

A close-up photograph of green leaves with raindrops falling from them. The background is a soft, out-of-focus green. The text is overlaid on the lower half of the image.

From rain gardens to resilience:

Green stormwater infrastructure for healthier cities

April 30, 2025 12 – 1 PM

Tugce Conger



We recognize that Fraser Health provides care on the traditional, ancestral and unceded lands of the Coast Salish and Nlaka'pamux Nations and is home to 32 First Nations within the Fraser Salish region.

Fraser Health



Vancouver Coastal Health

Our communities

- Largest HA Serving over 1.9 million people in 20 diverse communities from Burnaby to Boston Bar
- Including six Métis Chartered Communities and approximately 62,000 Indigenous Peoples associated with 32 First Nations communities.

Fraser Health

Our communities

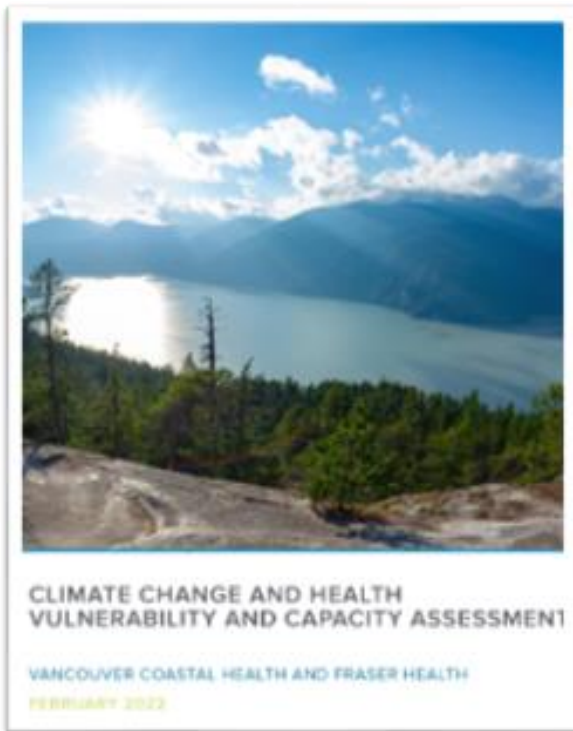
- Largest HA Serving over 1.9 million people in 20 diverse communities from Burnaby to Boston Bar
- Including six Métis Chartered Communities and approximately 62,000 Indigenous Peoples associated with 32 First Nations communities.

Our approach

A comprehensive, multi-scale approach with diverse actors:

- Wide range of participants: From individuals to health professionals, researchers, governments and policymakers.
- Multiple scales: Adaptation at various temporal and geographic levels.
- Vulnerable populations: Focus on those at highest risk.

Climate Change and Fraser Health



Health Benefits of Green Stormwater Infrastructure



Microsoft 350 library

- ✓ Temperature regulation
- ✓ Improved air quality
- ✓ Pollution reduction
- ✓ Access to Nature
- ✓ Social connectedness
- ✓ Economic benefits

Extreme Heat – 2021 Heat Dome

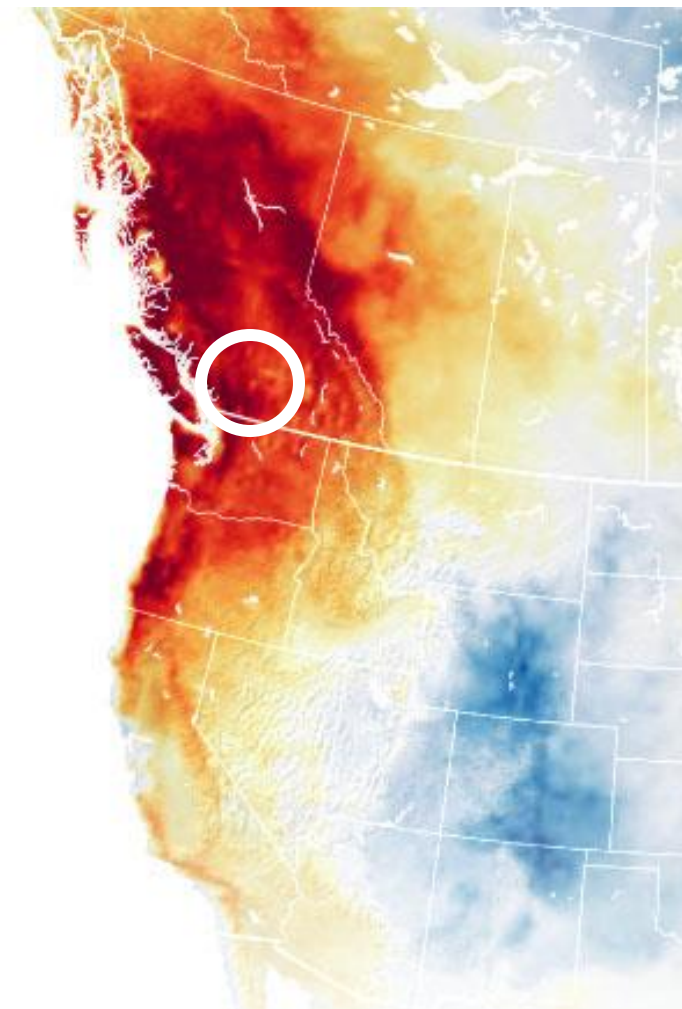
BC Heat Event: June 25–29

- 619 deaths across BC
- Fraser Health: 354 deaths (vs. 50 avg. in previous years)

