Sea2City DESIGN CHALLENGE

CITY OF VANCOUVER | COASTAL ADAPTATION

Today's Agenda

The Big Picture

- Climate Change and Sea Level Rise
- False Creek and Coastal Flooding

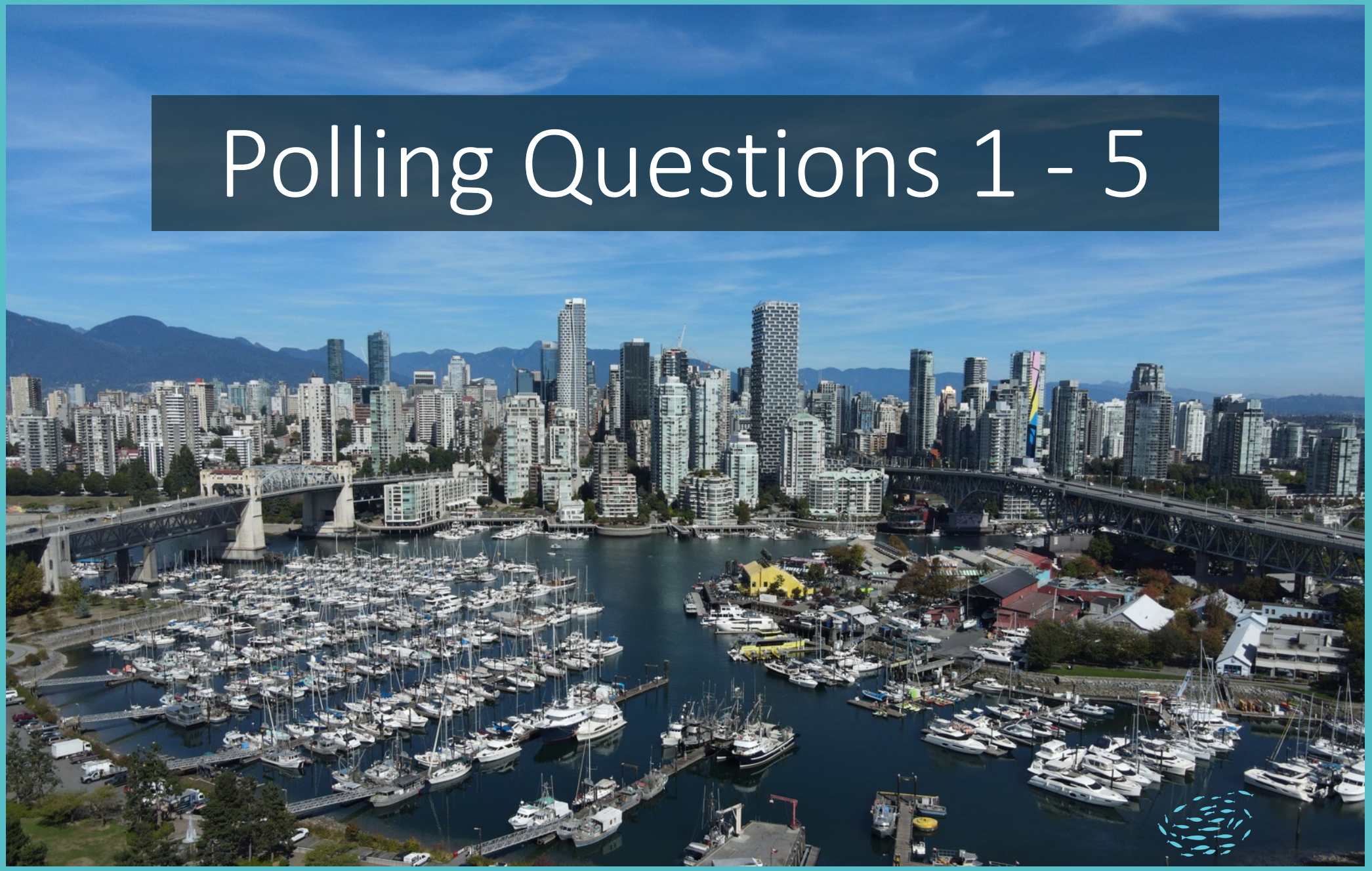
Vancouver Coastal Adaptation Plan

- Past Work
- Community Values
- Planning and Design Principles

Sea2City Design Challenge

- Overview
- Challenge Sites
- Process

Polling Questions 1 - 5

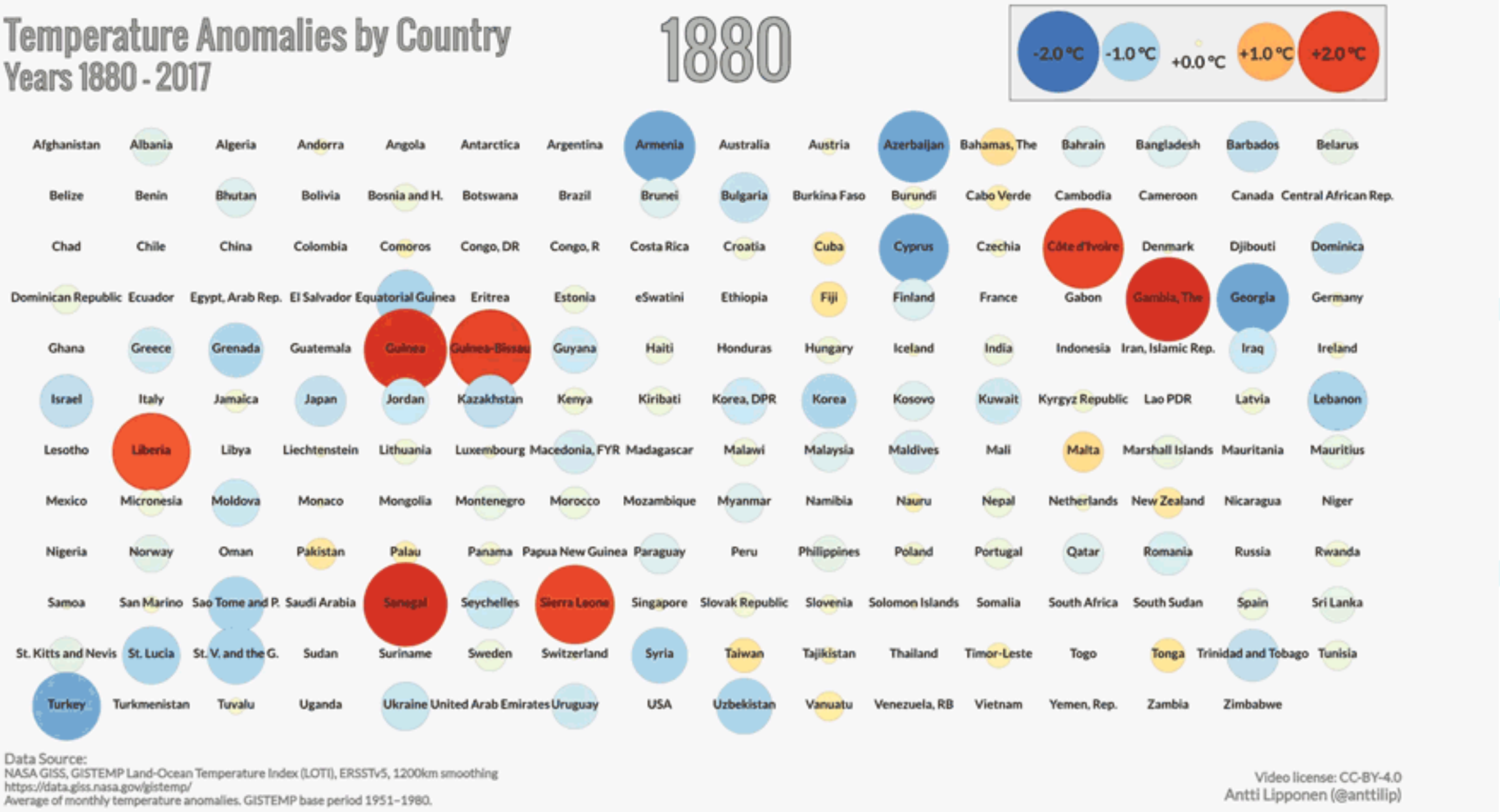


What’s the Challenge?

Sea Level Rise and Coastal Flooding

Climate Change and Coastal Flooding

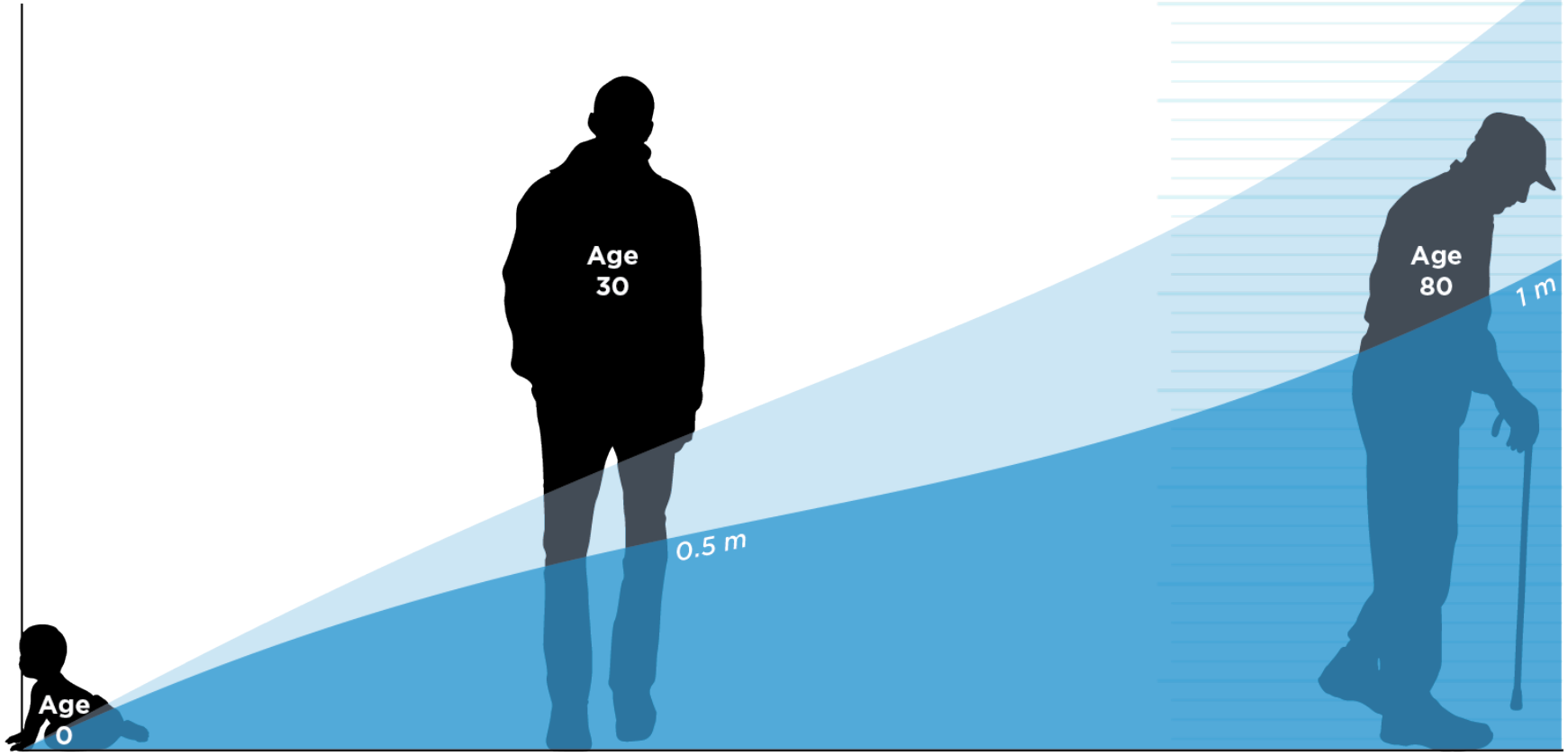
- Coastal cities around the world are facing similar challenges of sea level rise
- Rising global temperatures cause ice to melt and ocean water to expand
- More frequent and severe storm events add to the challenge


