



# INFRASTRUCTURE IN PARKS: Storm Damage Update

Regular Board Meeting  
Monday, January 16, 2023

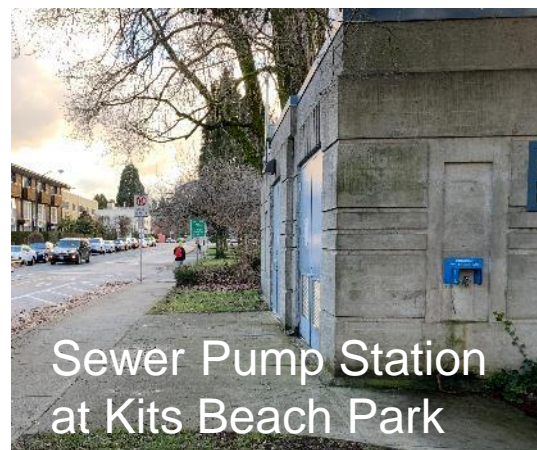


The purpose of this presentation is to provide:

- Background on Park Board coastal infrastructure and coastal flooding
- An update on recent flooding and storm events
- Updates on repairs and estimated costs
- Overview of next steps and coastal adaptation planning

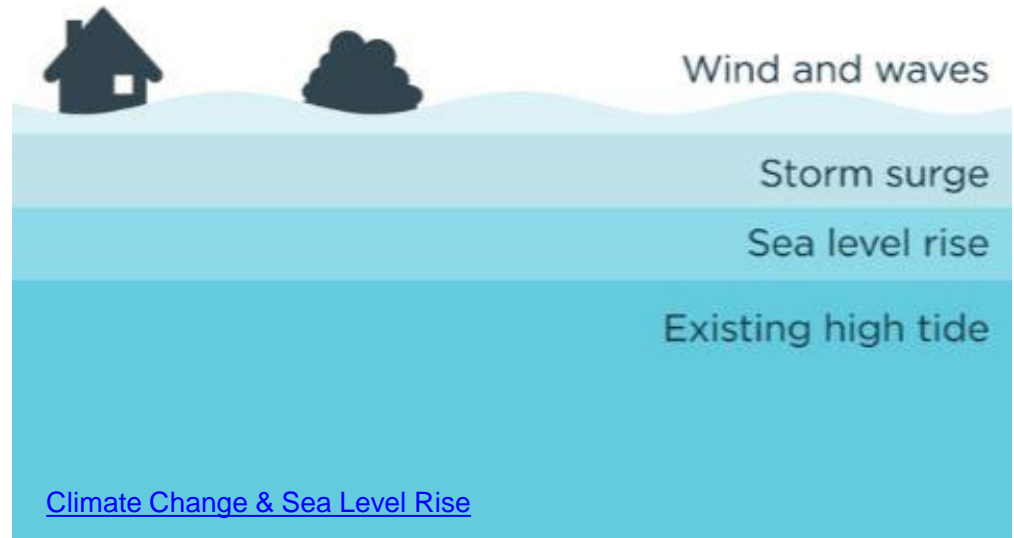
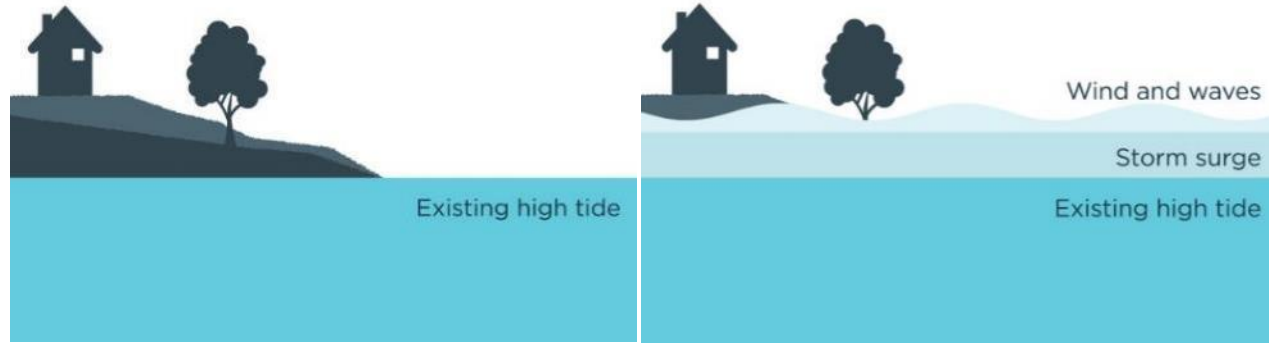
# Vancouver's Seawall, Shoreline, and Marine Infrastructure

