

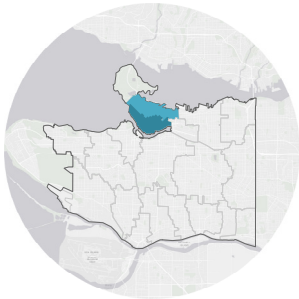
Richards Street

Rain City Strategy Green Infrastructure Implementation

Last Updated: 2022

About Richards Street

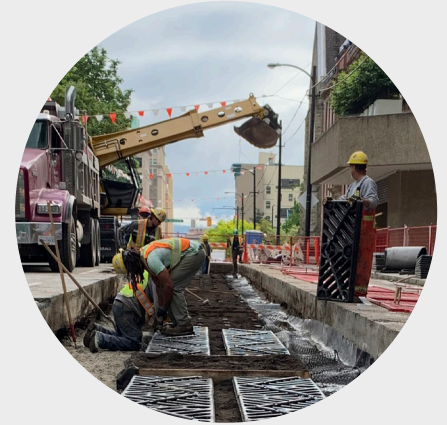
Location



Downtown North and
Downtown South Watersheds



Location of rainwater tree
trenches along Richards Street

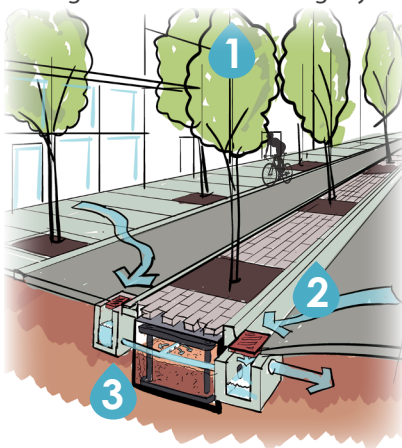


Project overview

Richards Street between Cordova and Pacific Street is part of the first installment of a citywide blue-green system. The system creates corridors that deliver rainwater management, provide active transportation routes to walk, bike, and roll, and add green spaces for the community and wildlife to enjoy. The rainwater tree trenches between Dunsmuir and Pacific capture and clean urban rainwater runoff, while the protected bike path creates safe travelling options. The addition of trees along this corridor contributes to the growth of the urban forest, enhancement of biodiversity, and mitigation of the urban heat island effect.

What is a rainwater tree trench?

Rainwater tree trenches are versatile green rainwater infrastructure assets that are well suited for Vancouver's dense urban environment. The urban rainwater runoff collected on Richards Street and the bike lane is redirected into the rainwater tree trenches. By natural filtration and tree uptake the urban rainwater runoff is absorbed, cleaned and kept from entering the sewer and drainage system.



- 1** **Trees** uptake rainwater through their roots, diverting water from entering our sewer system.
- 2** **Rainwater collection** captures runoff into the tree trench through inlets, catch basins, and permeable pavers.
- 3** **Infiltration** into the soil helps clean urban rainwater runoff and reduces the amount of water entering our sewers.

What is Green Rainwater Infrastructure (GRI)?

GRI is a cost-effective approach to rainwater management that protects, restores, and mimics the natural water cycle. It uses soils, plants, trees, and engineered structures to capture, store, and clean urban rainwater runoff before returning it to our waterways and atmosphere.

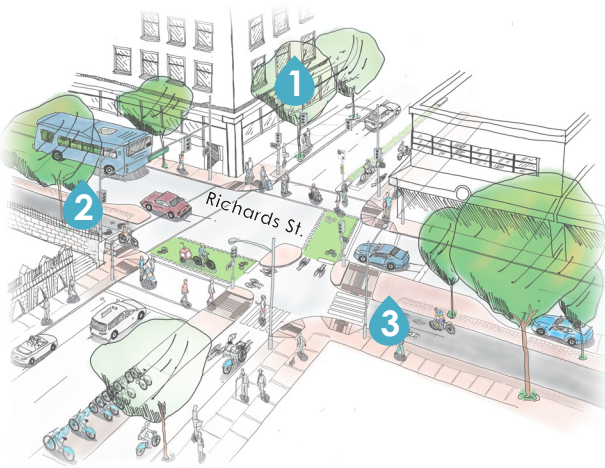
GRI delivers essential drainage services as well as additional co-benefit services such as reducing climate change risks, providing ecosystem services, and offering opportunities to stimulate the local economy.

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Project design

Project elements



1

Trees are nature's air conditioner and purifier. They provide shade, moderate the local climate, mitigate urban heat island effect, and improve air quality. Additionally, they reduce the amount of urban rainwater runoff, store carbon, and provide food, protection, and homes for many birds, pollinators, and small mammals.

2

Green rainwater infrastructure collects, cleans, and absorbs polluted rainwater from streets and sidewalks, improving the quality of water in our surrounding water bodies and protecting marine life and recreation.

3

Bike lanes are all two-way and fully protected providing an All Ages and Abilities active transportation route.

Design components



Permeable pavers allow for infiltration of rainwater into the tree trench while also providing an accessible walking surface. The pattern adds a playful element to Richards Street.



Structural soil has small pockets of growing medium and air between larger rocks that allow for root growth and water infiltration while still being compactable.



Silva cells are engineered frames that hold large volumes of growing medium for tree roots and rainwater infiltration. Silva cells can be compacted on all sides.

Design considerations



Management of all GRI phases of the project, from planning, design, and procurement to inspection and lifecycle operations and maintenance.



Accommodation of four significant utilities in the corridor, including BC Hydro, Water, Sewer, and Electrical.



Coordination with over 20 internal and external stakeholders and procurement of over 30 materials from 5 external vendors.

Richards Street

Rain City Strategy **Green Infrastructure Implementation**



8 blocks, two-way
All Ages and Abilities separated bike lane



100+
new trees



50,973 kg
carbon sequestration over 50 years



16 sensors installed
monitoring soil moisture levels



1.1 hectares
impervious area managed



15 million litres
urban rainwater runoff treated onsite annually



11 million litres
urban rainwater runoff diverted from sewers annually

Timeline & partners for GRI

The Richards Street project as a whole involved numerous Engineering divisions and City departments. **The GRI components were internally designed and constructed, led by the Green Infrastructure Implementation branch.** In the timeline below, key partners that supported the delivery of GRI are identified at each stage of the project.