Temperature Anomalies by Country
Years 1880 - 2017
1880
-2.0 °C
-1.0 °C
+0.0 °C
+1.0 °C
+2.0 °C
Afghanistan Albania Algeria Andorra Angola Antarctica Argentina Armenia Australia Austria Azerbaijan Bahamas, The Bahrain Bangladesh Barbados Belarus
Belize Benin Bhutan Bolivia Bosnia and H. Botswana Brazil Brunei Bulgaria Burkina Faso Burundi Cabo Verde Cambodia Cameroon Canada Central African Rep.
Chad Chile China Colombia Comoros Congo, DR Congo, R Costa Rica Croatia Cuba Cyprus Czechia Côte d'Ivoire Denmark Djibouti Dominica
Dominican Republic Ecuador Egypt, Arab Rep. El Salvador Equatorial Guinea Eritrea Estonia eSwatini Ethiopia Fiji Finland France Gabon Gambia, The Georgia Germany
Ghana Greece Grenada Guatemala Guinea Guinea-Bissau Guyana Haiti Honduras Hungary Iceland India Indonesia Iran, Islamic Rep. Iraq Ireland
Israel Italy Jamaica Japan Jordan Kazakhstan Kenya Kiribati Korea, DPR Korea Kosovo Kuwait Kyrgyz Republic Lao PDR Latvia Lebanon
Lesotho Liberia Libya Liechtenstein Lithuania Luxembourg Macedonia, FYR Madagascar Malawi Malaysia Maldives Mali Malta Marshall Islands Mauritania Mauritius
Mexico Micronesia Moldova Monaco Mongolia Montenegro Morocco Mozambique Myanmar Namibia Nauru Nepal Netherlands New Zealand Nicaragua Niger
Nigeria Norway Oman Pakistan Palau Panama Papua New Guinea Paraguay Peru Philippines Poland Portugal Qatar Romania Russia Rwanda
Samoa San Marino Sao Tome and P. Saudi Arabia Senegal Seychelles Sierra Leone Singapore Slovak Republic Slovenia Solomon Islands Somalia South Africa South Sudan Spain Sri Lanka
St. Kitts and Nevis St. Lucia St. V. and the G. Sudan Suriname Sweden Switzerland Syria Taiwan Tajikistan Thailand Timor-Leste Togo Tonga Trinidad and Tobago Tunisia
Turkey Turkmenistan Tuvalu Uganda Ukraine United Arab Emirates Uruguay USA Uzbekistan Vanuatu Venezuela, RB Vietnam Yemen, Rep. Zambia Zimbabwe
Data Source:
NASA GISS, GISTEMP Land-Ocean Temperature Index (LOTI), ERSSTv5, 1200km smoothing
https://data.giss.nasa.gov/gistemp/
Average of monthly temperature anomalies. GISTEMP base period 1951–1980.
Video license: CC-BY-4.0
Antti Lipponen (@anttilip)

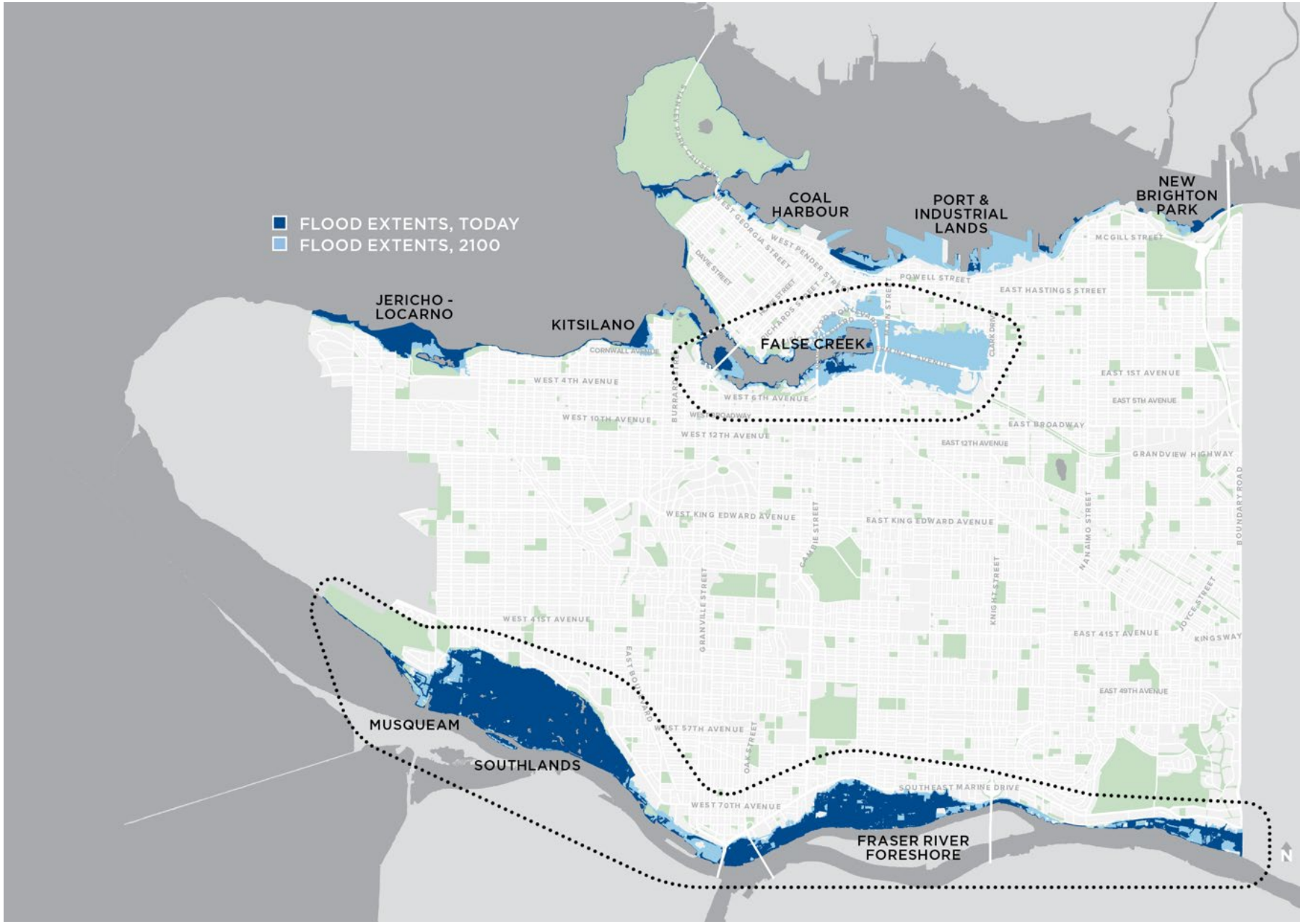
Sea Level Rise in BC

BC guidelines:

- Half a meter of sea level rise over next 30 years
- At least one meter over next 80 years

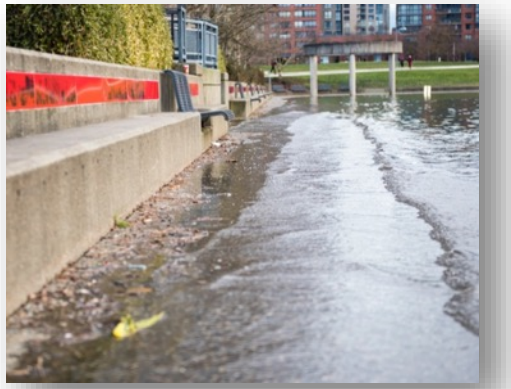


Vancouver's Coastal Floodplains



False Creek Flood Extents

False Creek Coastal Flooding



High Tide Events

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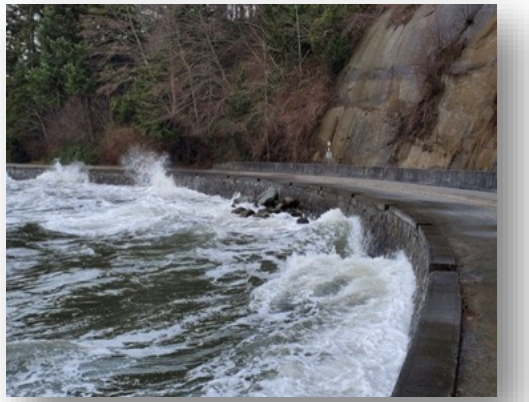

Storm Surge and Waves

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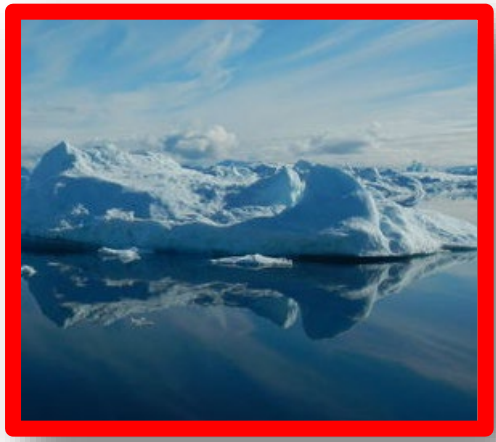


Sea Level Rise

=

“Design Event” flooding

Latest IPCC Report on Climate Change:

Human-caused

- “It is unequivocal that human influence has warmed the atmosphere, ocean and land.”

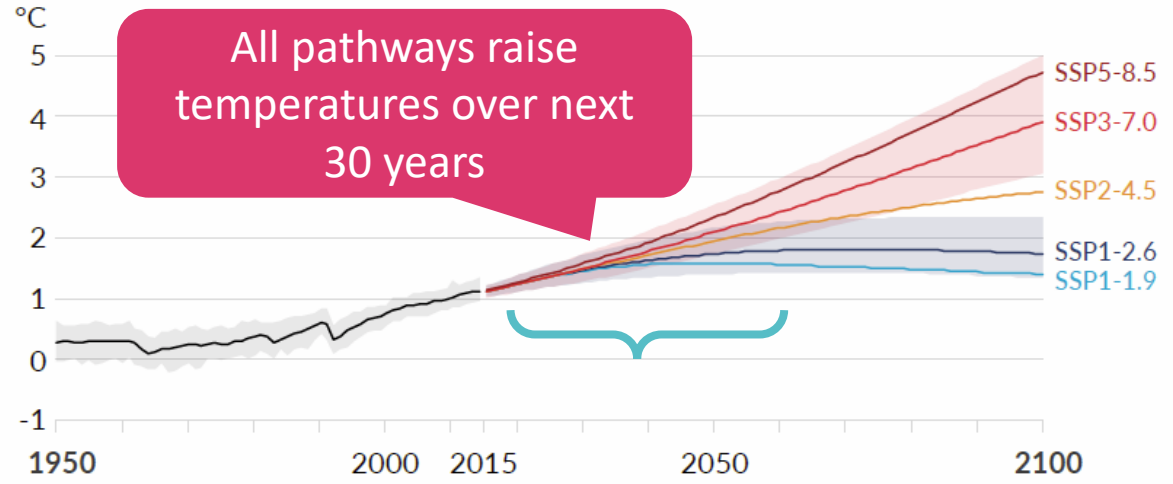
It’s going to get worse

- Temperature increases and sea level rise is “locked in” at least the next 30 years