- 23.3 km of seawall, armored shoreline (rip-rap), and beach
- 23 marine structures (docks, piers, and boardwalks)
- Other near-shore infrastructure



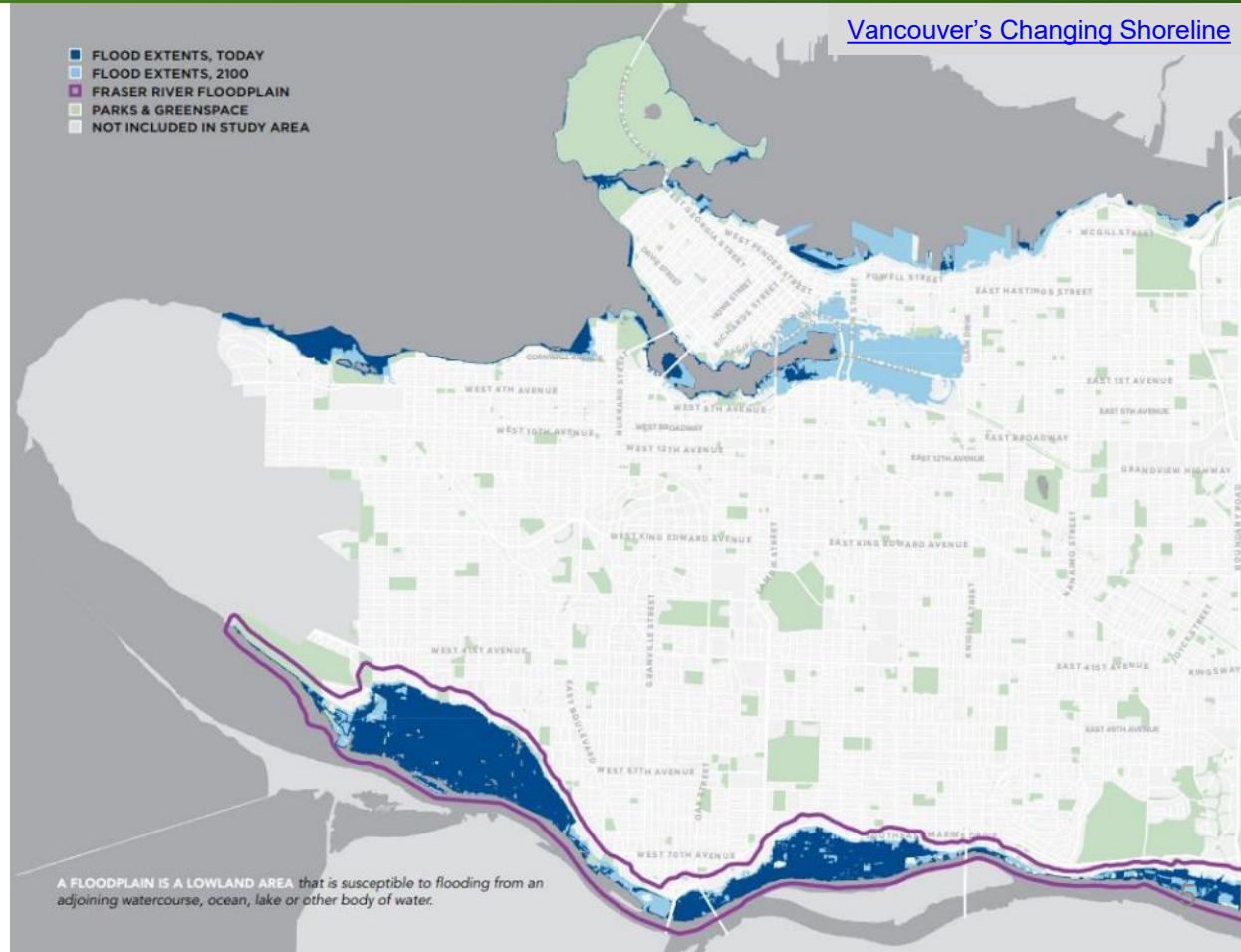
# Factors Contributing to Coastal Flooding

