

# RAIN CITY STRATEGY & BLUE-GREEN SYSTEMS

*Council presentation | November 5, 2019*



Today, we are here to  
seek approval on

## Rain City Strategy

long-term  
policy &  
implementation  
action plans

## Integrating Blue-Green Systems Planning

implementation  
programs



# OVERVIEW

- 1 | CONTEXT
- 2 | STRATEGIC PLAN
- 3 | TARGETS
- 4 | BLUE-GREEN SYSTEMS PLANNING
- 5 | RECOMMENDATIONS

*Becoming  
a water sensitive city*

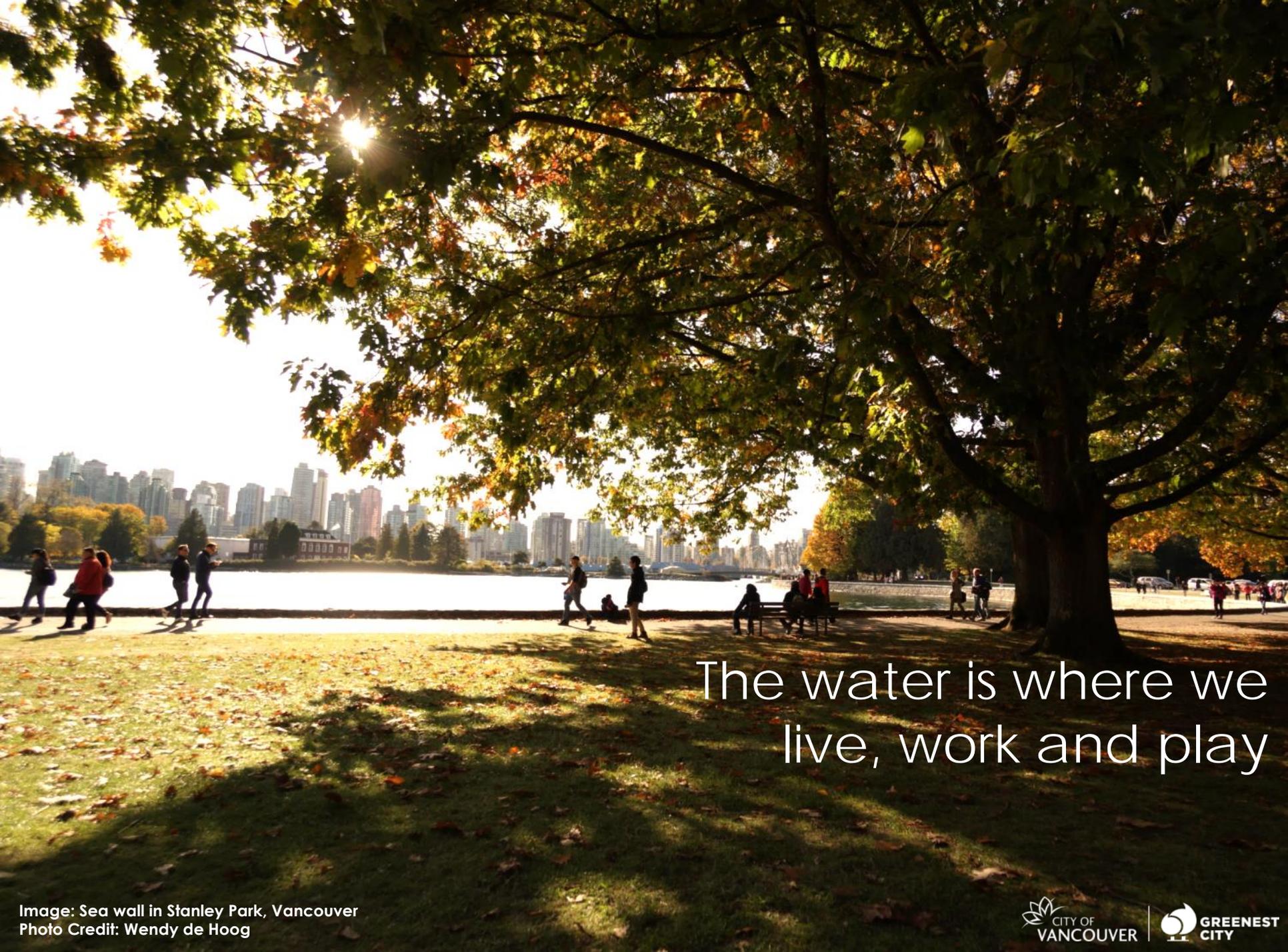
1

# CONTEXT

Vancouver is a city  
surrounded by water



Image: Overview of Vancouver's downtown peninsula  
Photo Credit: [www.fiercebiotech.com](http://www.fiercebiotech.com) 01/25/2017



The water is where we  
live, work and play

Our local waters  
and even the rain  
shape who we are

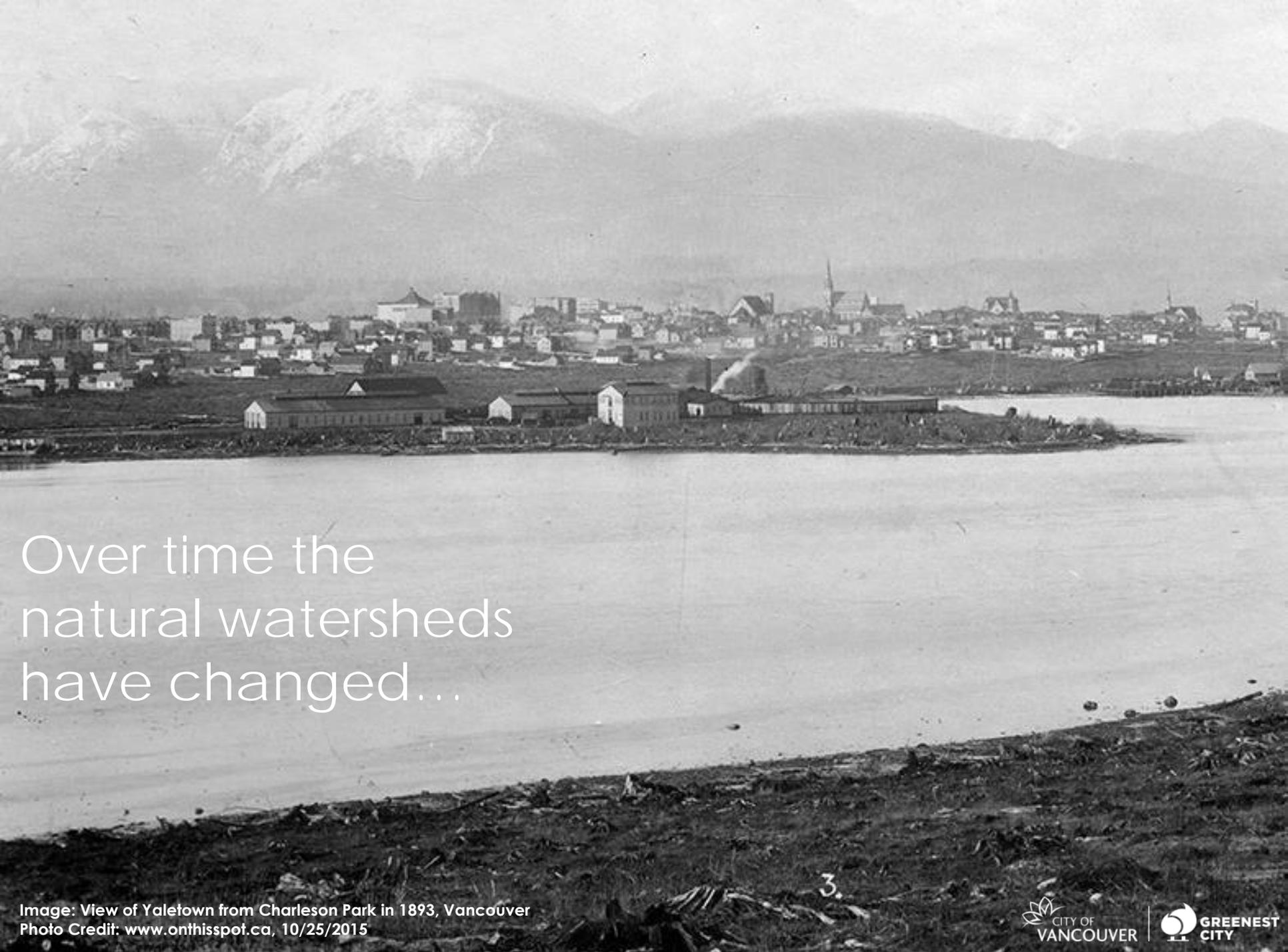


Image: West Hastings Street, Vancouver  
Photo Credit: Dan Toulgoet

A photograph of a dense forest of tall evergreen trees, likely Douglas firs, in a misty or foggy environment. The trees are dark green and stand against a light, hazy background. The fog is thick, obscuring the details of the trees in the distance and creating a sense of depth and atmosphere. The overall scene is serene and natural.