There’s still hope and opportunity

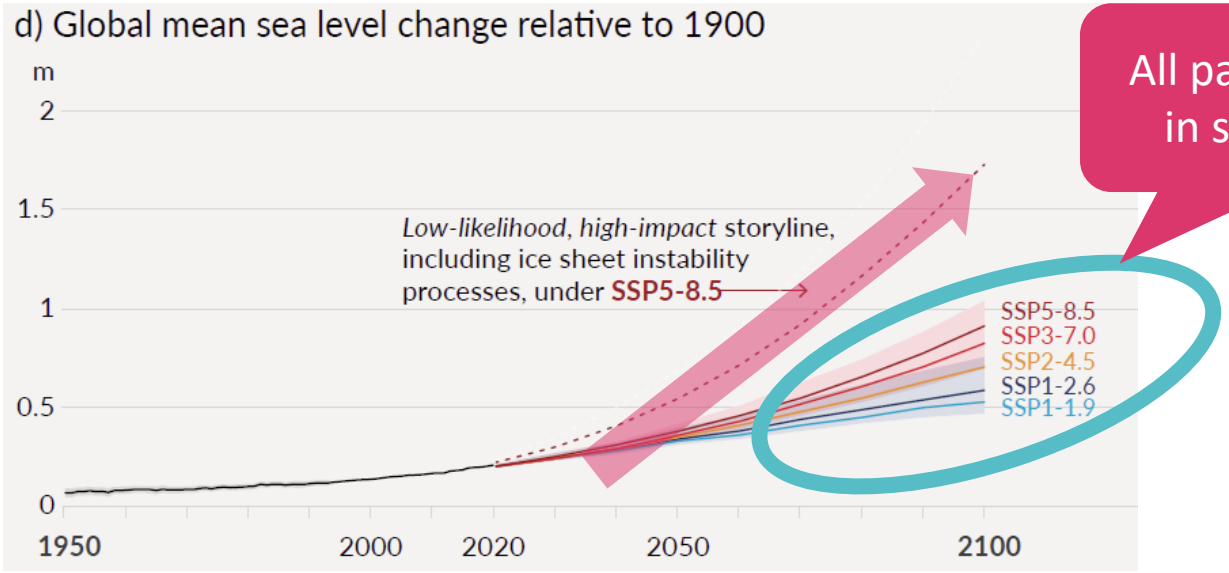
- We are still in the window to avoid 2.0+ degrees
- Vancouver is reducing GHGs and preparing for unavoidable changes

a) Global surface temperature change relative to 1850-1900

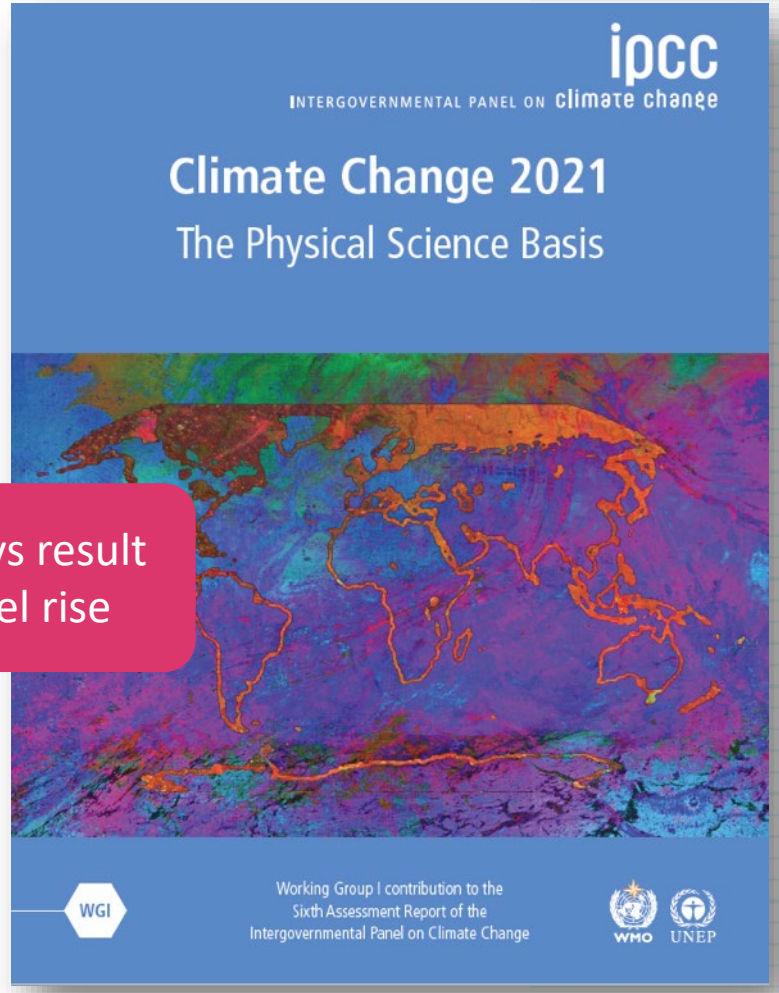


All pathways raise temperatures over next 30 years

d) Global mean sea level change relative to 1900



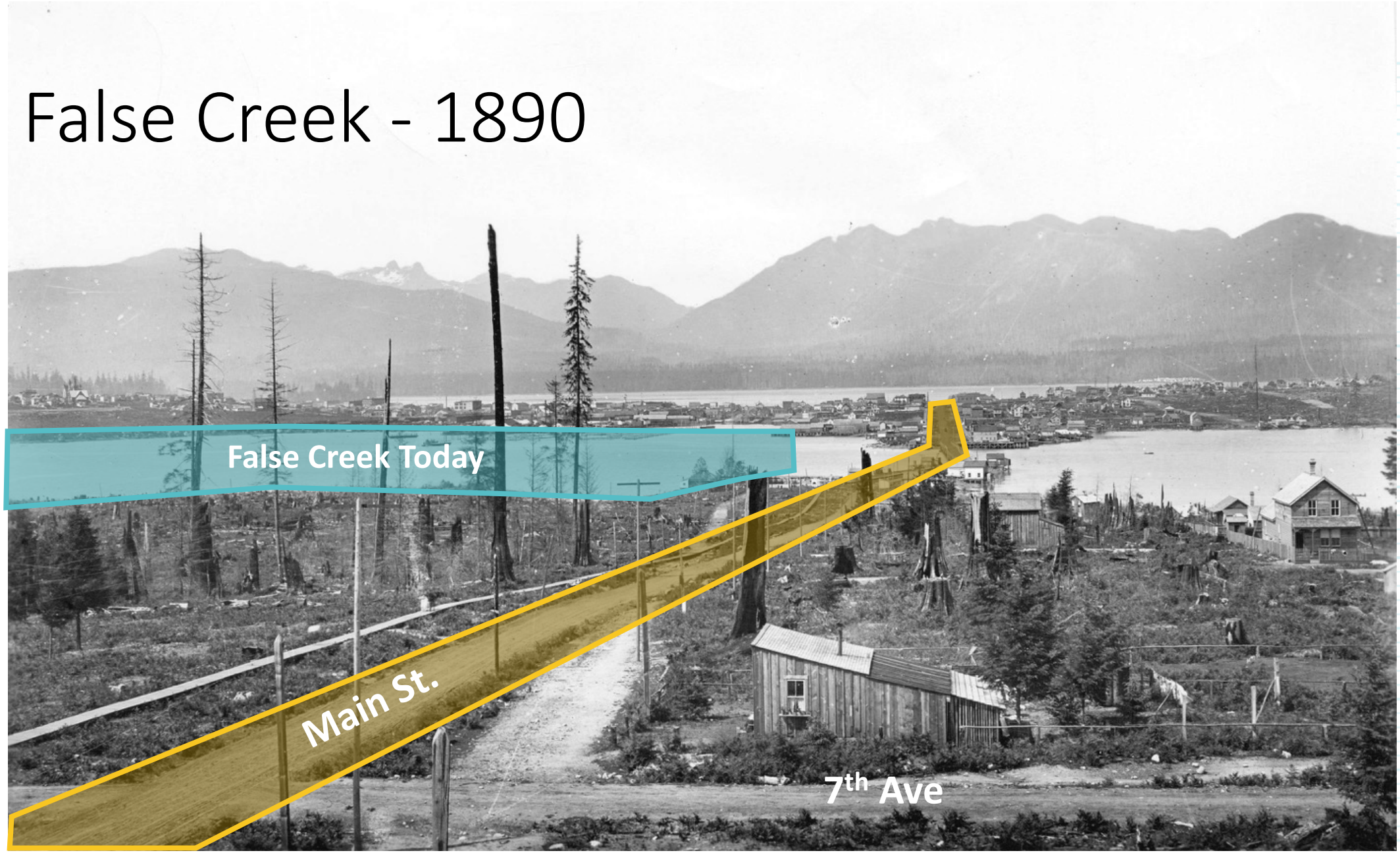
All pathways result in sea level rise



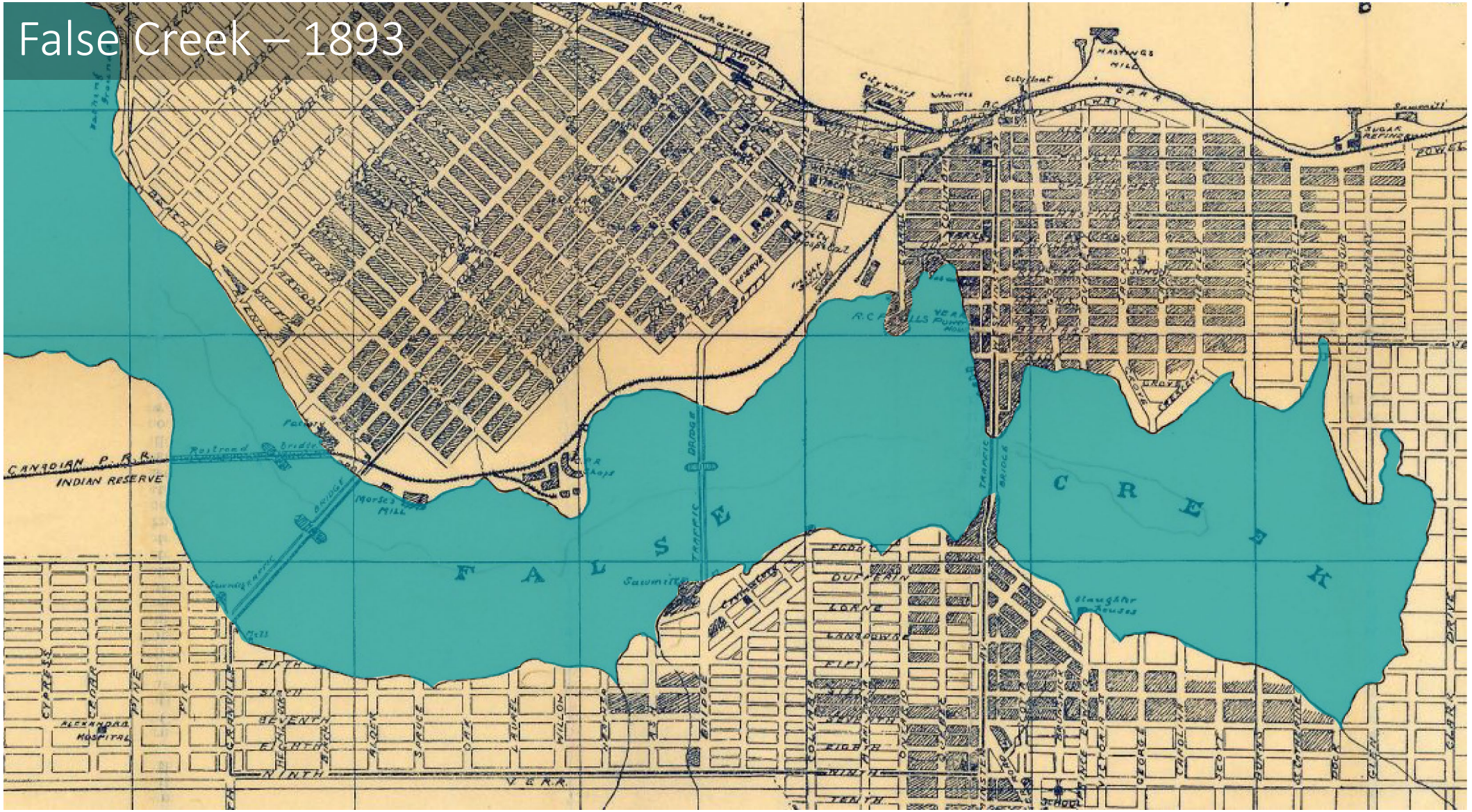
False Creek

A much loved urban waterway in the heart of the city

False Creek - 1890



False Creek – 1893



False Creek – today + 1893

False Creek – 1m SLR, 1:500 storm

What's at Risk?

A DYNAMIC, MIXED-USE AREA

- 38,000+ residents and a range of housing
- $19 billion in assessed property value
- 200 industrial properties
- Emergency and medical facilities
- Schools and childcare facilities
- Granville Island
- Parks, recreation, and activity centres
- Major utilities and other assets

Coastal Adaptation Plan

Fraser River Foreshore and False Creek

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*

Coastal Adaptation Plan

Public engagement and information

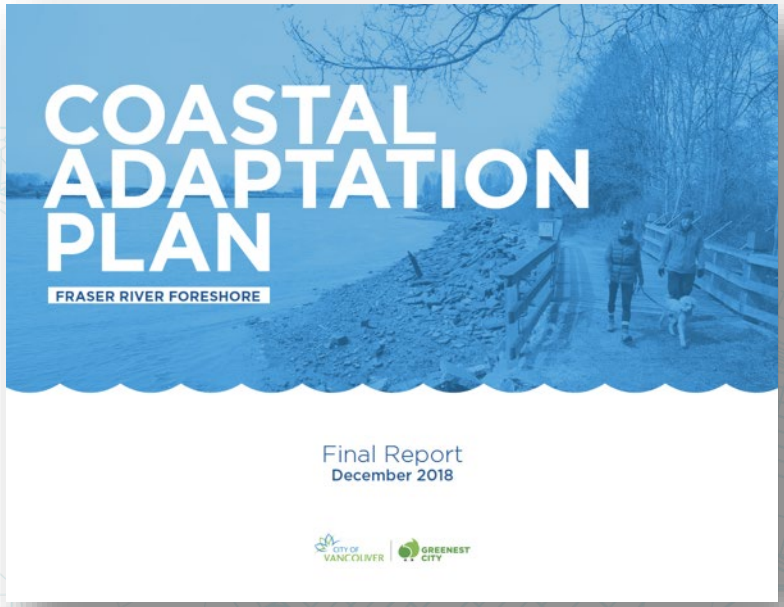
- Climate change and sea level rise 101 – what's happening, where, when?
- What's at risk?

