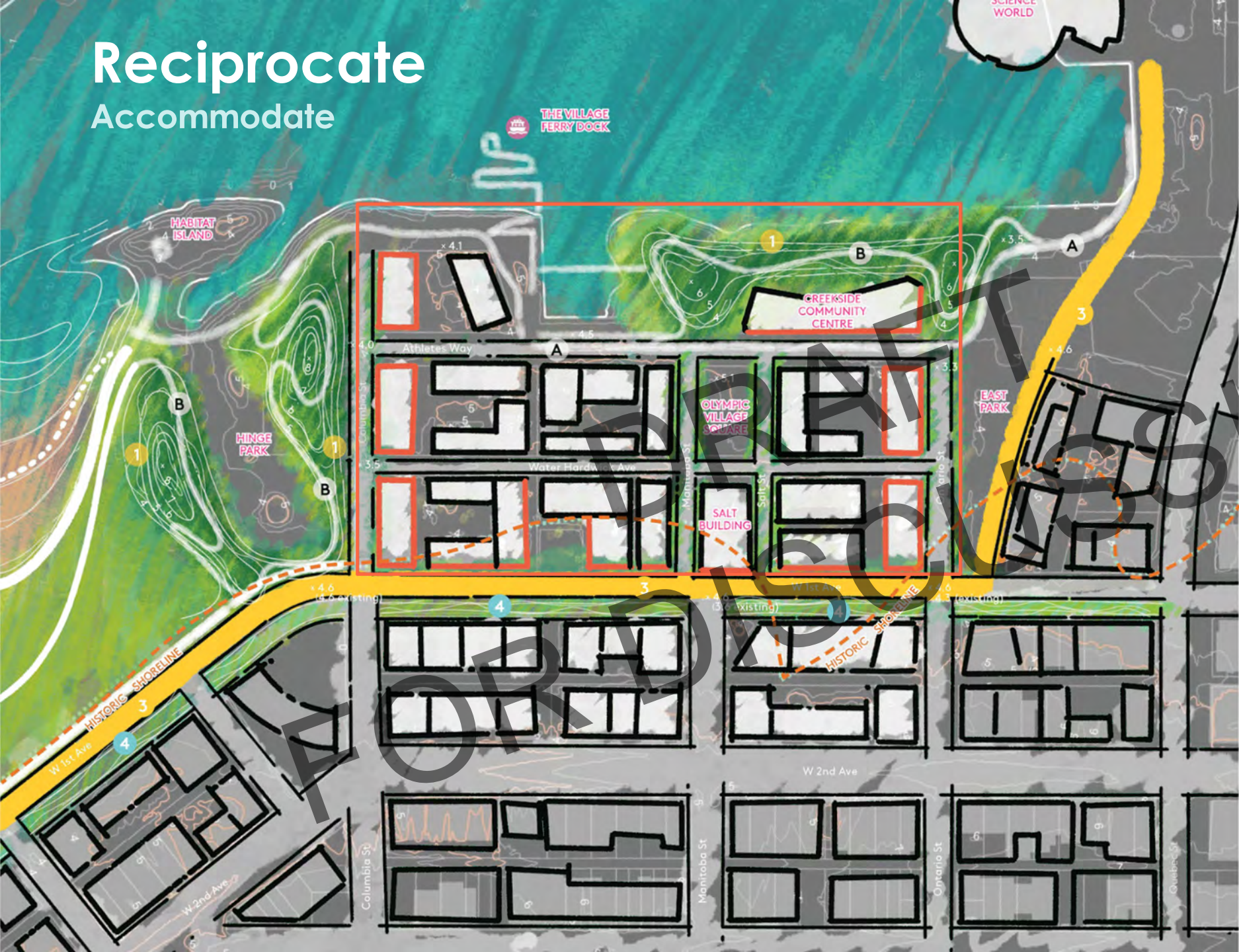
Acknowledge

Resist



Reciprocate

Accommodate



Adaptation Strategies

- 3** 1st Ave Flood Control Ribbon
- 4** 1st Ave Blue Green Corridor
- Floodproofed Buildings

