



# SOURCE 2STREAM

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# **BIG SALMON DREAMS FOR A SMALL VANCOUVER STREAM: INTEGRATING WATERSHED AND LAND USE PLANNING**



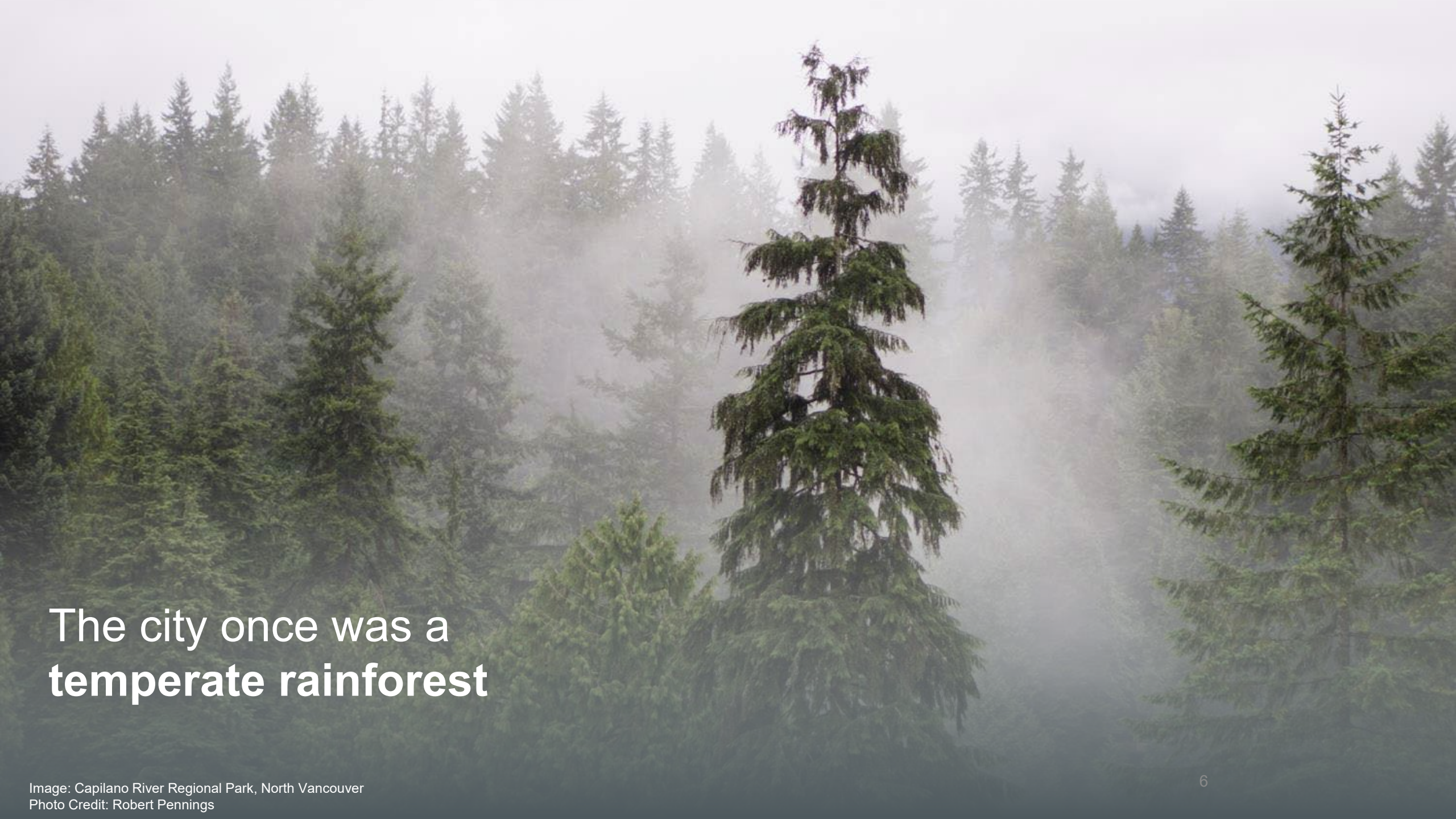
# OUTLINE

1. Vancouver's One Water journey
2. Still Creek watershed background information
3. Land use pressure, potential impacts and technical studies
4. Emerging 'Big Ideas'
5. Next steps and lessons learned



Vancouver is a city  
with a deep connection to water

Image: Sunset Serenades under the Cambie Bridge  
Photo Credit: Steve Chou



The city once was a  
**temperate rainforest**

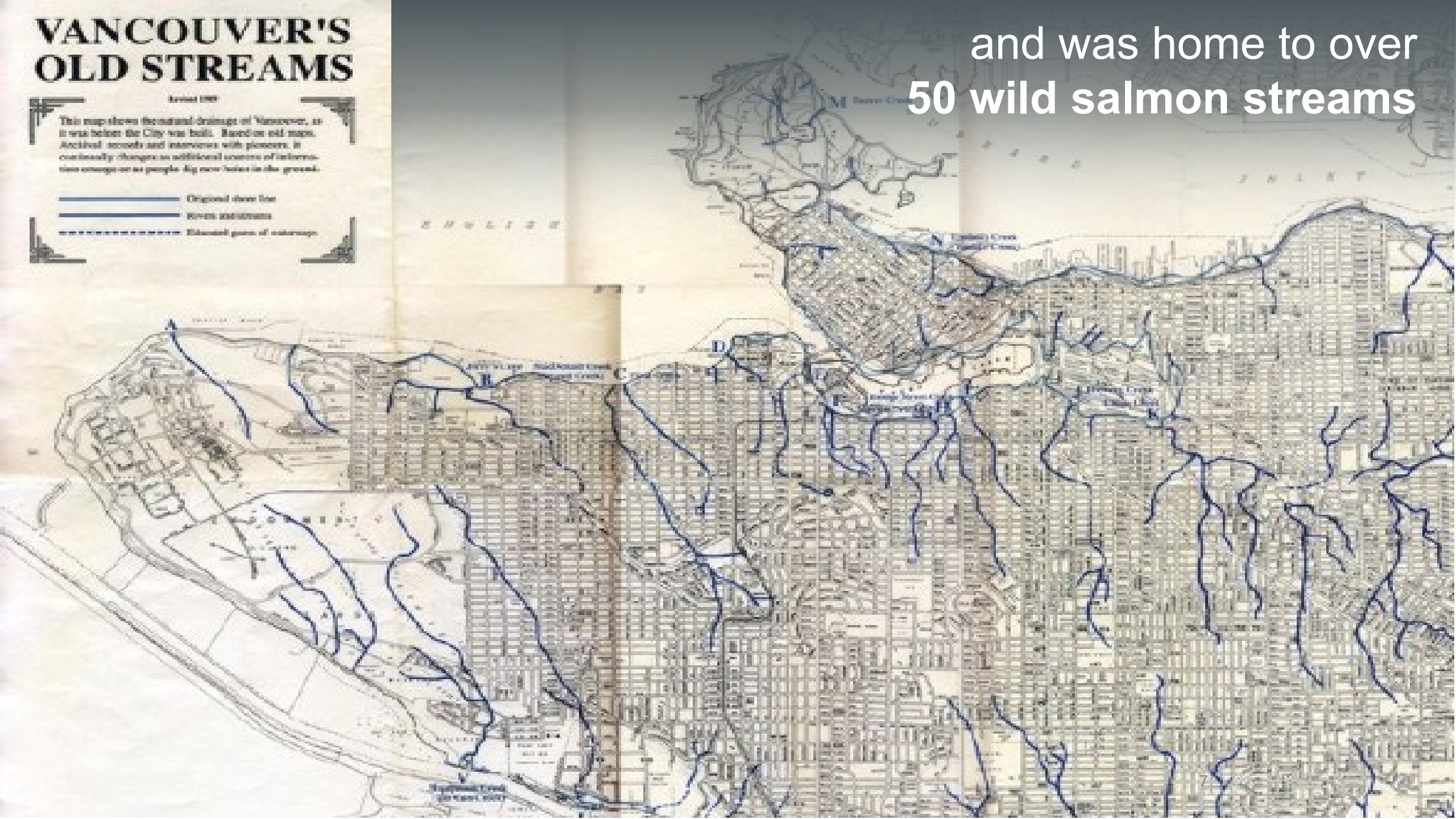
# VANCOUVER'S OLD STREAMS

1861-1862

This map shows the natural drainage of Vancouver, as it was before the City was built. Based on old maps, archival records and interviews with pioneers, it continually changes as additional sources of information emerge or as people dig new holes in the ground.

- Original stream line
- Rivers and streams
- Estimated paths of waterways

and was home to over 50 wild salmon streams





Over time,  
we have changed the natural watersheds...

Image: Hastings Town site 1928, Vancouver  
Photo Credit: Vancouver Archives

6751 MOORE  
8



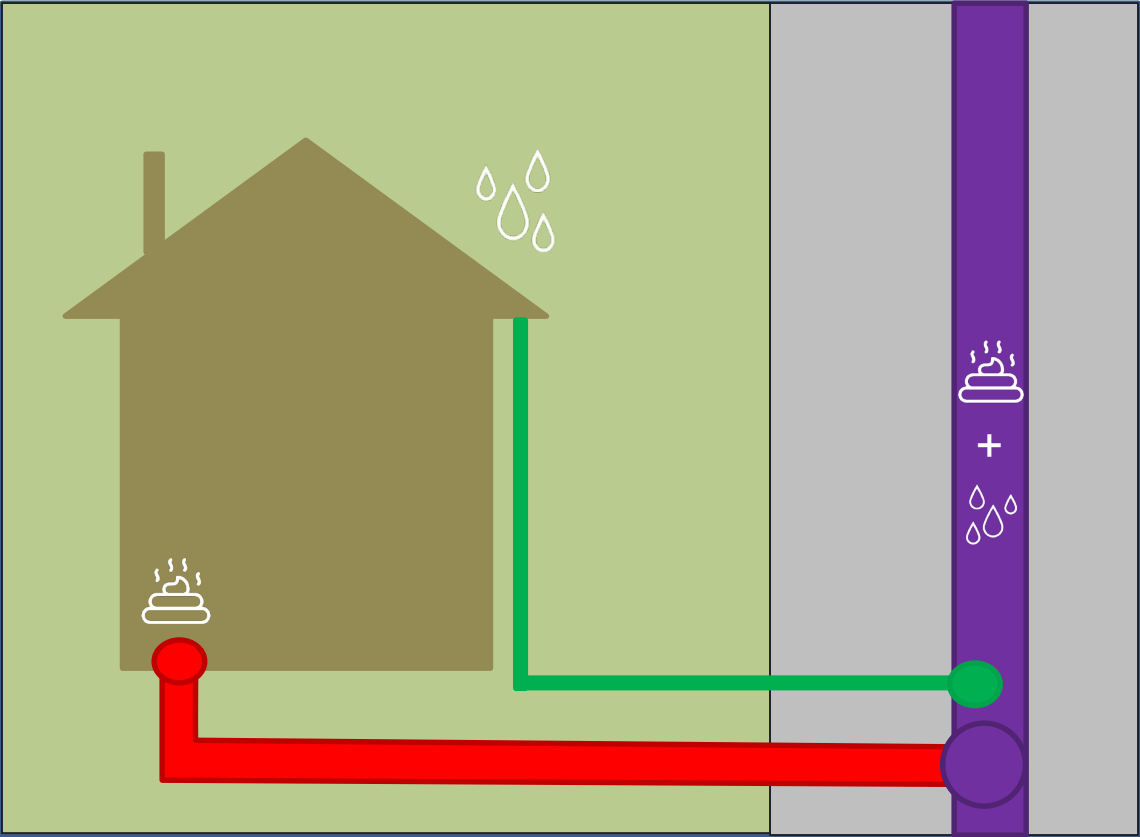
And we have altered  
our natural infrastructure.