The city once was a  
temperate rainforest

Image: Capilano River Regional Park, North Vancouver  
Photo Credit: Robert Pennings



Over time the  
natural watersheds  
have changed...

Image: View of Yaletown from Charleson Park in 1893, Vancouver  
Photo Credit: [www.onthisspot.ca](http://www.onthisspot.ca), 10/25/2015

to allow residents and businesses  
to prosper and grow



Image: View of Yaletown from Charleson Park in 2013, Vancouver  
Photo Credit: Wendy de Hoog

Think  
strategically  
about adapting  
for the future

**climate  
emergency**

**combined  
sewer overflow  
mitigation**

**ecosystem  
health &  
services**

**growth +  
aging sewer  
& drainage  
infrastructure**



extreme rain  
events will be  
**36%**  
more intense

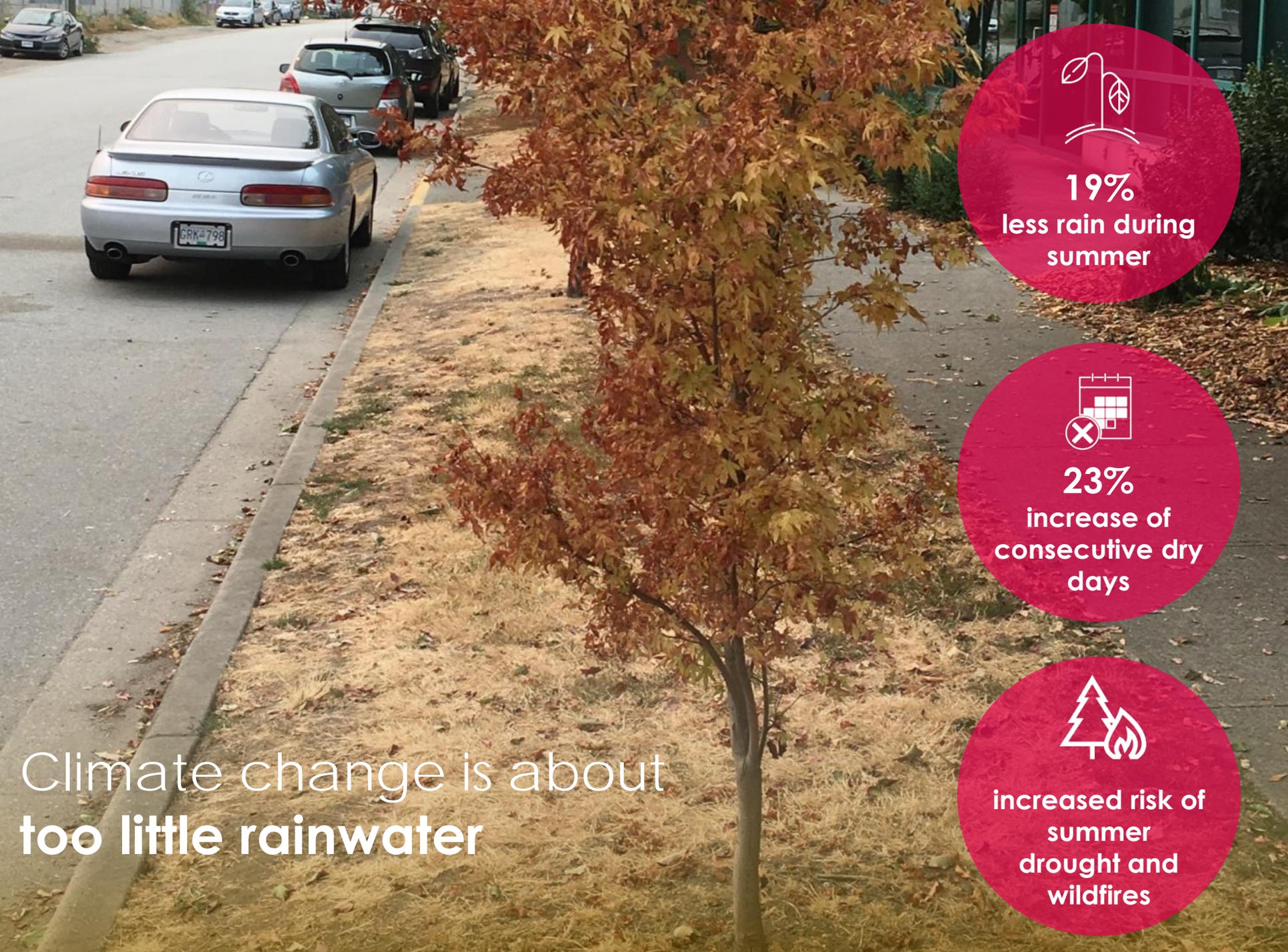


**33%**  
more rain on  
very wet days



increased risk of  
overland &  
coastal flooding

Climate change is about  
**too much rainwater**



Climate change is about  
**too little rainwater**



**19%**  
less rain during  
summer



**23%**  
increase of  
consecutive dry  
days



increased risk of  
summer  
drought and  
wildfires



over **33 billion**  
litres of combined  
sewage was  
discharged  
in 2018



ongoing efforts to  
mitigate  
combined sewer  
overflows since  
the 1970's

Water quality is impacted by  
combined sewer overflows (CSOs)



**pollutants**

litter

tire debris

copper & zinc

oils & gasoline

animal waste

fertilizer

micro-plastics

sediment

Water quality is impacted by  
polluted urban rainwater runoff

Image: polluted urban rainwater runoff

Photo Credit: By Канопус Киля - Own work, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=3628232>

# Growth & aging sewer and drainage infrastructure

system captures



higher demand on system & less room for rainwater to soak into the ground



major renewal

Image: Sewer pipe upgrade  
Photo Credit: City of Vancouver

# Regulatory requirements



water  
quality

# Regulatory requirements



**water  
quality**

**cost  
effective**

# Regulatory requirements



Image: Rainy day in Vancouver  
Photo Credit: Dusan Milenkovic / Shutterstock

# Regulatory requirements



**health  
& equity**

**water  
quality**

**climate  
resilience**

**cost  
effective**





## green rainwater infrastructure

uses vegetation, soils and  
other engineered systems  
to mimic natural processes  
required to manage water  
and create resilient and  
healthier urban  
environments



absorbent landscape



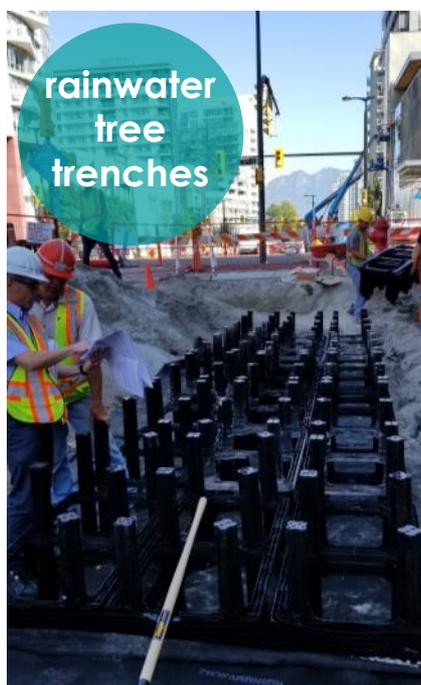
blue-green roofs



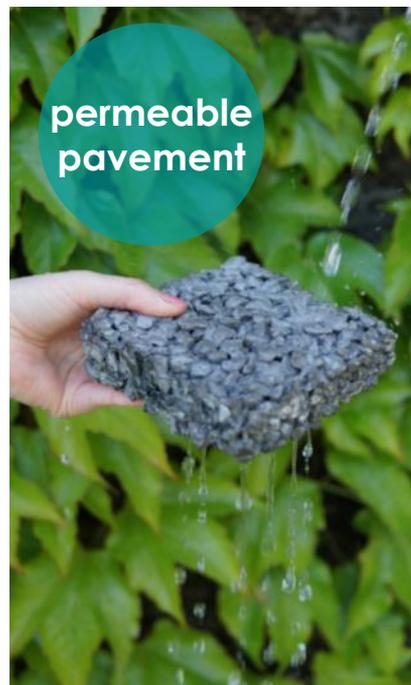
wetland



rainwater harvesting



rainwater tree trenches



permeable pavement



bioswale

# What we have been doing

Streets &  
Public Spaces

**238**

green rainwater  
infrastructure assets  
have been  
implemented

Buildings &  
Sites

**> 170**

sites have a rainwater  
management plan  
introduced rainwater  
harvest permit  
program