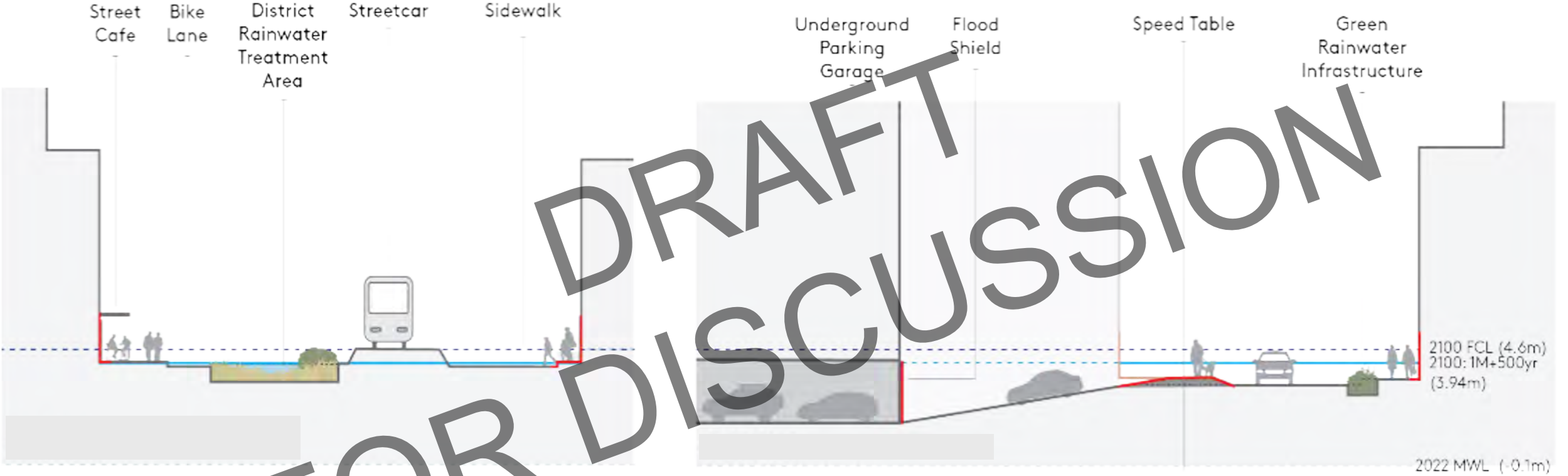
Cultural Ribbon

- A** Accessible/Bike Path
- B** Cultural Path



Reciprocate

Accommodate



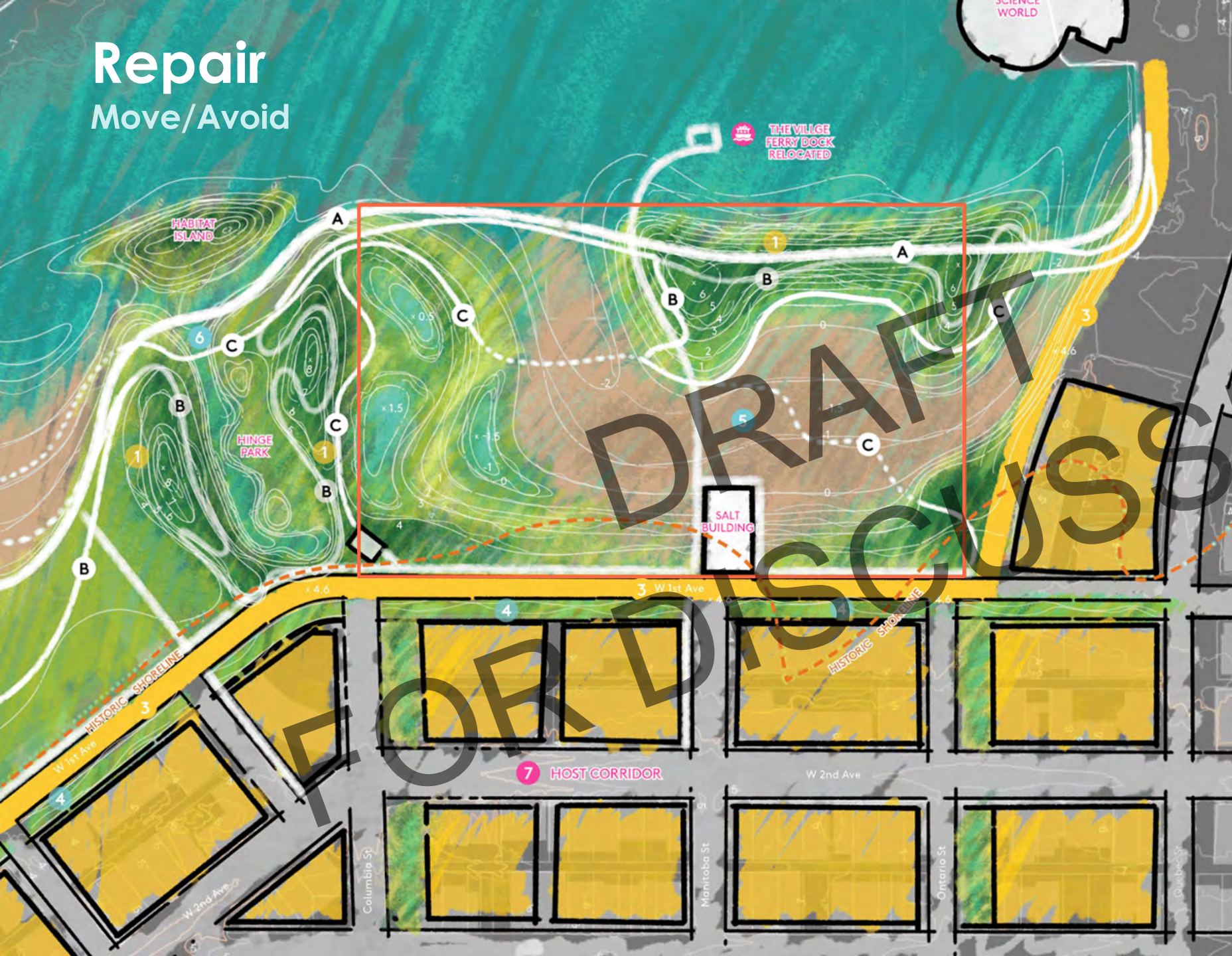
Reciprocate

Accommodate



Repair

Move/Avoid



Adaptation Strategies

- 5 Salt Marsh Wetland



- 6 Hinge Park Tidal Connection



Cultural Ribbon

- 7 Host Corridor

- A Accessible/Bike Path
B Cultural Path
C Ecological Path



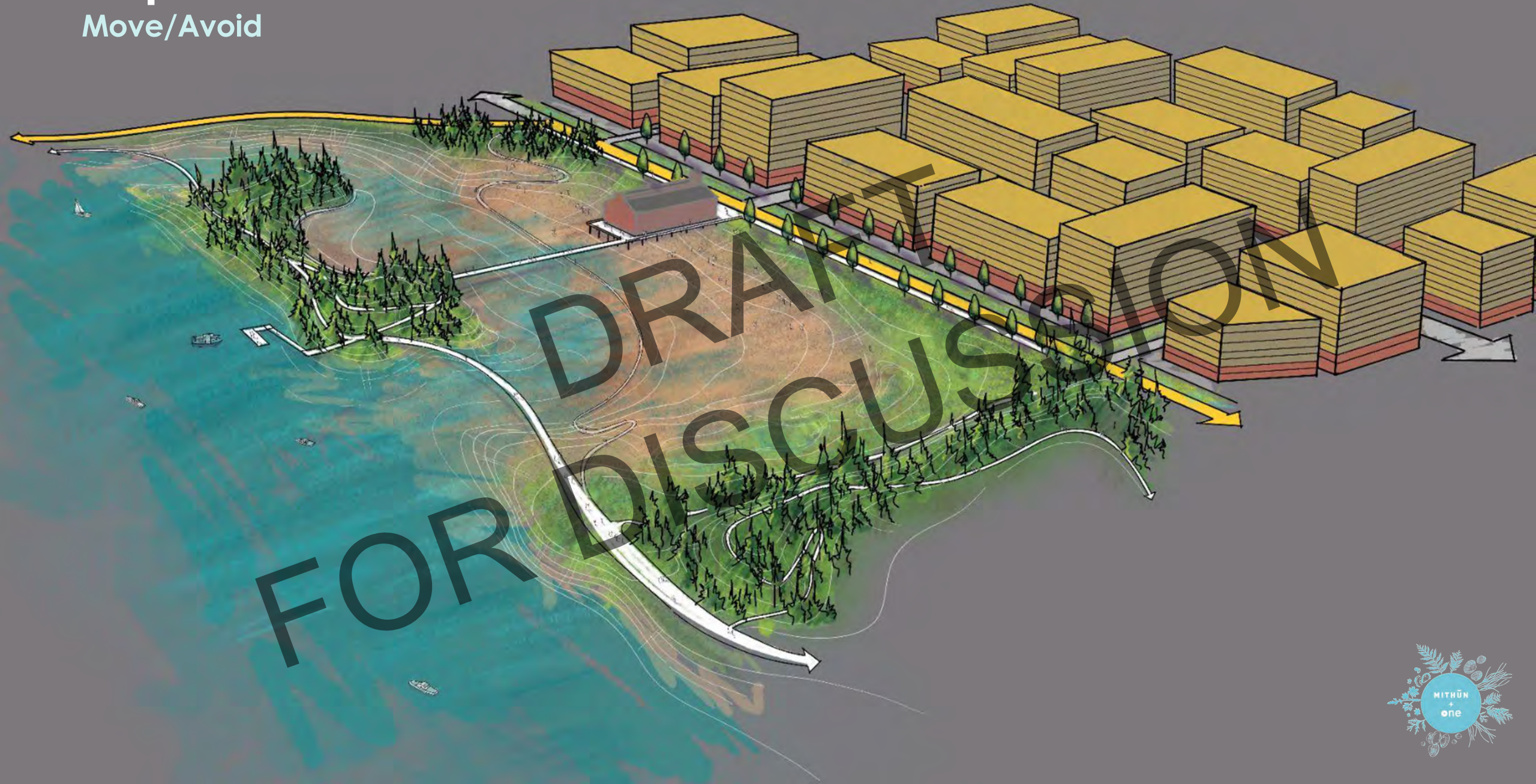
Repair

Move/Avoid



Repair

Move/Avoid



Olympic Village

