

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



*Becoming
a water sensitive city*

OVERVIEW

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

1

CONTEXT

Vancouver is a city surrounded by water



Image: Overview of Vancouver's downtown peninsula
Photo Credit: 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

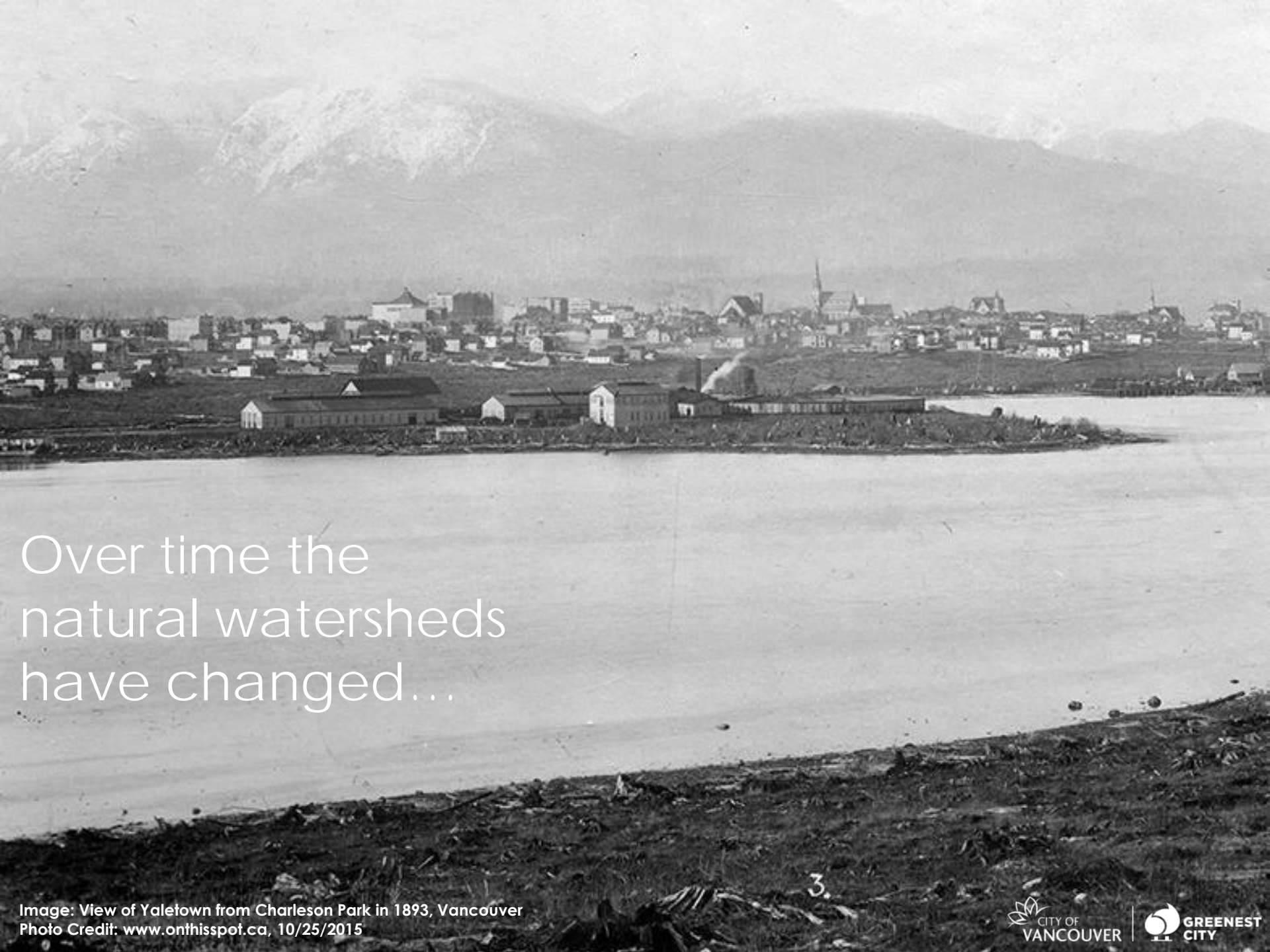


Image: West Hastings Street, Vancouver
Photo Credit: Dan Toulgoet



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...