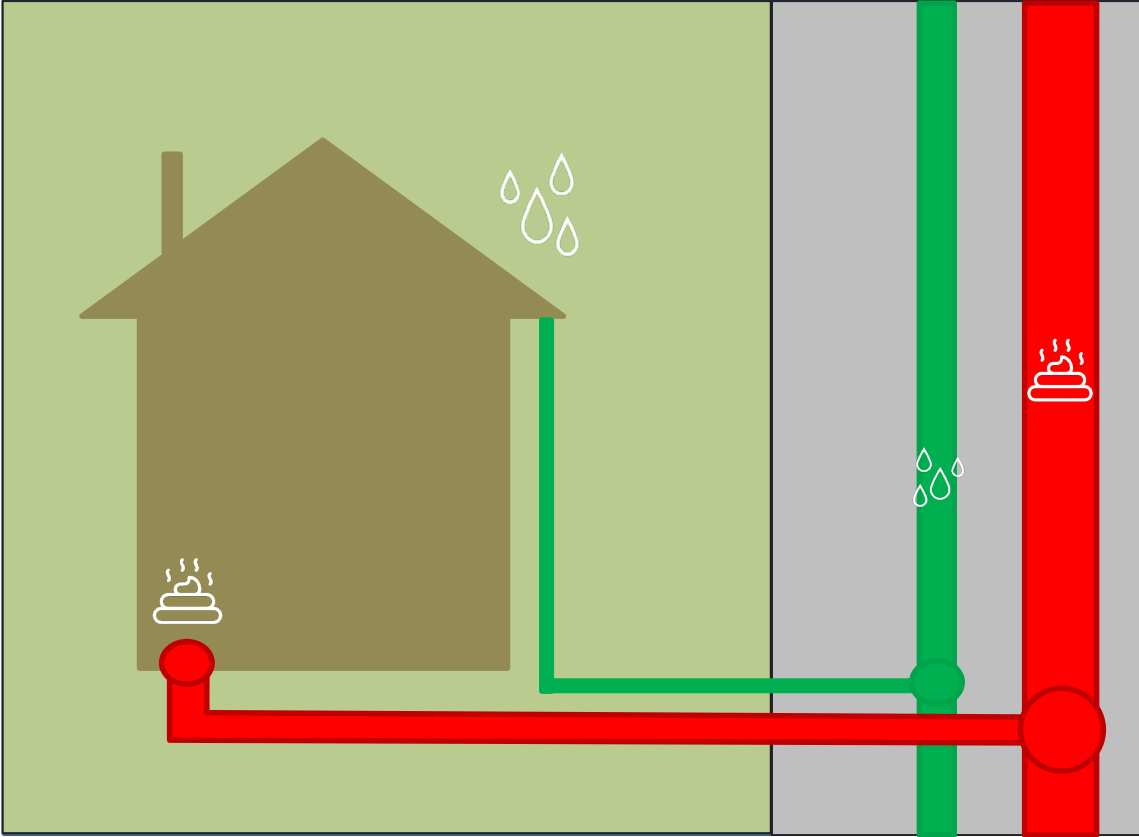
BACKGROUND

# WATERSHED PIPE NETWORK

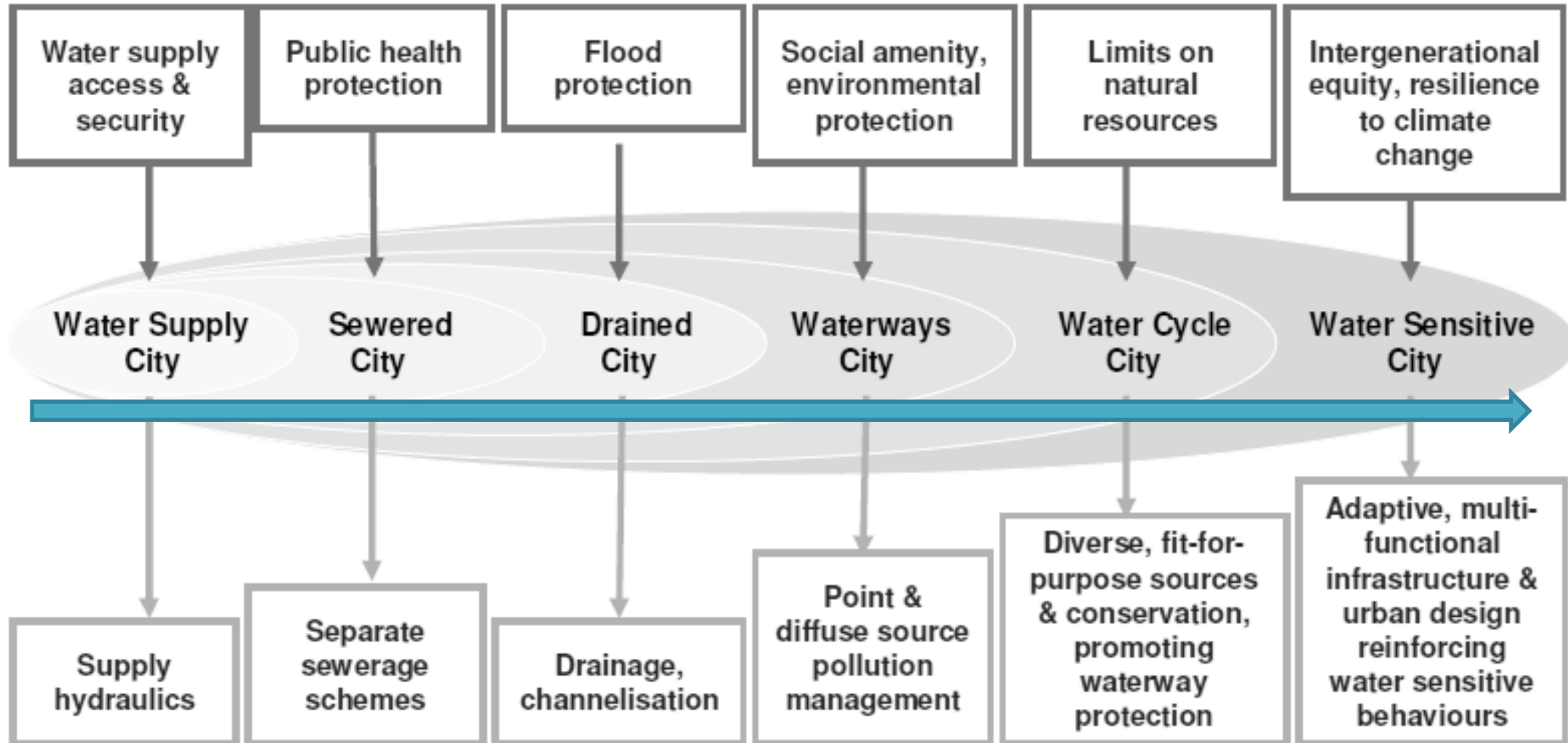
Combined



Storm Sanitary



# SHIFT TOWARDS A WATER SENSITIVE CITY

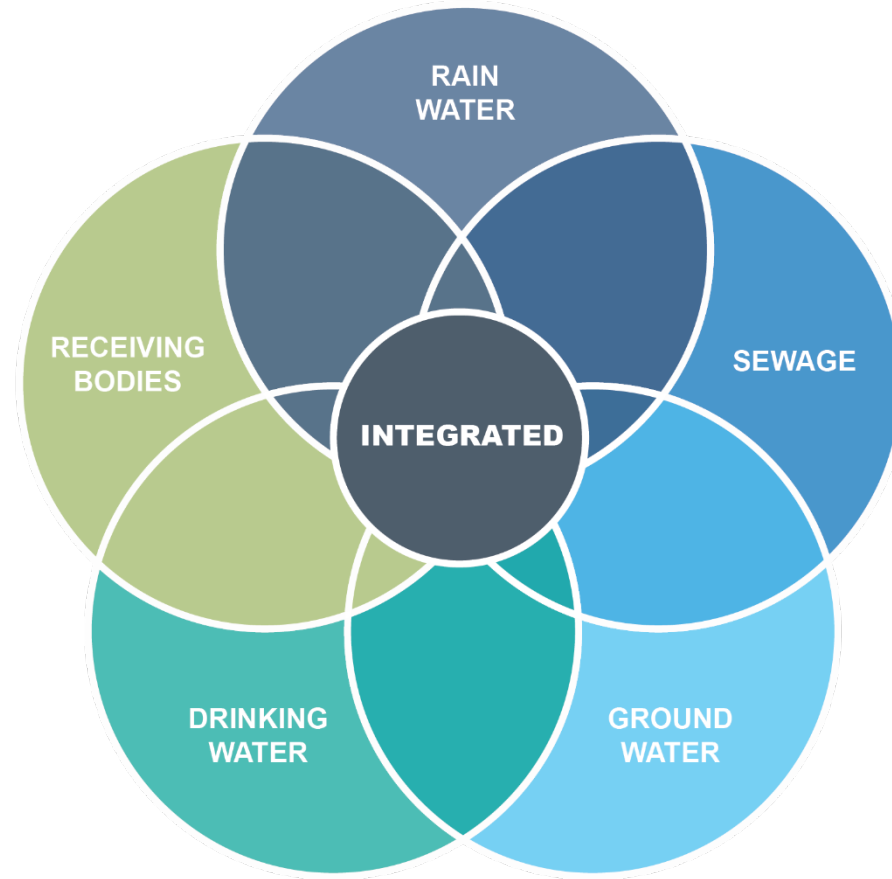


BACKGROUND

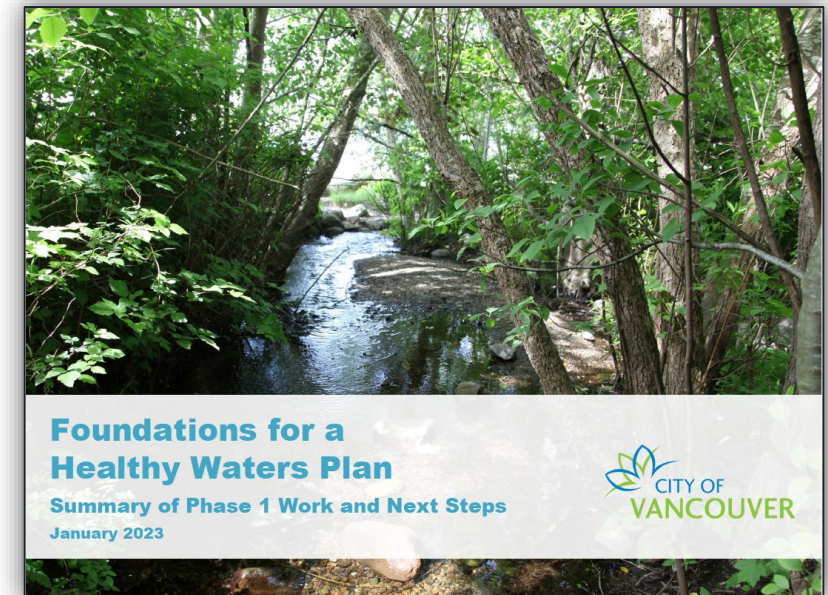
# SHIFT TOWARDS A WATER SENSITIVE CITY



2019



One Water Approach



Healthy Waters Plan (2024)