- What do you think?
- Likes, dislikes, questions

DRAFT
FOR DISCUSSION

Stamps Landing—

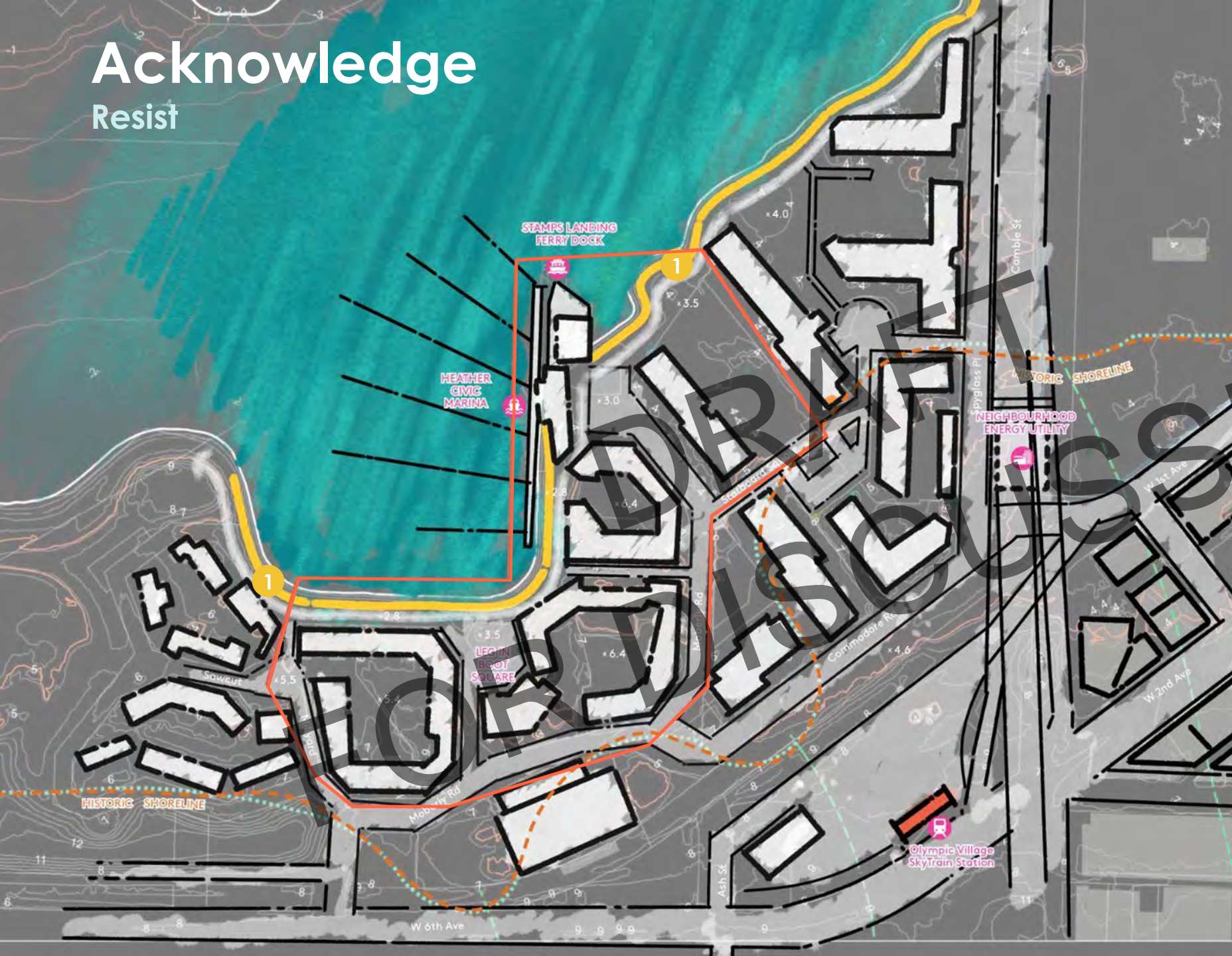


DRAFT
FOR DISCUSSION



Acknowledge

Resist



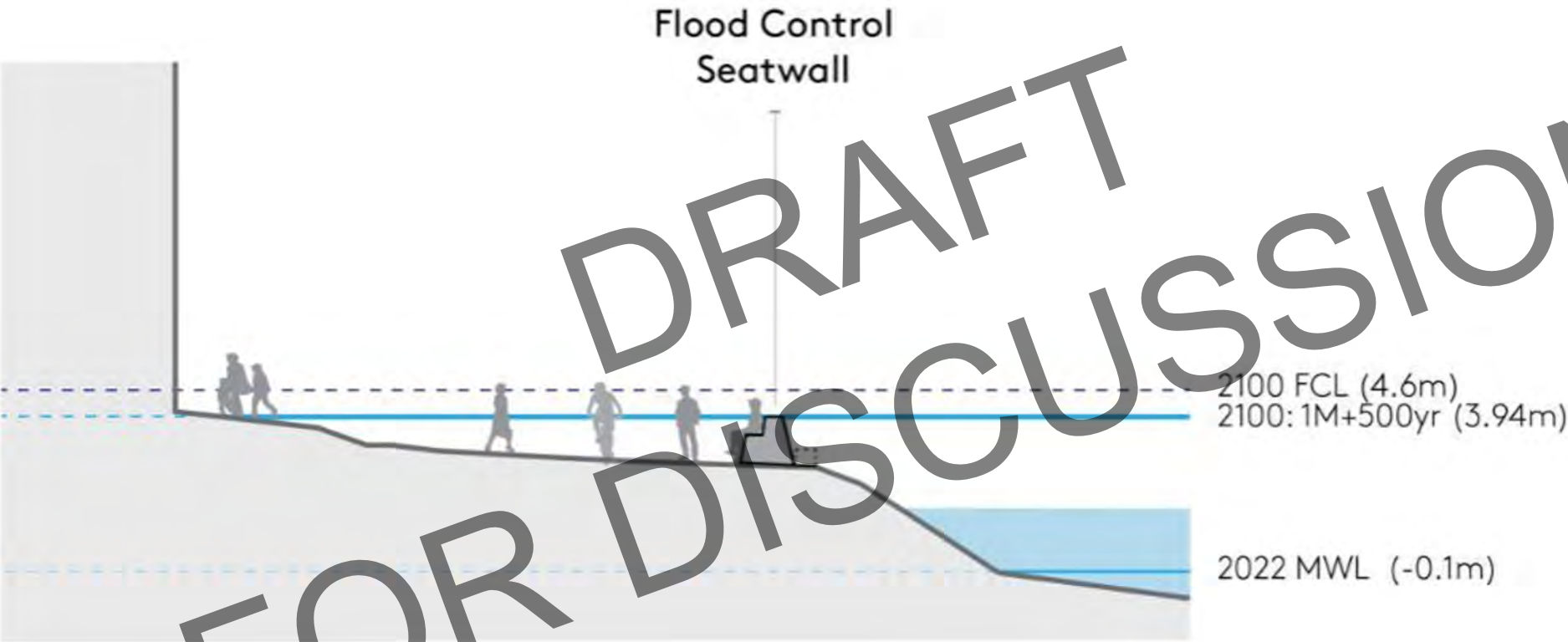
Adaptation Strategies

- 1 Flood Control
Seat Wall



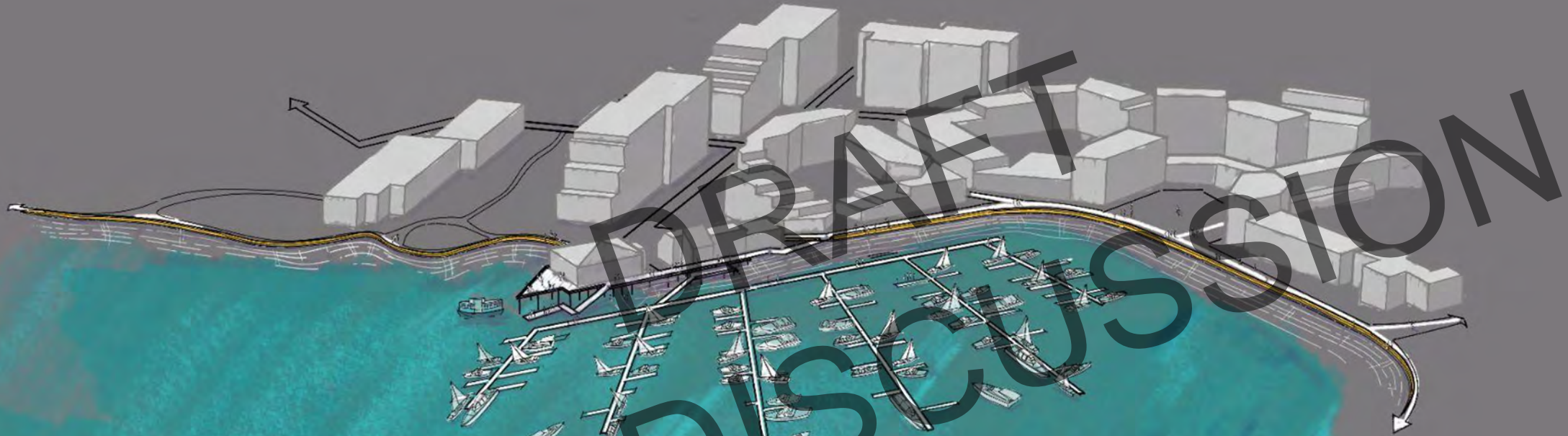
Acknowledge

Resist



Acknowledge

Resist



Reciprocate

Accommodate



Adaptation Strategies

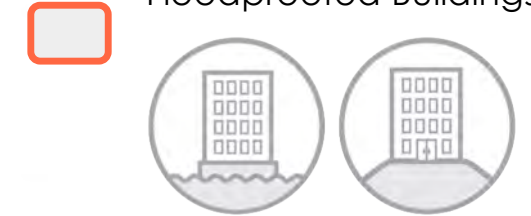
1 1st Ave Flood Control Ribbon + Blue Green Corridor