Most emergency visits: *older adults*

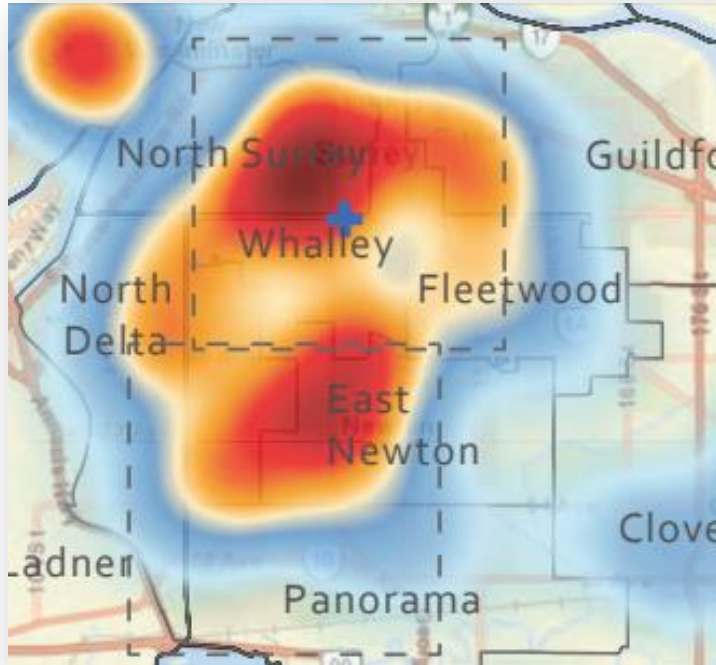
Higher emergency visits in *deprived neighborhoods*

Increased risk of death linked to *higher neighborhood deprivation & less surrounding greenness*



Map of temperature anomalies during 2021 heat dome
[The 2021 Pacific Northwest Heatwave \(Heat Dome\)](#)

Urban Areas and Health



Fraser Health Authority. (2022, March 23). *FHA Heat Dome Report*.



Université Laval, Faculté de foresterie, de géographie et de géomatique. (n.d.). *Vulnérabilité aux vagues de chaleur*

Risk factors

Age – children & older adults

Health – chronic conditions, mental health and addiction, pregnancy, disabilities

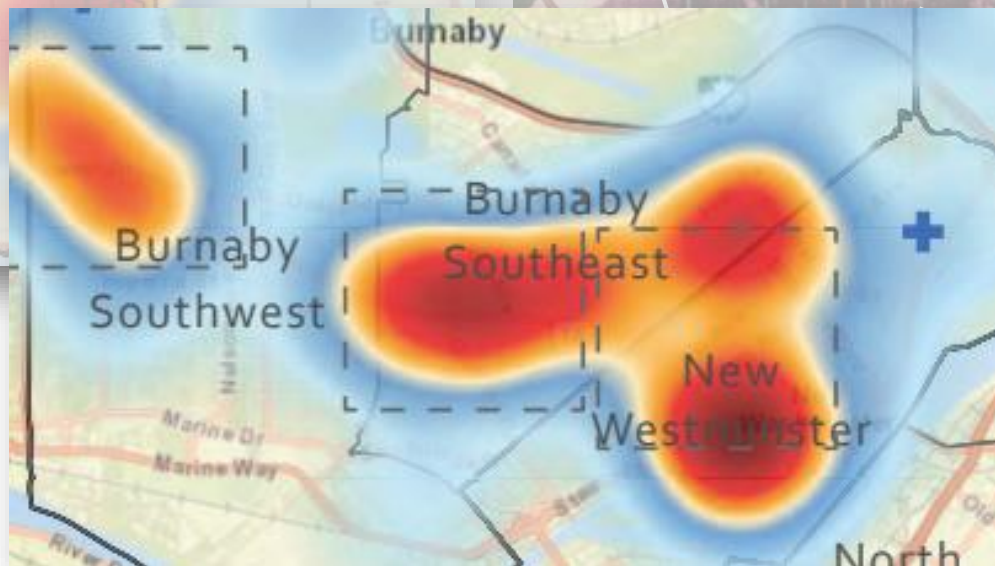
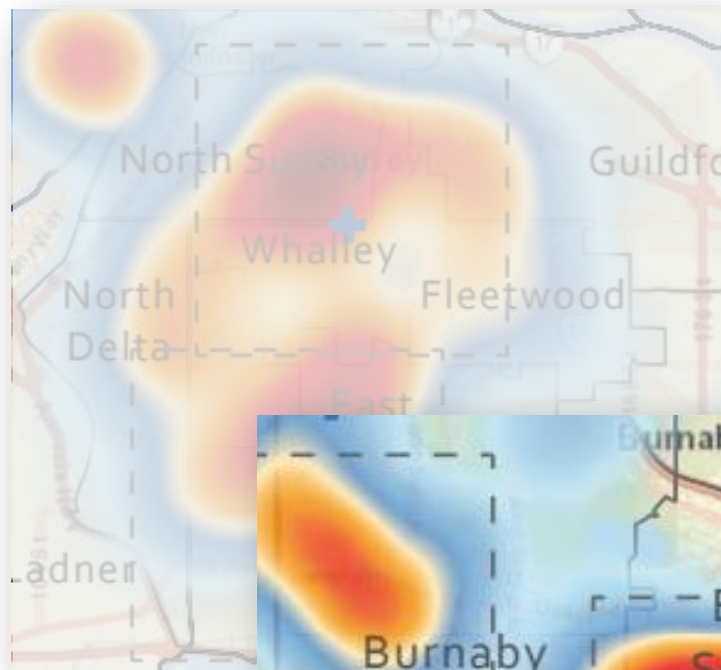
Economic – low income

Urban Areas and Health

Risk factors

Life – outdoor workers, social isolation, immigrants

Environment – housing and neighborhood quality



Fraser Health Authority. (2022, March 23). *FHA Heat Dome Report*.

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What works – Lessons learned



Microsoft 350 library

Partnerships & collaborations

- We don't control all the levers
- Realize synergies and amplify benefits

Cooling buildings & neighborhoods save lives

- BCBC min temperature threshold
- Retrofits & cooling bylaws
- Green Roofs, green transportation corridors
- Tree Canopy
 - 3-30-300 Greening Target
 - Min. 40% Canopy Cover*

What works – Lessons learned

Social connectedness saves lives

- Social networks are essential
- Cities, spaces and housing play an important role

Reactive vs. Proactive Approach

- Upstream work on education, prevention and resilience



Microsoft 350 library

Why Green Infrastructure for Public Health?