- Impacts coastal communities globally
- Result of combined factors: high tide, storm surge, large waves, wind direction
- Sea level rise leads to increased frequency, severity, duration of coast flooding



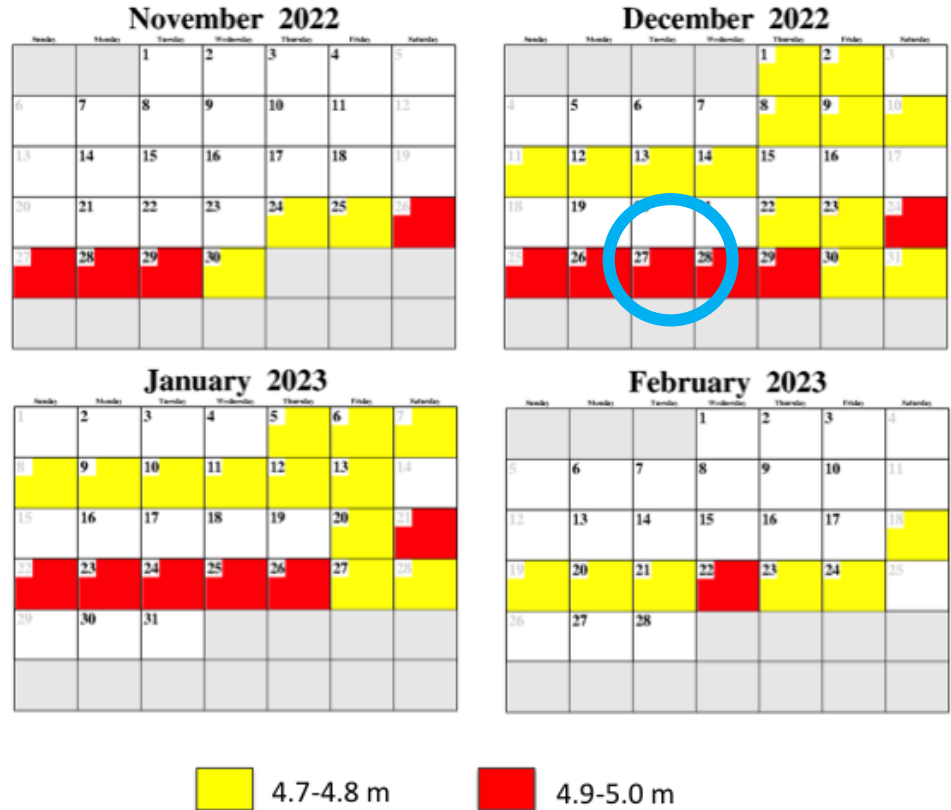
# Predicting Coastal Flooding – Flood Extents

- Flood extent can modeled/predicted
- City-wide floodplain map now (dark blue) and with 1 metre sea level rise (light blue)
- Flood extent should no intervention take place