3 Historic Stream Daylight



4 Upland Development + Floodproofed Buildings

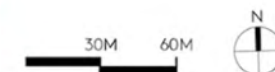


Cultural Ribbon

A Accessible/Bike Path

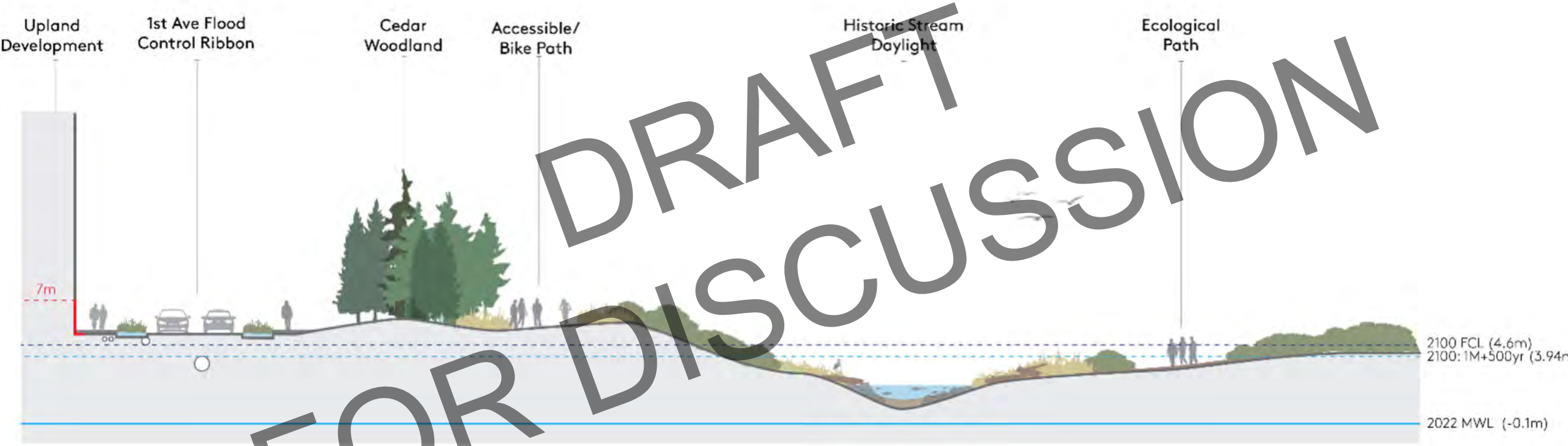
B Cultural Path

C Ecological Path



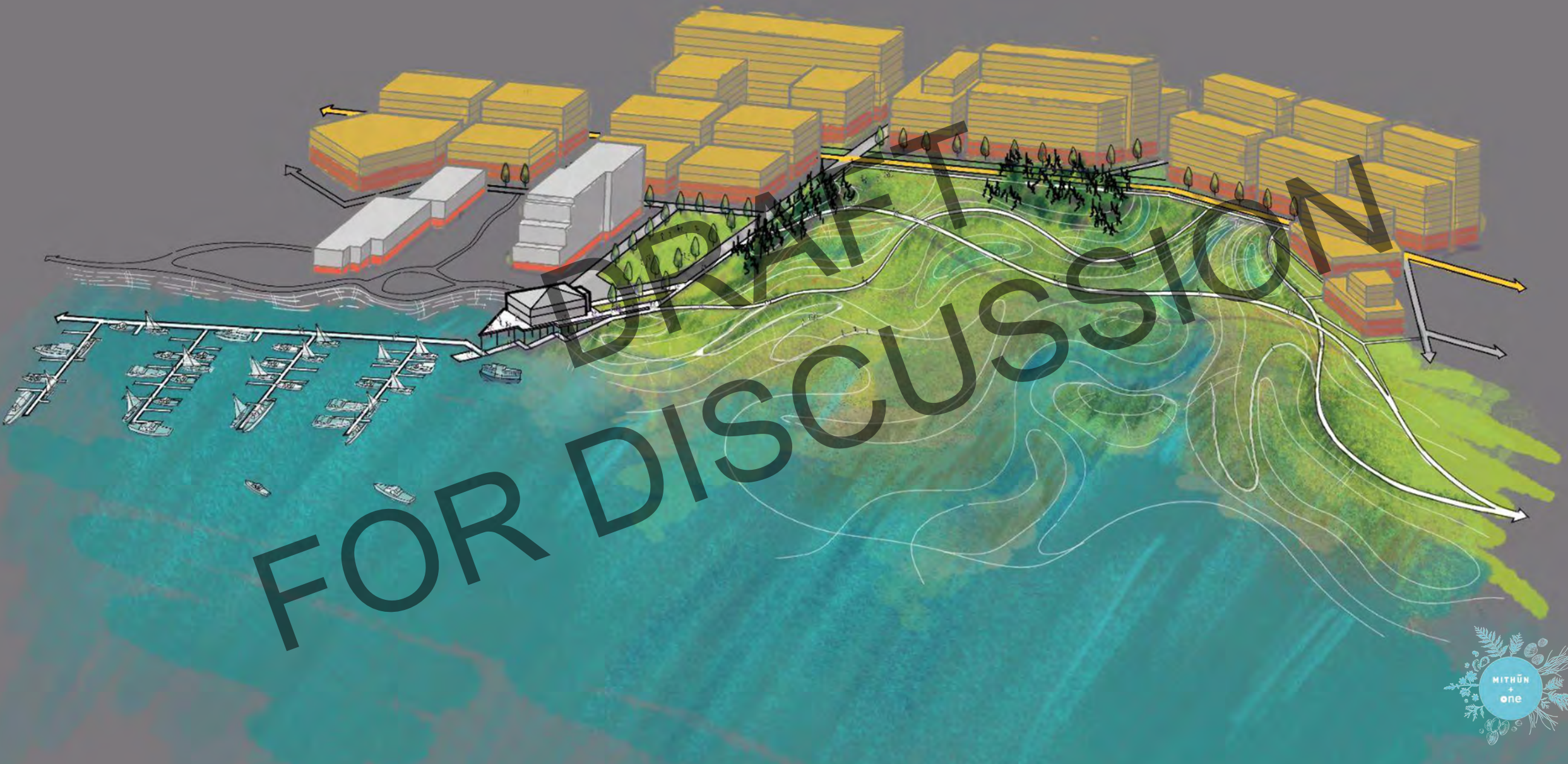
Reciprocate

Accommodate



Reciprocate

Accommodate



Reciprocate

Accommodate

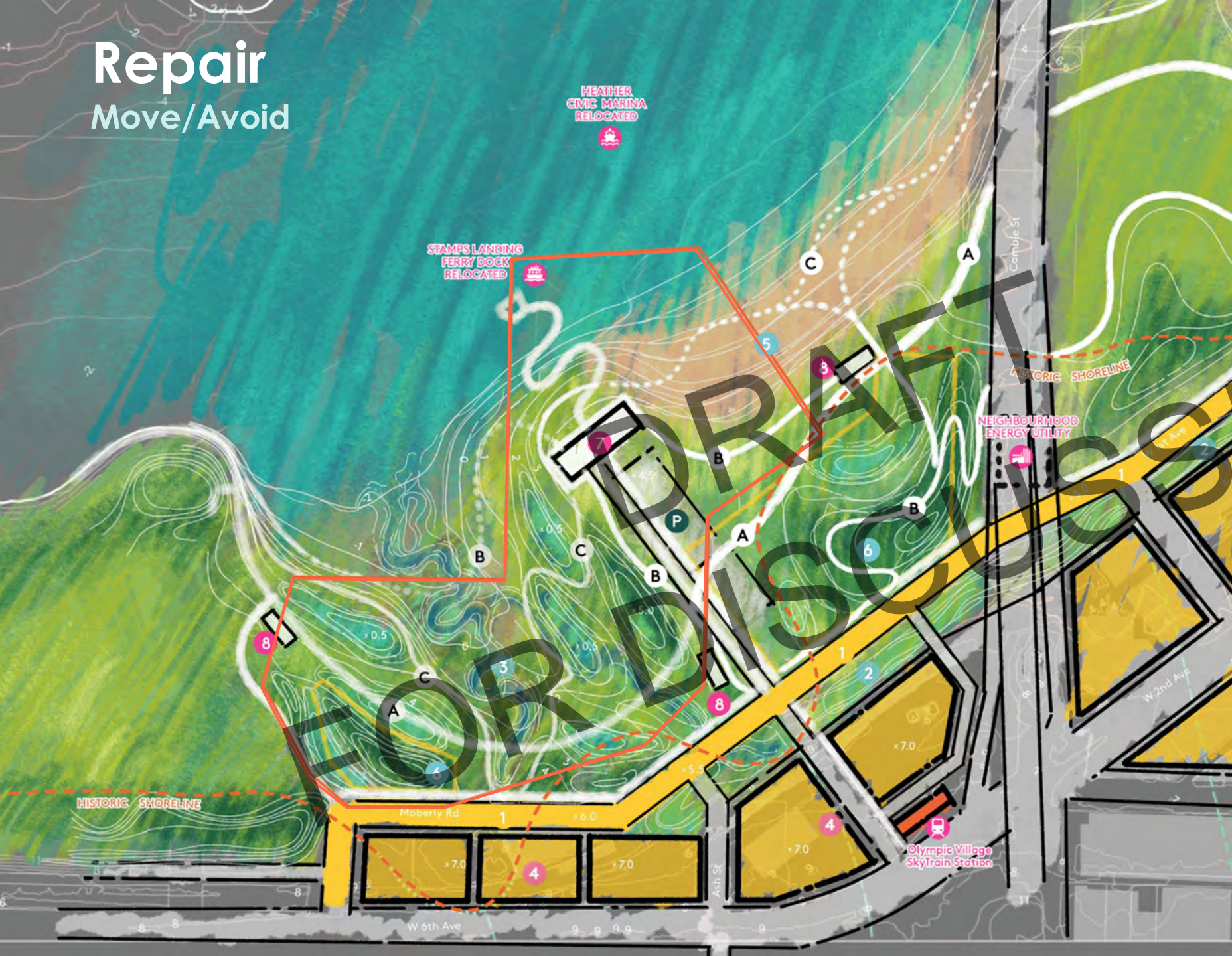


New Brighton Park



Repair

Move/Avoid



Adaptation Strategies

- 5 Gravel Beach & Aquatic Habitat Bench



- 6 Cedar Woodland Berm



Cultural Ribbon

- 7 First Nations Cultural Exchange
- 8 Community & First Nations Facilities

- A Accessible/Bike Path
- B Cultural Path
- C Ecological Path



Repair

Move/Avoid



Repair

Move/Avoid



Stamps Landing

- What do you think?
- Likes, dislikes, questions

DRAFT
FOR DISCUSSION

The shifting ribbon

North Creek Collective
Sea2City - Collaboratorium II presentation



2

The Future of False Creek

Our ambitions & vision 2100

Can the future waterfront become a robust, continuous central park for the city?



Central Park, NYC, US

But also become a zone of cultural adaptation in the heart of Vancouver that enables the evolution of an inclusive, prosperous society - a cultural shift



From a language of colonization.....



From
"Resist"



From
"Accomodate"



From
"Retreat"

...to a language of reciprocity and relational adaptation



Let's protect
eachother

To
"Protect
(eachother)"



Welcome. What
do you need?