“Reconciled Futures”

Art Mentorship Camp for Indigenous Youth



Raven
Madison Corkum-Gallon, Haida Nation



Heron and Sun
Heron: Brandon and Vincent Morgan, Tsawwassen Nation
Sun: Ethan Baker, Tsawwassen



Hummingbird
Pia Bond, Nlaka'pamux Nation



Spawning Salmon I
Top: Madelyn Hourston-Baker, Squamish & Ojibway Nations
Bottom: Katelynn Aquash, Squamish Nation



Spawning Salmon II
Top: Scarlett Sparrow-Felix, Musqueam Nation
Bottom: Kaleigh Goetzinger, Musqueam & Haida Nations

Deaths due to Urban Heat Effect



VANCOUVER SUN

Nearly 600 people died due to record-setting B.C. heat wave this summer

Cheryl Chan
Nov 01, 2021 • November 1, 2021

B.C. Heat Wave Deaths June 25 - July 1



Image: Summer drought
Photo Credit: City of Vancouver

A Healthier Vancouver through Green Stormwater Infrastructure (GSI)

Improve and protect Vancouver's
water quality

Increase Vancouver's
resilience
through sustainable
water management

Enhance Vancouver's
livability
by improving natural
and urban
ecosystems

SHOULD I BE WORRIED?