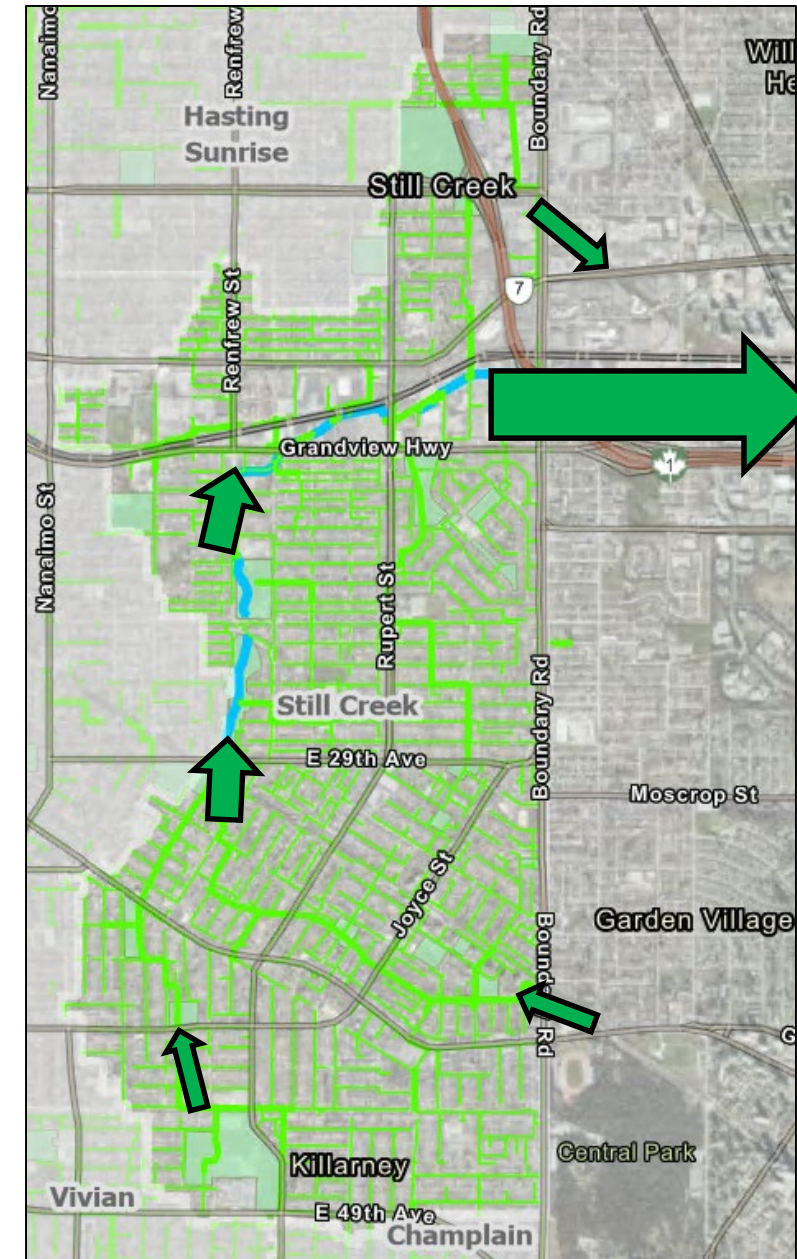


## VANCOUVER'S 'OLD' STREAMS



## STILL CREEK BACKGROUND INFRASTRUCTURE DRAINAGE

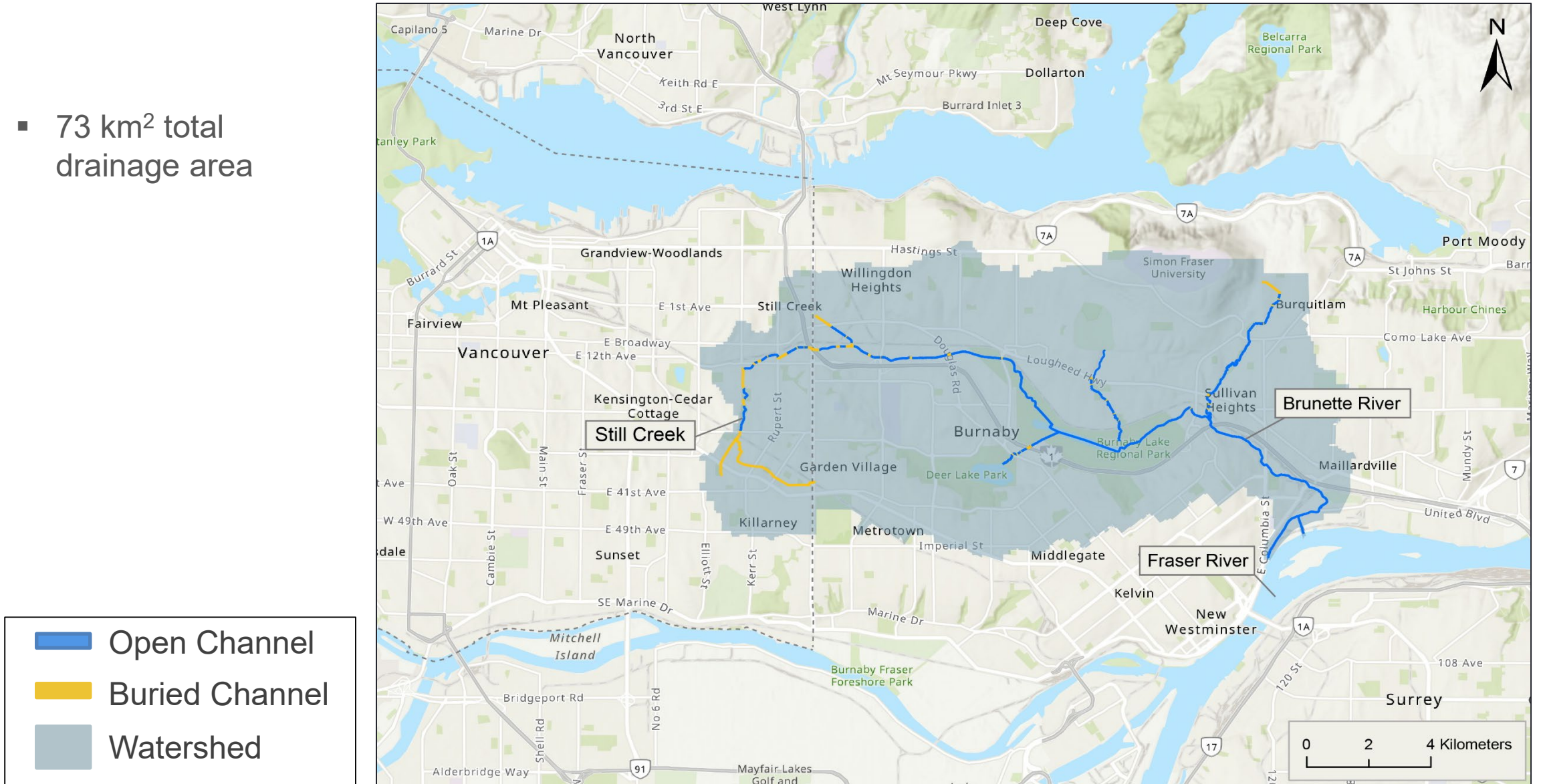
- 3 km creek = natural drainage asset
- 135 km City storm sewers
- Regional trunk storm sewer and culverts
- 7 green infrastructure facilities (historic)



# STILL CREEK BACKGROUND

## STILL CREEK – BRUNETTE RIVER BASIN

- 73 km<sup>2</sup> total drainage area





## STILL CREEK BACKGROUND **BIG SALMON DREAMS**

- Chum returned to East Vancouver in 2012 - 2020, first time in ~80 years
- Spawners more regularly downstream in Burnaby
- Still Creek Streamkeepers monitor for fish, conduct clean-ups and invasive species removals, and plant native species



Still Moon Streamkeepers



East Van Chum spawners, 2012



East Van Stickleback, 2019



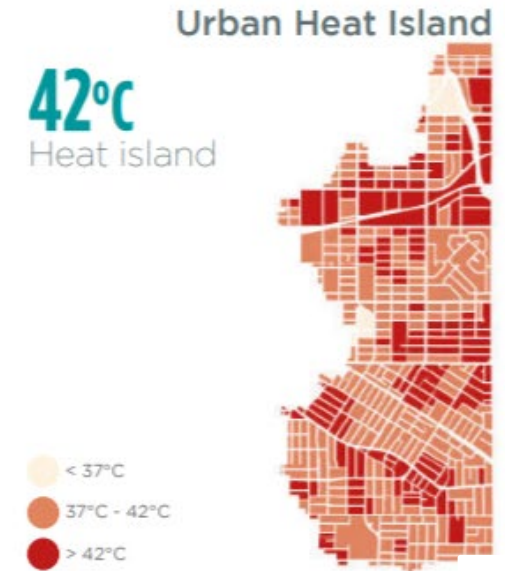
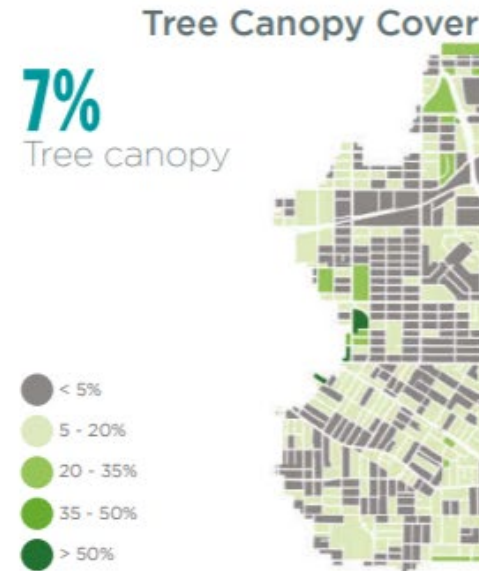
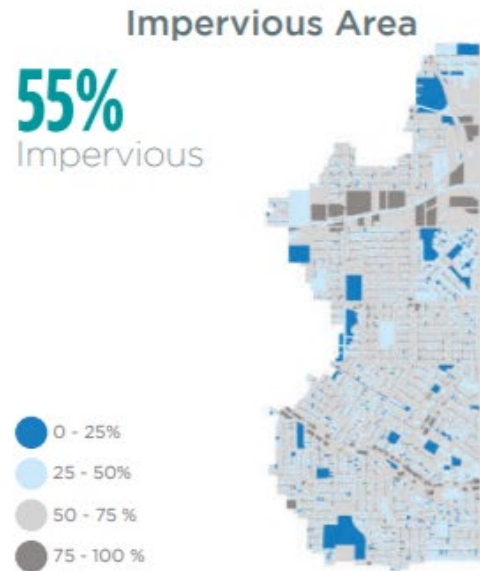
Chum, 2015



# STILL CREEK BACKGROUND CURRENT CONDITIONS

## Key issues:

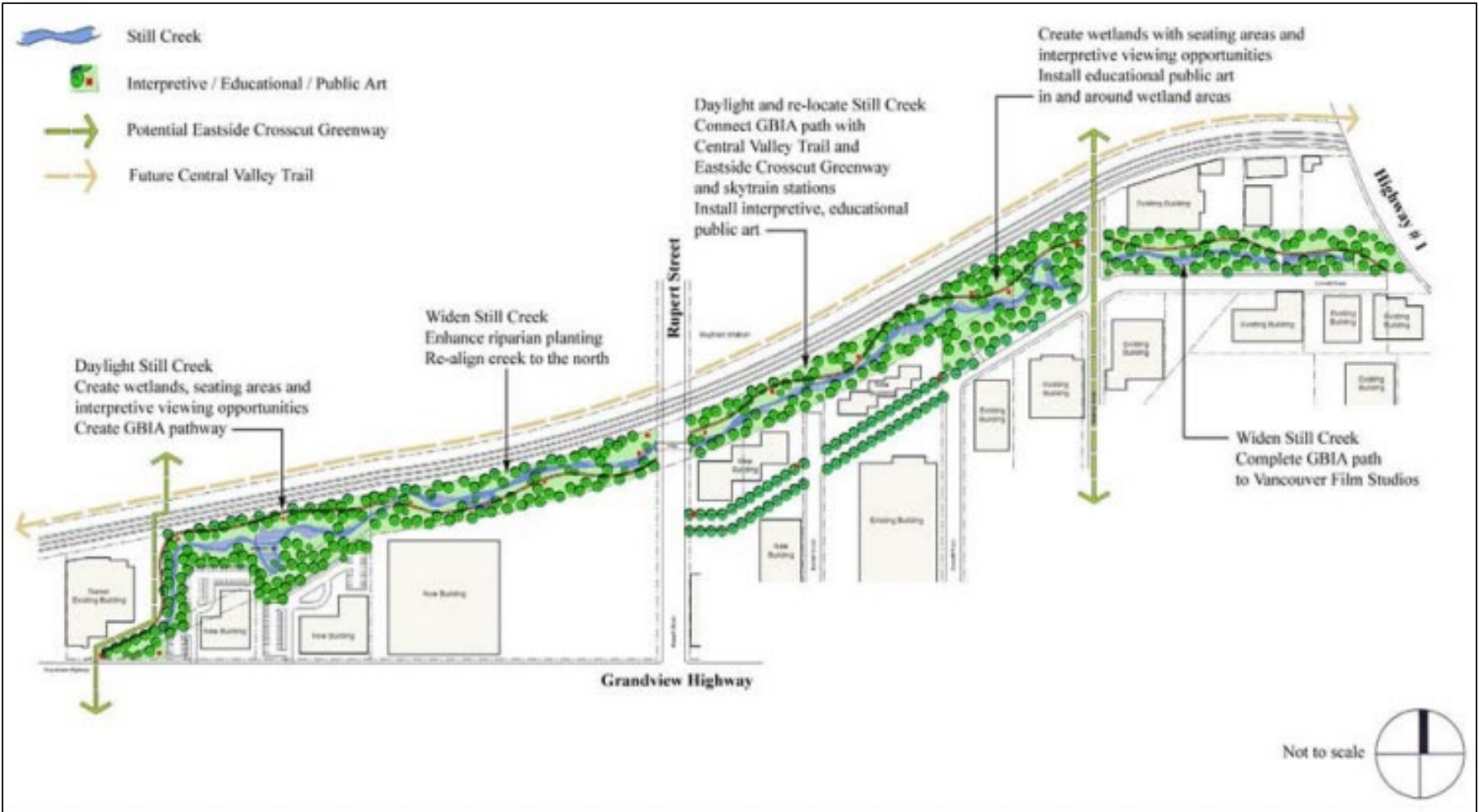
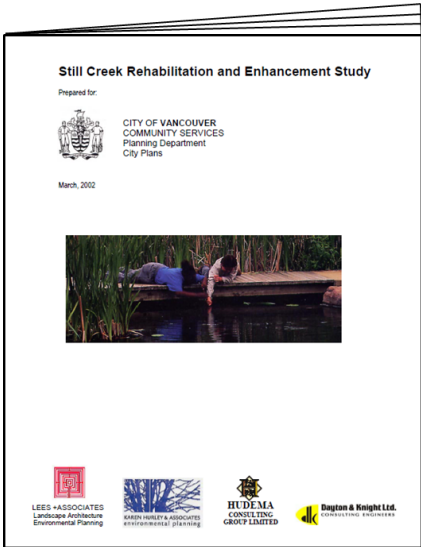
- Water quality
- Physical habitat
- Tree canopy and urban heat island
- Impervious area
- Flooding
- Flow attenuation (flashy)
- Groundwater (year round flow)