To
"Host"



Let's go
together

To
"Move Together"

...to a process of gradual adaptation: a phased and concurrent approach instead of separate ideas



4

**Our vision for Between Bridges:
initial concept ideas**

Between Bridges Current (2022)



Between Bridges TOMORROW (From Present to 2050 - 3.6m FCL)

Water levels 1:500 storm surge 0.6m freeboard



Protect (each other)

Prioritize protecting critical infrastructure while simultaneously restoring (protecting) the natural systems and our connection to them

This approach prioritizes the protection of critical infrastructure while recognizing the necessity of initiating nature-based solutions today to ensure resiliency tomorrow. While the traditional response of resistance focuses solely on the protection of property using rigid and ever-raising dykes, this approach recognizes the constraints of the site to support a barrier system and expands the idea of protection to our natural systems.

FLOOD BARRIERS

- Introduction of floating walkways and constructed habitats that align with MST values and aspirations for a resilient/adaptive foreshore
- Consider combining with inflatable flood barriers

ADAPT BUILDING UTILITIES

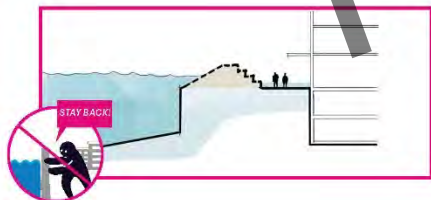
- Saltwater inundation will impact parkade and building structures, requiring additional pumping and relocation of mechanical systems Check foundations of existing buildings
- Maintain and reinforce pumping system of underground parking
- Preparations for relocating critical infrastructure
- Move underground utilities to higher levels
- Possibly prepare underground structures for controlled future flooding

INTEGRATE BLUE-GREEN INFRASTRUCTURE

- Integrate rainwater management into the public realm (bioswales, permeable paving etc)
- Plant climate adaptive trees and planting
- Explore ways to improve False Creek water quality by using green shore strategies and natural filtration

PREPARE FUTURE MOBILITY NETWORKS

- Strengthen alternative mobility backbone on higher ground to make waterfront accessible by new modes once garages are non-operable anymore



THE PROBLEM WITH "RESIST"

In highly urbanized sites like Between Bridges, it's tempting to respond with walls and dykes. However, these hard-edged engineered solutions:

- creates a barrier that separates access to the water's edge
- limits the natural ability for the foreshore to absorb wave energy/storm surge and run-off
- limits potential for intertidal habitat
- creates accessibility challenges



Between Bridges MID TERM (From 2050-2100 - 4.6m FCL)

1:500 storm surge 0.6m freeboard 0.5m-1m sea level rise

This approach explores how we can transform the built environment into a resilient and adaptive system that provides the room and support for natural systems to thrive - even in dense and urban sites like Between Bridges. Instead of simply accommodating flooding waters, this approach asks how we can welcome, support, and steward our natural systems - and by doing so, create resilient responses to rising sea levels that are integrated into our urban fabric.



Host

Prioritize transforming our built environment into a resilient and adaptive system that provides the room and support for natural systems to thrive.

TRANSFORM AFFECTED BUILDINGS

- Transform ground floor of affected buildings
- Activate public and non-residential programs on higher levels
- Adaptive conversions of existing buildings to mix in affordable housing, e.g. for urban indigenous communities in close proximity to the water, leisure programs, spaces for innovation/creation/education, gastronomy

SOFTEN THE SHORELINE

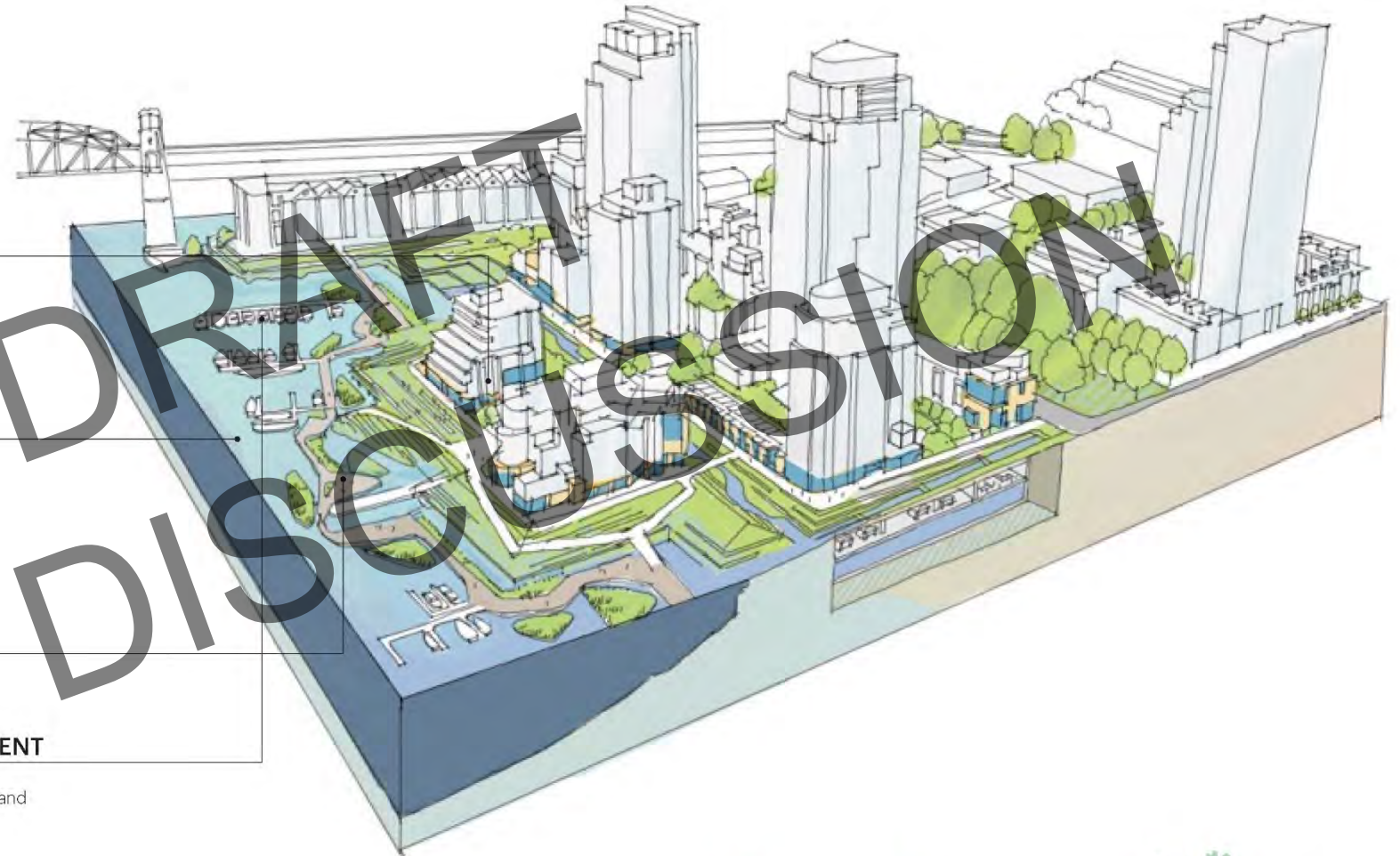
- Start replacing the seawall with terraces and slopes
- Extension of green spaces and naturalized shorelines that support co-management initiatives between the Park Board and Host Nations
- Wetland parks to intercept fluvial events and reintroduction of cedar forests (and other culturally significant species)
- Extension of adaptive floating armatures to support rewilding initiatives in the urban setting for foreshore space is limited

PREPARE FUTURE MOBILITY NETWORKS

- Connect the 2nd floors of waterfront buildings to create a new, safe public waterfront access level

INCREASE ABSORPTION + INTEGRATED WATER MANAGEMENT

- Increase water storage on higher ground to limit runoff
- Consider water treatment facilities for greywater as part of the functional landscape and explore potential for small, decentralized blackwater treatment facilities...



Between Bridges LONG TERM (2100 - 4.6 - 5.0m FCL)

1:500 storm surge 0.6m freeboard 1.0 - 1.4m sea level rise

The approach illustrates a cultural shift and imagines a future where the city has reconnected with nature and recognizes a relationship of reciprocity and respect with the water. It assumes False Creek has been restored to a healthy, biodiverse, and productive part of the urban environment and is able to provide flood protection through nature-based solutions.



Move Together

Representing a cultural shift, this approach imagines a future where the city has reconnected with nature and recognizes a relationship of reciprocity and respect with the water.