Climate Change and Urban Health Risks



Green infrastructure and health benefits

Cleans air
& water

Reduces
flooding
risks

Increases
exposure &
access to
nature

Provides
opportunities
for urban
agriculture

Reduces
noise
exposure

Improves
transportation
& connectivity

Green infrastructure and health benefits

Cleans air & water

Reduces flooding risks

Improves physical & mental health

Increases physical activity & fitness

Increases exposure & access to nature

Provides opportunities for urban agriculture

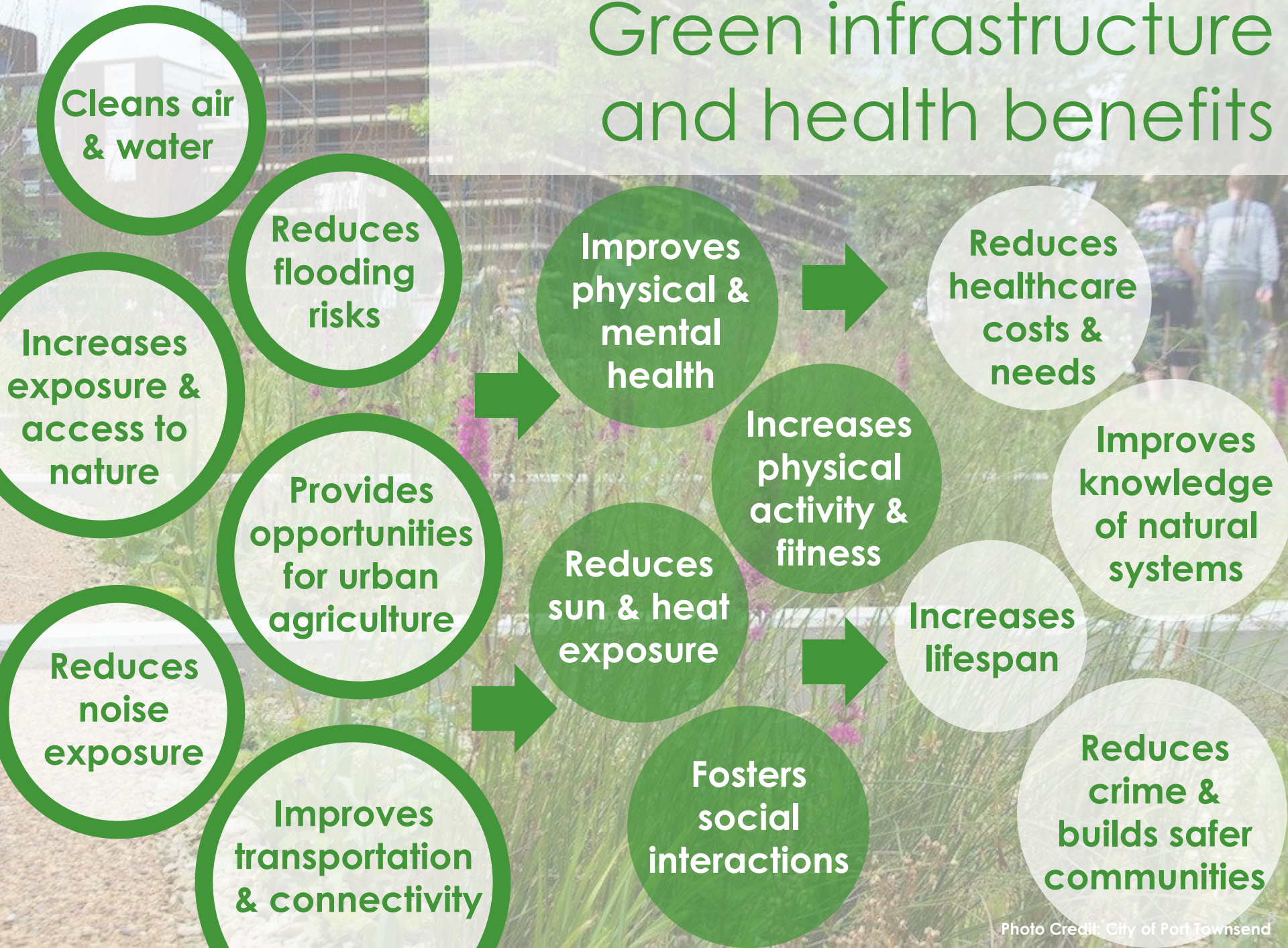
Reduces sun & heat exposure

Reduces noise exposure

Improves transportation & connectivity

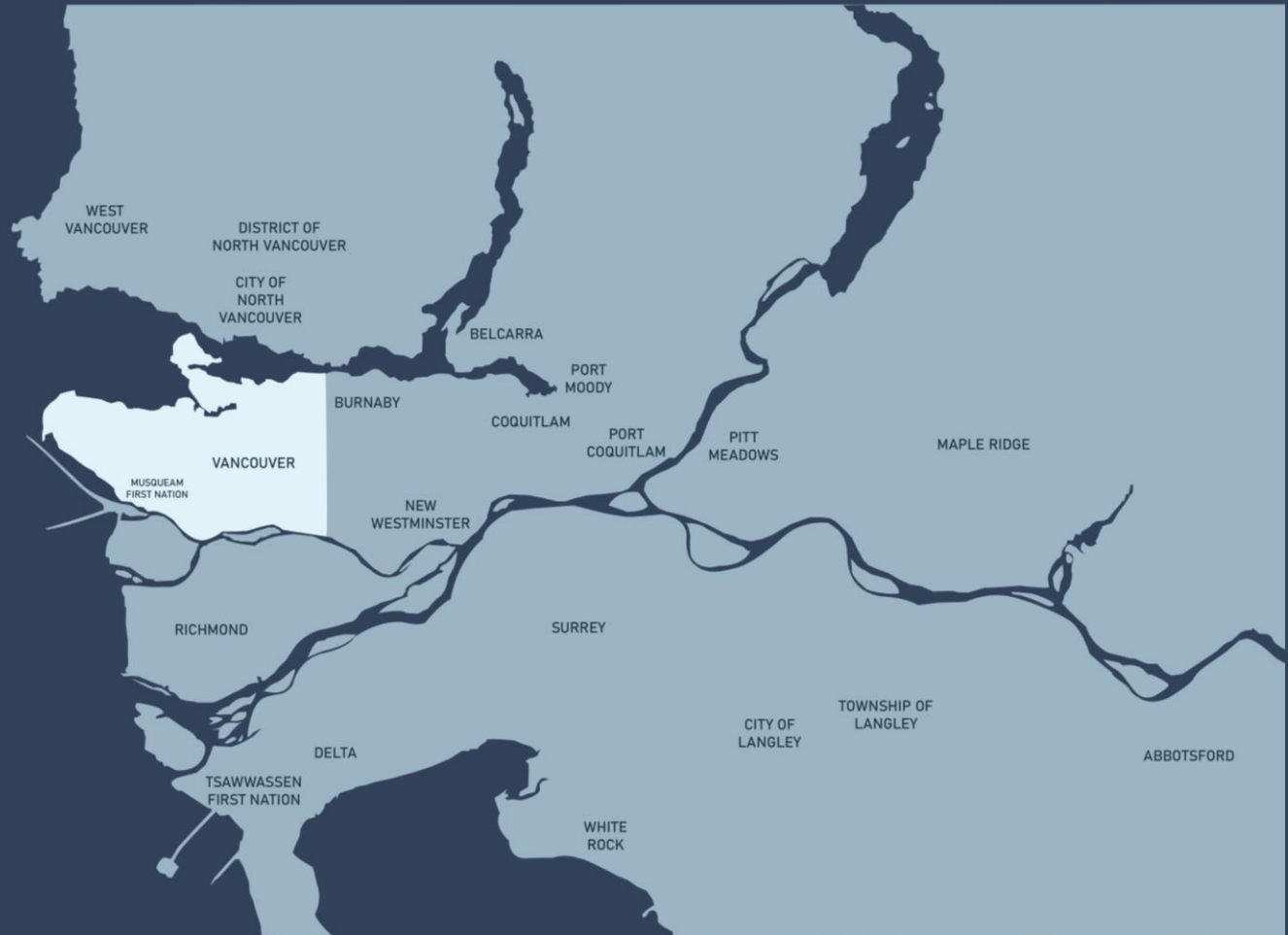
Fosters social interactions

Green infrastructure and health benefits

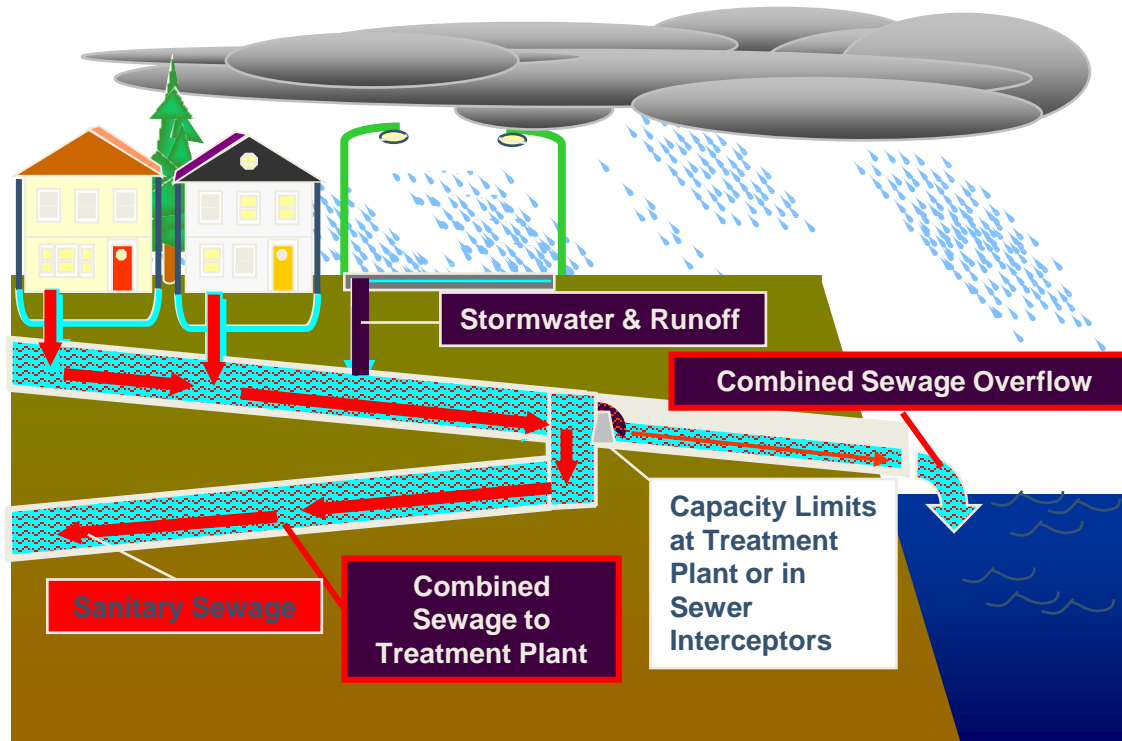


VANCOUVER

- Largest City in the Metro Vancouver region
- Highest population density of any major city in Canada
- Approximately 1400 mm of rainfall per year
- Combined sewer system services ~70% of City