# Predicting Coastal Flooding – King Tide Forecasting

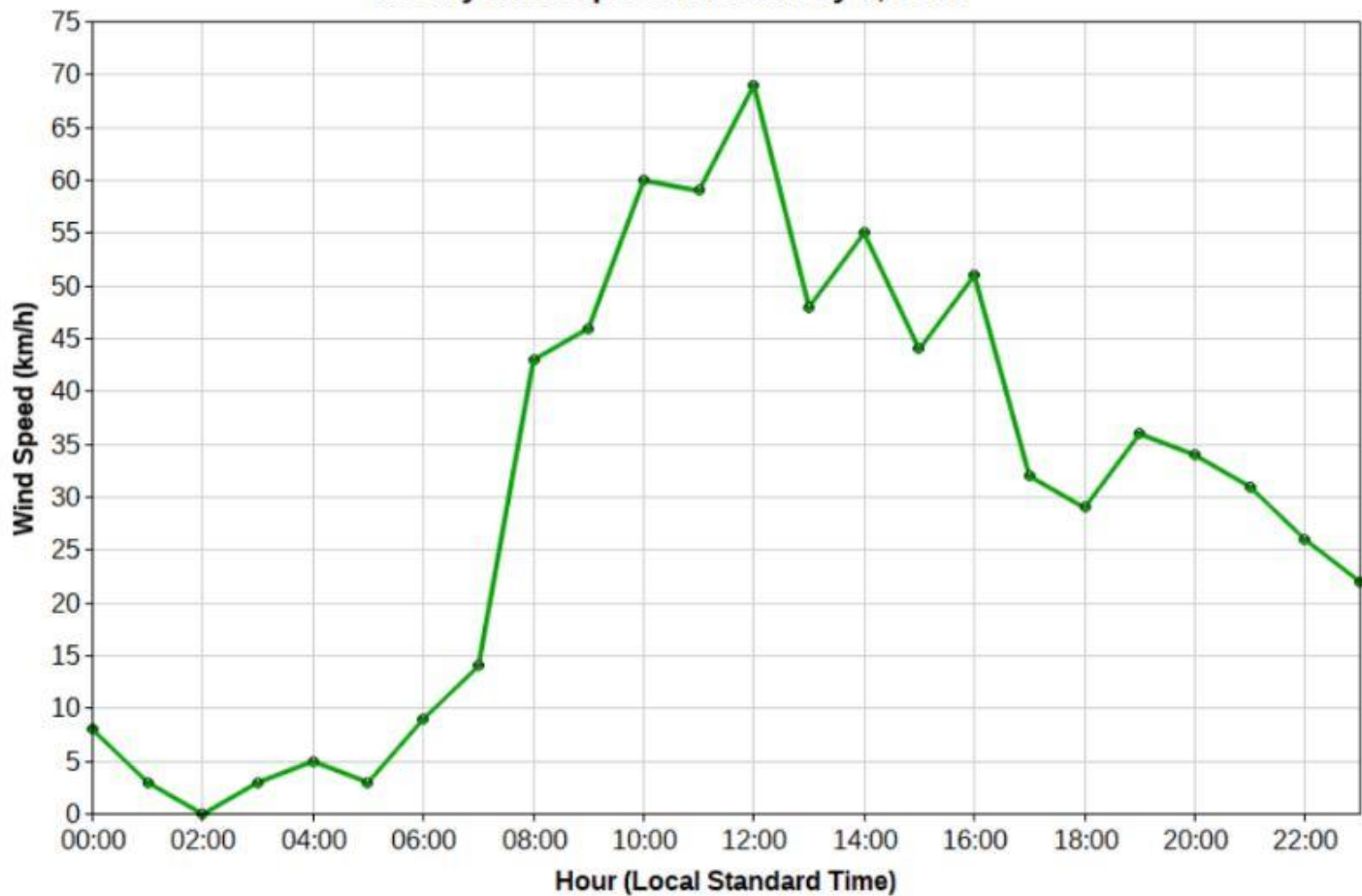
- No combined storm surge & high wind and wave warning
- Vancouver and Point Atkinson tide stations recorded the highest water levels on record on Dec 27, 2022
- Storm surge + high wind and waves on Jan 7, 2022 caused significant damage to coastal assets



# January 7, 2022 King Tide & Storm



### Hourly Wind Speed for January 7, 2022





Mitigation

Immediate Response

Assessment & Options

Design & Construction

Adaptation Planning



## Mitigation

- Public safety
- Take steps to minimize damage
- Limited options without holistic planning

## Immediate Response

- Issue warning if health or safety risk
- Determine extent of damage



# Mitigation and Immediate Response – Debris Removal



Park Board staff accumulating logs for removal by log salvage boat at Jericho Beach (January 2023)

## Assessment & Repair Options

- Determine where to focus resources:
  - Safety and Accessibility / Demand
- Repair options and associated costs

## Design & Construction

- Repair work in-house or by external contractors
- Access, weather, tide and fisheries windows, environmental permitting