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



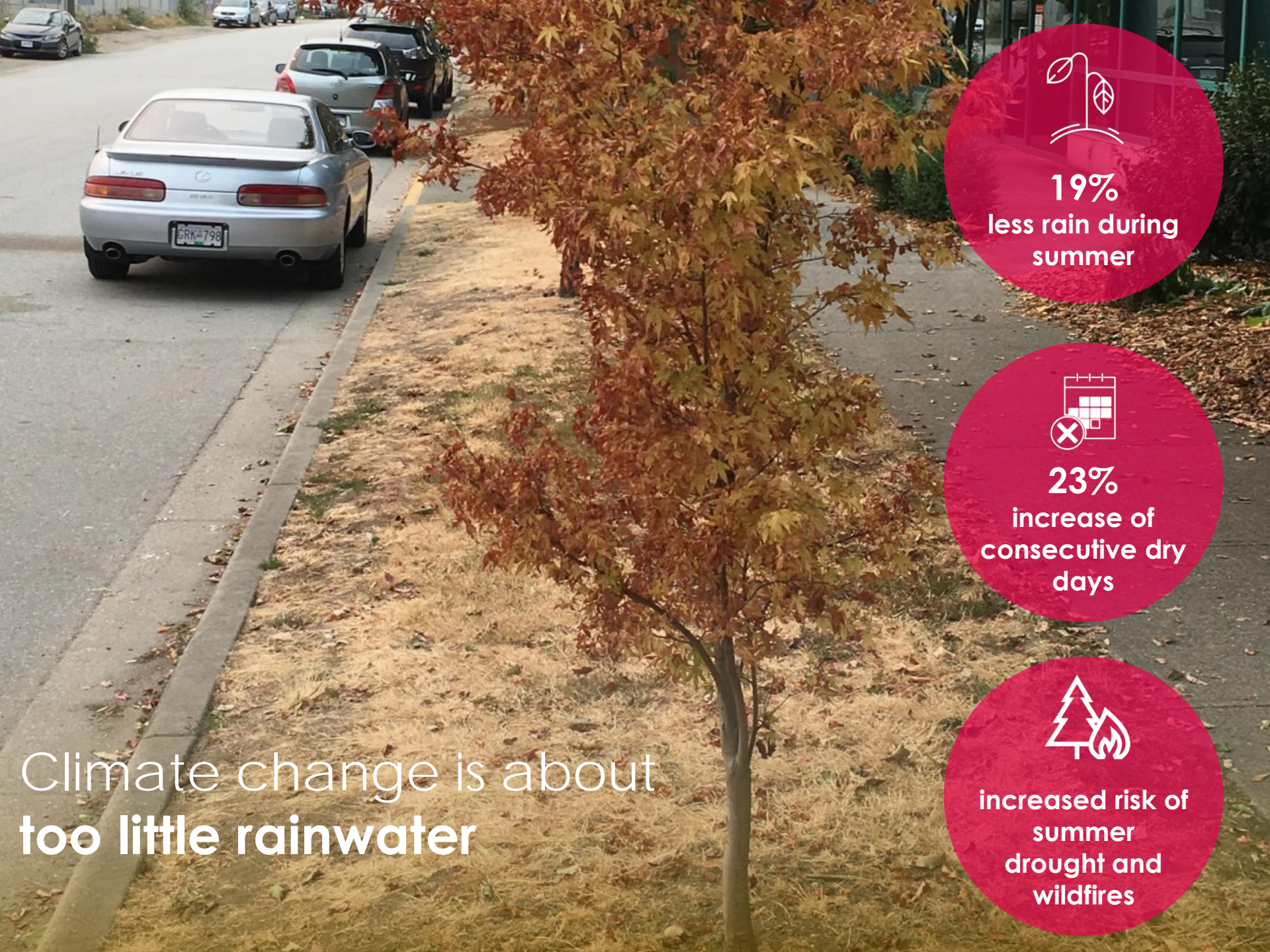
33%
more rain on
very wet days



increased risk of
overland &
coastal flooding

Climate change is about
too much rainwater

Image: Overland flooding at Cambie St & W Broadway, Vancouver on October 12, 2017
Photo Credit: Alexandra Coulliard