Vancouver's Combined Sewers



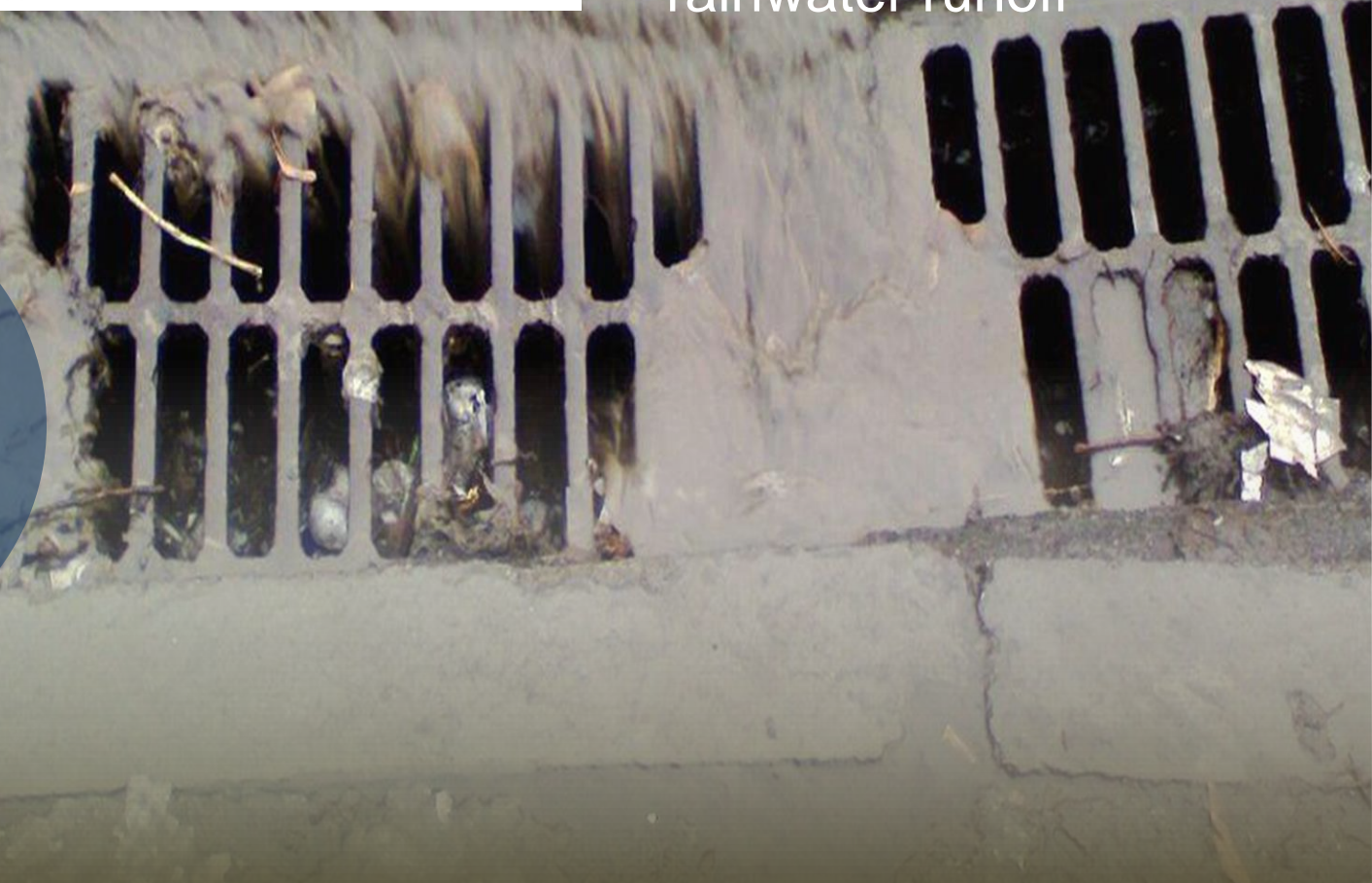


First Nation calls on B.C. to restore shellfish harvesting sites closed for decades due to poor water quality

JANE SKRYPNEK
PUBLISHED JULY 3, 2023

Water quality is impacted by polluted urban rainwater runoff

- pollutants
- litter
- tire debris
- copper & zinc
- oils & gasoline
- animal waste
- fertilizer
- micro-plastics
- sediment





Reconciliation at the City

- In 2014, the City of Vancouver started a journey towards becoming a City of Reconciliation
 - Focused on improving Cultural Competency, Strengthening Relationships with First Nations, and improving decision making processes.
- October 2022, Council approves United Nations Declaration in the Rights of Indigenous Peoples (UNDRIP) Strategy for the City of Vancouver
- On June 25, 2024 Council adopted the UNDRIP Action Plan