Parks &  
Beaches

**~240**

parks play a role in  
managing rainwater



reduce  
volume of  
rainwater  
entering the  
pipe system

reduce  
pollutants  
in urban  
rainwater  
runoff

# Objectives

2

# STRATEGIC PLAN

# A collaborative effort across departments

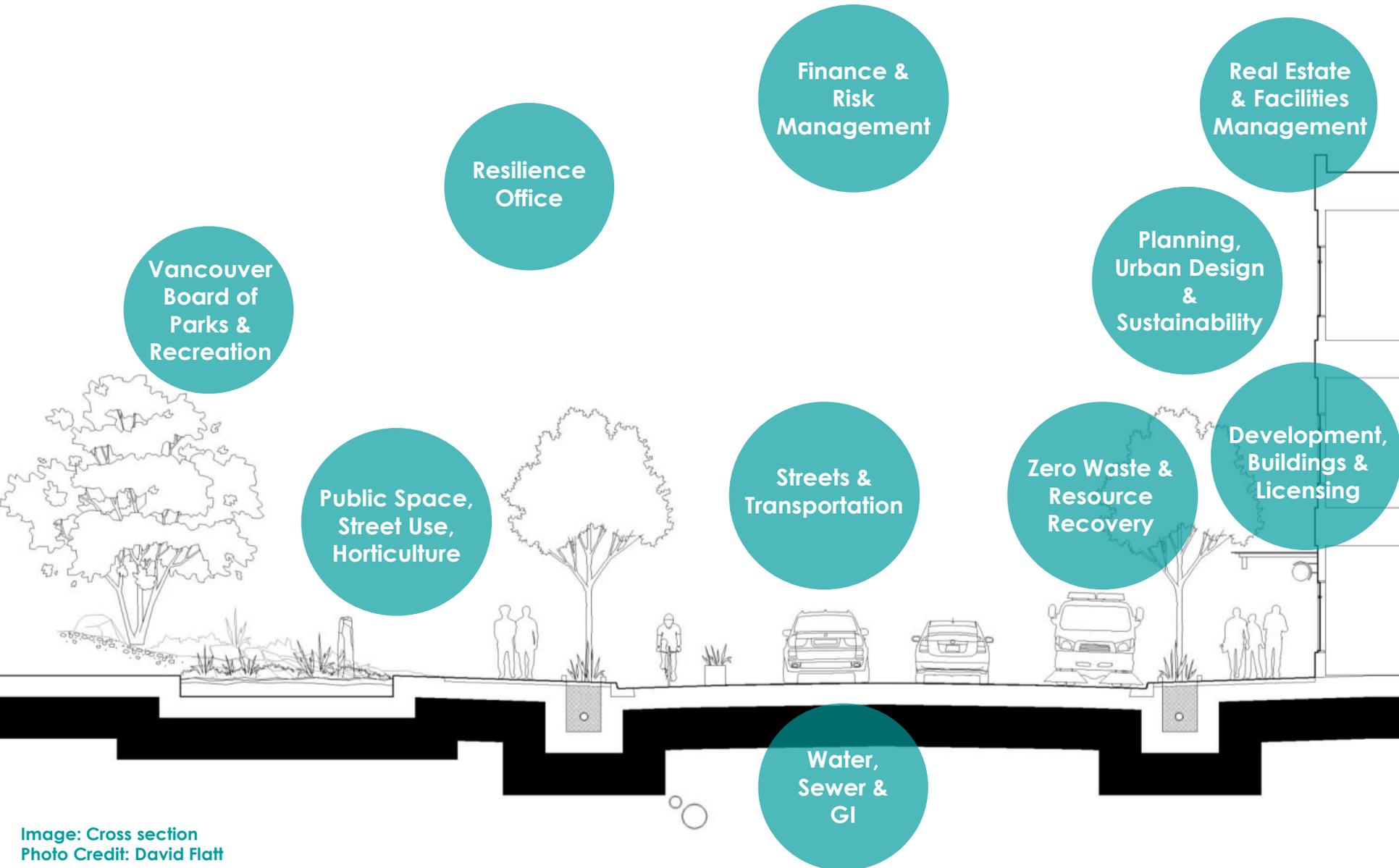


Image: Cross section  
Photo Credit: David Flatt

community  
& industry  
workshops

1,400  
community  
& industry  
survey

1,250  
people  
attended the  
open house

## Desired focus areas

1. Education
2. Connectivity
3. Resiliency
4. Green and multi-functional spaces
5. Green Jobs

## Concerns

1. Urgent action needed
2. Costs
3. Processing times

Engaged residents  
& industry

# Engaged an expert panel

**23**

experts

**5**

sessions

Academics | UBC | SFU | Kwantlen  
Architects | Landscape Architects  
Biologists | Toxicologists  
Community not-for-profits  
Engineers  
Environmental Law

## Key advice

1. Urgency
2. Collaboration
3. Move beyond pilots
4. Innovation
5. Capacity building

# Shifting how we manage rainwater in the city



# Rain City Strategy

9

transformative  
directions

3

action plans

Streets & Public Spaces  
Buildings & Sites  
Parks & Beaches

A high level, 30-year plan that aims to manage rainwater through green rainwater infrastructure that

protects

restores

mimics

the natural water cycle

# 9 Transformative directions

1. Strive to become a **water sensitive city**
2. Respond with urgency to **climate change**
3. Accelerate action to protect the **health and vitality** of surrounding waterbodies
4. Revitalize **watersheds and waterfronts** to enable communities and natural systems to thrive
5. Shape systems to integrate and **value all forms of water**
6. Explore intersectionality, **equity** and Indigenous **reconciliation** through urban water management
7. Drive **innovation** and system effectiveness through data and analytics
8. Enable a culture of **collaboration**
9. Invest in education, capacity building and partnerships to **mobilize action**

# Outcomes



**adapt to  
intense  
rainstorms &  
drought**

**Rain  
City  
Strategy**

# Outcomes



**adapt to  
intense  
rainstorms &  
drought**

**Rain  
City  
Strategy**



**mitigate  
heat stress**

# Outcomes



**adapt to  
intense  
rainstorms &  
drought**

**Rain  
City  
Strategy**



**mitigate  
heat stress**



**reduce CSOs  
to protect  
the environment**

# Outcomes



**adapt to  
intense  
rainstorms &  
drought**



**mitigate  
heat stress**

**Rain  
City  
Strategy**



**enhance  
biodiversity  
& habitat  
connectivity**



**reduce CSOs  
to protect  
the environment**

# Outcomes

support green jobs  
& strengthen  
social ties



adapt to  
intense  
rainstorms &  
drought



Rain  
City  
Strategy

mitigate  
heat stress



enhance  
biodiversity  
& habitat  
connectivity



reduce CSOs  
to protect  
the environment



# Supports an equitable water future



## What we build

Cost-effective services that support affordability and the needs of vulnerable populations and underserved areas



## Where we build

Prioritize placement and type of GRI to benefit people more affected by hazards, stressors and service deficits



## How we build

Engagement so community aspirations influence designs  
Green jobs, economic opportunity and accessible employment