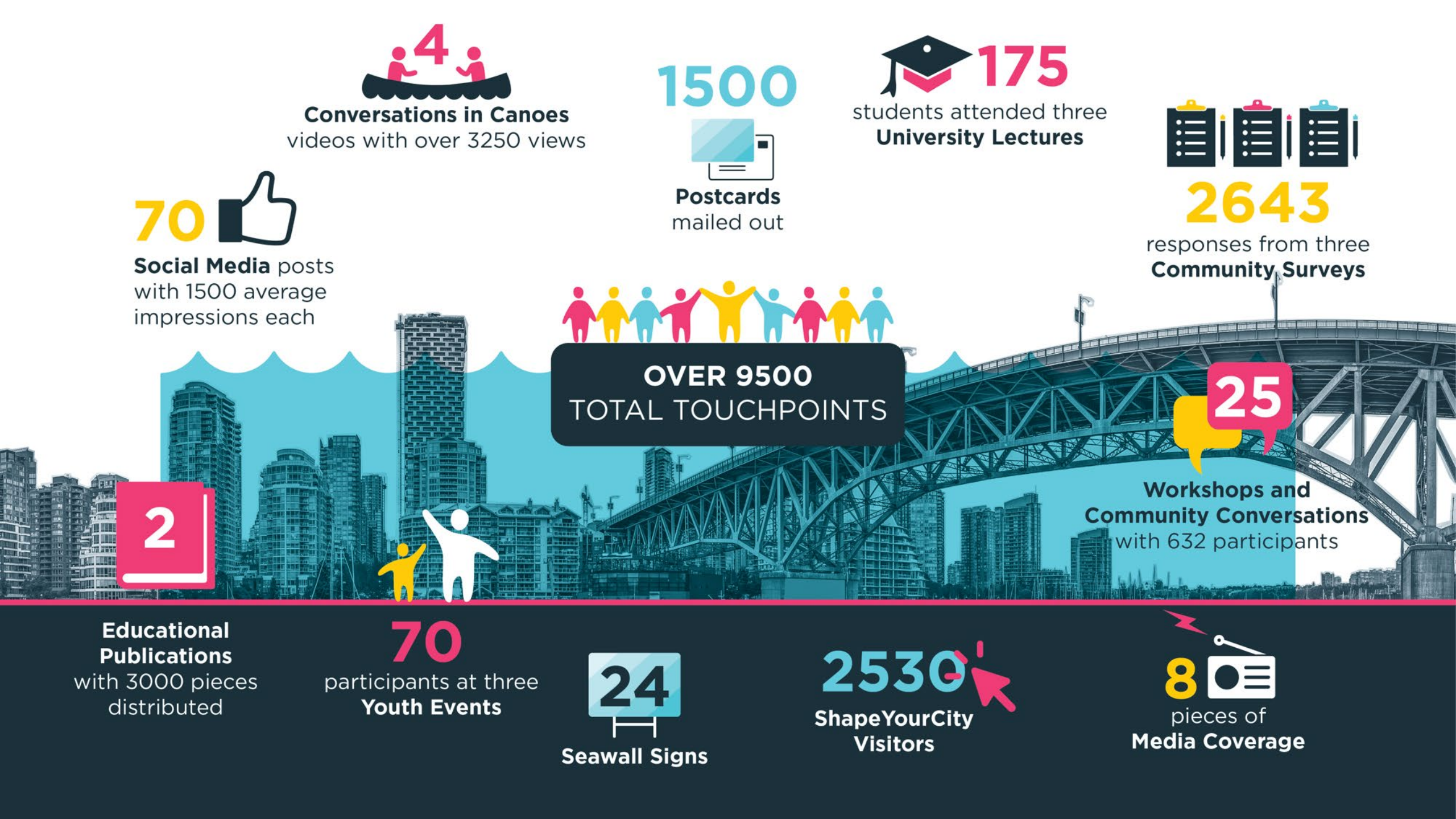
Community values

- What matters?
- What needs to be considered in future work?

Planning and Design Principles

- Guide future planning and design work




4
Conversations in Canoes
videos with over 3250 views
1500
Postcards
mailed out
175
students attended three
University Lectures
2643
responses from three
Community Surveys
70
Social Media posts
with 1500 average
impressions each
OVER 9500
TOTAL TOUCHPOINTS
25
Workshops and
Community Conversations
with 632 participants
2
Educational
Publications
with 3000 pieces
distributed
70
participants at three
Youth Events
24
Seawall Signs
2530
ShapeYourCity
Visitors
8
pieces of
Media Coverage


Community workshop at Dunbar Community Centre

Community Values – False Creek

Communities, People, and Homes

Health and Safety

Infrastructure and Transportation

Environment

Local and Regional Economy

Arts, Culture, and Heritage

Recreation

Coastal Adaptation Plan - Design Principles

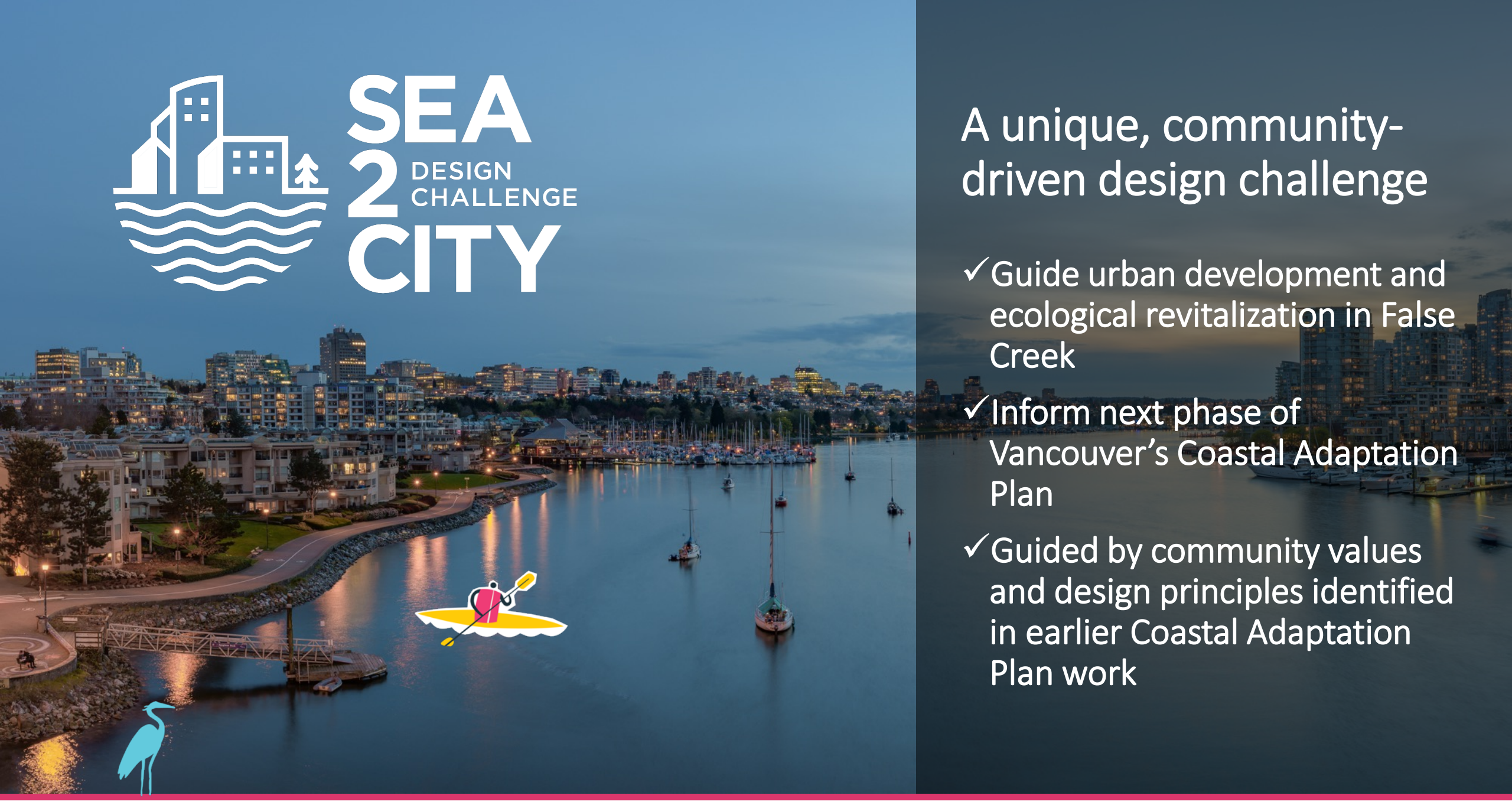
- Design for adaptability
- Design for safety and public health
- Design for safe-to-fail infrastructure systems
- Design for nature
- Design for access
- Design for co-benefits

Coastal Adaptation Plan - Planning Principles

- Plan for integration with other City processes
- Plan for coordination with external partners
- Plan for reconciliation with Musqueam, Squamish, and Tsleil-Waututh Nations and urban Indigenous peoples
- Plan for transparency (education)
- Plan for equity
- Plan for cost-sharing

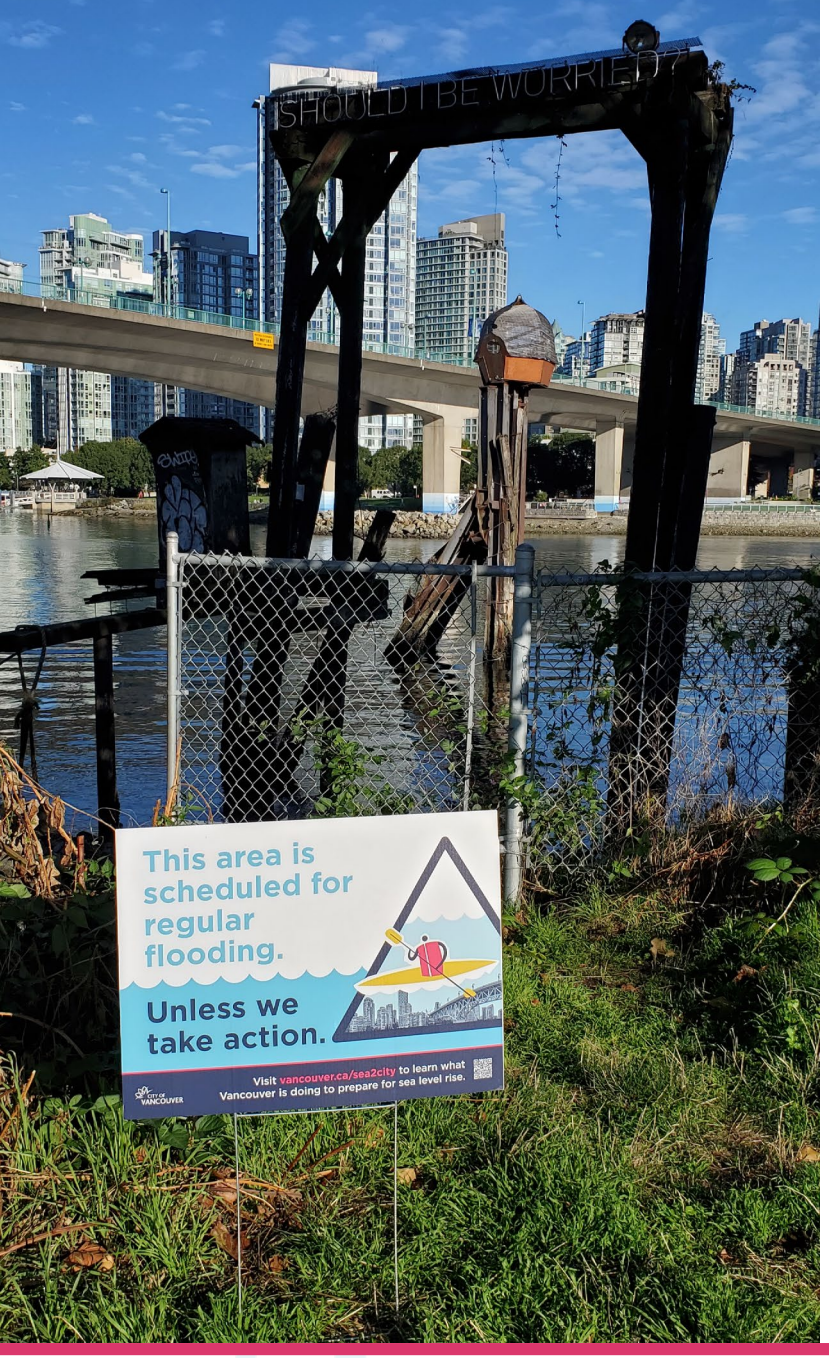
Sea2City Design Challenge

Overview



A unique, community-driven design challenge

- ✓Guide urban development and ecological revitalization in False Creek
- ✓Inform next phase of Vancouver's Coastal Adaptation Plan
- ✓Guided by community values and design principles identified in earlier Coastal Adaptation Plan work