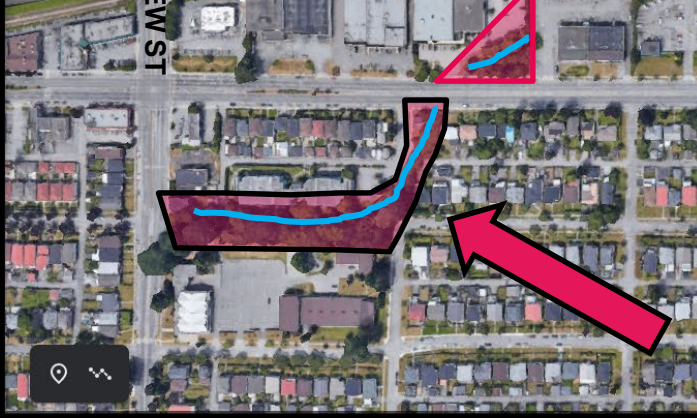
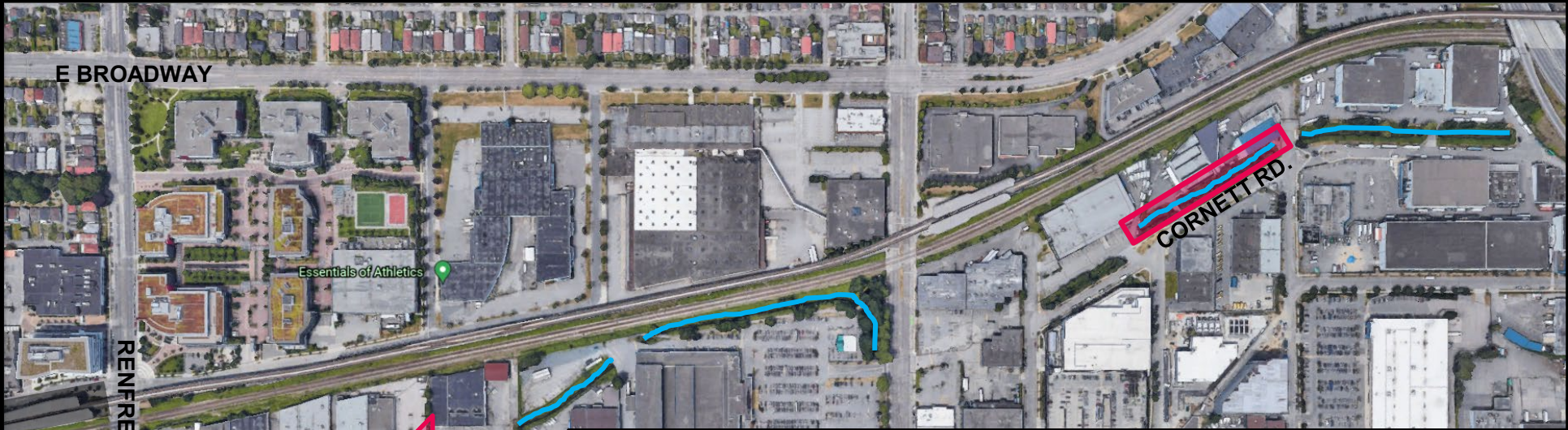
Roads make up 32% of Still Creek watershed.

# STILL CREEK BACKGROUND

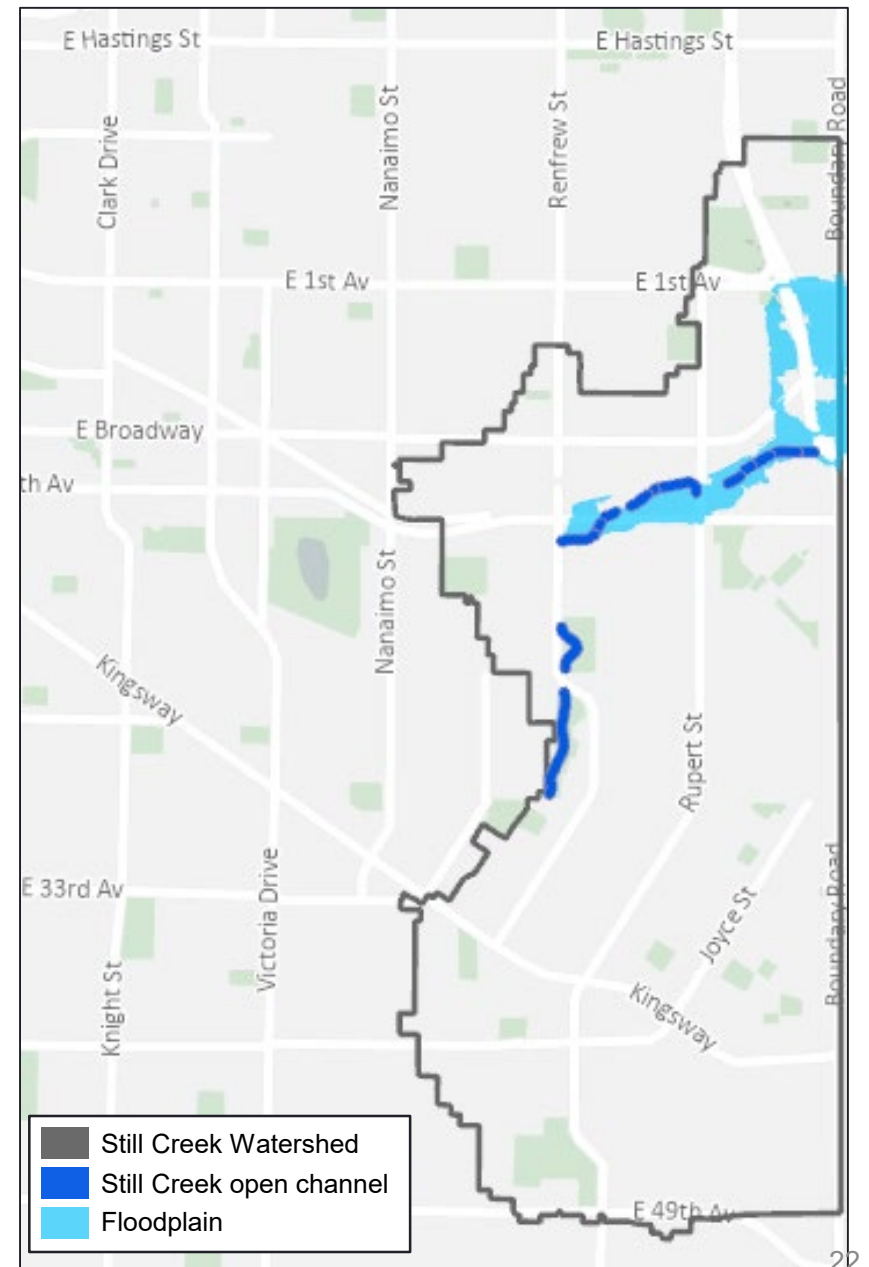
## CITY LED ENHANCEMENT (2000's)



# STILL CREEK BACKGROUND COMPLETED PROJECTS 2005 - 2011



# STILL CREEK BACKGROUND **FLOODPLAIN**





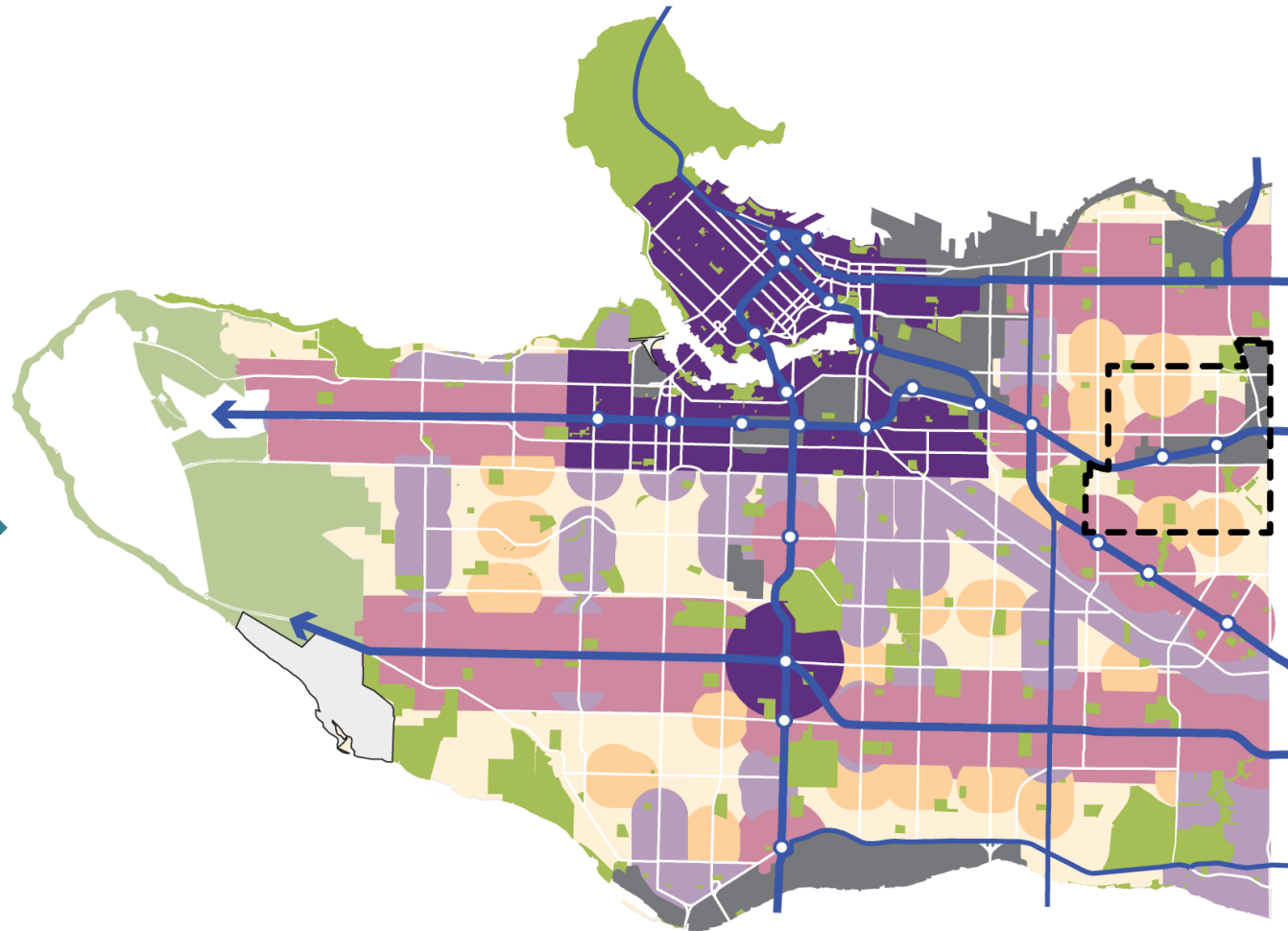
# LAND USE PRESSURE, POTENTIAL IMPACTS AND TECHNICAL STUDIES

# VANCOUVER PLAN LAND USE STRATEGY



## 3 Big Ideas

1. Equitable Housing and Complete Neighborhoods
2. An Economy that Works for All
3. Climate Protection and Restored Ecosystems