19%
less rain during
summer



23%
increase of
consecutive dry
days



increased risk of
summer
drought and
wildfires

Climate change is about
too little rainwater



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

Regulatory requirements



water
quality

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

Regulatory requirements



Regulatory requirements



Regulatory requirements





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



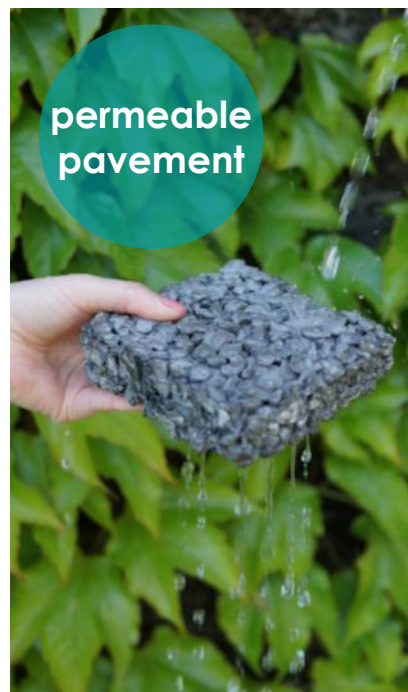
blue-
green
roofs



rainwater
harvesting



rainwater
tree
trenches



permeable
pavement



wetland



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

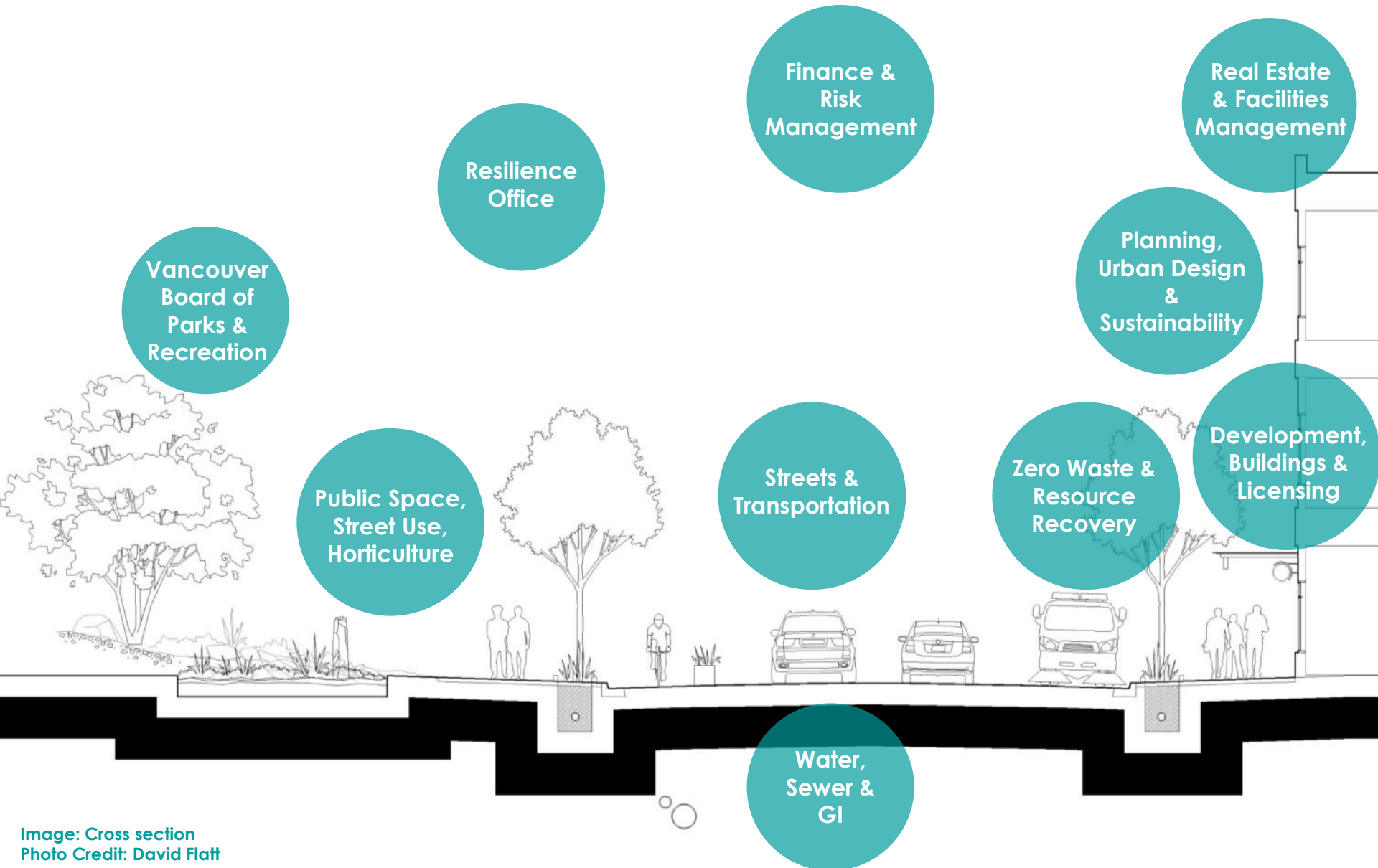
reduce
pollutants
in urban
rainwater
runoff

Objectives

2

STRATEGIC PLAN

A collaborative effort across departments



**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**



**mitigate
heat stress**

**Rain
City
Strategy**

Outcomes



**adapt to
intense
rainstorms &
drought**



**mitigate
heat stress**

**Rain
City
Strategy**



**reduce CSOs
to protect
the environment**

Outcomes

**adapt to
intense
rainstorms &
drought**



**Rain
City
Strategy**

**mitigate
heat stress**



**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

<1%

2019

12%

2030

40%

2050

Expected benefits by 2050

28
billion litres
treated and
diverted from
pipe system
per year

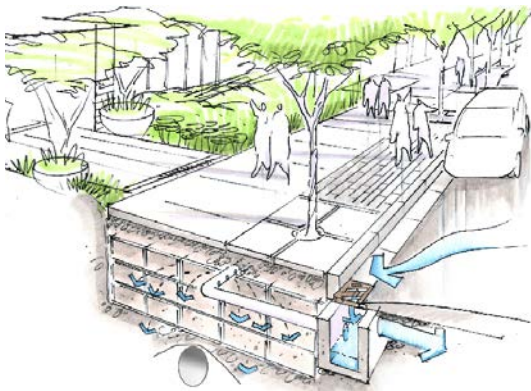
1/3
estimated
reduction in
annual CSO

3 Action plans, 46 programs

Streets & Public Spaces

11 implementation programs

5 enabling programs



Buildings & Sites

7 implementation programs

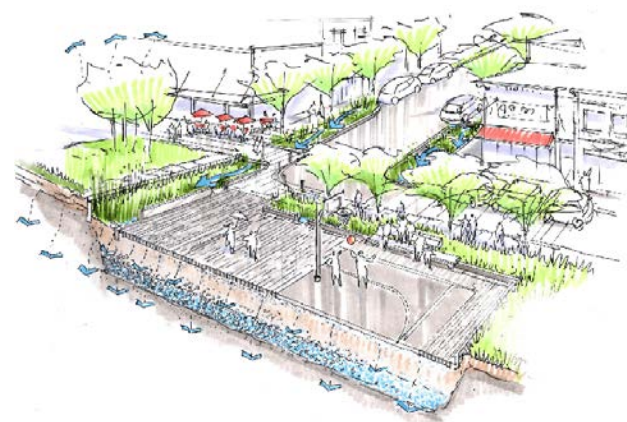
7 enabling programs



Parks & Beaches

12 implementation programs

4 enabling programs





The diagram is set against a background of purple flowers and green stems. A central teal circle is surrounded by four dark blue circles, all connected by a dashed white line. The central circle lists four sample programs. The surrounding circles represent the stages of a cycle: capacity building & engagement, monitoring & evaluation, sustainable funding program, and capacity building & engagement.