Sea2City Design Challenge

- Two multidisciplinary teams to work together and with the City and other project partners to:
  - Explore coastal adaptation approaches to sea level rise and coastal flooding that respond to the social equity, economic, and ecological challenges
  - Investigate adaptation approaches for sea level rise beyond one metre
  - Expand the City's toolbox of coastal flood management approaches
  - Increase public awareness of climate change and sea level rise

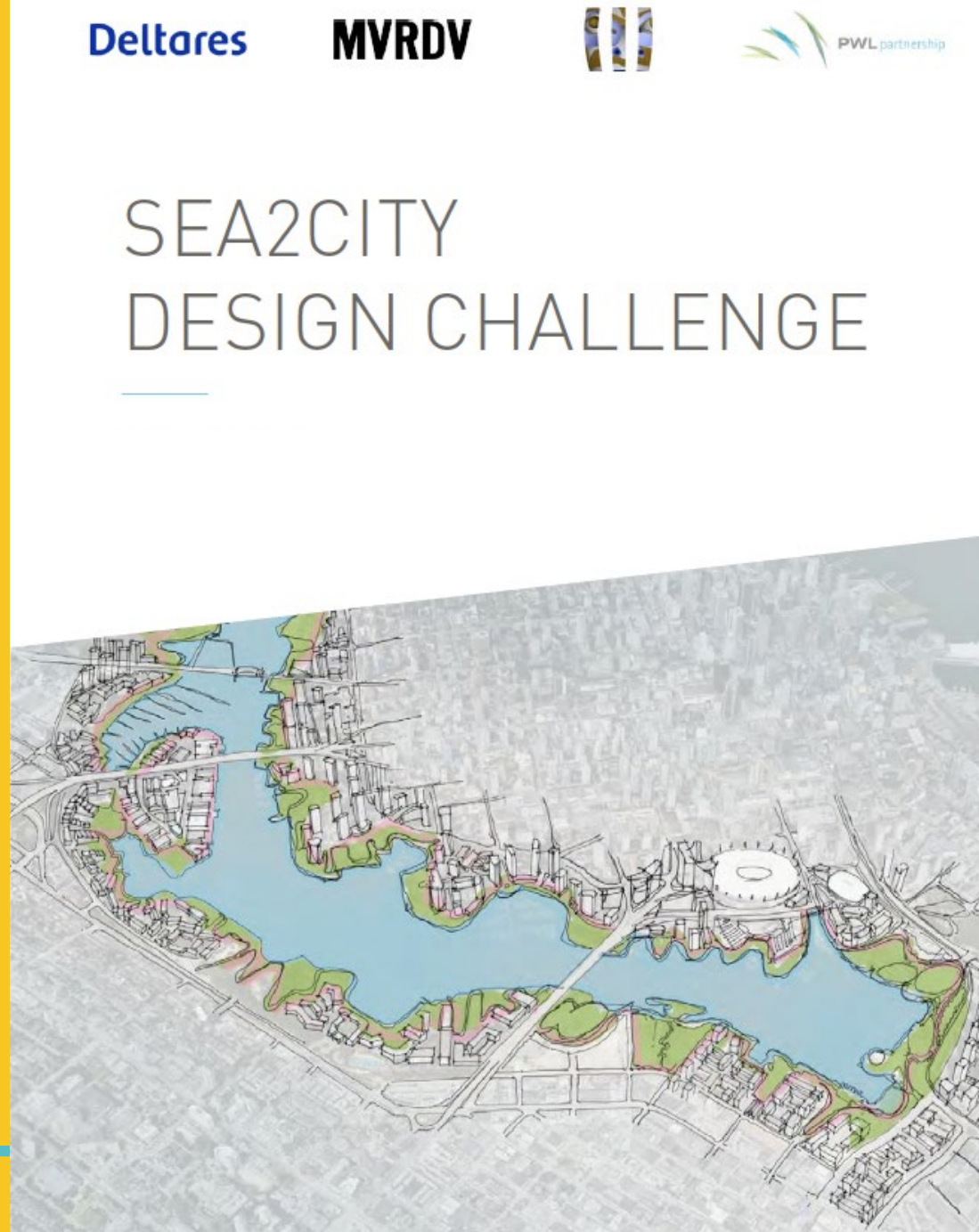
Why a Challenge?

- Safe space for creativity and experimentation
  - Exploring concepts without the pressure of making commitments
- Foster collaboration and build capacity
  - An unprecedented challenge that requires everyone to work and lean together
  - Help mainstream coastal adaptation at the City
- Informing and involving public
  - Building shared awareness around the challenge of sea level rise and potential adaptation pathways
  - Priming people for future work and difficult choices ahead

PWL + MVRDV Team

- PWL Partnership – landscape architecture and design (Vancouver)
- MVRDV – architecture and design (Rotterdam, Netherlands)
- Deltares USA – water research (Maryland and Netherlands)
- Modern Formline Design – Coast Salish cultural expression (North Vancouver)

  - Westmar Advisors – coastal engineering
  - G.L. Williams & Associates Ltd. – environment
  - Happy City – urban planning and design
  - MODUS – urban design and engagement
  - Goudappel – mobility planning



Mithun + One

- Mithun – landscape architecture design (Seattle)
- ONE – architecture and urban design (New York and Netherlands)

  - Moffat & Nichol – urban water, coastal, environmental (Vancouver/Seattle)
  - Herrera – water resources, environment, nearshore habitat restoration (Bellingham/Seattle)

SEA2CITY DESIGN CHALLENGE

CHALLENGE SITES

1. Between Bridges
2. Coopers Park
3. Stamps Landing
4. Olympic Village

CHARRETTE SITE

5. East of Cambie

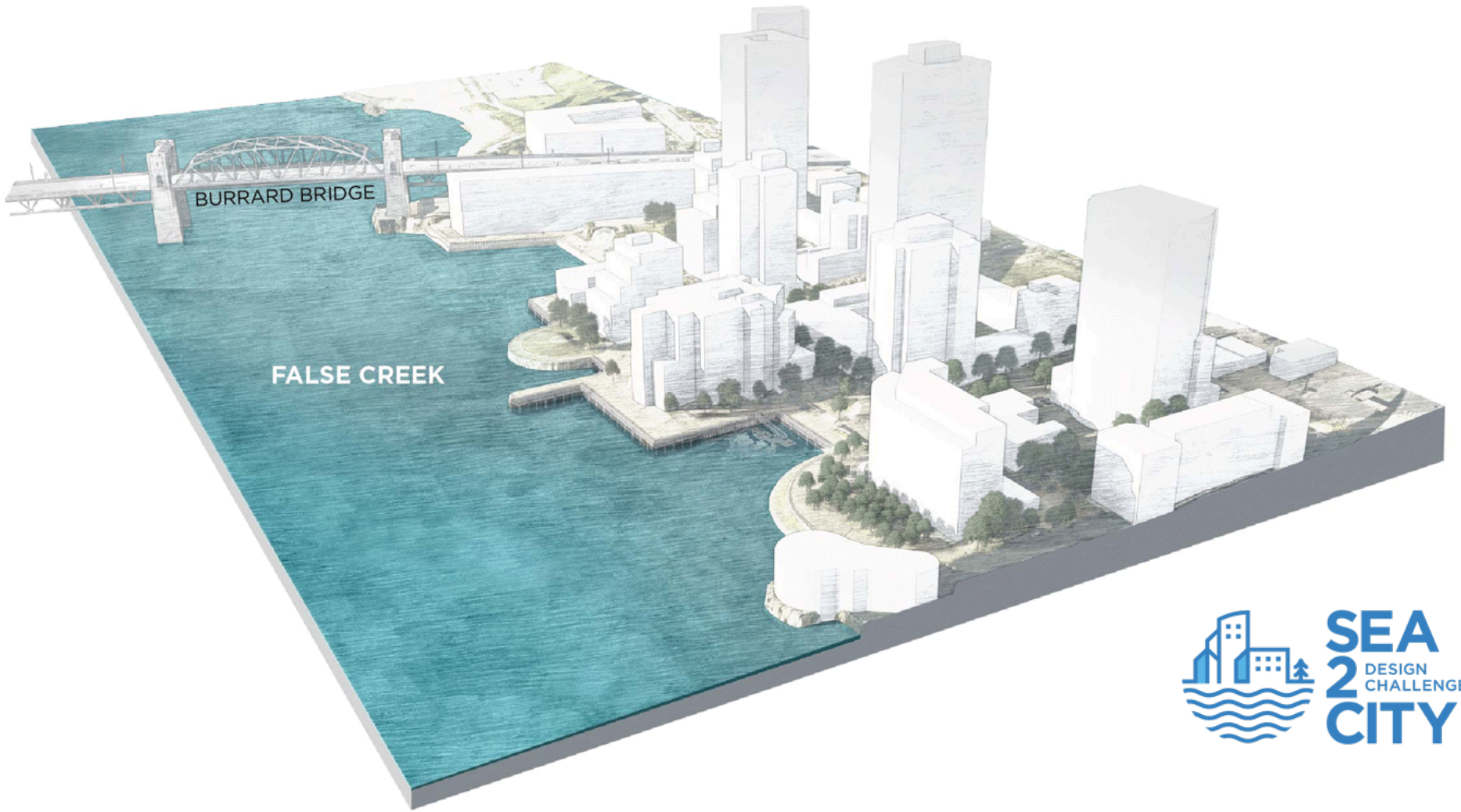
SEA 2 CITY DESIGN CHALLENGE

Between Bridges

- False Creek Ferry/Aquabus dock and private marinas
- Residential towers with mixed-use ground floors that include commercial, and office uses
- Shoreline includes significant decking

Between Bridges

Today



SEA 2 CITY DESIGN CHALLENGE

SEA 2 CITY DESIGN CHALLENGE

Coopers' Park

- Portions underneath north end of Cambie Street Bridge
- Shoreline a combination of rip rap and sea walls
- Residential towers with some ground floor commercial/office
- Connection site – Plaza of Nations