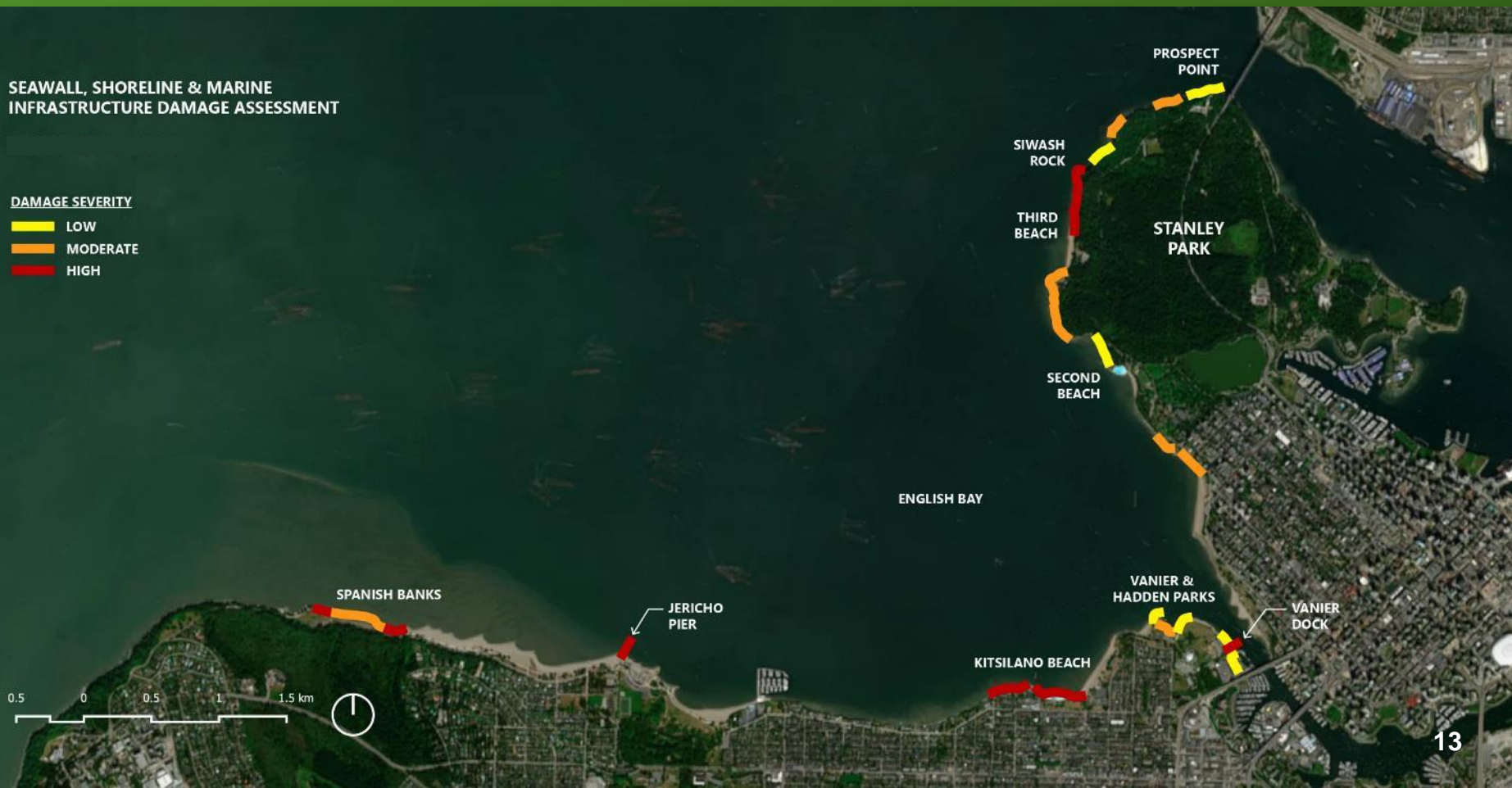


# Damage Overview – 2021/2022 Storm Season

## SEAWALL, SHORELINE & MARINE INFRASTRUCTURE DAMAGE ASSESSMENT

### DAMAGE SEVERITY

- LOW
- MODERATE
- HIGH



# Stanley Park Seawall



# Vanier Boat Launch



# Jericho Pier





# Spanish Banks





Photos of Kits Pool during January 7, 2022 Storm



# Kitsilano Pool



- Summary of spend on seawall, shoreline, and marine asset damage repair from 2021/2022 storm season (excluding Jericho pier and Kits Pool facility)