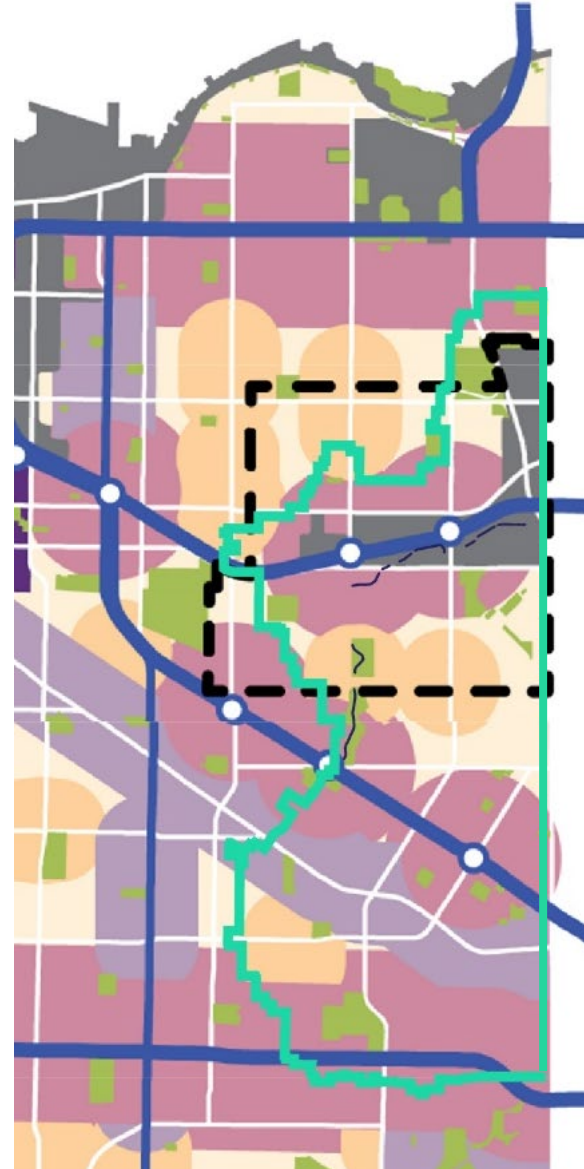
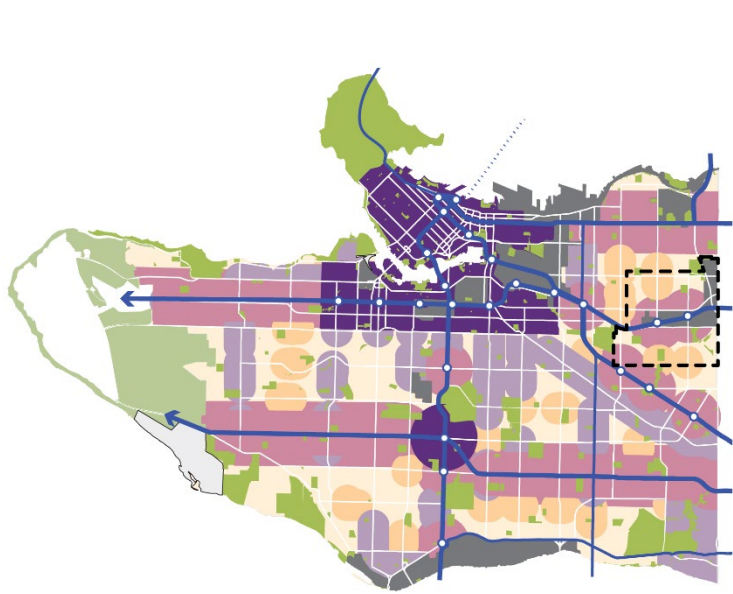




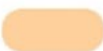







- Metro Core/Broadway + MTC
- Rapid Transit Area
- Neighbourhood Centre
- Village
- Multiplex Area
- Industrial/Employment
- Existing Rapid Transit Station
- Major Transit Network
- Parks and Open Spaces
- First Nations Reserves
- Rupert & Renfrew Area Plan Boundary



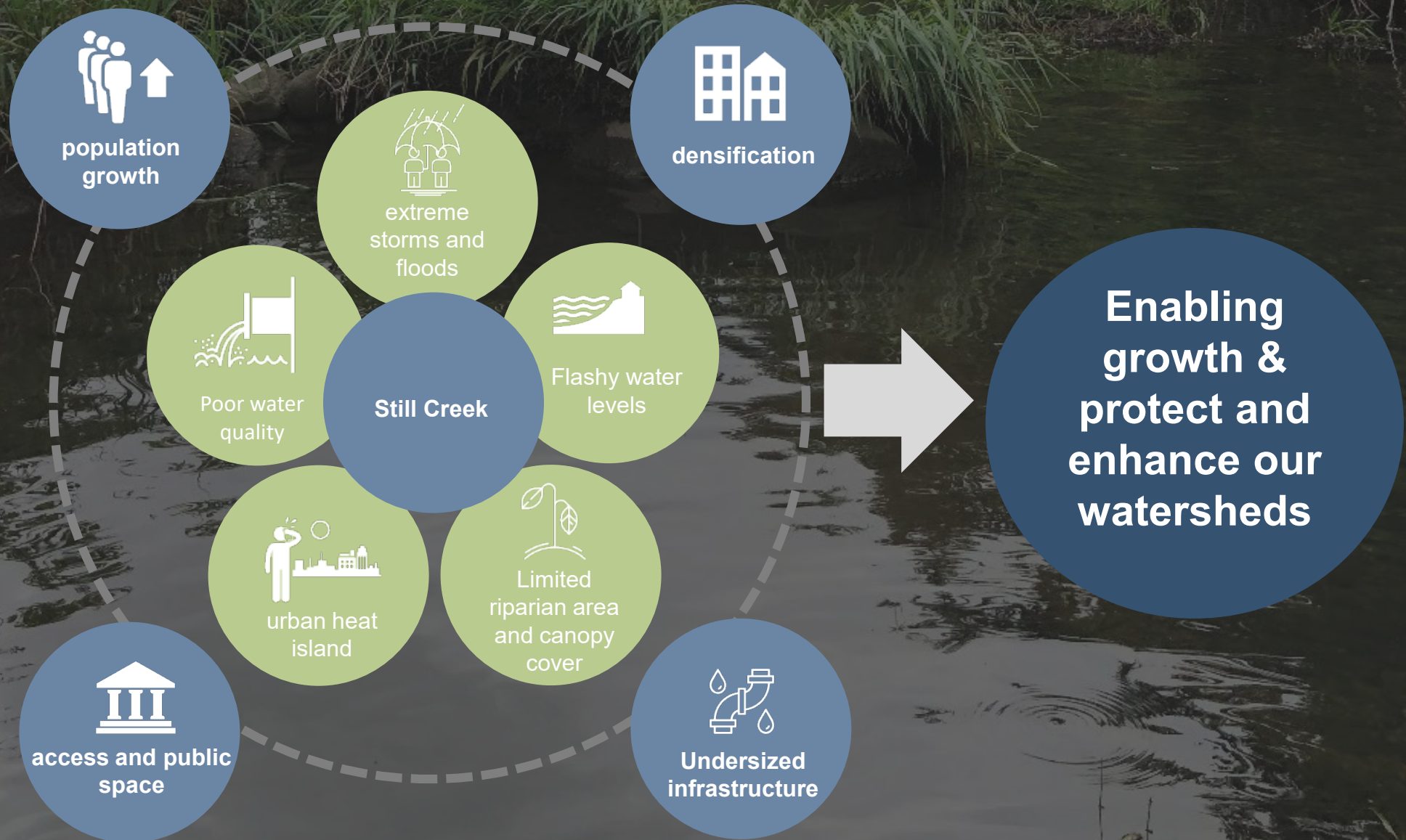
LAND USE PRESSURE

# RUPERT + RENFREW STATION AREA PLAN



-  Rapid Transit Area
-  Neighbourhood Centre
-  Village
-  Multiplex Area
-  Industrial/Employment
-  Existing Rapid Transit Station
-  Major Transit Network
-  Parks and Open Spaces
-  Still Creek Watershed
-  Rupert & Renfrew Area Plan Boundary

# INTEGRATING LAND USE AND WATERSHED PLANNING

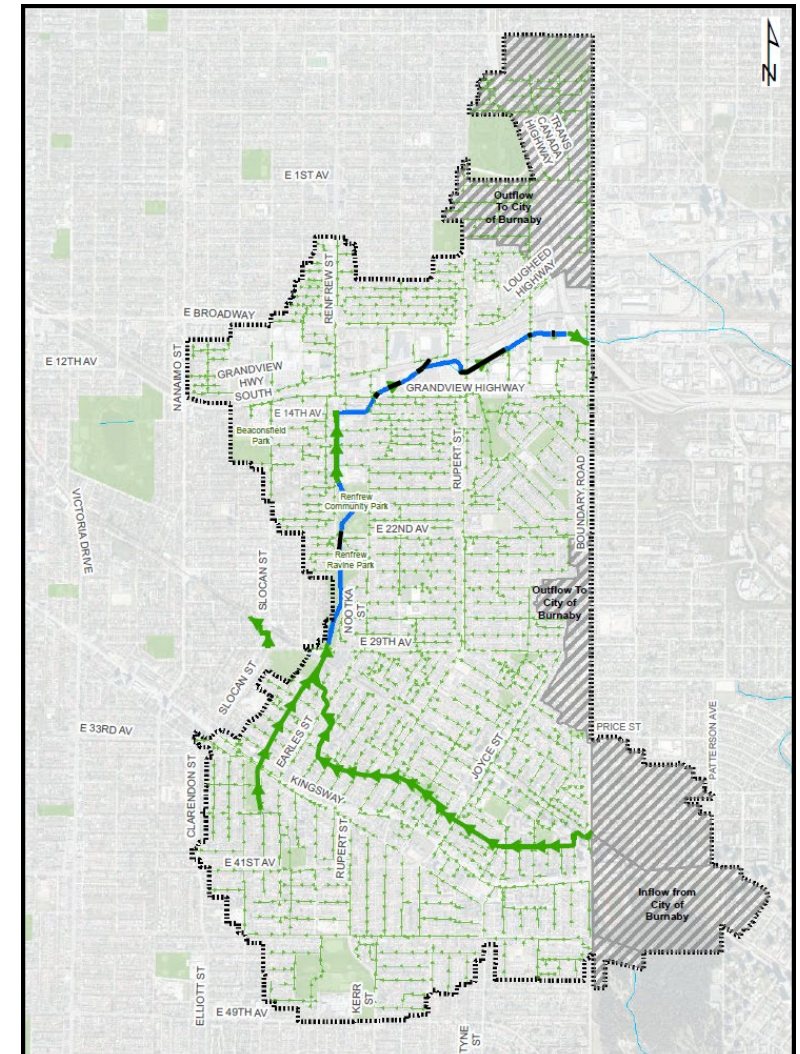
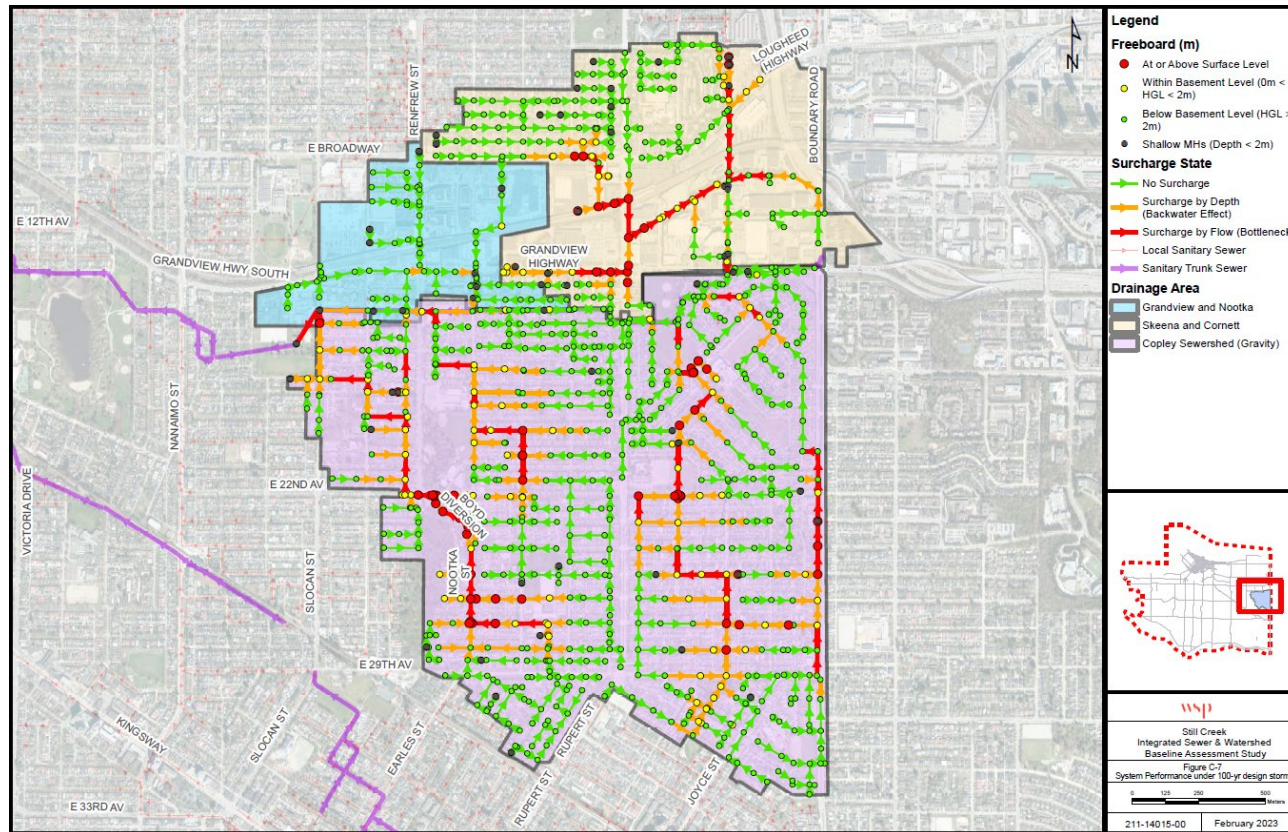