**capacity
building &
engagement**

sample programs
permeable pavement
program

resilient roofs
program

rainwater harvesting
program

blue-green system
program

**sustainable
funding
program**

**monitoring
& evaluation**

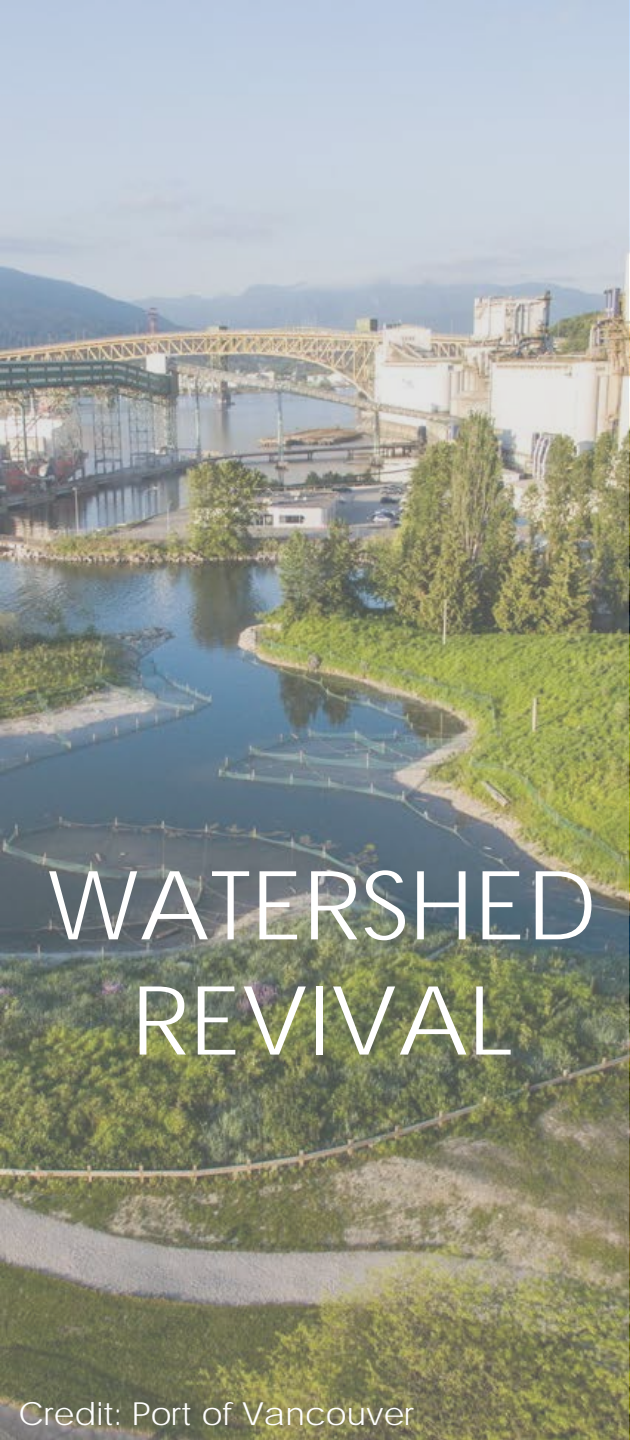
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BLUE-GREEN SYSTEMS PLANNING