Coopers' Park

Today

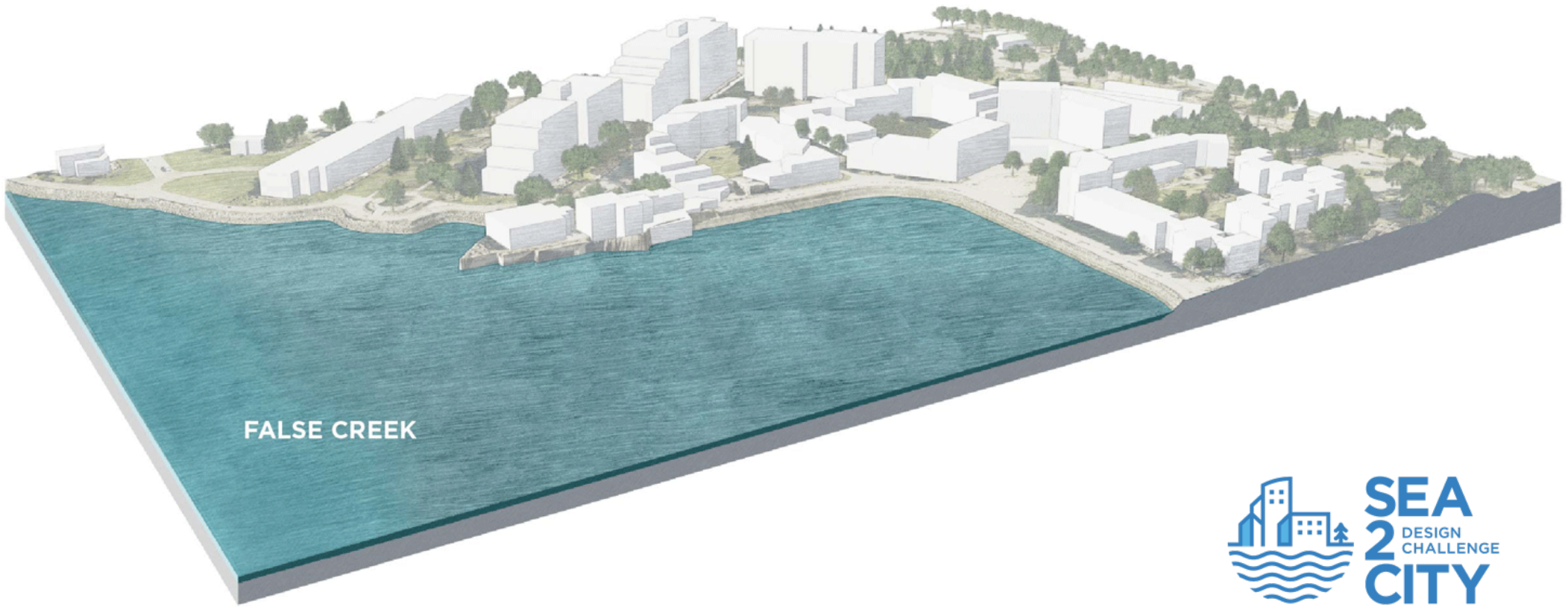
SEA 2 CITY DESIGN CHALLENGE

SEA 2 CITY DESIGN CHALLENGE

Stamps Landing

- Located east of Charleson Park
- Shoreline mostly rocky with some decking
- Heather Civic Marina
- Mixed-use residential with busy commercial hub
- CSO north of the site

Stamps Landing
Today



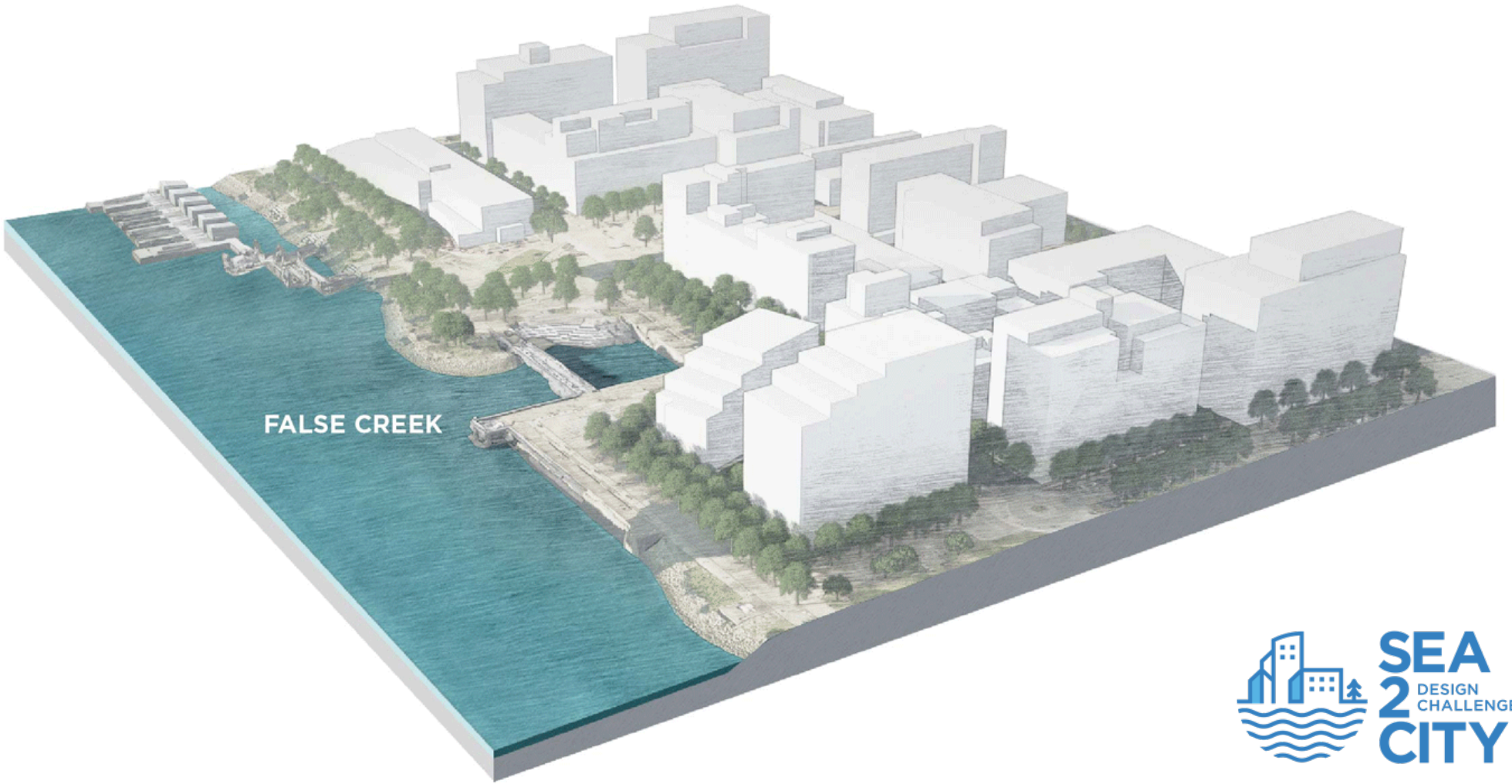
SEA 2 CITY DESIGN CHALLENGE

SEA 2 CITY DESIGN CHALLENGE

Olympic Village

- Large mixed-use area (2010 Olympics)
- Rip rap, sea walls, and some decking on shoreline
- High-density residential buildings, some rental and a co-op buildings
- Busy commercial hub with many shops/services
- Creekside Community Centre
- Busy marina and dock complex
- Connection site - East Park

Olympic Village
Today



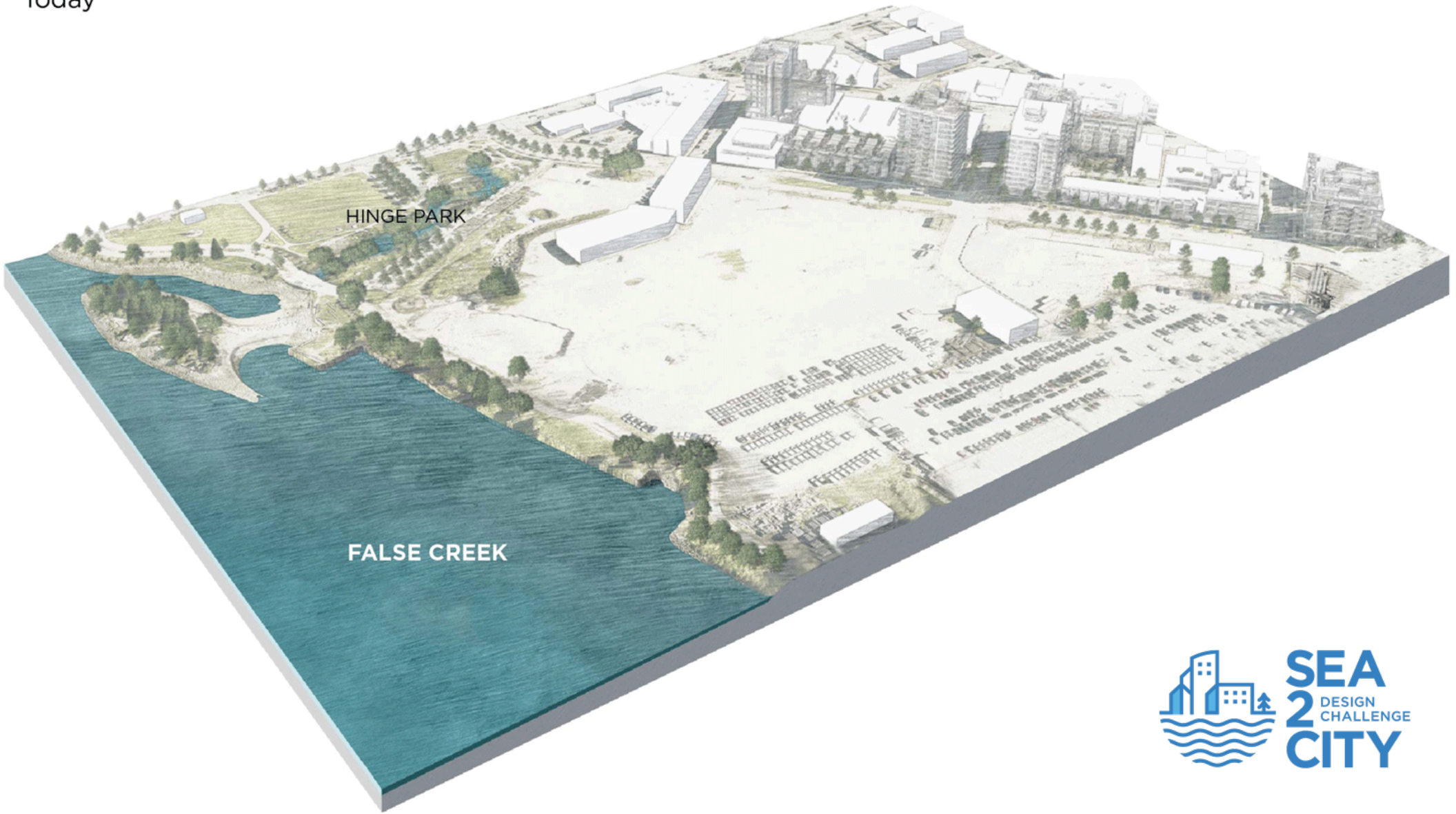
SEA 2 CITY DESIGN CHALLENGE

East of Cambie

- Charrette site
- Large City-owned site
- New elementary school to be located east of site
- Existing temporary social housing, urban farm and social venture
- False Creek Neighbourhood Energy Utility located in south-west corner of site