LAND USE PRESSURE & POTENTIAL IMPACTS  
**POTENTIAL IMPACTS**

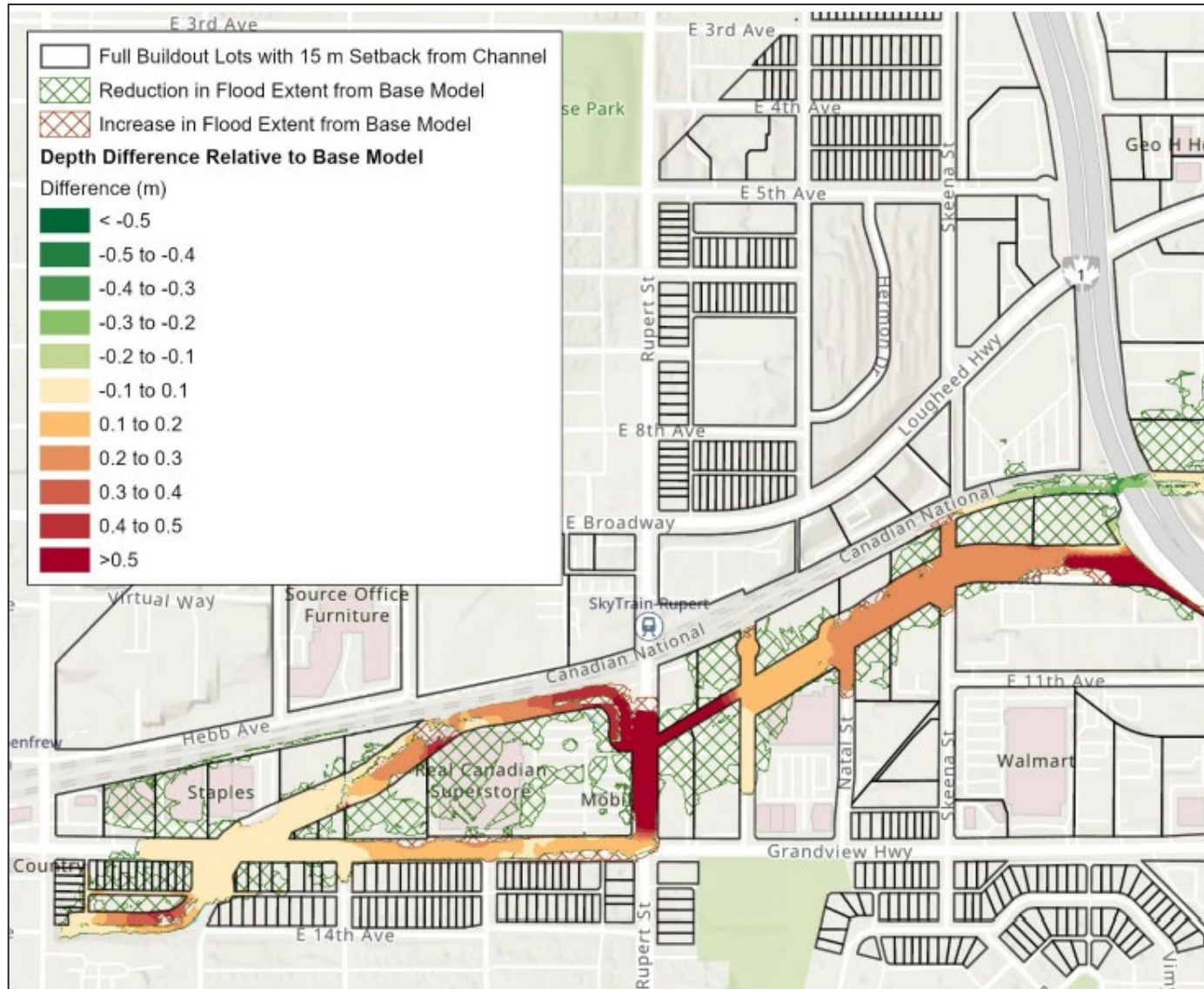
1. Sewer capacity
2. Loss of pervious surfaces
3. Flood hazard increase due to new buildings in the floodplain
4. Underground parking disrupting groundwater flow