INTEGRATING **BLUE-GREEN** SYSTEMS PLANNING

COUNCIL PRESENTATION | November 05 2019





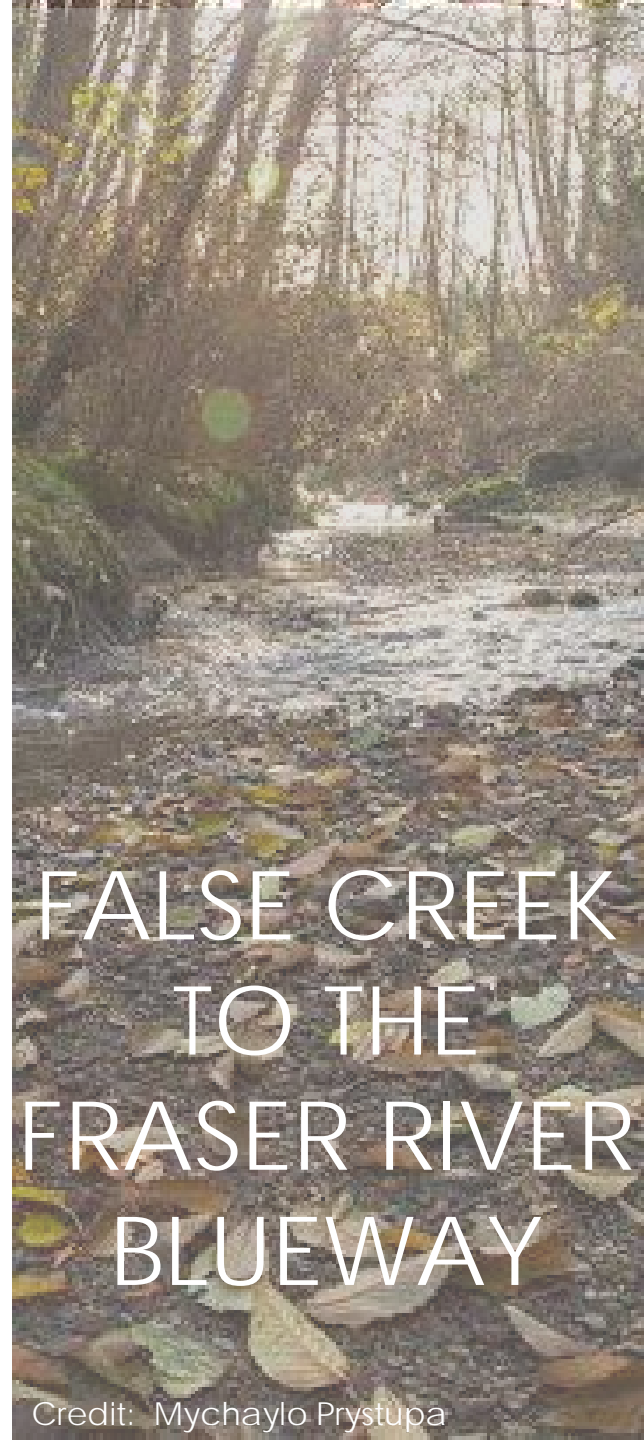
WATERSHED REVIVAL

Credit: Port of Vancouver



GREENWAYS PLAN

Credit: Wendy de Hoog



FALSE CREEK TO THE FRASER RIVER BLUEWAY

Credit: Mychaylo Prystupa

CITY-WIDE PLAN + VANPLAY

Transportation
2040

Biodiversity
Strategy

Rain City
Strategy

Urban
Forest
Strategy

Places for
People

Integrated
Rainwater
Management

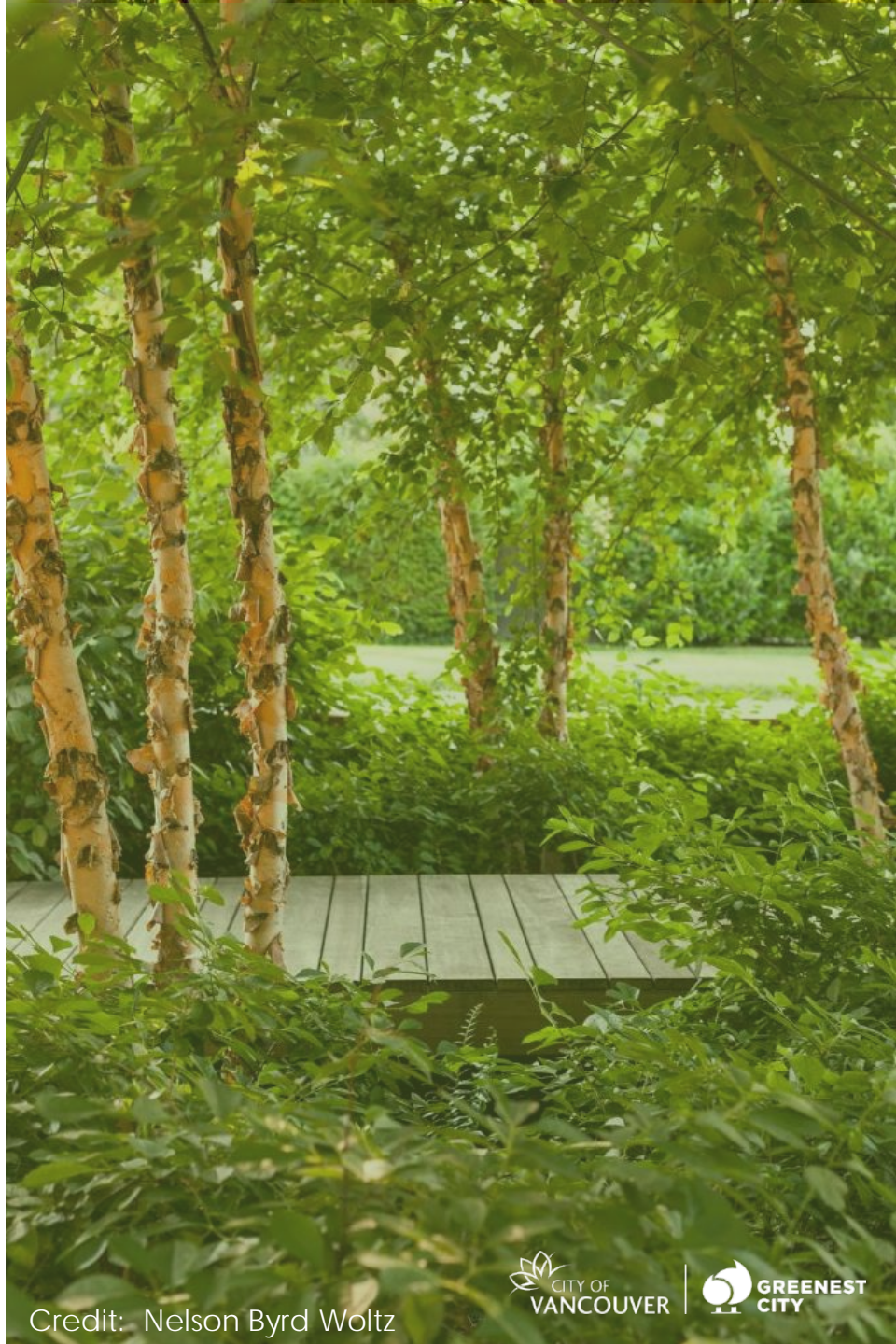
Climate
Adaptation
Plan

Complete
Streets
Framework

Climate
Emergency
Response



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...