## How we use GRI

Opportunities for enhancing access to and relationships with nature, education, capacity building and community building

3

# TARGETS

# Performance target

capture and clean  
a minimum of  
**90%**  
of Vancouver's  
average annual  
rainfall volume

capture  
and clean  
**48 mm**  
of rainfall  
per day

## Design standard

# Citywide green rainwater infrastructure implementation target

becomes  
business as usual  
through

renewal,  
redevelopment  
retrofits



# Expected benefits by 2050

**28**  
**billion litres**  
treated and  
diverted from  
pipe system  
per year

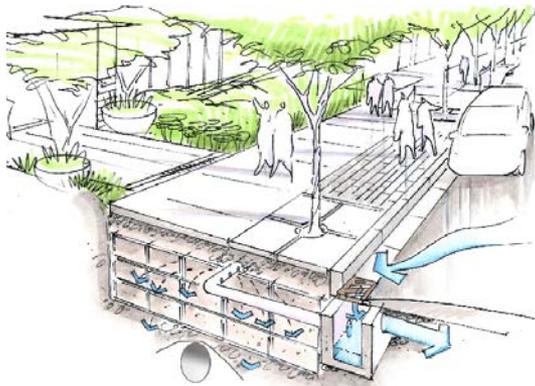
**1/3**  
estimated  
reduction in  
annual CSO

# 3 Action plans, 46 programs

## Streets & Public Spaces

11 implementation programs

5 enabling programs



## Buildings & Sites

7 implementation programs

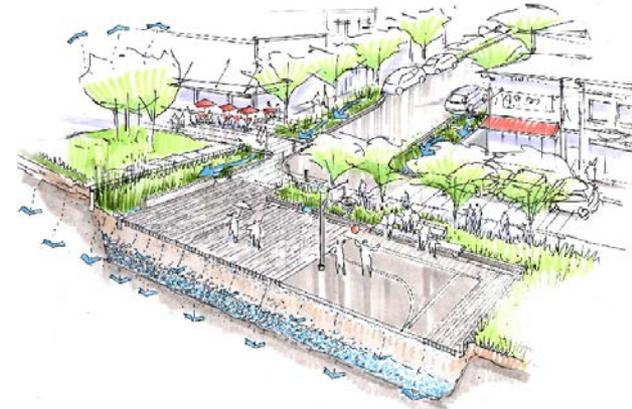
7 enabling programs



## Parks & Beaches

12 implementation programs

4 enabling programs



**capacity  
building &  
engagement**

**sample programs**  
permeable pavement  
program

resilient roofs  
program

rainwater harvesting  
program

blue-green system  
program

**monitoring  
& evaluation**

**sustainable  
funding  
program**

4

# BLUE-GREEN SYSTEMS PLANNING

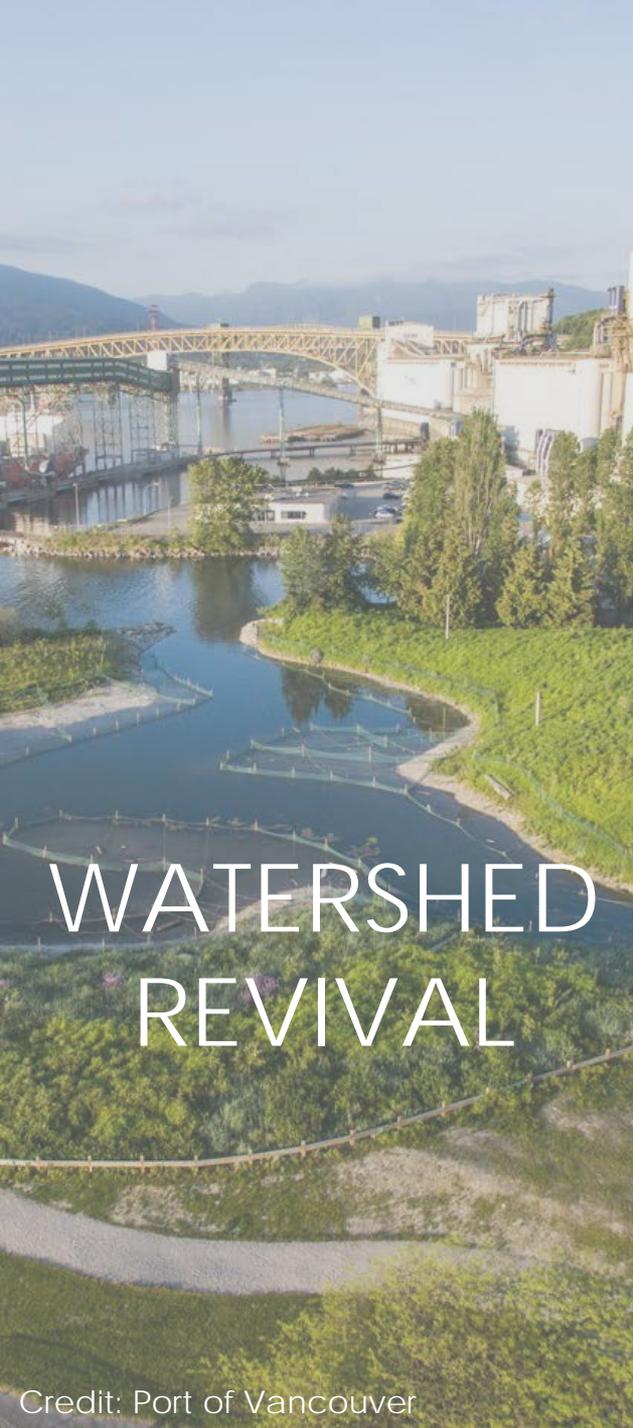
# INTEGRATING BLUE-GREEN SYSTEMS PLANNING