To Date	Anticipated	Total
\$1.1M	\$1.2M	\$2.3M

- 2023-2026 Capital Plan
  - \$3.5M for Park Board sections of seawall and shoreline
  - \$1M for marine structures repair
- Estimated replacement cost of Stanley Park seawall

# Next Steps in Coastal Adaptation Planning

## Now

- Incident Response
- Repair existing infrastructure

## Next Steps

- Current State & Hazard mapping
- Vulnerability assessment
- Design Principles & Approaches
- Pilot and Monitor

## Long term

- Refine: What options will work for us?
- Solution seeking

## Examples:

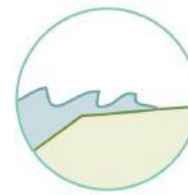
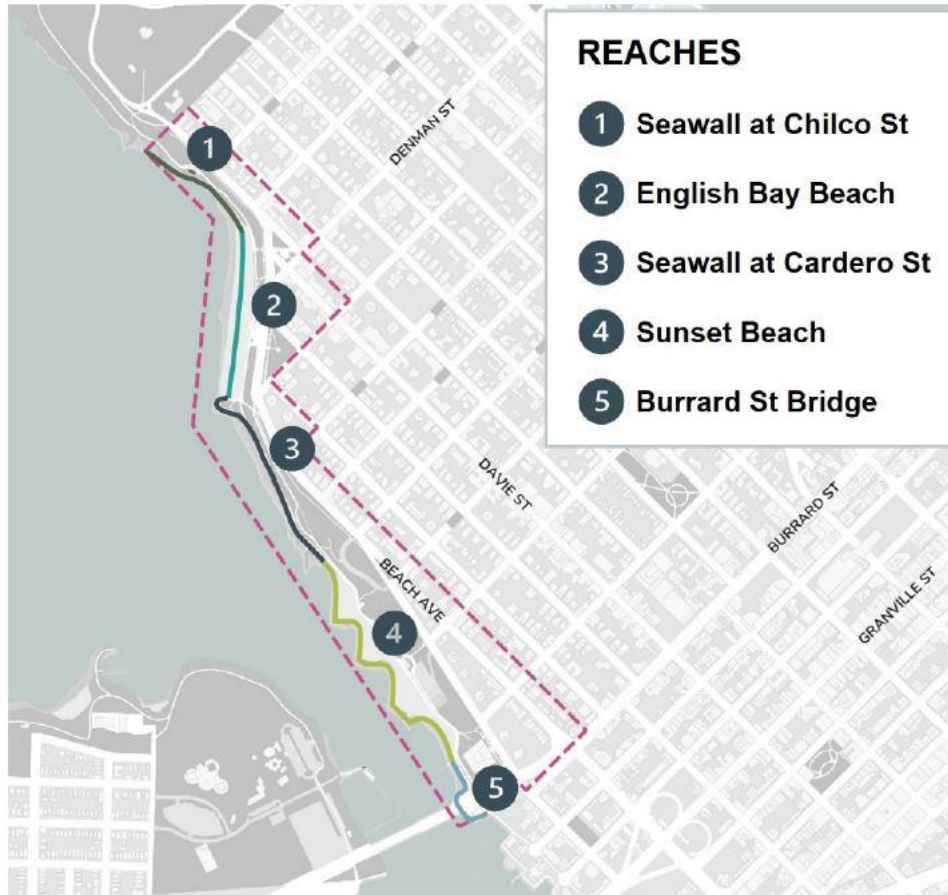
- Construction of flood protection infrastructure
- Sea2City
- West End Waterfront Plan
- Park Board Coastal Adaptation Planning



- Long term comprehensive plan for the West End Waterfront
- Update to the Board later in 2023
- Coastal and landscape processes, and shoreline environment



# West End Waterfront Plan



## AVOID

Avoid development in hazardous areas.