VENEMA CREEK SEATTLE

LOW DENSITY

4 blocks
long

Rainwater
treatment for
32 ha

Credit: Cascade Design Collaborative



SWALE ON YALE SEATTLE

DISTRICT SCALE



680
Million liters
treated
annually

4 swales
11,000
liters/minute

TANNER SPRINGS PORTLAND

HIGH DENSITY

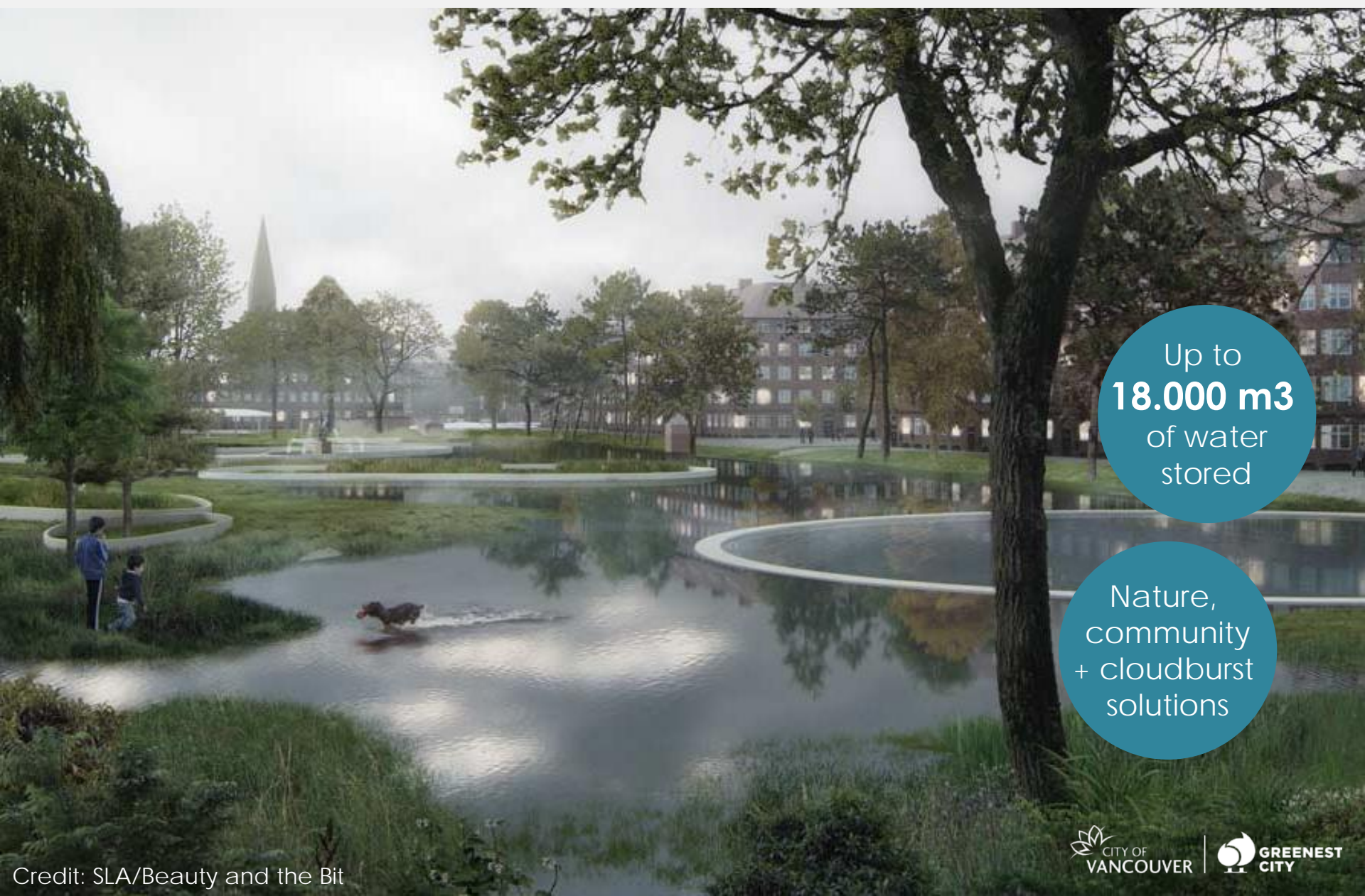


ULI Finalist
ASLA Award

Treats water
from adjacent
streets

HANS TAVSENS PARK COPENHAGEN

FLOODABLE OPEN SPACE



Up to
18.000 m³
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