POSITIVE TRANSFORMATION IN DOWNTOWN

- Densification of hinterland, strengthening the link with the waterfront
- Retrofit previously developed sites, green roofs and building envelopes with blue/green infrastructure

NEW WAY OF BUILDING

- Demolish selected waterfront buildings or reuse their structures to host temporary/flexible/seasonal structures for inclusive living, creative and clean production, education, urban farming and other programs
- Allow for total inundation of underground parking structures and building foundations

LIVE WITH THE SHORELINE

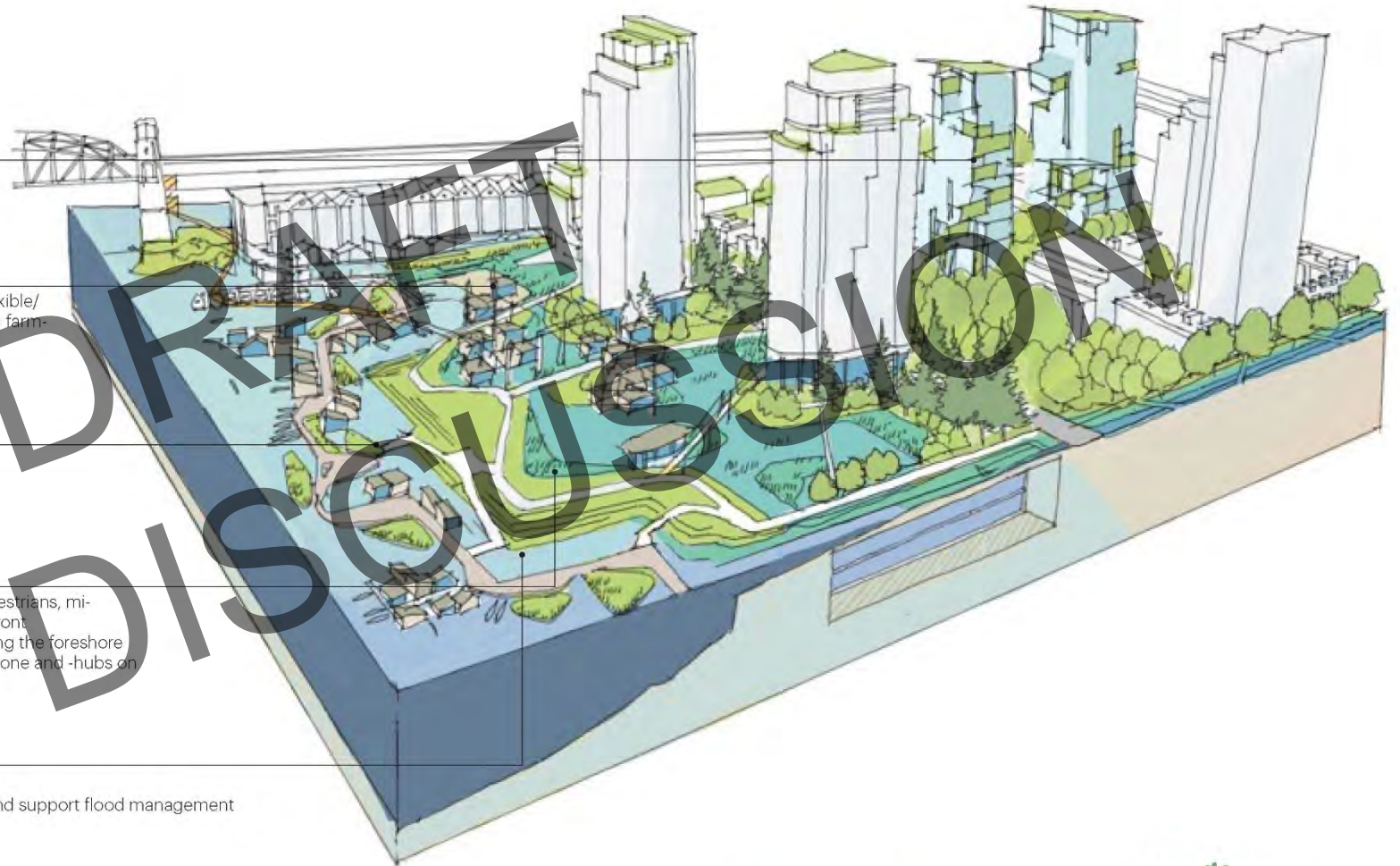
- Cultural identifiers are expressed in the built form and landscape; Cultural centre support indigenous arts community
- Move relocated housing units to roofscape/waterscape/new developments
- Modular housing including pods for artist and seasonal harvesters

CONNECTED TO THE WATER

- Conversion of city streets into corridors for diverse sustainable accessibility (bikes/pedestrians, micro-mobility modes, mobility as a service), clearly connecting Downtown to the waterfront
- Elevated and accessible pedestrian walkways connect to buildings and bridges, allowing the foreshore to fluctuate and support non-human habitats; linked to a safe, city-wide mobility backbone and -hubs on higher ground

LANDSCAPE AS SPONGE

- Conversion of streets into blue-green infrastructure corridors to manage fluvial events
- Restored ecosystems and greenshores improve the capacity to absorb disturbances and support flood management



Between Bridges LONG TERM (2100 - 5.0 - 5.6m FCL)

1:500 storm surge 0.6m freeboard 1.4-2.0m sea level rise

*As sea level rise seems to increase exponentially, there are uncertainties about sea levels in 2100 and beyond. To acknowledge this uncertainty, this approach explore a second LONG TERM scenario of ca. 2.0m SLR by 2100.



Move Together

Representing a cultural shift, this approach imagines a future where the city has reconnected with nature and recognizes a relationship of reciprocity and respect with the water.

NEW IMPULSES IN DOWNTOWN

Densified and green-blue downtown with strong connections to/from waterfront

DESIGNING WITH NATURE

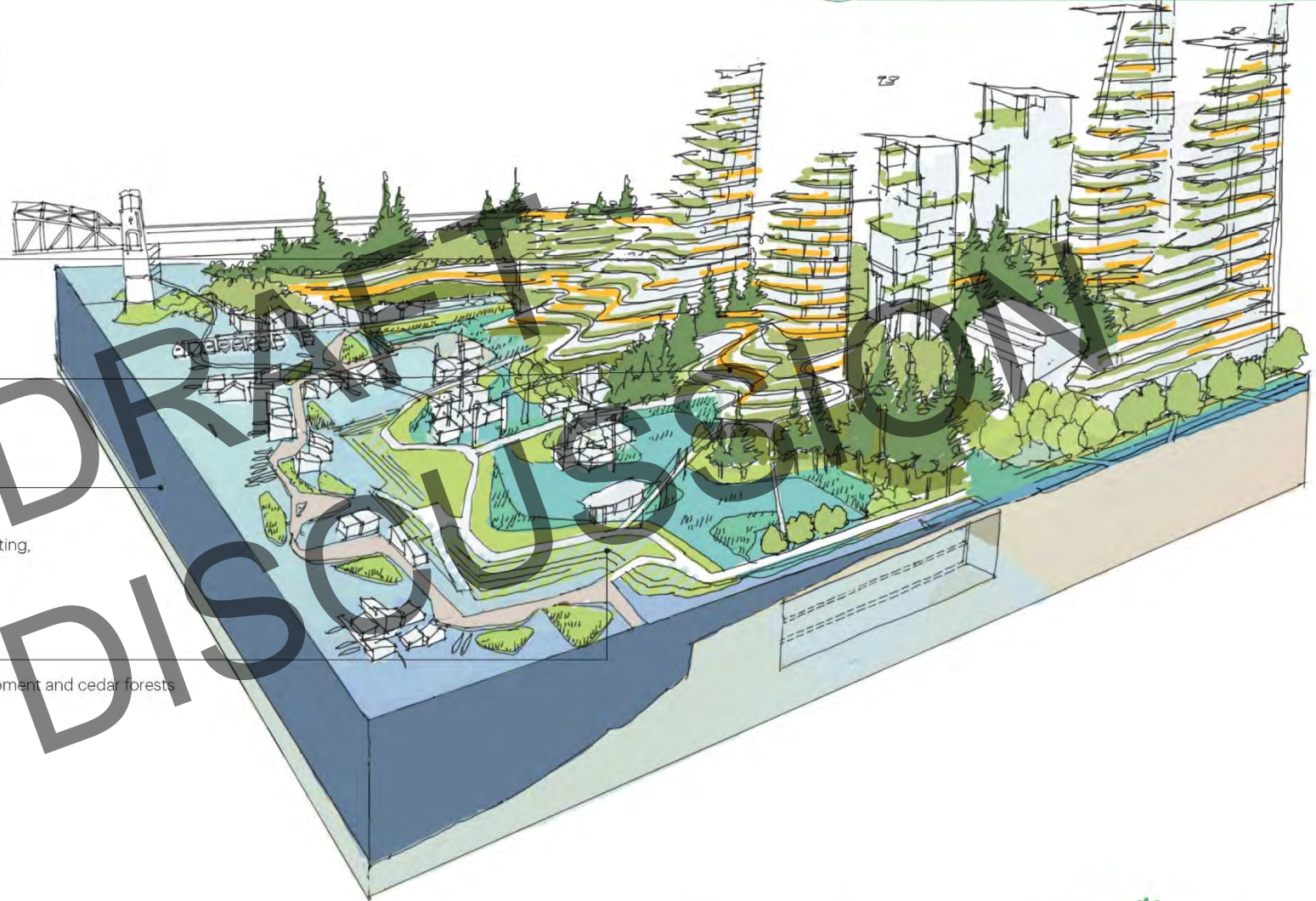
Indigenous-designed housing that express the story of the site while incorporating vertical rewilding strategies

LIVE WITH THE SHORELINE

- Rewilding of waterfront parks/open spaces that prioritize the restoration of native, climate-adaptive species
- Activating the shoreline with seasonal/sustainable industries - including marine harvesting, artist studios, camping platforms etc.