## ACCOMODATE

Continue to use hazardous areas, but accommodate changes through alternative design practice or land-uses.



## RETREAT

Relocate or abandon assets in hazardous areas. Allow natural systems to migrate inland.



## PROTECT

Protect existing land-uses from hazards using 'hard' or 'soft' techniques.

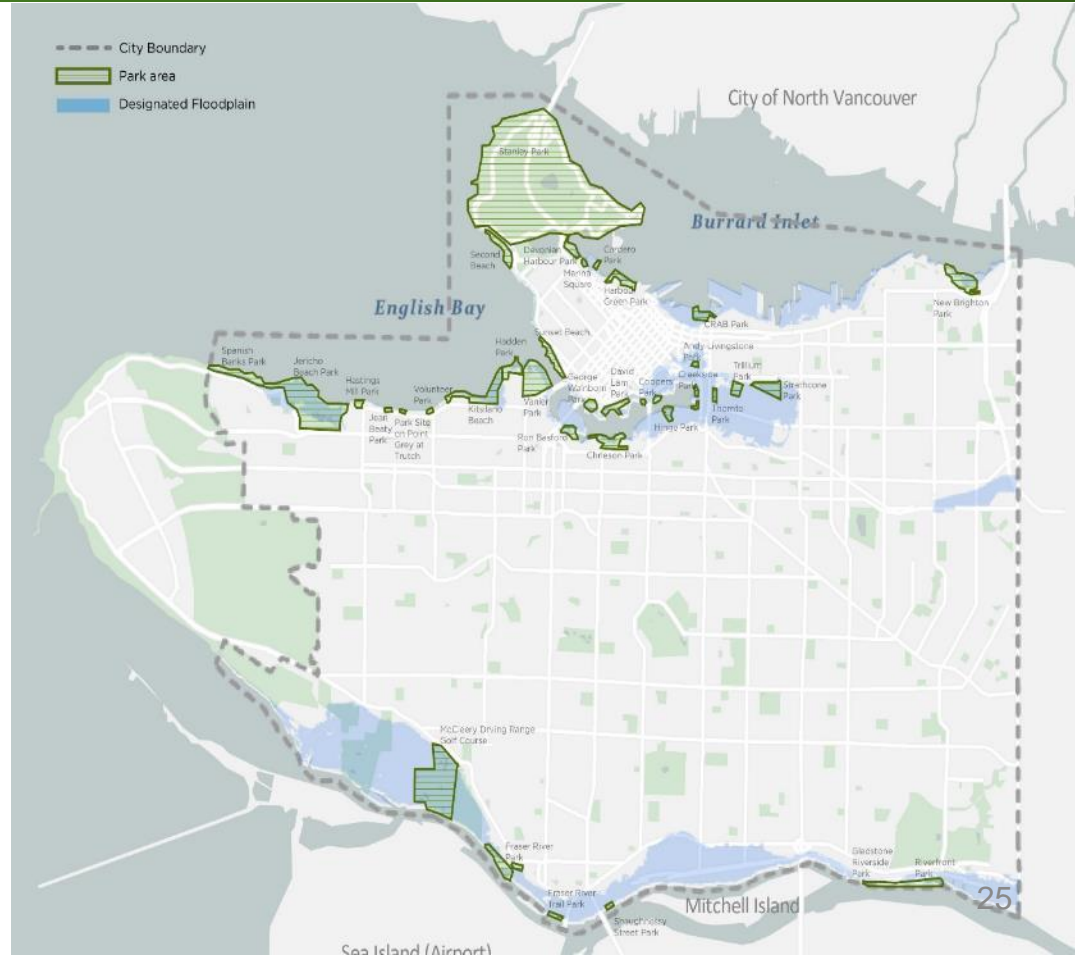


## ADVANCE

Extend land-use into hazardous areas. Frequently combined with 'protect' approaches.



- 2023-2026 Capital Plan funding
- Extend work of West End Waterfront to other coastal areas
- Coastal hazard and vulnerability assessment





# Questions and Comments