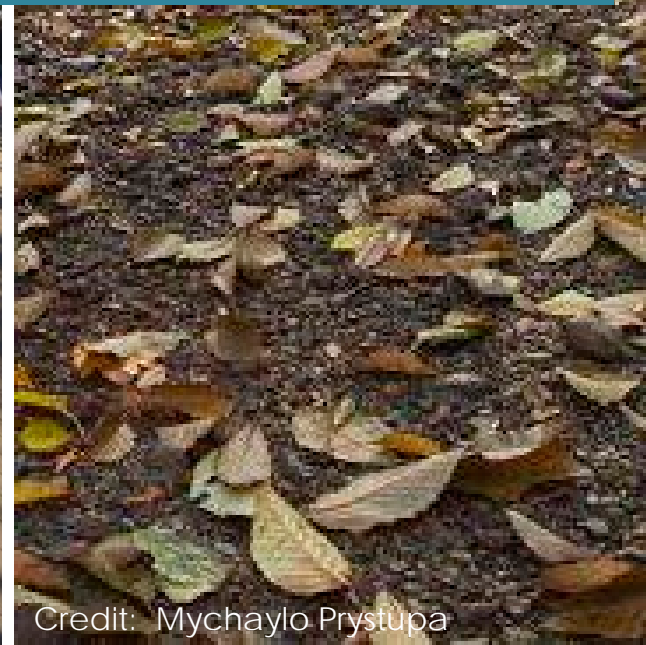
WATER MANAGEMENT ACTIVE TRANSPORTATION NATURE IN THE CITY



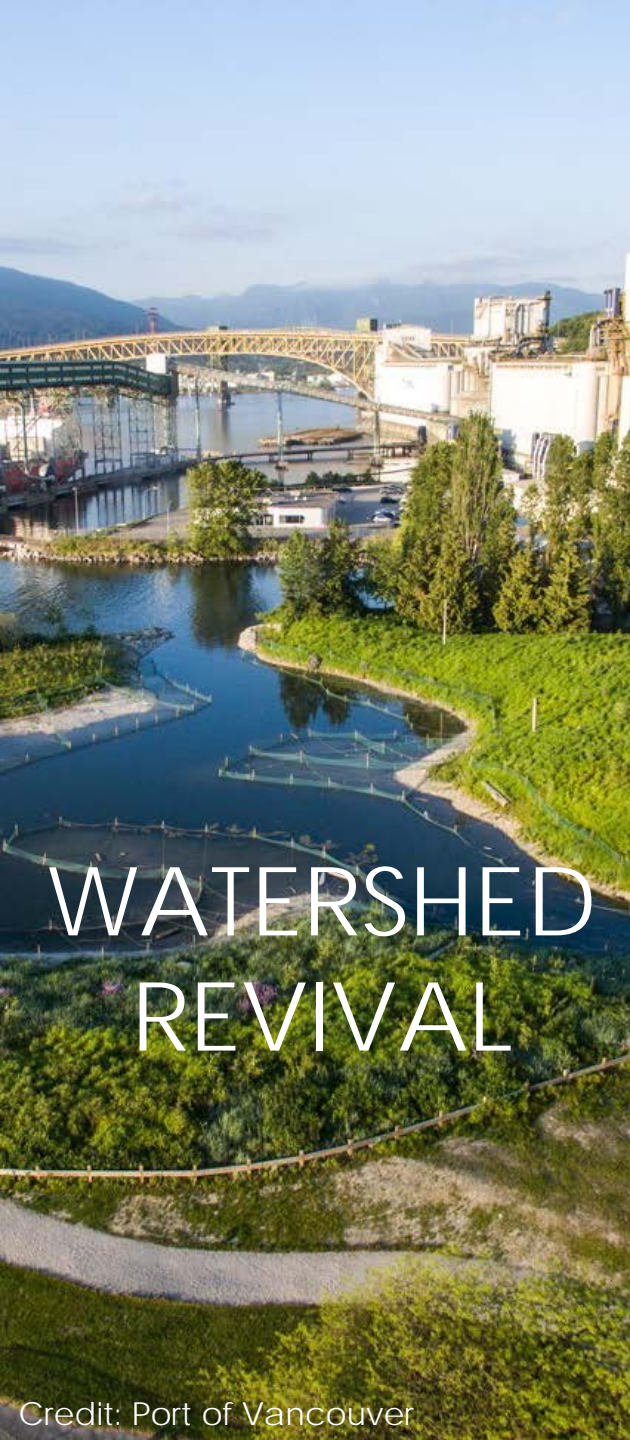
Credit: Port of Vancouver



Credit: Wendy de Hoog



Credit: Mychaylo Prystupa



WATERSHED REVIVAL





GREENWAYS PLAN

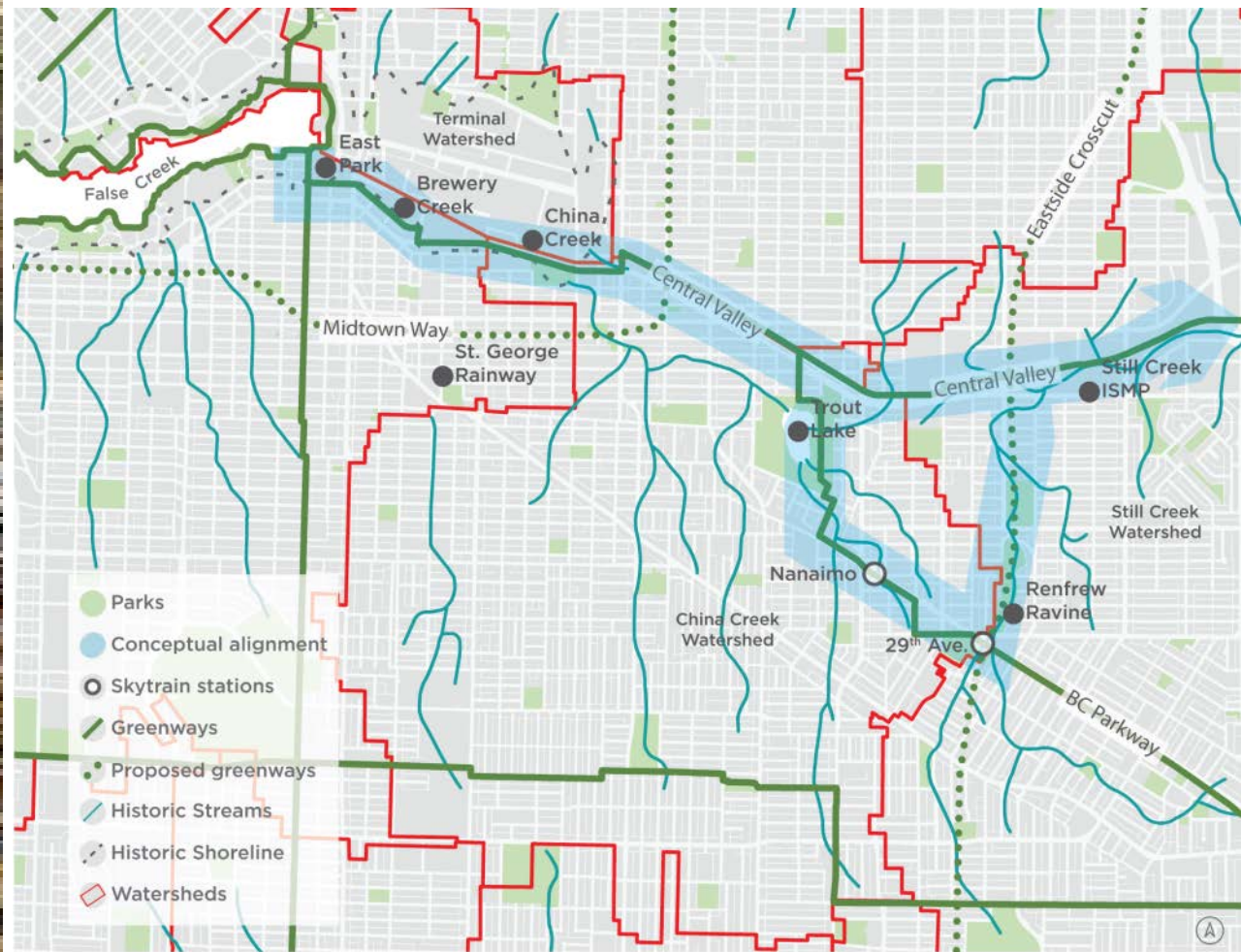
1995 City Greenways Plan

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

TECHNICAL STUDIES

REFINEMENTS

PRIORITIES

IMPLEMENTATION

2019

2020

Q3 2020

PROGRESS UPDATE