Green Infrastructure

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

Grey Infrastructure

Less adaptable
Single purpose
Limited integration with other City priorities



Green Infrastructure

Adaptable
Multi purpose
Leverage co-benefits for other City priorities



evapotranspiration



infiltration



harvest & reuse



protect & enhance environment



social/cultural benefits



health benefits



49 m²

Bioretention planting area helping to increase local biodiversity



2.5 thousand m²

Impervious surfaces managed by capturing rainwater runoff



3.1 thousand m³

Annual rainfall managed on site



Rain garden



Non porous asphalt

Porous asphalt



Tree soil cells



Grid grass



Green roof



Absorbent landscape



Day-lighting streams



Rainwater harvesting



Detention tank



Wetland



Bioswale

Green Infrastructure in the City of Vancouver



Bioretention
187 Assets



Subsurface
Infiltration
95 Assets



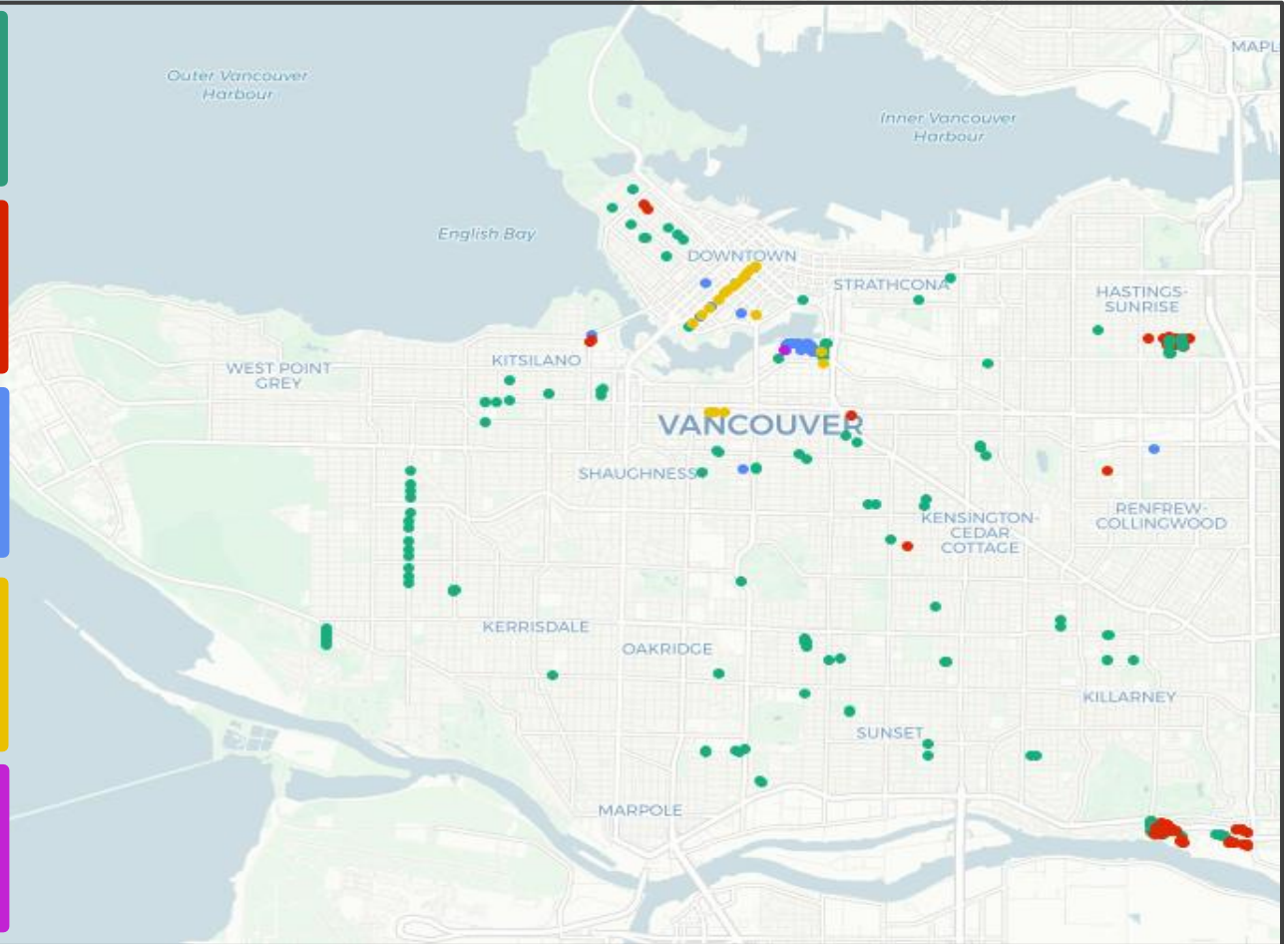
Permeable
Pavement
52 Assets



Rainwater Tree
Trench
28 Assets



Wetland
1 Asset





Current Work in Vancouver

Richards Street Blue-Green System

 **16 sensors installed**
Monitoring soil moisture levels

 **8 Blocks, two-way**
All ages separated bike Lane

 **4.2 Thousand lbs**
Carbon sequestration annually

 **1.1 hectares**
Street runoff managed annually

 **11 million litres**
Runoff diverted from sewers annually

 **15 million litres**
Runoff treated on-site annually

 **100+**
New trees





Quebec and 1st, Vancouver, BC

Bioswales and stormwater
tree trenches collect and
treat runoff from the
roadways



**63rd & Yukon,
Vancouver, BC**

**Manages and treats
rainwater runoff from streets
and provides public space**

Place-Making GSI Projects

Prince Edward St. Closure



St George Rainway

4 BLOCKS OF GREEN INFRASTRUCTURE



The Rainway
will filter
42 ML
of polluted
rainwater
each year

St George Rainway

4 BLOCKS OF GREEN INFRASTRUCTURE



St. George Rainway at
work: Atmospheric River
event October 19, 2024



Public Engagement



ST. GEORGE RAINWAY

Community Plants | Cast your vote!

Vote for plants that you want to see in the St George Rainway and beyond.

The selected plants will be planted in the Rainway and will be featured in future engagement events and plant giveaways to encourage local gardeners to plant in the wider St George Community.

Select one plant in each of the four sub-groups:

Fabulous Full Sun	Stunning Part-Sun	Shaded Superstars	Beautiful Bulbs
 Beardtongue	 Western Columbine	 Wood Sorrel	 Chocolate Lily
 Tick Seed	 Geranium	 Yellow Marsh Marigold	 Tiger Lily
 Yarrow	 Western Aster	 Western Wild Ginger	 Pink Fawn Lily



Ethnobotany & Supporting Ecological Relationships

Indigenous Plants



Indigenous yew
slow growing, supportive
to other Indigenous
species, enjoys growing on
cedar bark/mulch



Cascara
Not too bushy, very slow
growing deciduous tree,
bark used for medicine



Lilies and other culturally
relevant wildflowers
chocolate, tiger, pink fawn,
camas



Black huckleberry
great pollinator, supports
birds, popular berry



Low-growing Oregon Grape
fantastic pollinator, bee and
bird friendly, cultural-uses



Sedums
especially on bed
edges



Strawberry
Ideal ground
cover

Good Plants, Bad Rap



Western buttercup
supports camas root
structures



Oxalis
ground cover also great
pollinator and bird feeders,
functions as living mulch



Horsetail
Thrives in wetland
habitat and indicator of
ecosystem health

Plant Guilds



Like companion plants
they support each other in
the elements of thriving.