NEW ACCESSIBILITY TO/FROM THE WATER

- Integration of elevated pedestrian connections through new resilient (upland) development and cedar forests
- Decommissioning/elimination of underground parking structures



Between Bridges - current situation



Between Bridges - vision 2100



Between Bridges

- What do you think?
- Likes, dislikes, questions

DRAFT
FOR DISCUSSION

**Our vision for Coopers Park:
initial concept ideas**

Coopers Park CURRENT (2022)



Coopers Park CURRENT (2022)



Coopers Park TOMORROW (From Present to 2050 - 3.6m FCL)

Water levels 1:500 storm surge 0.6m freeboard



Protect (each other)

Prioritize protecting critical infrastructure while simultaneously restoring (protecting) the natural systems and our connection to them

This approach prioritizes the protection of critical infrastructure while recognizing the necessity of initiating nature-based solutions today to ensure resiliency tomorrow. While the traditional response of resistance focuses solely on the protection of property using rigid and ever-raising dykes, this approach utilizes the public waterfront to expand the idea of protection to our natural systems.

MONITOR AND MAINTAIN

Potential increase of pluvial flooding on garages, pressure on foundations - monitoring needed

DESIGNATED FLOODWAYS AND ALTERNATIVE ROUTES

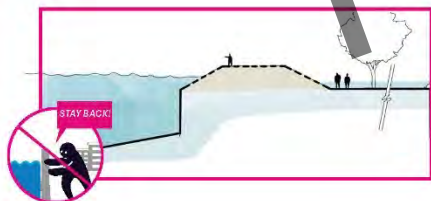
Intermittent inundation of seawall walkway and bikeway - prioritize the creation of alternative routes and connections

PLANT FOR THE FUTURE

Prioritize the planting of climate adaptive, salt-tolerant and culturally relevant plant species to increase biomass, tree canopy and absorption of landscapes

ADAPT BUILDING UTILITIES

Saltwater inundation will impact parkade and building structures, requiring additional pumping and relocation of mechanical systems



THE PROBLEM WITH "RESIST"

In areas such as Coopers Park, where a public park provides some "room", it's tempting to propose solutions such as dykes. However, dykes:

- create a barrier that separates access to the water's edge
- limits the natural ability for the foreshore to absorb wave energy/storm surge and run-off
- limits potential for intertidal habitat
- require significant space



Coopers Park MID TERM (2050-2100 - 4.1 - 4.6m FCL)

1:500 storm surge 0.6m freeboard 0.5m-1m sea level rise

This approach explores how we can transform the built environment into a resilient and adaptive system that provides the room and support for natural systems to thrive - while providing recreational, cultural and community services. Instead of simply accommodating flooding waters, this approach asks how we can welcome, support, and steward our natural systems - and by doing so, create resilient responses to rising sea levels that are integrated into our urban fabric.



Host

Prioritize transforming our built environment into a resilient and adaptive system that provides the room and support for natural systems to thrive.

ADAPT BUILDINGS

- Relocate building utilities to higher levels
- Remediate / reinforce or reuse underground parking and pumps

WELCOME VISITORS

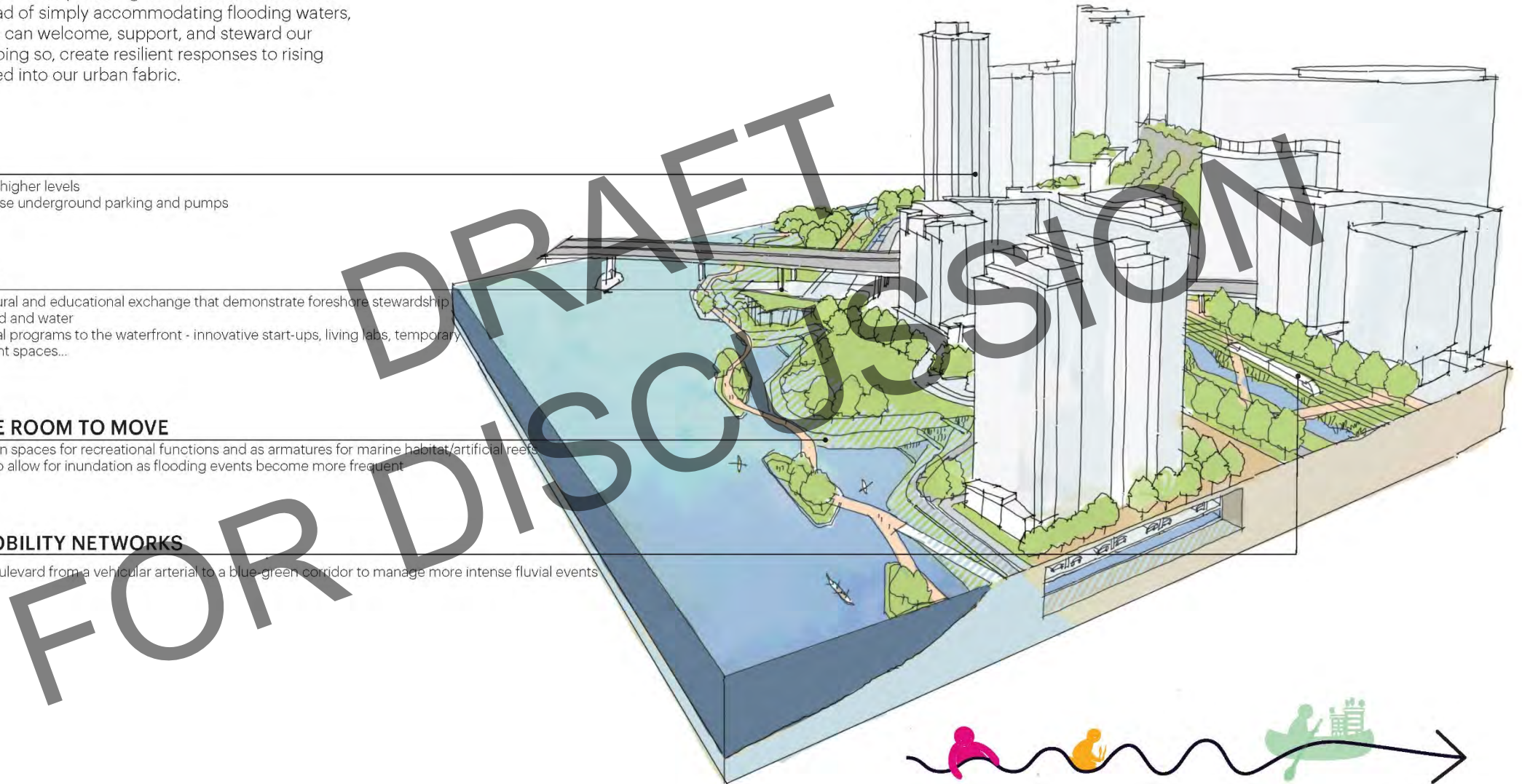
- Indigenous facilities for cultural and educational exchange that demonstrate foreshore stewardship and connection with the land and water
- Add more diverse/communal programs to the waterfront - innovative start-ups, living labs, temporary bars, cafés, educational event spaces...

GIVE THE SHORELINE ROOM TO MOVE

- Introduction of floating green spaces for recreational functions and as armatures for marine habitat/artificial reefs
- Rewilding of the foreshore to allow for inundation as flooding events become more frequent

PREPARE FUTURE MOBILITY NETWORKS

- Transformation of Pacific Boulevard from a vehicular arterial to a blue-green corridor to manage more intense fluvial events



Coopers Park LONG TERM (2100 - 4.6 - 5.0m FCL)

1:500 storm surge 0.6m freeboard 1.0 - 1.4m sea level rise

The approach illustrates a cultural shift and imagines a future where the city has reconnected with nature and recognizes a relationship of reciprocity and respect with the water. It assumes False Creek has been restored to a healthy, biodiverse, and productive part of the urban environment and is able to provide flood protection through nature-based solutions.



Move Together

Representing a cultural shift, this approach imagines a future where the city has reconnected with nature and recognizes a relationship of reciprocity and respect with the water.