COUNCIL PRESENTATION | November 05 2019



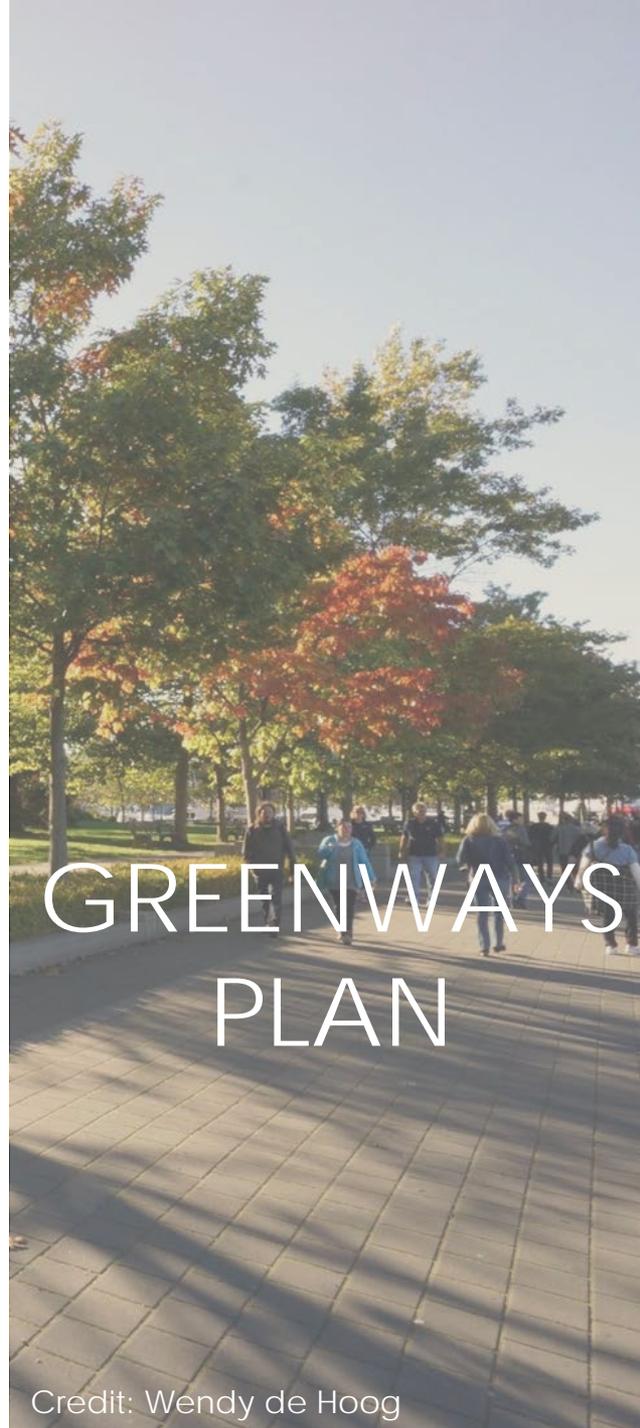
Credit: Wendy de Hoog





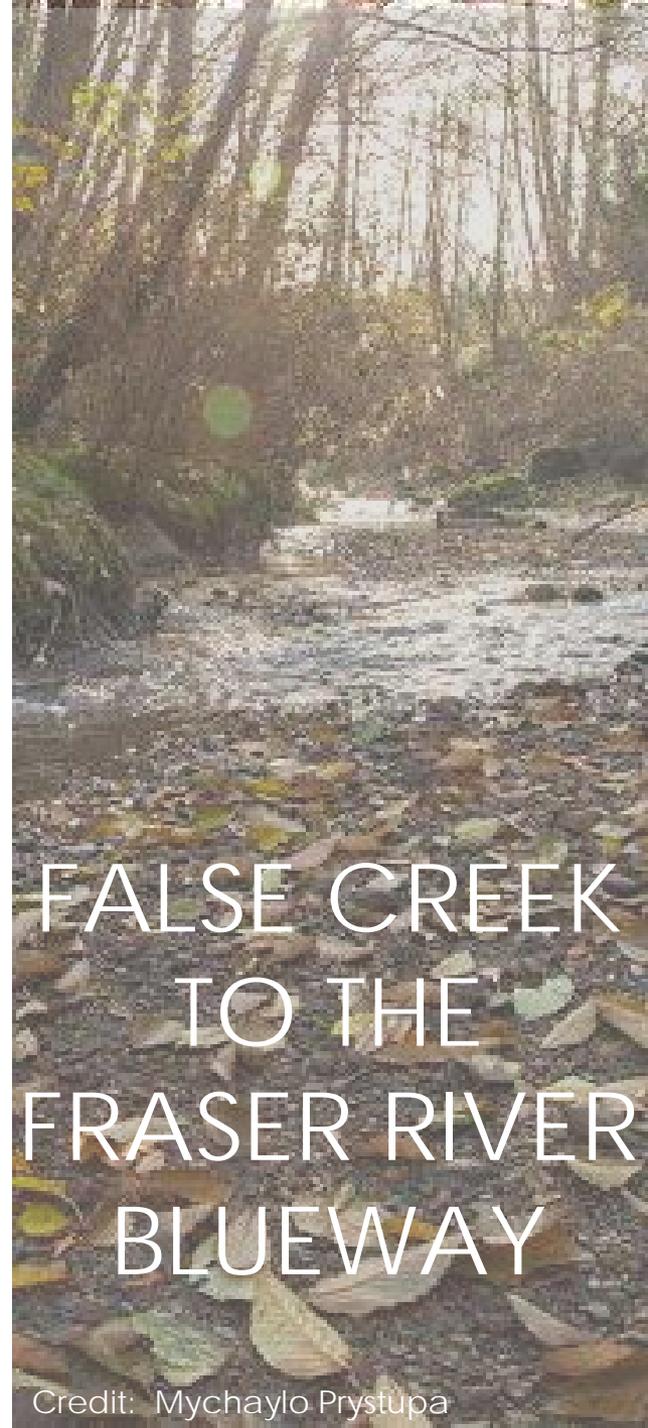
# WATERSHED REVIVAL

Credit: Port of Vancouver



# GREENWAYS PLAN

Credit: Wendy de Hoog



# FALSE CREEK TO THE FRASER RIVER BLUEWAY

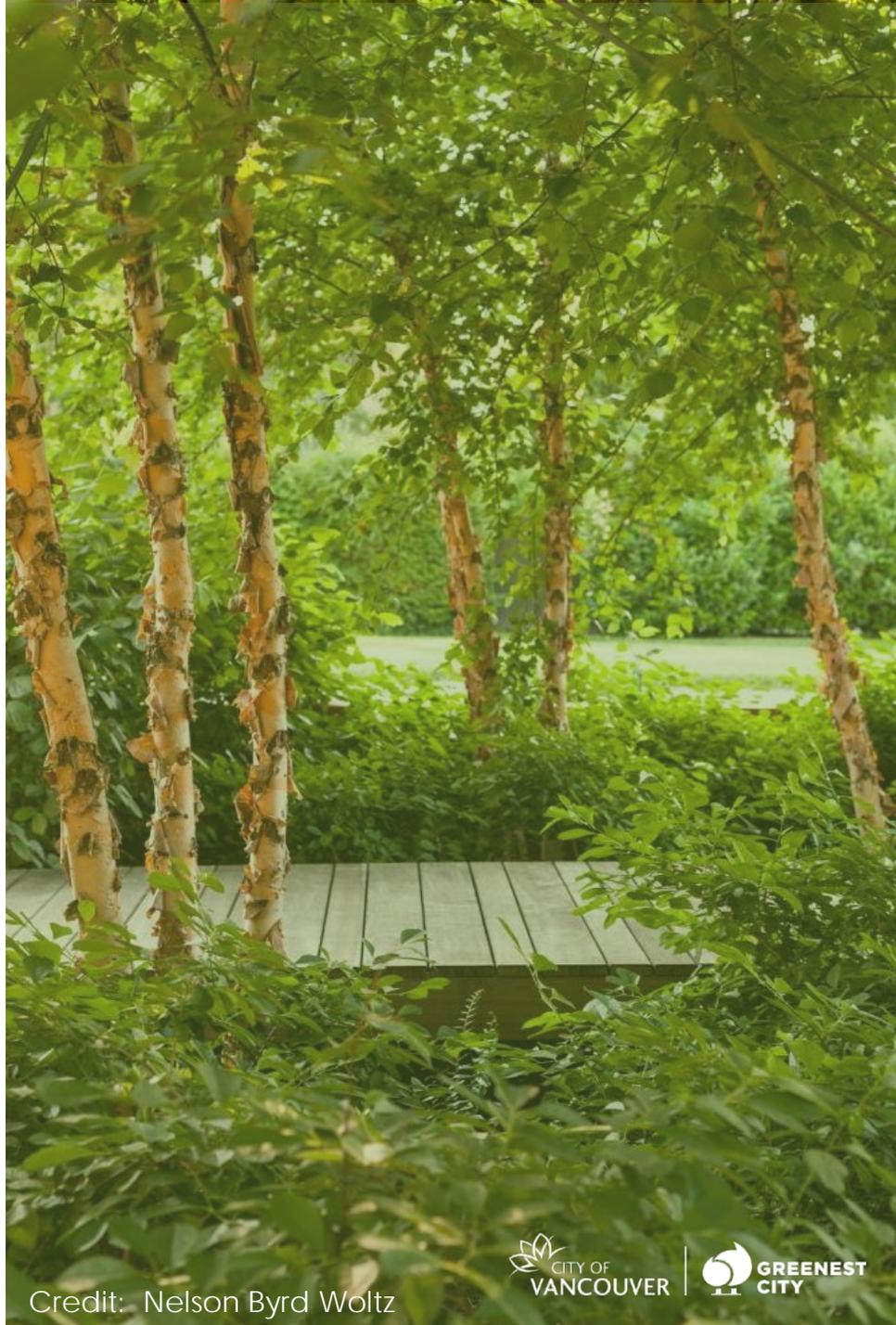
Credit: Mychaylo Prystupa

# CITY-WIDE PLAN + VANPLAY





Credit: Lucas Williams



Credit: Nelson Byrd Woltz



# THE PARADIGM SHIFT

PLAN  
DESIGN  
ENGINEER } WITH **NATURE**

BECAUSE **BLUE + GREEN** IS LIFE...



THE VISION  
IN THE NOT TOO  
DISTANT FUTURE...