2021

Q3 2021

PROGRESS UPDATE

2022

Q1 2022

BLUE-GREEN SYSTEMS
PLANS + REPORT



DELIVERABLES



WATERSHED PLAN
METHODOLOGY +
PILOTS



GREENWAYS PLAN



OPPORTUNITIES
ASSESSMENT +
PRELIMINARY
BLUEWAY SCOPING

BLUE-GREEN SYSTEMS



THANK YOU.



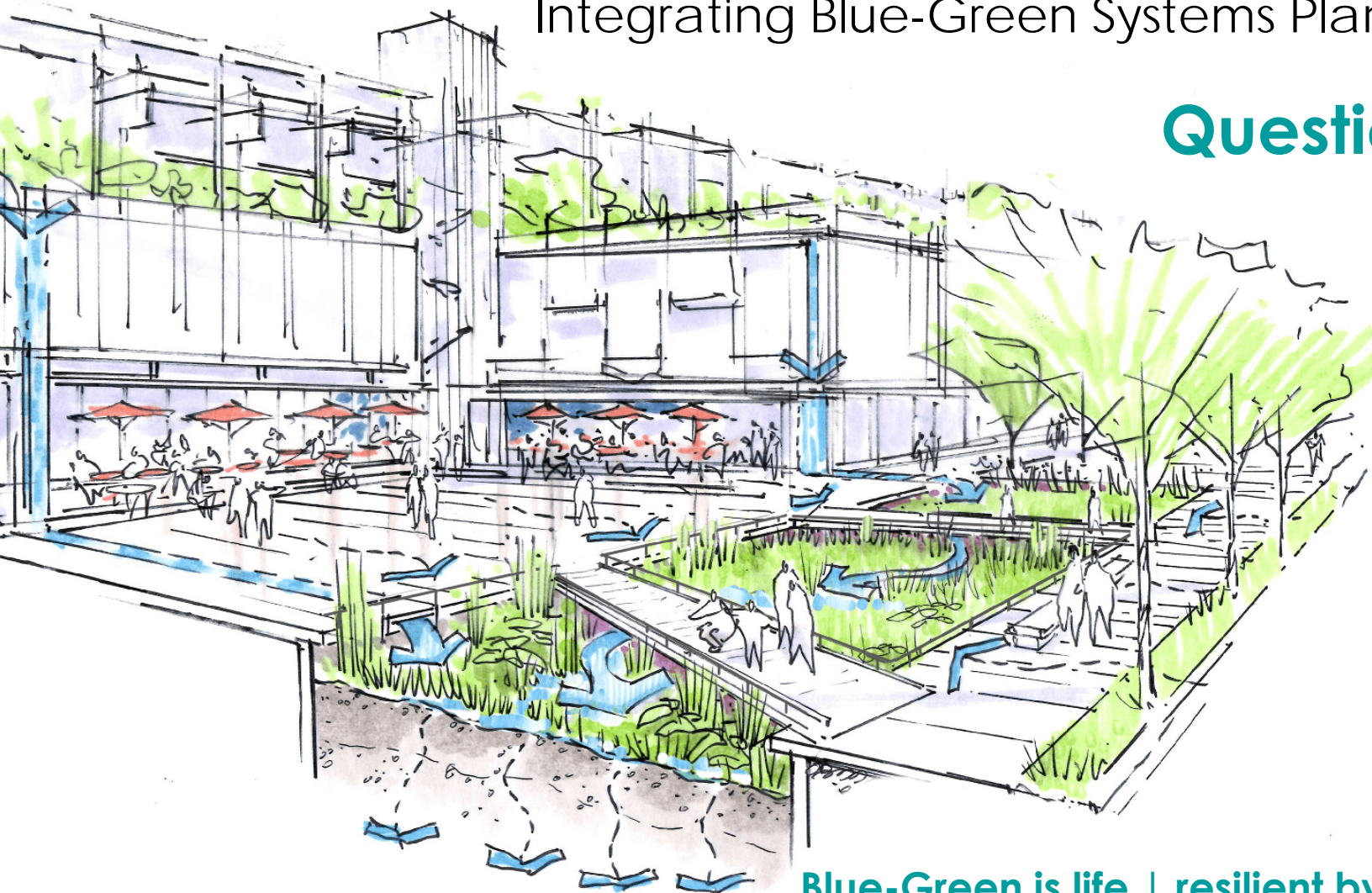
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RECOMMENDATIONS

For decision today:

Rain City Strategy
Integrating Blue-Green Systems Planning

Questions?



Blue-Green is life | resilient by nature