URBAN TRANSFORMATIONS

- Densified hinterland, strengthening the link with the waterfront
- Retrofitting previously developed sites, green roofs and building envelopes with blue-green infrastructure

NEW WAY OF BUILDING

- Demolish selected waterfront buildings or reuse structures to host temporary/flexible/seasonal spaces for inclusive living, creative and clean production, education, urban farming and other programs
- Allow for total inundation of underground parking structures and building foundations

GIVE NATURE ROOM WHILE ENHANCING CONNECTION TO IT

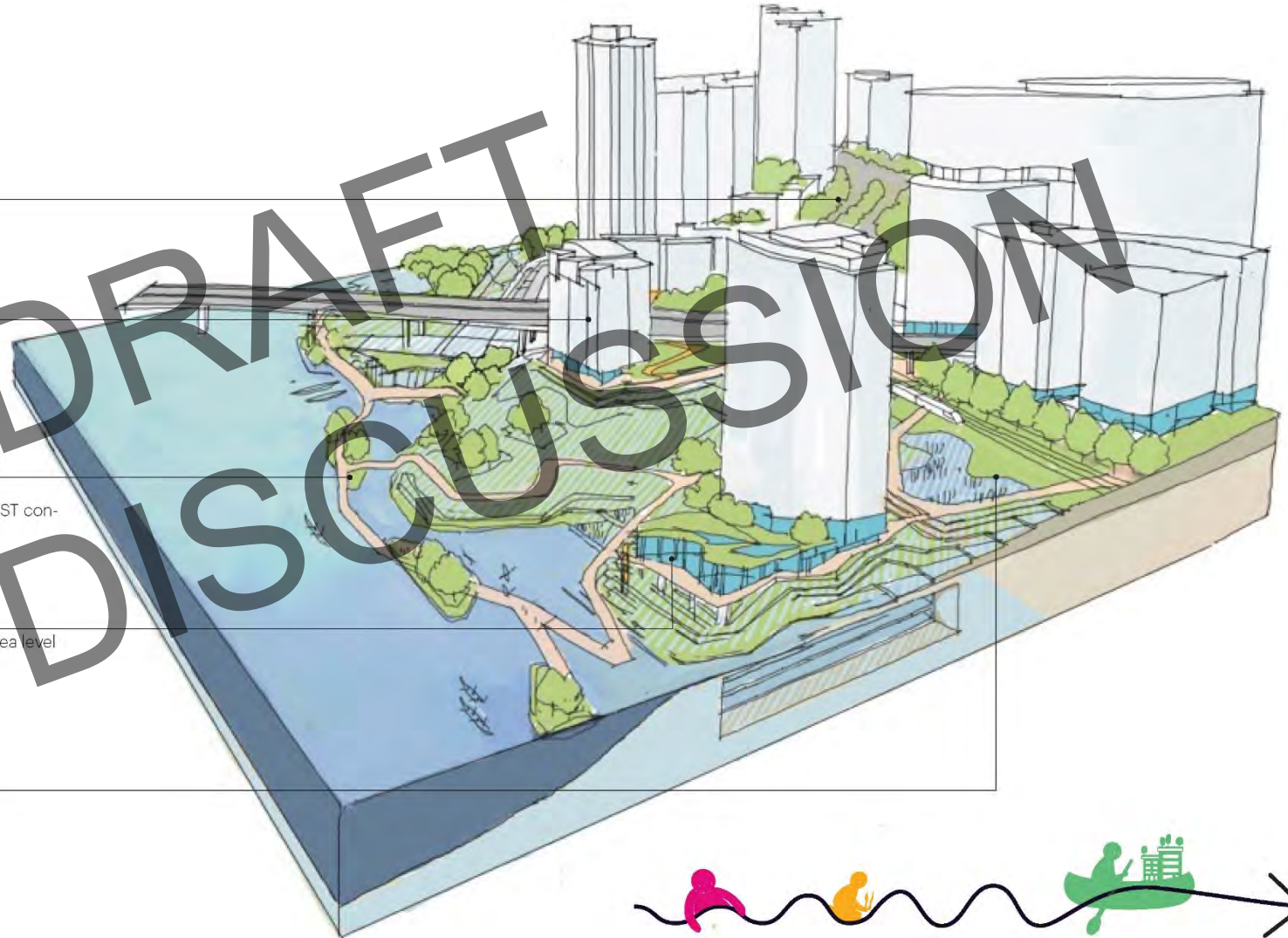
- Expand extent of flood park and create more water storage within the public realm
- Rewilding of the foreshore and marine ecology- "at low tide, the table is set" - restoring MST connection to land-food-water systems

ADAPT THE BUILT FORM

- Finished elevations for City ROWs and building elevations to be raised one storey above sea level
- Increased saltwater inundation consuming parkade level building foundations
- Removal of buildings that have come to end of life
- Activation and connection to second floors

LANDSCAPE AS SPONGE

- Conversion of streets into blue-green infrastructure corridors to manage fluvial events
- Introduction of freshwater wetlands



Coopers Park LONG TERM (2100 - 5.0 - 5.6m FCL)

1:500 storm surge 0.6m freeboard 1.4-2.0m sea level rise

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REPURPOSE AND REBUILT

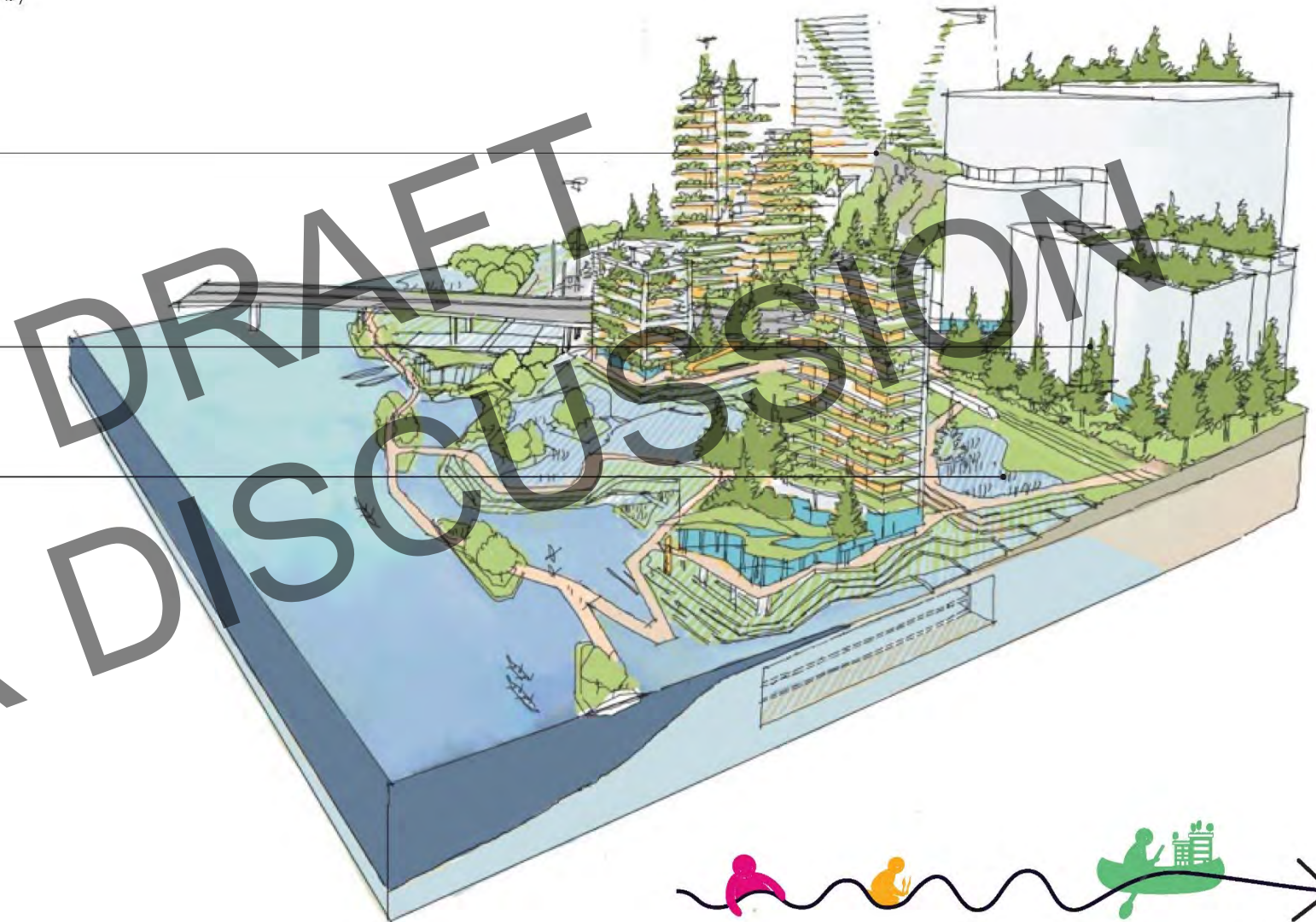
- Repurposed building structures accommodate modular homes and vertical rewilding strategies
- Integrated green-blue infrastructure on plots, building roofs and facades
- Further densification of upland areas with indigenous-designed housing that reflects the cultural expression of the Host Nations

LIVING AND WORKING WITH NATURE

- Rewilding of open spaces and stewardship/guardianship programs co-managed with Host Nations and Park Board
- Expanded extent of flood park, emphasis on seasonal recreation
- Re-establishment of subsistence fishery and harvesting

RESILIENT PUBLIC REALM

- Freshwater wetlands and conversion of streets to blue-green corridors



Coopers Park - current situation



Between Bridges - vision 2100



Coopers' Park

- What do you think?
- Likes, dislikes, questions

DRAFT
FOR DISCUSSION

ROUND 1

Getting Started



Sep - Oct 2021

ROUND 2

Preliminary Designs

Mar - Apr 2022

ROUND 3

Final Concepts

East of Cambie Design Charrette

Jun - Jul 2022



DRAFT FOR DISCUSSION



Thank You!

www.vancouver.ca/sea2city

sealevelrise@vancouver.ca

**RISE
TO
THE
CHALLENGE**