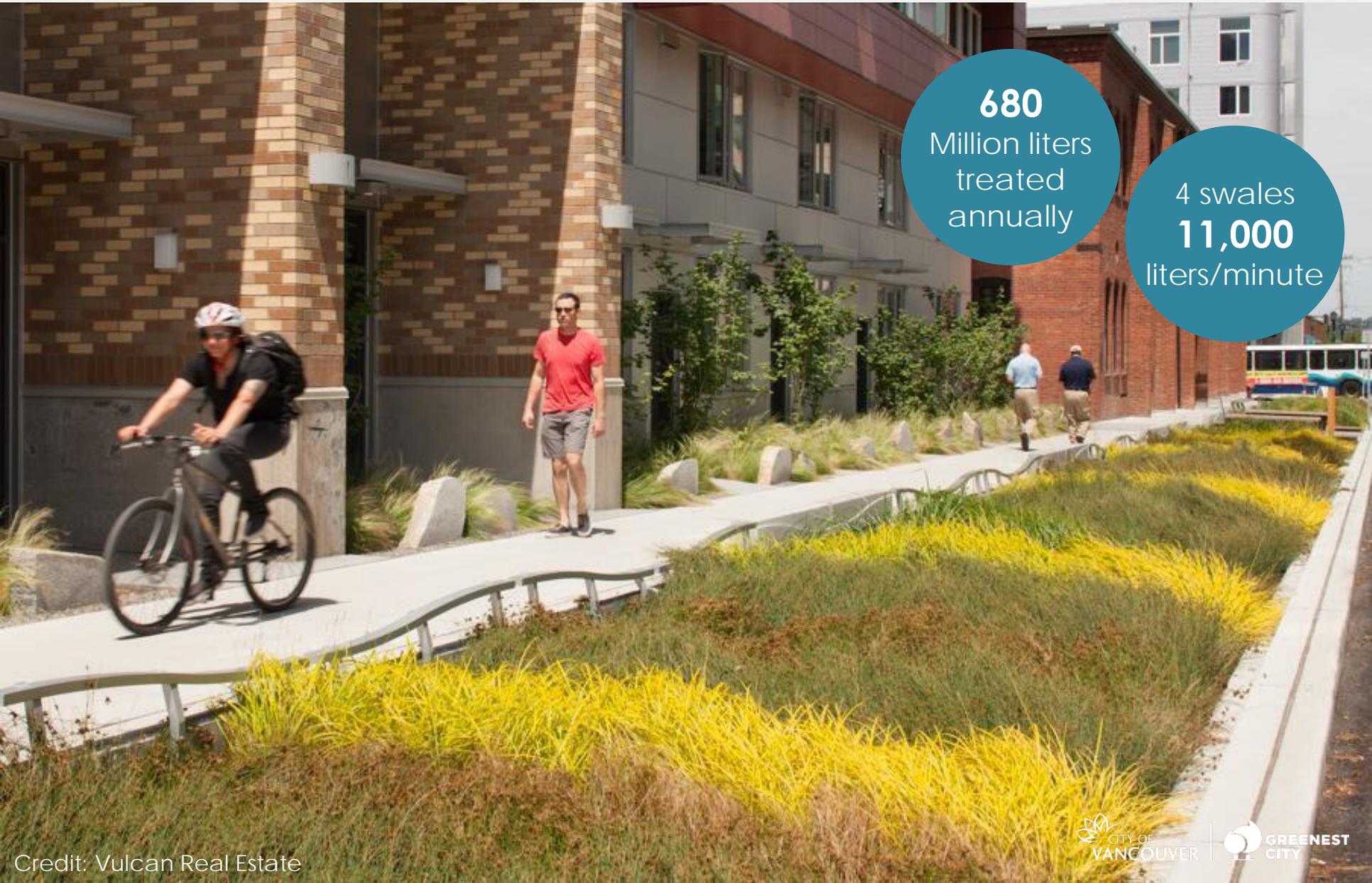


**4** blocks  
long

Rainwater  
treatment for  
**32 ha**

# SWALE ON YALE SEATTLE

## DISTRICT SCALE



**680**  
Million liters  
treated  
annually

4 swales  
**11,000**  
liters/minute

# TANNER SPRINGS PORTLAND

HIGH DENSITY



ULI Finalist  
ASLA Award

Treats water  
from adjacent  
streets

# HANS TAVSENS PARK COPENHAGEN

## FLOODABLE OPEN SPACE



Up to  
**18.000 m<sup>3</sup>**  
of water  
stored

Nature,  
community  
+ cloudburst  
solutions

# HUNTER'S POINT NEW YORK

## COASTAL ADAPTATION



**0.4 ha**  
wetland  
absorbs/releases  
stormwater  
slowly

**15 ha**  
former  
industrial site  
revitalized



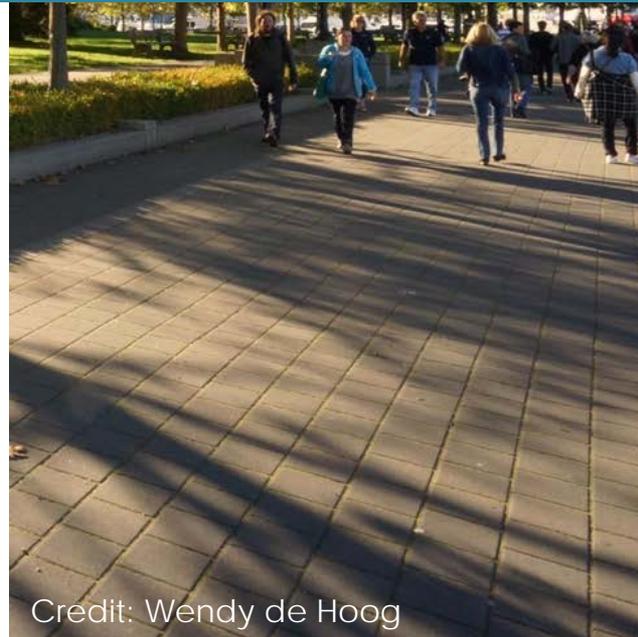
# INTEGRATED BLUE-GREEN SYSTEMS



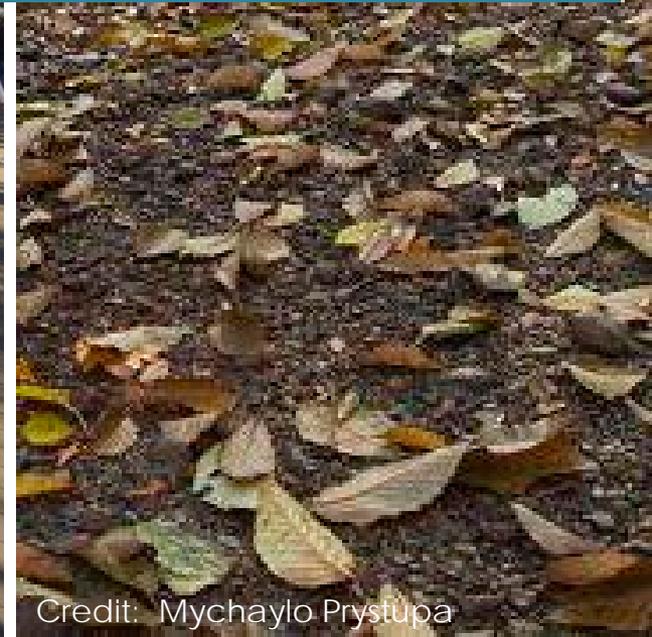
## WATER MANAGEMENT ACTIVE TRANSPORTATION NATURE IN THE CITY



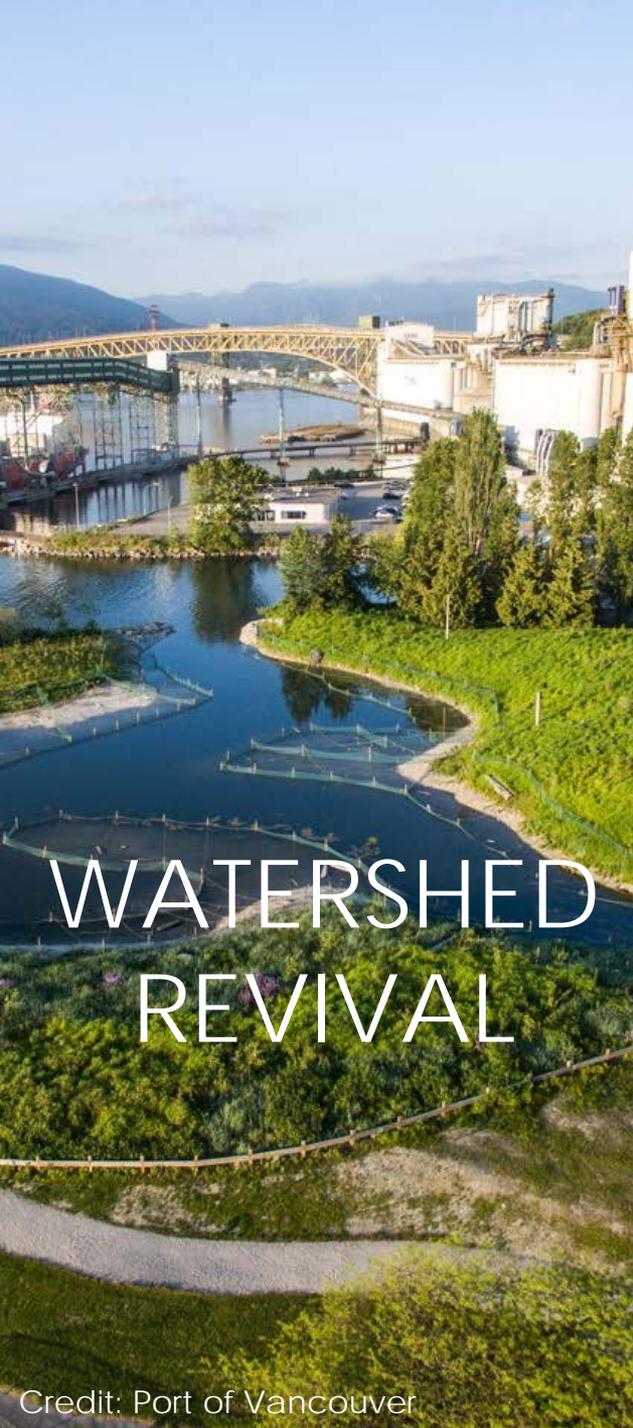