Useful Plants to Community



Lambs Ear



Lavender



Rosemary



Calendula

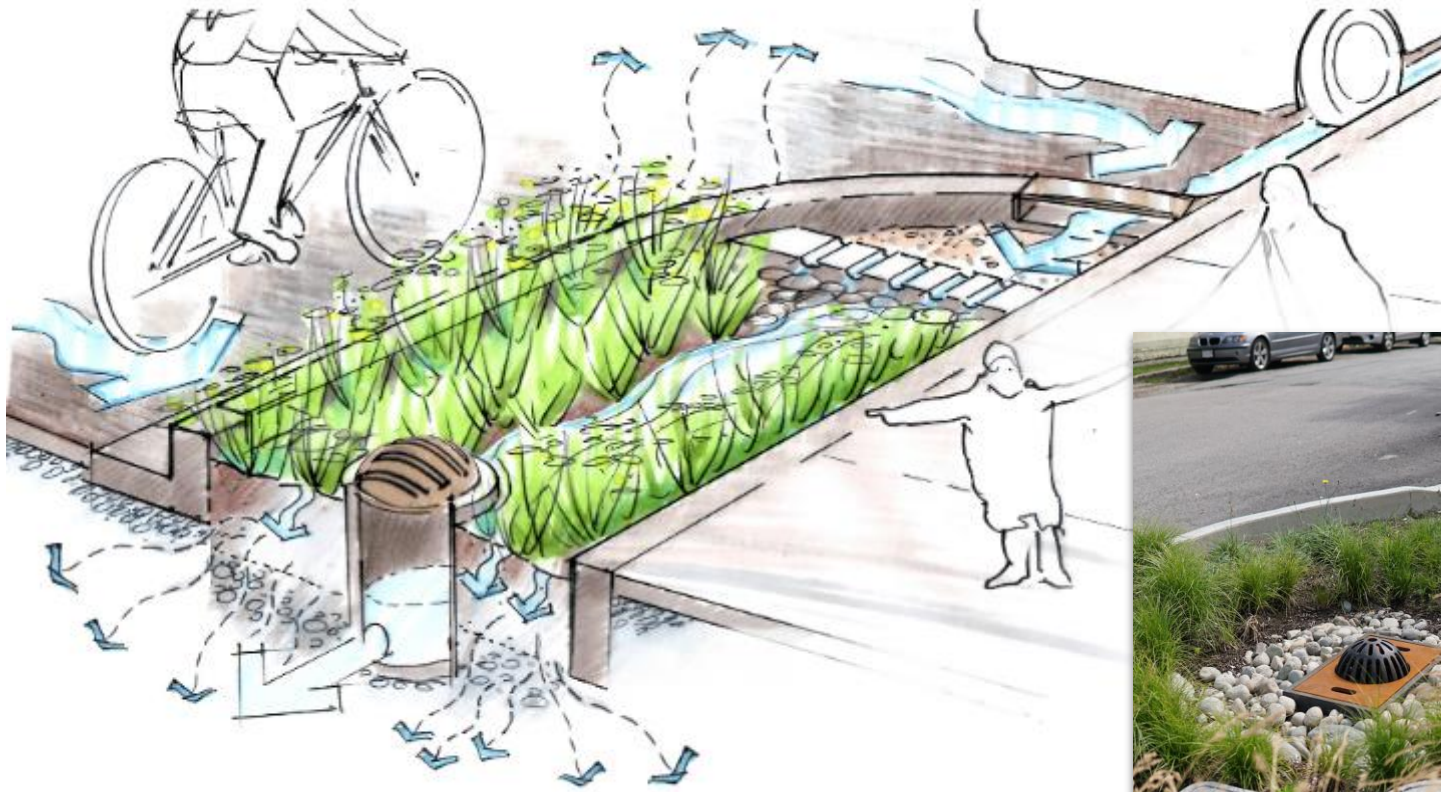


California Poppy



Alyssum

Bioretention – Corner Bulges



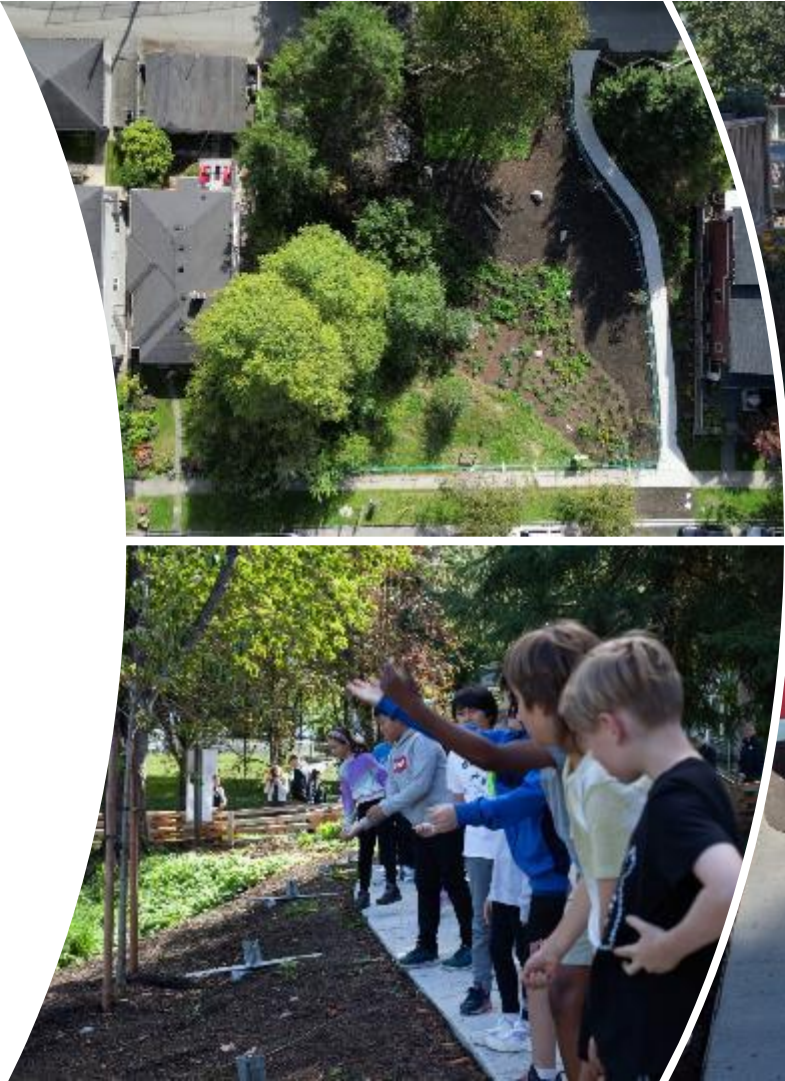
Rainwater Tree Trenches to Support New Urban Trees