# TECHNICAL STUDIES

## SEWER CAPACITY & LOSS OF PERVIOUS SURFACES – MODELING



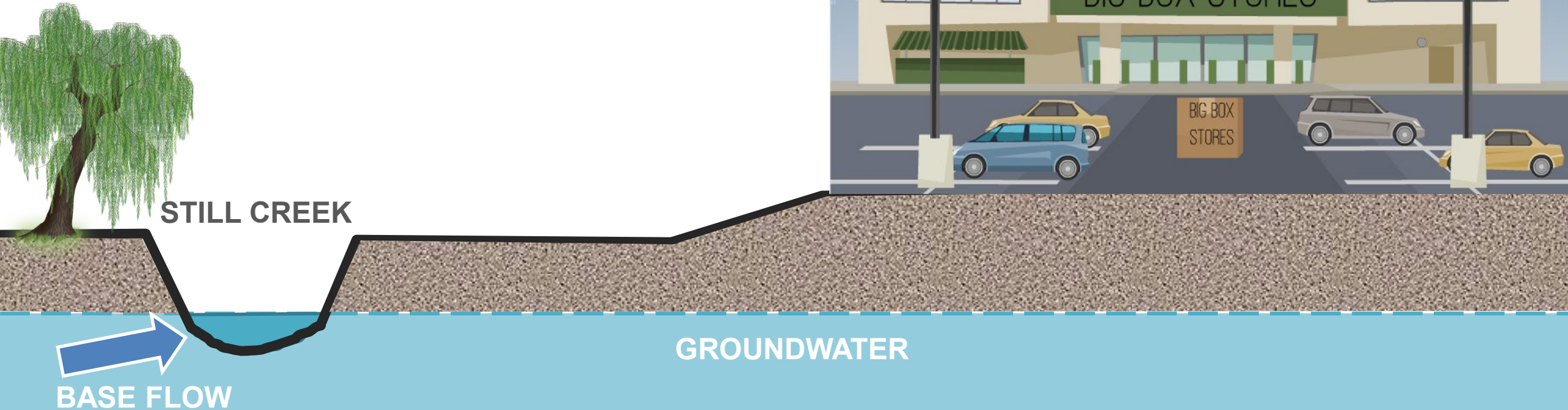
# FLOOD HAZARD – INVESTIGATING FLOOD INCREASE FROM NEW BUILDINGS



POTENTIAL IMPACTS

# UNDERGROUND PARKING DISRUPTS GROUNDWATER FLOW

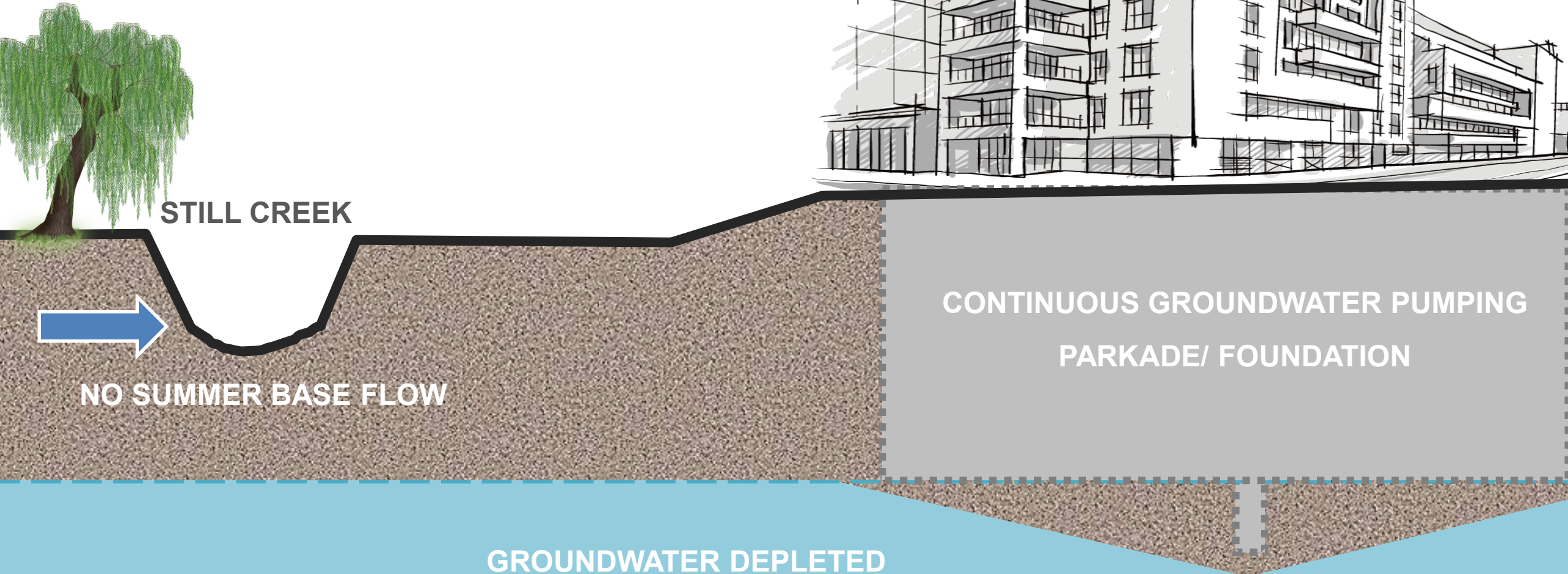
- Current state summer time



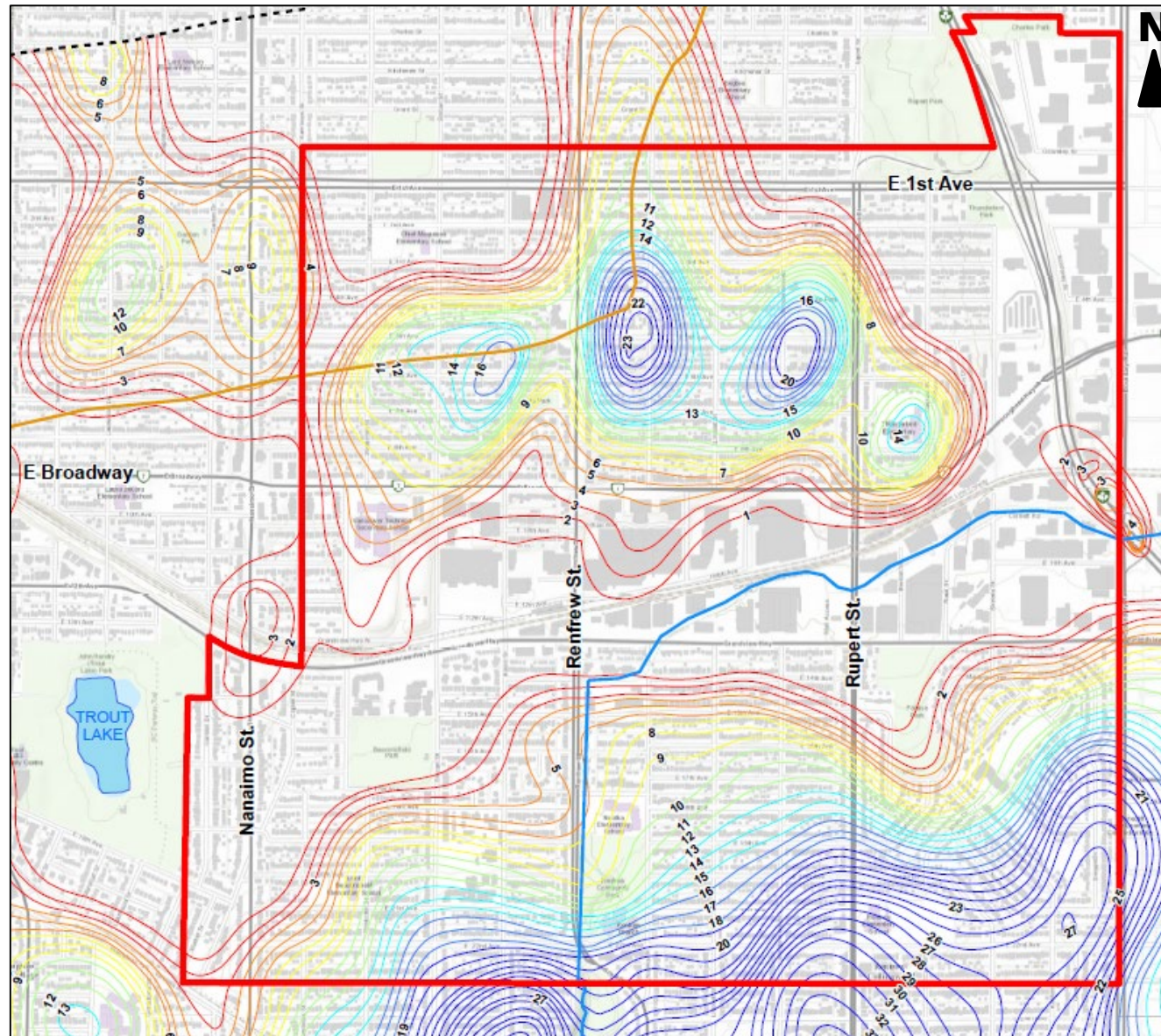
POTENTIAL IMPACTS

# UNDERGROUND PARKING DISRUPTS GROUNDWATER FLOW

- Post development summer time



# GROUNDWATER – DEPTH OF GROUNDWATER



Depth to Groundwater

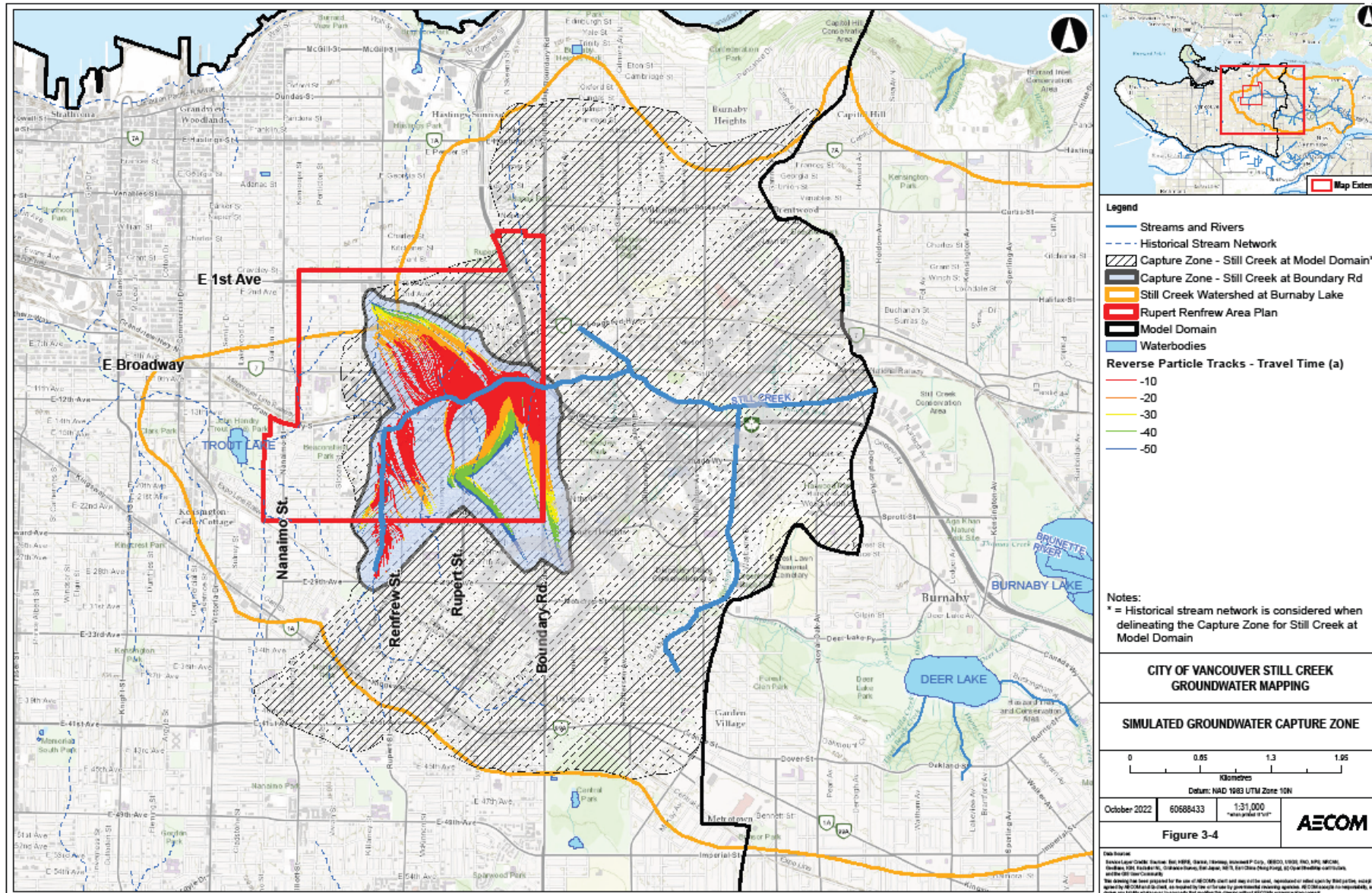
— Plan boundary

— Depth to groundwater



# TECHNICAL STUDIES

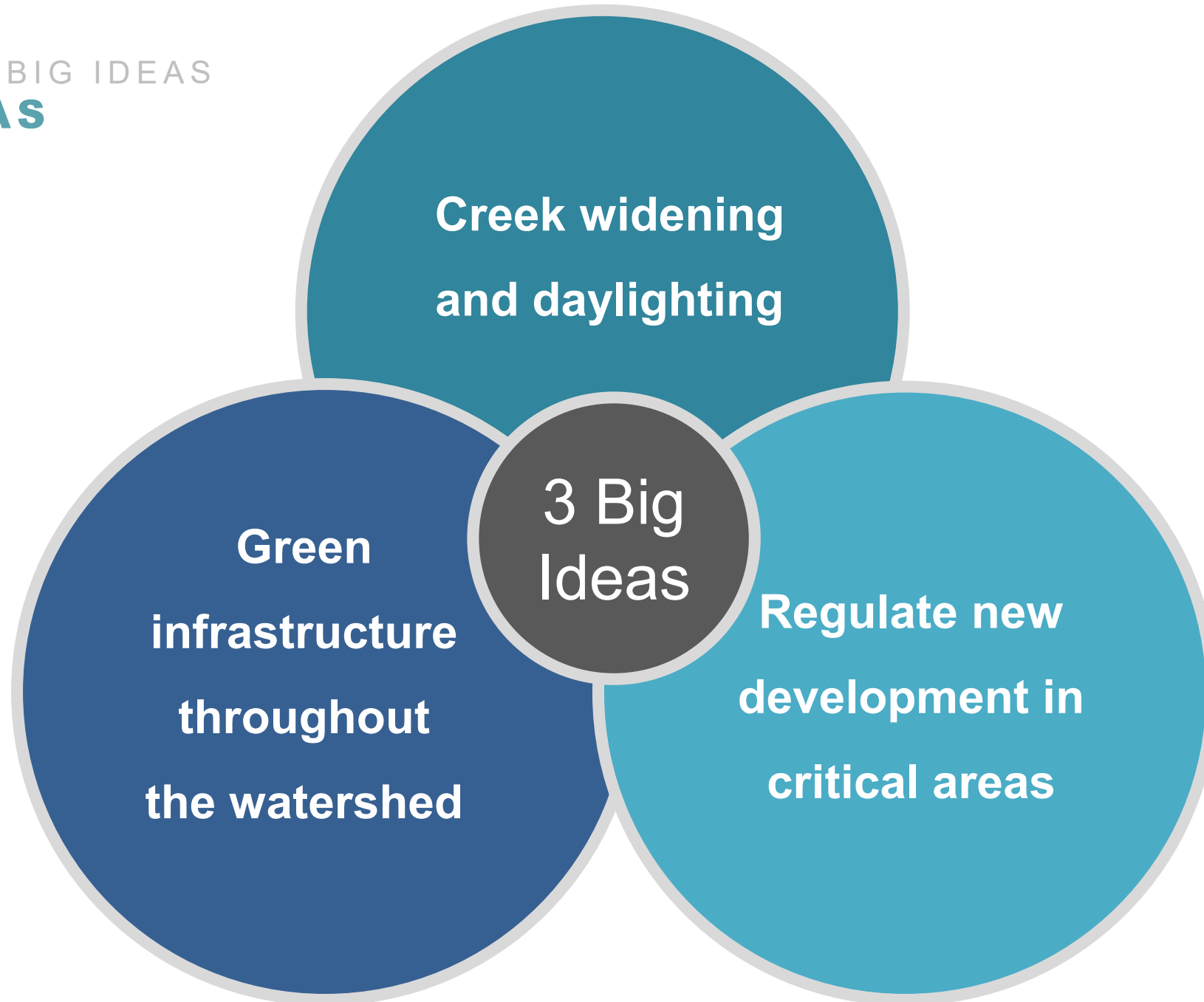
## GROUNDWATER – FLOW PATHWAYS





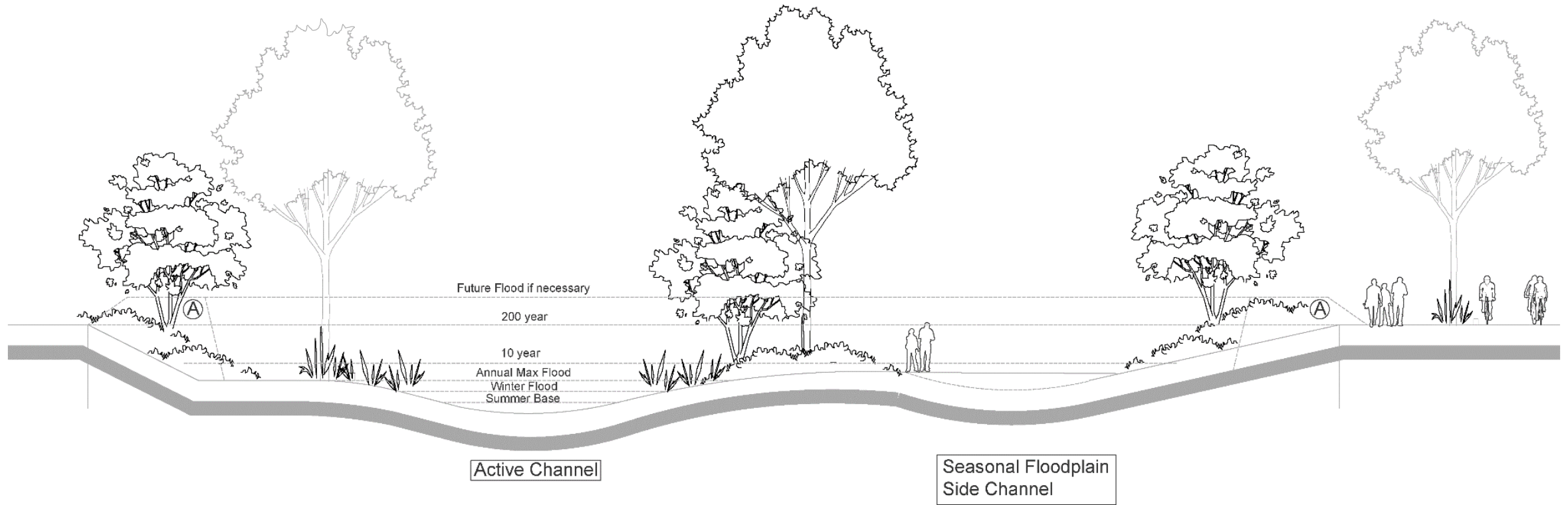
**EMERGING BIG IDEAS**

EMERGING BIG IDEAS  
**BIG IDEAS**



# EMERGING BIG IDEAS

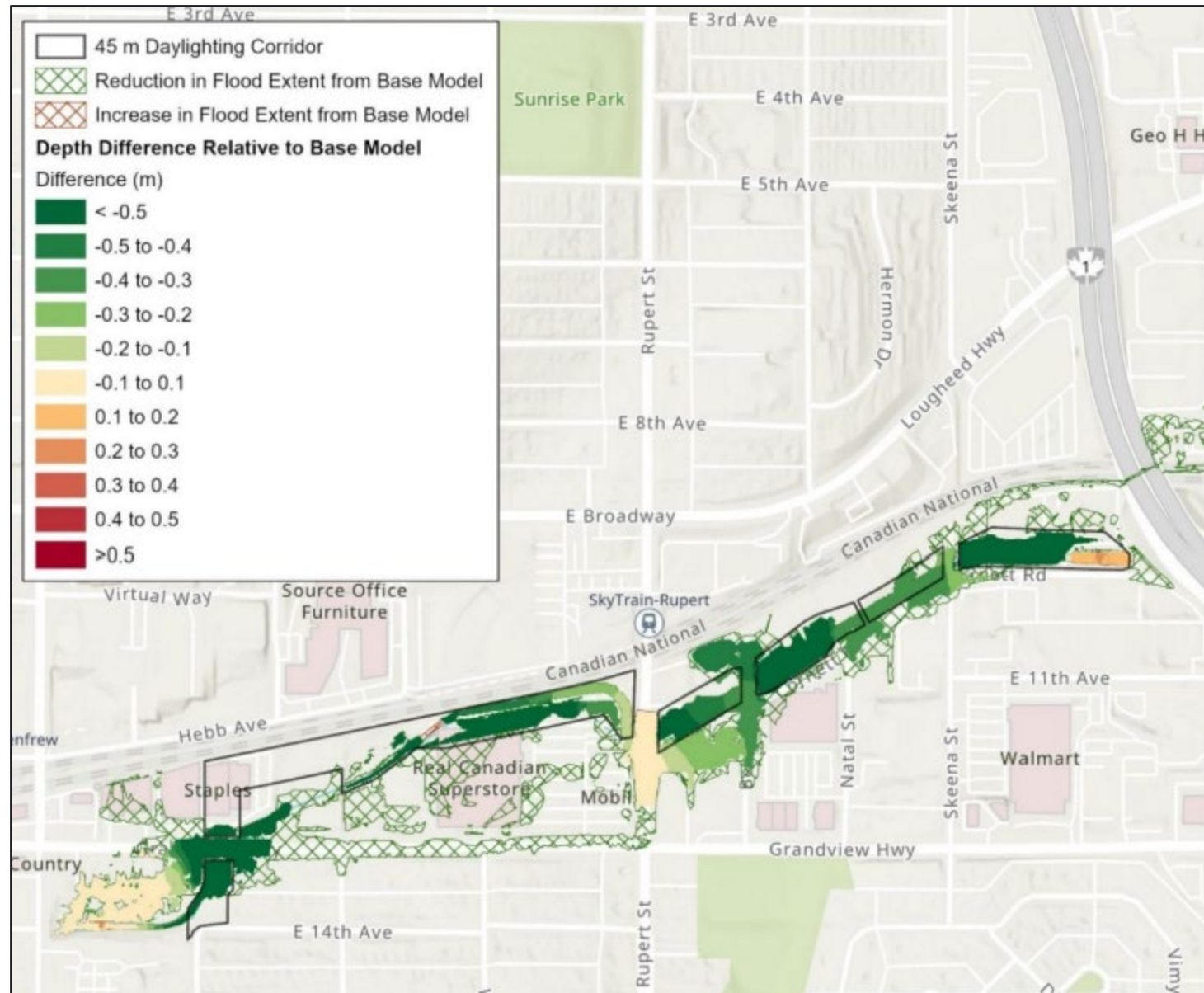
## CREEK WIDENING AND DAYLIGHTING



- ① Extreme Flood Level [eg. 0.5% AEP / 200 year return]
- ② Moderate Flood Level [eg. 0.10% AEP / 10 year return]
- ③ Annual Maximum Flood Level [eg. November to January atmospheric rivers]
- ④ Fall / Winter Storm Flow Level [eg. 6 month return or less]
- ⑤ Summer Base Flow

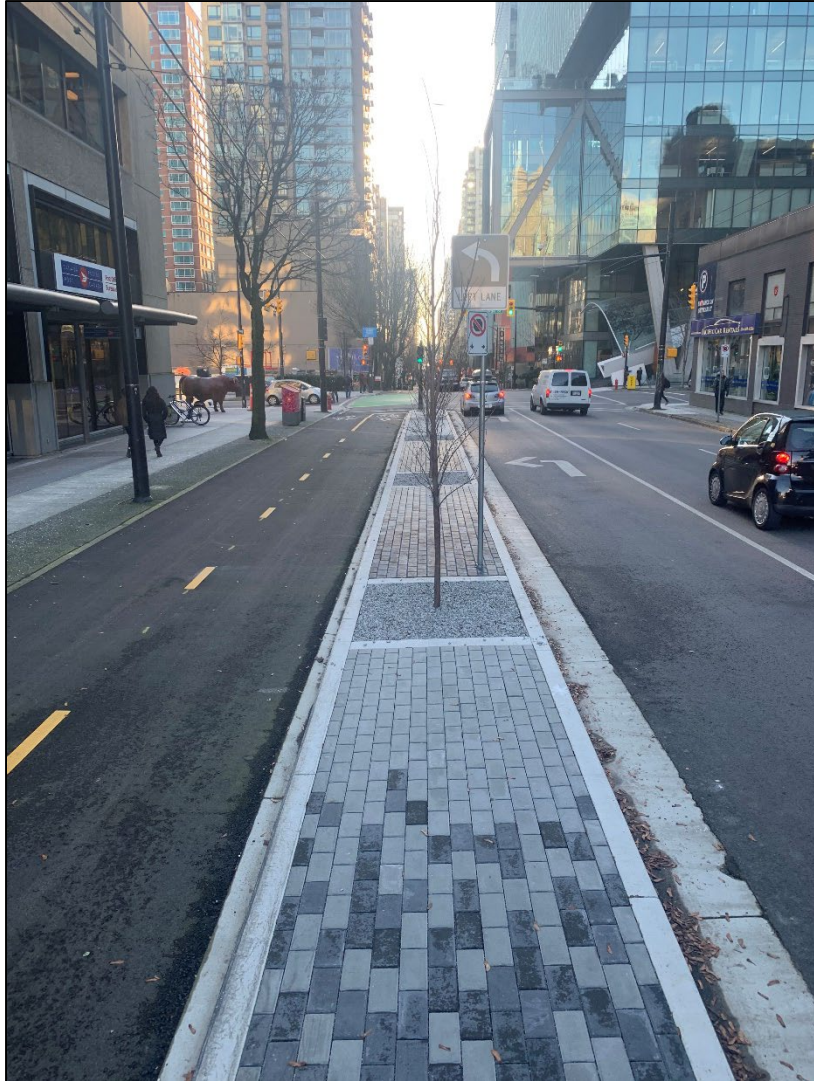
Ⓐ Allowance for future flood protection berm if necessary

# CREEK WIDENING AND DAYLIGHTING – REDUCING FLOOD RISK



EMERGING BIG IDEAS