Credit: Port of Vancouver



Credit: Wendy de Hoog

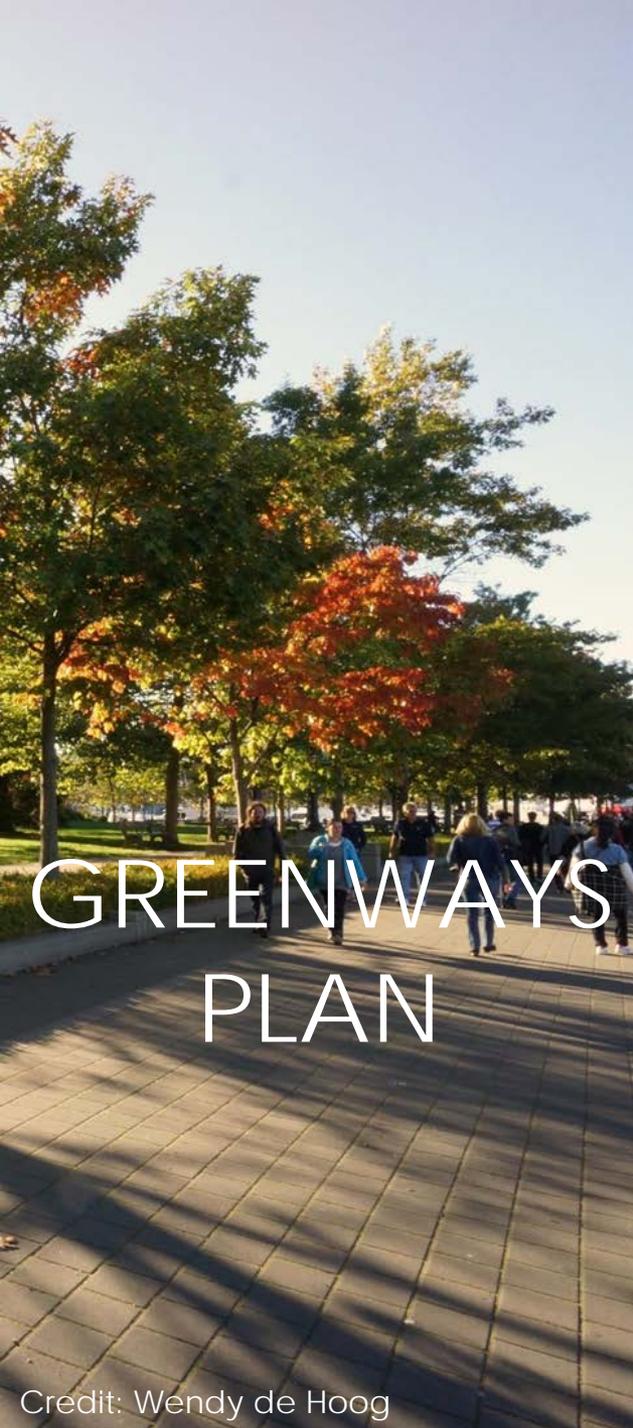


Credit: Mychaylo Prystupa



# WATERSHED REVIVAL





# GREENWAYS PLAN

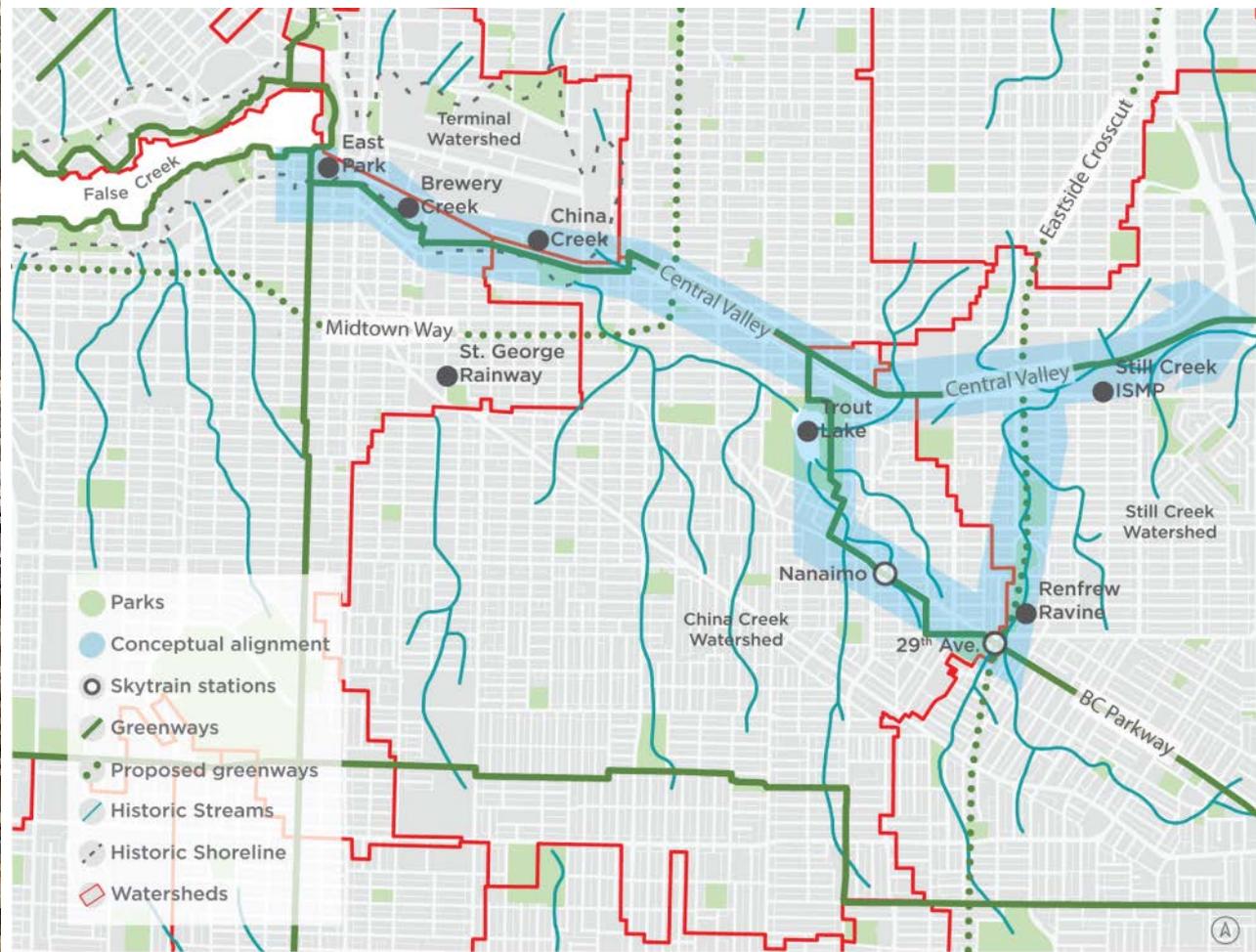
## 1995 City Greenways Plan

### Proposed Routes

- ① Seaside
  - ② Lagoon
  - ③ Central Valley
  - ④ Granville
  - ⑤ Downtown Historic Trail
  - ⑥ Carrall
  - ⑦ Portside
  - ⑧ Midtown Way
  - ⑨ Parkway
  - ⑩ Spirit Trail
  - ⑪ Ridgeway
  - ⑫ Arbutus
  - ⑬ Ontario
  - ⑭ Eastside Crosscut
  - ⑮ North Arm Trail
  - ⑯ Fraser River Trail
  - ⑰ City Centre
  - ⑱ Comox-Helmcken
- Greenway  
Constructed or in progress
  - Proposed Greenway  
Exact route to be determined through public consultation and detailed study
  - Bikeway  
Constructed or in progress
  - TransCanada Trail



# FALSE CREEK TO THE FRASER RIVER BLUEWAY



# WORKPLAN

## CITY-WIDE PLAN

PARTNERSHIPS, VALUES,  