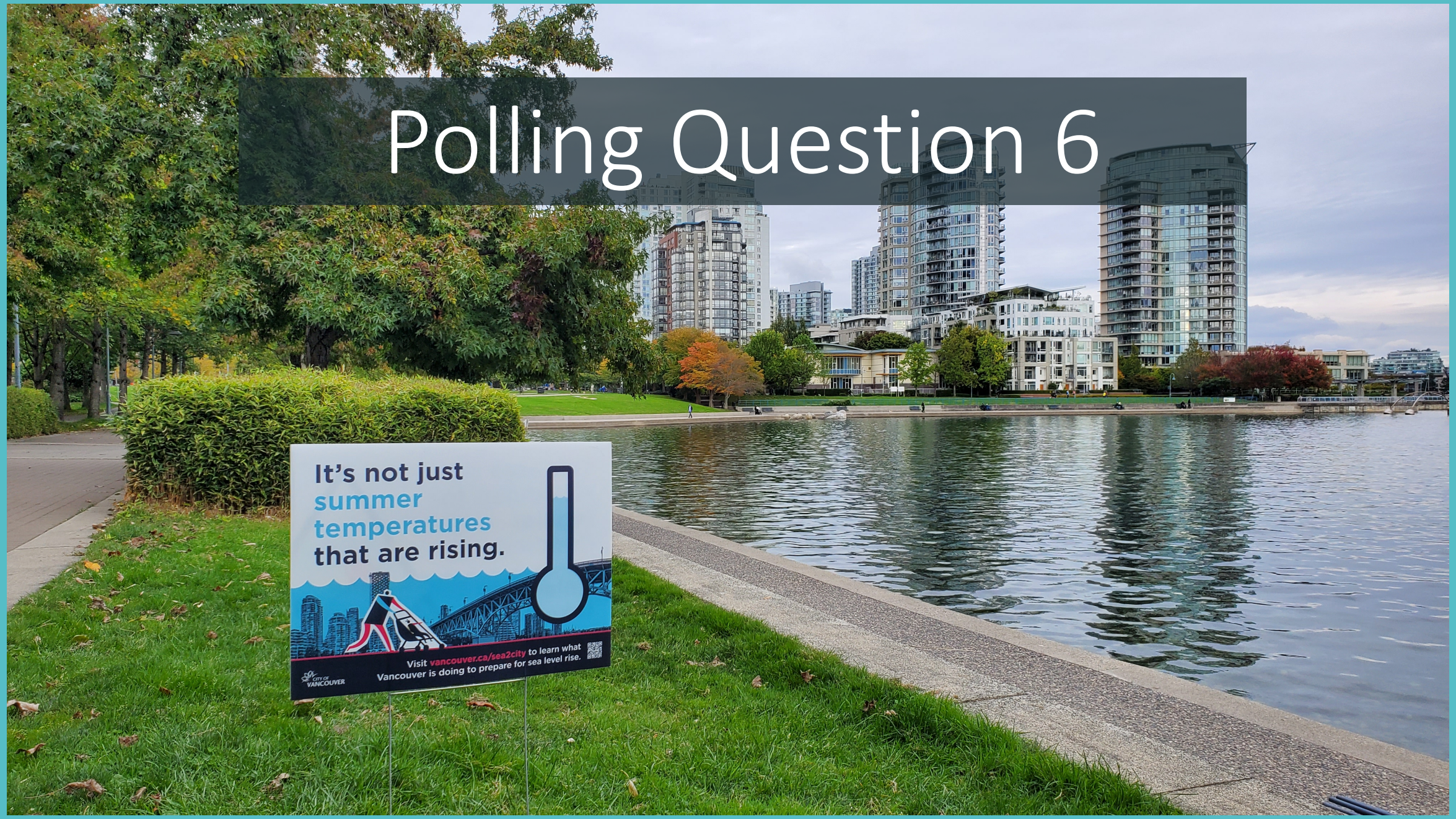
East of Cambie

Today



SEA 2 CITY DESIGN CHALLENGE

Polling Question 6



Sea2City Design Challenge

Process

CITY OF VANCOUVER

Sea2City

DESIGN TEAMS	City Advisory Team	Technical Advisory Group	Community Advisory Group	Youth Adaptation Lab

Public, Partners, Collaborators

ROUND 1
Getting Started

Sep - Oct 2021

Two teams selected

Team orientation - False Creek, the community, Challenge sites

ROUND 2
Preliminary Designs

Mar - Apr 2022

Early concepts – what could be done?

Community and technical review

Public events and activities

ROUND 3
Final Concepts
East of Cambie Design Charrette

Jun - Jul 2022

Final concepts – Challenge Sites

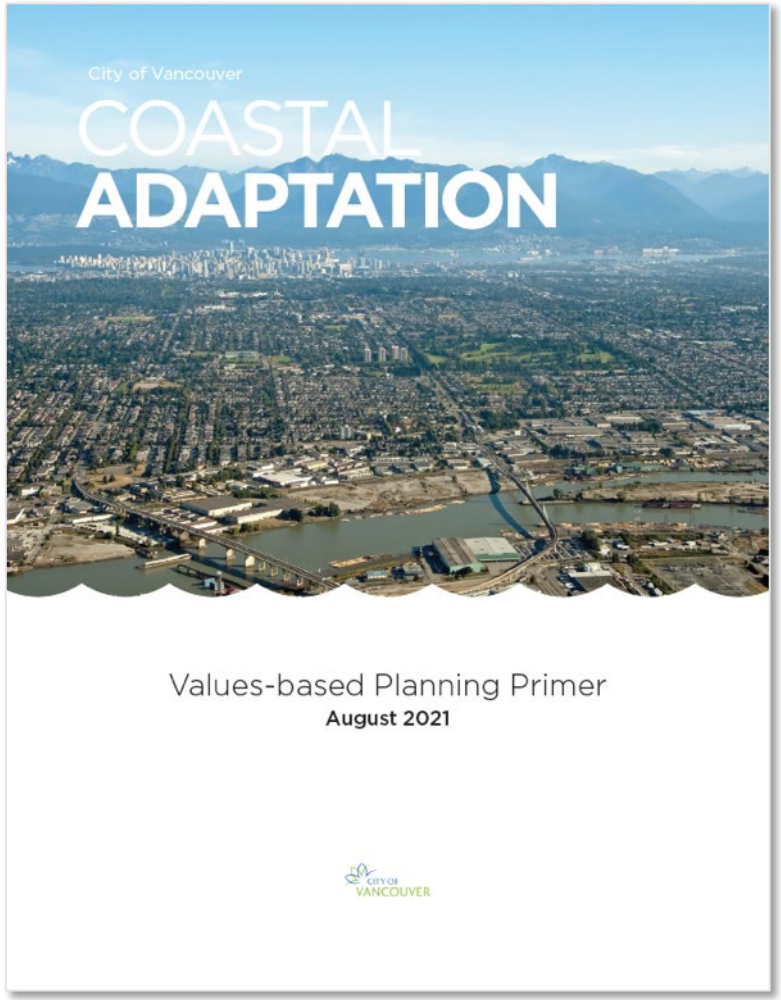
Early concepts – where to "draw the line" in False Creek

Community and technical review

Public events and activities

East of Cambie Design Charrette

A values-based approach

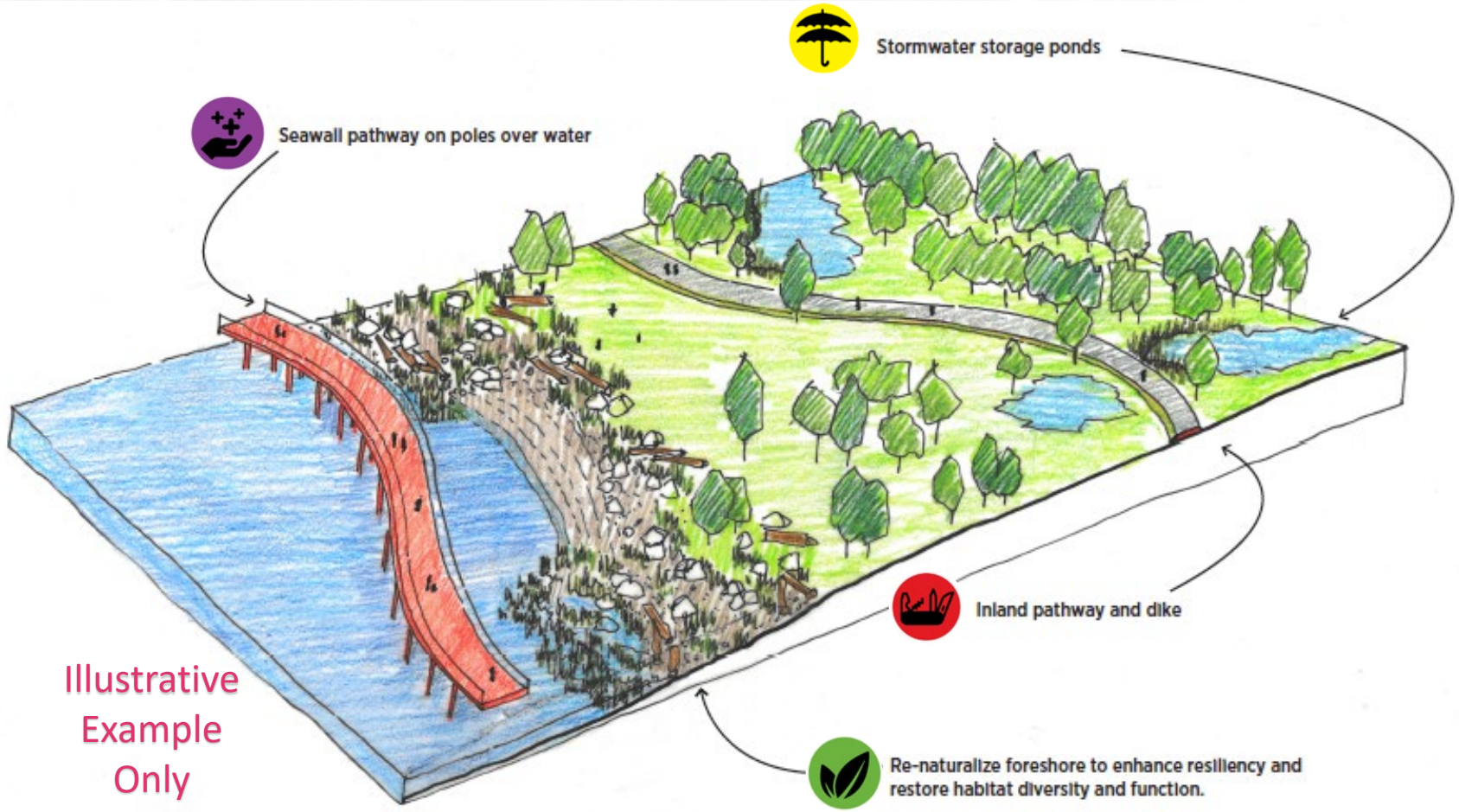


- Making sure future work incorporates **facts** *and* **values**
- Design criteria guide development of concepts for Sea2City Challenge sites
  - One concept for each general adaptation approach – resist, accommodate, move/avoid (spring 2022)
  - One preferred concept – likely a combination of approaches (summer 2022)
- Community values used to evaluate concepts
- Testing our approach for future work – "learning by doing"

SEA 2 CITY DESIGN CHALLENGE

Design Principles

1m Sea Level Rise and 1:500 storm



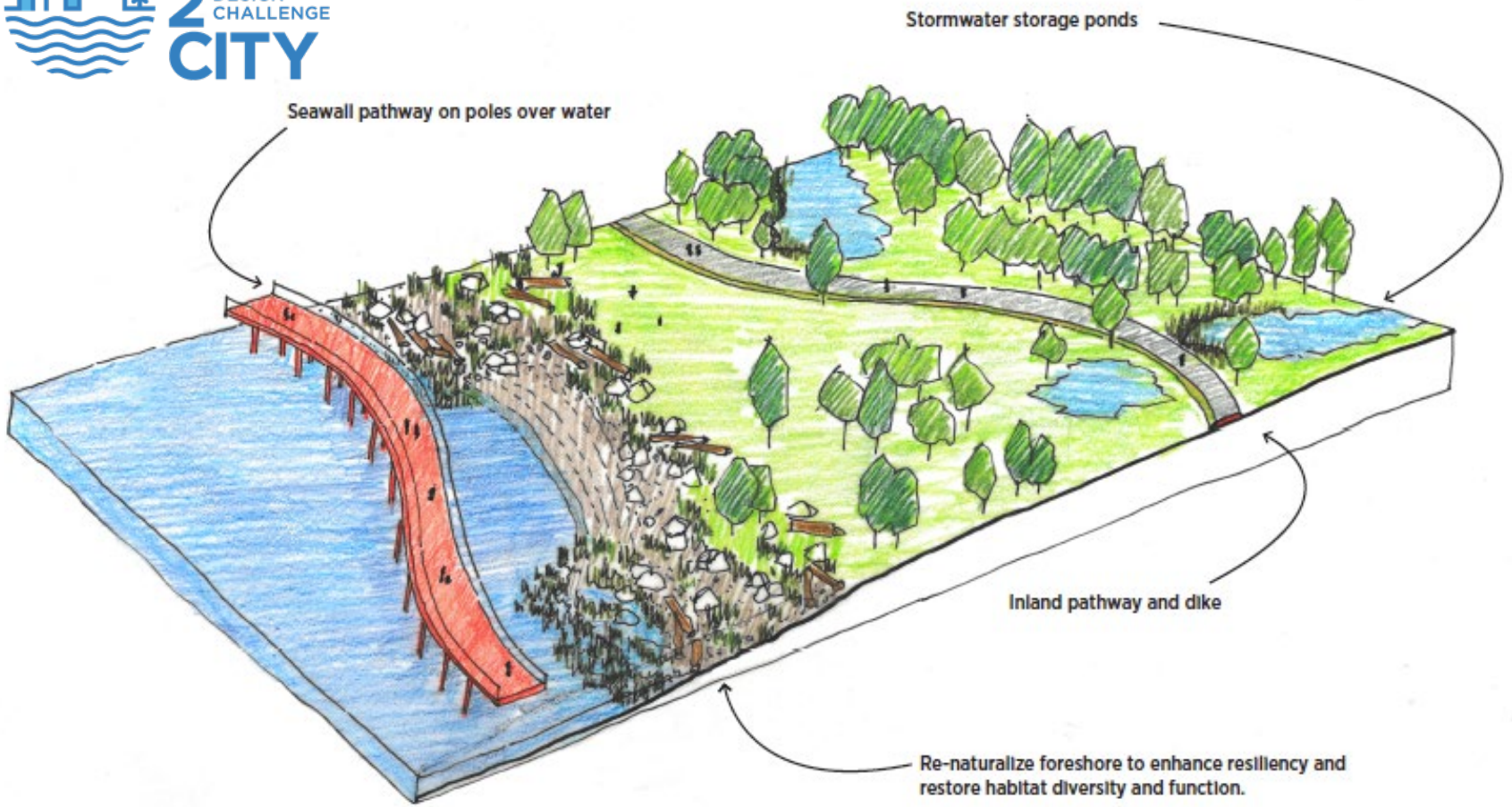
Illustrative Example Only

Used by teams to inform and guide design of adaptation concepts

- **Design for adaptability**
- **Design for safety and public health**
- **Design for safe-to-fail infrastructure**
- **Design with nature**
- **Design for access**
- **Design for co-benefits**