**GREEN INFRASTRUCTURE THROUGHOUT THE WATERSHED**

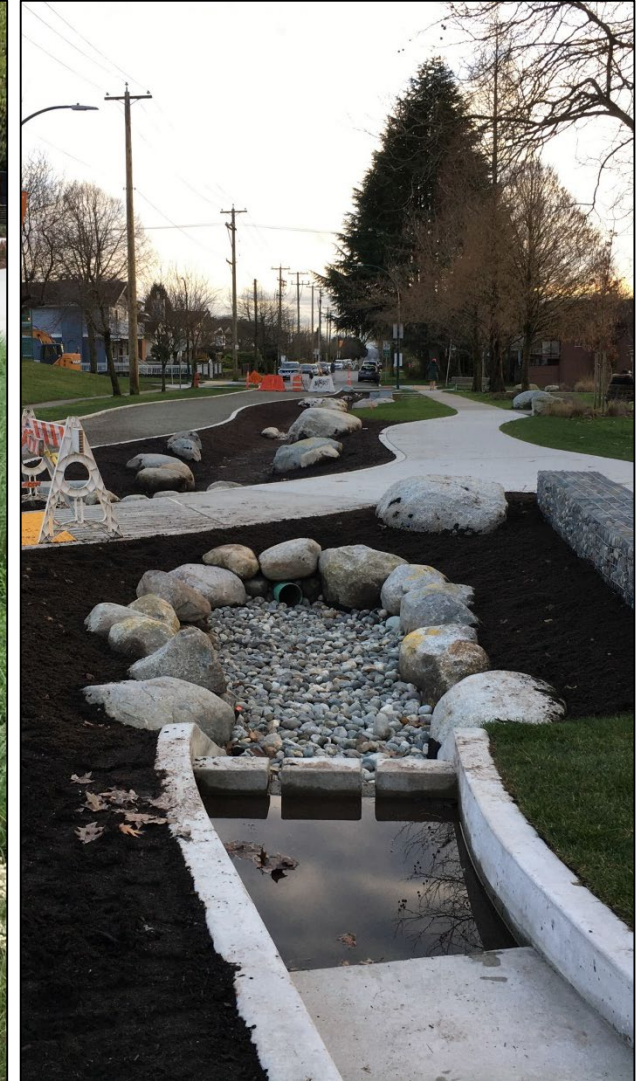


Richards St

Source: Vancouver.ca



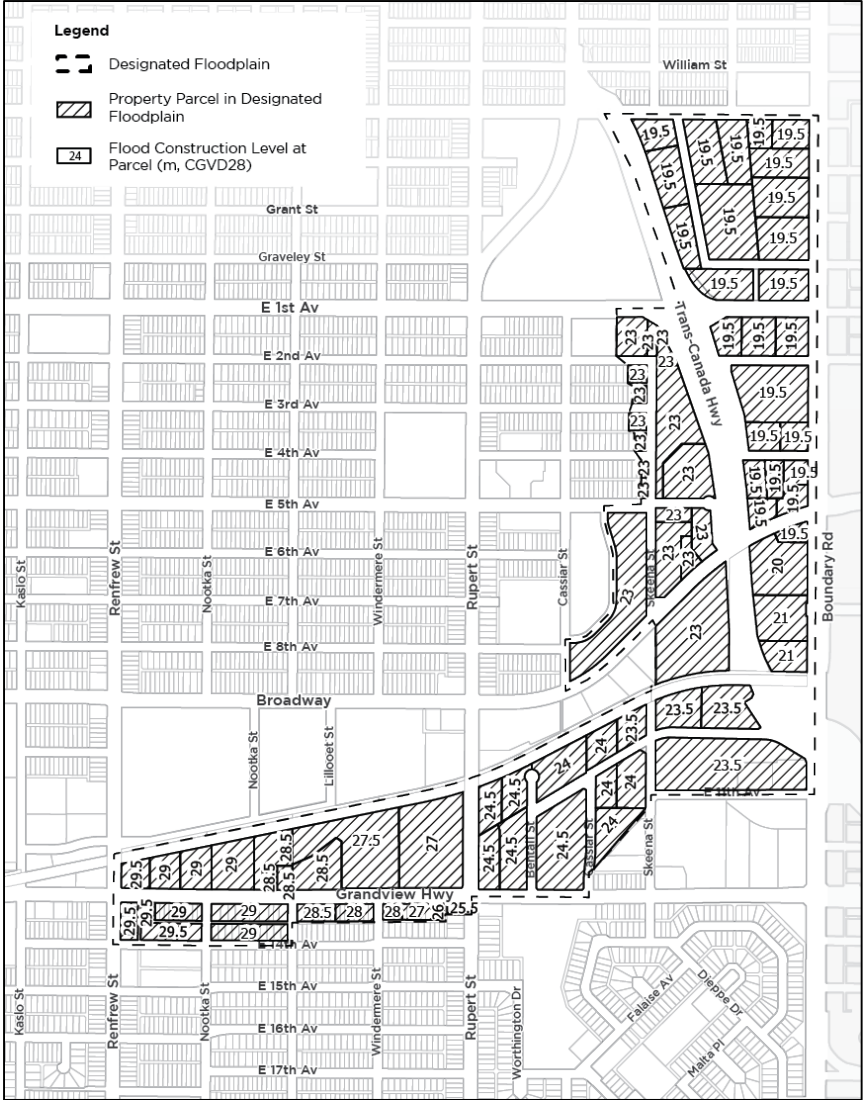
63<sup>rd</sup> & Yukon



Sunset Park

EMERGING BIG IDEAS

**REGULATE NEW DEVELOPMENT IN CRITICAL AREAS**



# Bulletin

Groundwater Management Bulletin

*Effective July 11, 2018*  
*Last amended April 20, 2020 and November 14, 2022*  
*Authority: Director of Planning*

Source: City of Vancouver Floodplain Standards Policy, 2023

## LESSONS LEARNED

# STILL CREEK WATERSHED PLANNING

- Embed a watershed planner into land use planning early
- Build models as early as possible to inform land use decisions
- Identify “no-regret” solutions that can be implemented from the beginning
- Understand the community stewardship programs and groups - connect and learn



# THANK YOU

## Contact Information

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Chris O'Donnell

[Chris.ODonnell@vancouver.ca](mailto:Chris.ODonnell@vancouver.ca)

## Reference

- Still Creek Groundwater Mapping, AECOM Dec 5 2022 Draft Report
- Still Creek Integrated Sewer & Watershed Baseline Assessment Study, WSP, December 22, 2022 Vol 1 & 2, Draft Report
- Vancouver Still Creek Floodplain Sensitivity Building Footprints and Creek Naturalization, NHC, July 29, 2022