IDEAS + PRIORITIES

SCENARIOS, CHOICES, POLICY OPTIONS,  
TRADE-OFFS + STRATEGIC DIRECTIONS

REVIEW OF  
REFINED PLAN

IMPLEMENTATION

## INTEGRATED BLUE-GREEN SYSTEMS

ENGAGEMENT, PARTNERSHIPS + INTEGRATION

REFINEMENTS

PRIORITIES

TECHNICAL STUDIES

IMPLEMENTATION

2019

2020

2021

2022

Q3 2020  
PROGRESS UPDATE

Q3 2021  
PROGRESS UPDATE

Q1 2022  
BLUE-GREEN SYSTEMS  
PLANS + REPORT



# DELIVERABLES



↓

WATERSHED PLAN  
METHODOLOGY +  
PILOTS



↓

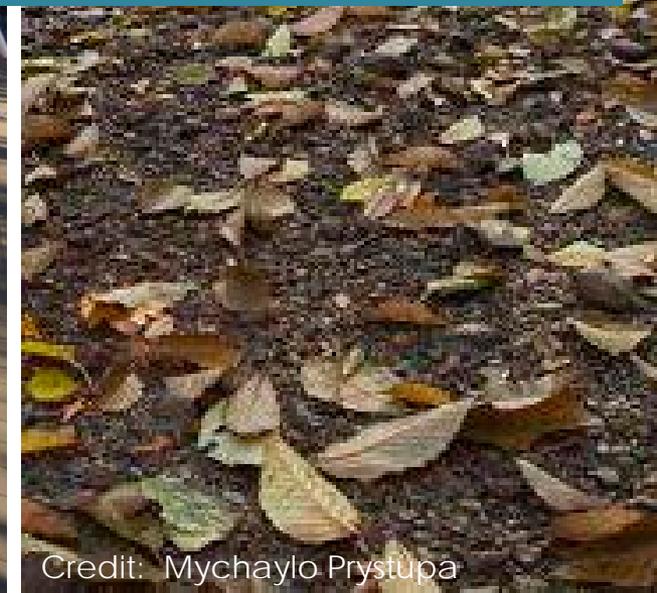
GREENWAYS PLAN



↓

OPPORTUNITIES  
ASSESSMENT +  
PRELIMINARY  
BLUEWAY SCOPING

## BLUE-GREEN SYSTEMS



THANK YOU.



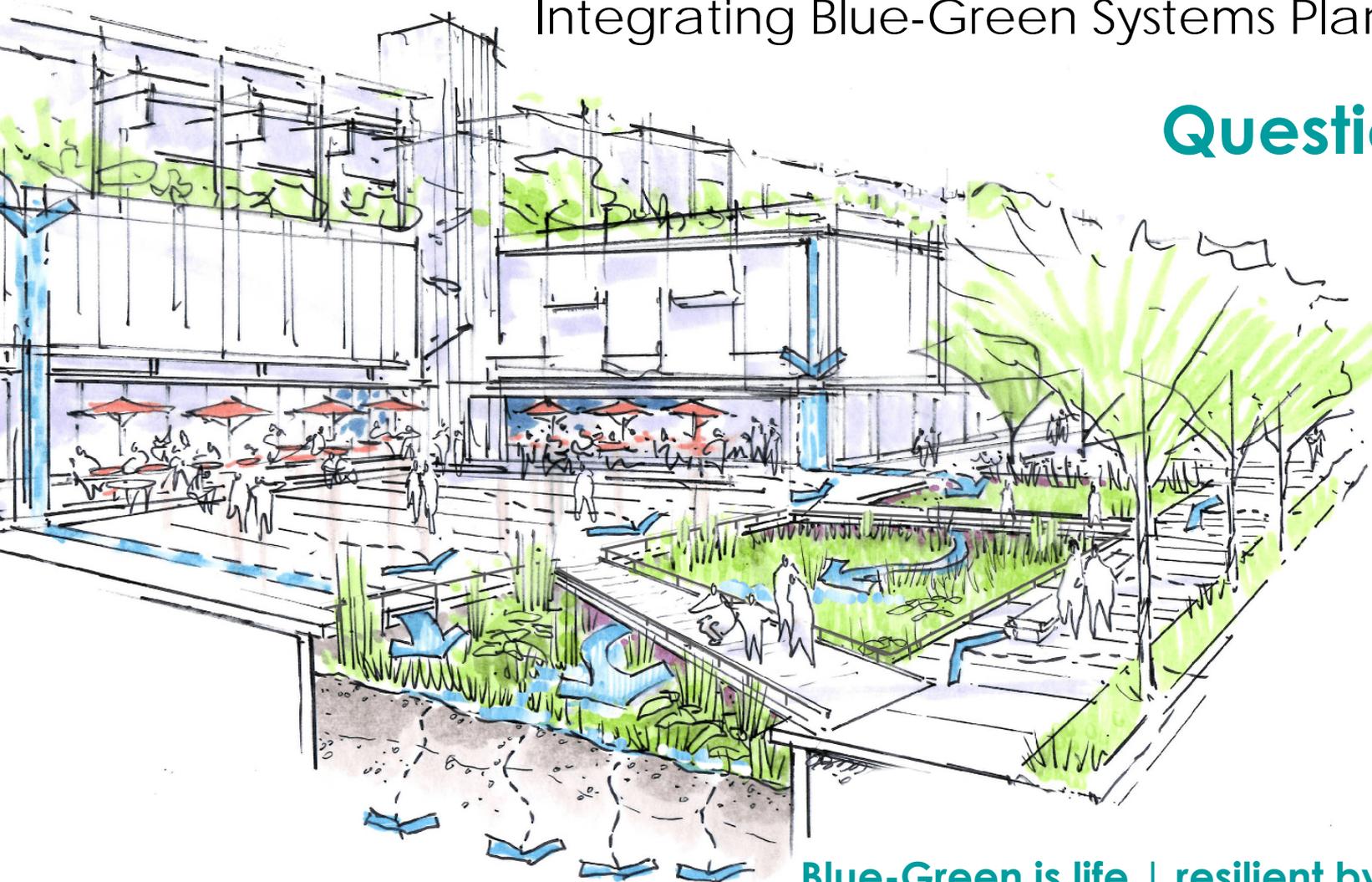
# 5

# RECOMMENDATIONS

# For decision today:

## Rain City Strategy Integrating Blue-Green Systems Planning

### Questions?



Blue-Green is life | resilient by nature