36 trees planted; soil cells & tree pits in all blocks.

Partnering with Schools

Gibby's Field
Naturalized
Park
and Tyee
Elementary
School



Partnering with Schools

Sketching at Beaconsfield Park
With Kat Wadel



Where is water? What is our connection
to water? To land? What is community?



Partnering with Community



Seeding Stewardship is a new community support program which empowers community champions to connect with the nature-based solutions in their neighbourhood. Support is provided by joint efforts from the City and Parks through access to tools, knowledge, and in-kind resources.

This program focuses on providing opportunities for connection to land, water, and community through stewardship.



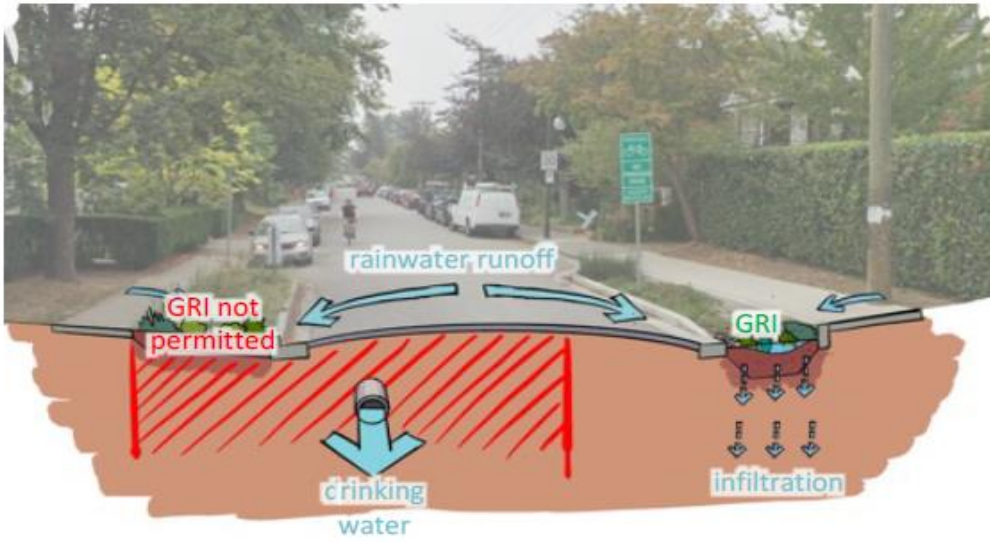
Challenges

Transforming cities:
revisiting our risk
perceptions in the face
of climate change

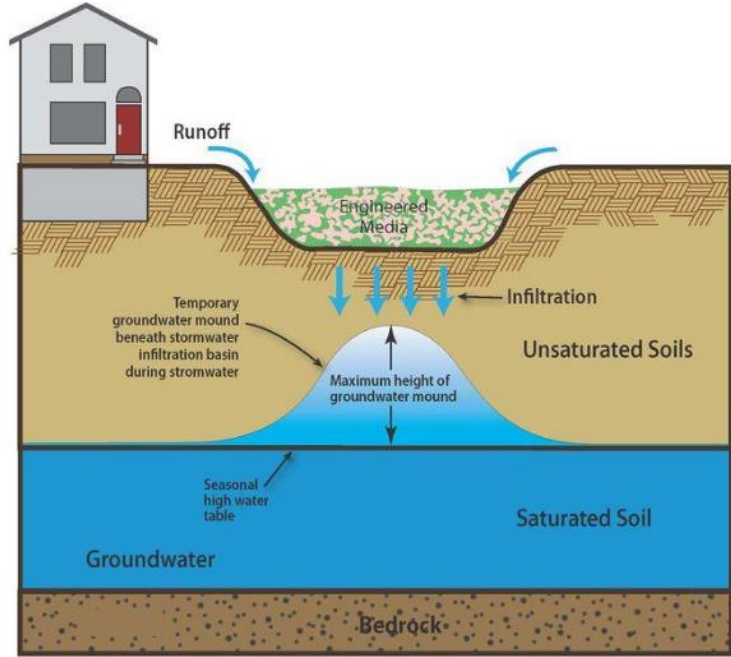
Transforming minds:
changes to streetscape

Challenges: Existing Standards

Current City of Vancouver Offset: 3 m (≈ 10 ft)



National Building Code 5m offset from Dry Wells



Key Takeaways

- Urban design impacts health more than previously recognized.
- Growing populations & extreme weather make green infrastructure and nature-based solutions (NBS) essential for livable, resilient cities.
- Traditional health metrics focus on reactive care, but environmental factors matter too—tree canopy, urban cooling, and access to green space.
- We must rethink "business as usual" to implement these green infrastructure solutions urgently in response to climate change.



Thank you!

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<https://vancouver.ca/home-property-development/green-infrastructure.aspx>

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Sunset Park





“If there is a magic on this planet, it is contained in water...”

Its substance reaches everywhere; it touches the past and prepares the future; it moves under the poles and wanders thinly in the heights of air. It can assume forms of exquisite perfection in a snowflake, or strip the living to a single shining bone cast up by the sea”.

-Loren Eiseley