SEA 2 CITY DESIGN CHALLENGE

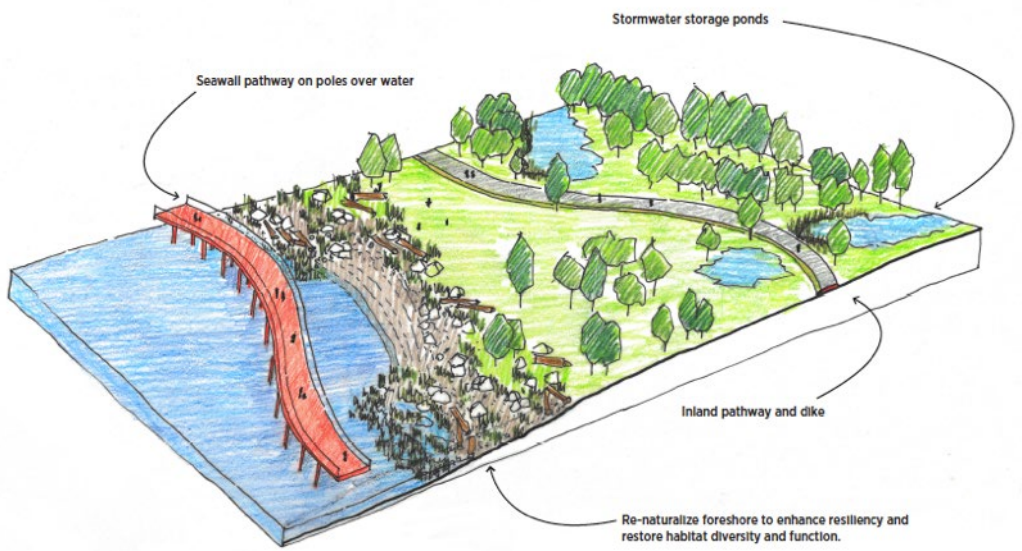
Values



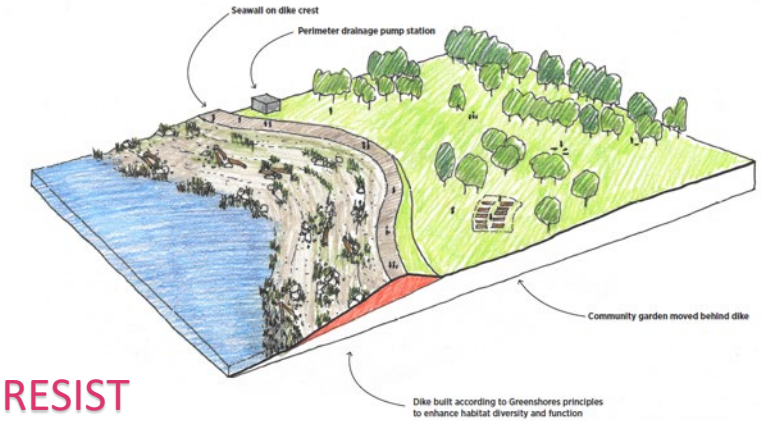
Used to help evaluate design concepts

- *How do design concepts respond to values?*
- *How could design concepts be improved?*

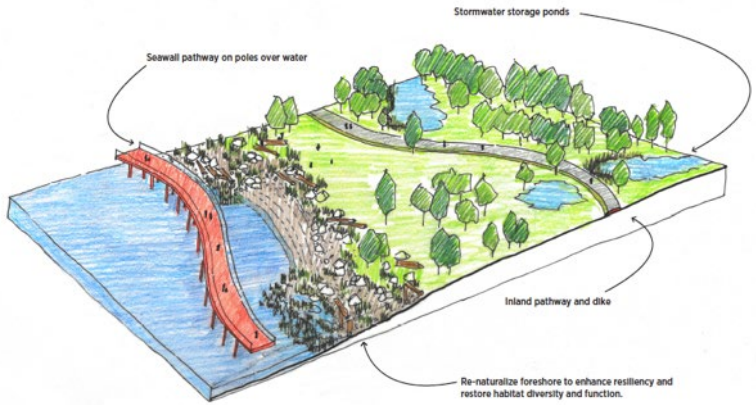
SEA 2 CITY DESIGN CHALLENGE



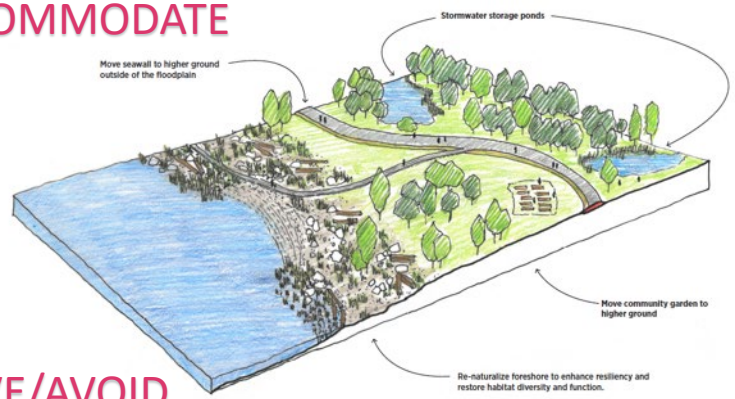
OPTION 1: RESIST		
Values Criteria	**Description**	**Indicator**
Communities, People, and Homes	*Example:* No residents are relocated. Views of False Creek would be impacted by an onshore dike (~5m).	*Indicator: People permanently displaced* — *NO CHANGE*
Health and Safety	*Description of option's impact on value criterion.*	*Indicator: Linked to criterion* — *SLIGHTLY BETTER*
Infrastructure and Transportation	*Description of option's impact on value criterion.*	*Indicator: Linked to criterion* — *SLIGHTLY WORSE*
Environment	*Description of option's impact on value criterion.*	*Indicator: Linked to criterion* — *FAR BETTER*
Local and Regional Economy	*Description of option's impact on value criterion.*	*Indicator: Linked to criterion* — *SLIGHTLY BETTER*
Arts, Culture, and Heritage	*Description of option's impact on value criterion.*	*Indicator: Linked to criterion* — *NO CHANGE*
Recreation	*Description of option's impact on value criterion.*	*Indicator: Linked to criterion* — *SLIGHTLY WORSE*



RESIST



ACCOMMODATE

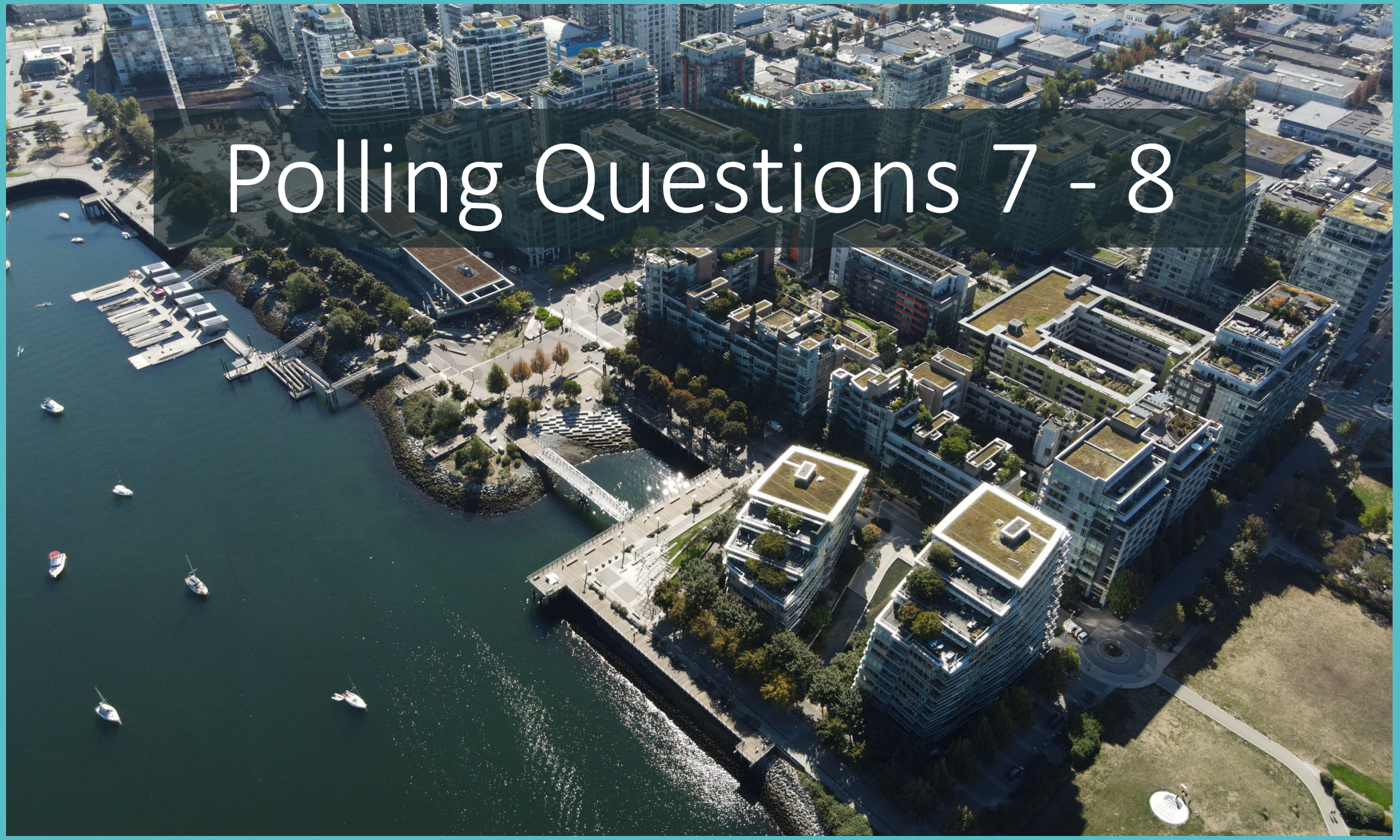


MOVE/AVOID

	BASELINE NO ADAPTATION	OPTION 1 RESIST	OPTION 2 ACCOMMODATE	OPTION 3 MOVE/AVOID
Values Criteria				
Communities, People, and Homes	MODERATELY WORSE	NO CHANGE	MODERATELY BETTER	FAR WORSE
Health and Safety	SLIGHTLY WORSE	SLIGHTLY BETTER	SLIGHTLY BETTER	MODERATELY BETTER
Infrastructure and Transportation	FAR WORSE	SLIGHTLY WORSE	SLIGHTLY WORSE	FAR BETTER
Environment	NO CHANGE	FAR BETTER	NO CHANGE	FAR BETTER
Local and Regional Economy	FAR WORSE	SLIGHTLY BETTER	SLIGHTLY WORSE	MODERATELY WORSE
Arts, Culture, and Heritage	NO CHANGE	NO CHANGE	NO CHANGE	MODERATELY BETTER
Recreation	FAR WORSE	SLIGHTLY WORSE	SLIGHTLY BETTER	FAR BETTER

Indigenous Knowledge

- This community value honours the wisdom and stewardship of Musqueam, Squamish, and Tsleil-Waututh peoples and calls upon the City to listen and act on this wisdom and stewardship in a good way
- Musqueam, Squamish, and Tsleil-Waututh will be invited to provide input on design concepts
- Design Teams will be asked to reflect on, and where appropriate and as directed by Musqueam, Squamish, and Tsleil-Waututh, incorporate Indigenous design principles developed through the Northeast False Creek parks planning process



Polling Questions 7 - 8

Thank you

Stay involved.

Visit www.vancouver.ca/sea2city

Email us: sealevelrise@vancouver.ca