

ST. GEORGE RAINWAY

Background | Design Parameters

Green Rainwater Infrastructure Parameters

Utility Conflicts

There are many underground utilities below St. George Street, including gas, drinking water, sewer, electrical, and third party utilities. Each of these has a setback requirement. Because of this, green rainwater infrastructure will occupy the east side of the street in all the options, though the amount of space available for it will vary depending on the street layout chosen. These utility setbacks also mean that no trees can be planted in the front boulevard on the west side of the street.



Road right-of-way area



Underground utility conflicts



Available space for green rainwater infrastructure

Daylighting Infeasibility

We recognize that many in the community have a desire to celebrate and restore natural systems, including lost streams. In this case, it is not part of the scope to 'daylight' (or bring to the surface) the existing buried stream, as it has been buried too deep underground to make this possible. Instead, the rainway will manage local rainwater run-off at the surface using green rainwater infrastructure along St. George Street. Through thoughtful landscape design, artwork, and signage, we hope to honour the lost stream while also enhancing the local environment.



This diagram of St. George Street highlights both the required utility setbacks, as well as the depth at which the lost stream is buried.

ST. GEORGE RAINWAY

Background | About Green Rainwater Infrastructure

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.

Types of Green Rainwater Infrastructure

There are many types of green rainwater infrastructure. Some of the common ones seen in Vancouver include rain gardens, rainwater tree trenches, and permeable pavement.



Rain Gardens (also called bioswales or bioretention) are shallow gardens that feature layers of rocks, engineered soils, and vegetation such as trees, shrubs, and flowers. They help to capture, clean, and convey rainwater.



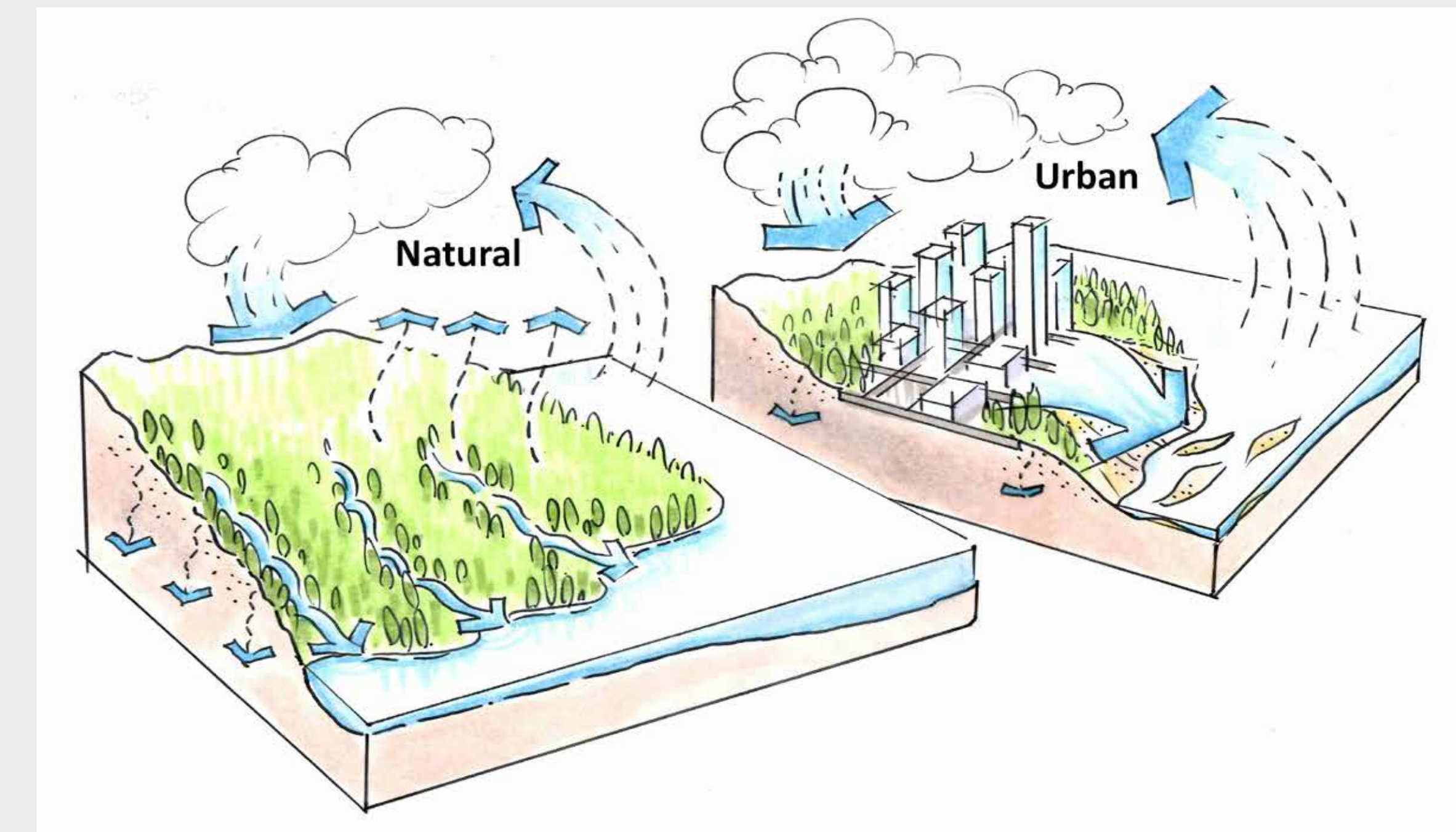
Rainwater Tree Trenches use trees along with underground structures and perforated pipes for rainwater management. Structures underground provide extra room for soil and tree roots to grow while also storing rainwater that can be used by trees.



Permeable Pavement is a special type of surface used on roads, sidewalks, driveways, and parking lots that allows rainwater to pass through the pavement and soak into the ground.

How does Rainwater Become Polluted?

The rainwater that falls on our hard urban surfaces – also known as urban rainwater runoff – collects pollutants found on our rooftops, streets, parking lots, and other hard surfaces. These pollutants are then conveyed with the water through the sewer system to our treatment plants, or directly into local waterbodies.



Pollutants commonly found in rainwater include:

- Hydrocarbons and petroleum pollutants
- Tire dust and debris
- Bacteria and viruses
- Heavy metals
- Litter
- Nitrogen and phosphorous
- Micro-plastics
- Sediment
- Salt

These pollutants can affect aquatic ecosystem health. Green rainwater infrastructure captures and helps clean rainwater before the water infiltrates into underground aquifers or is conveyed through the sewers to surrounding watersheds. A number of studies both in the laboratory and field have proven that GRI is able to capture and help treat rainwater pollutants, with the exception of salt.

ST. GEORGE RAINWAY

Background | Policy context

These are the primary City policies and strategies guiding the development of the St. George Rainway.

The Rain City Strategy

Strategy goals and objectives:

Water quality:

- Improve and protect Vancouver's water quality.
- Increase total green area that treats urban rainwater runoff.

Climate resilience:

- Increase Vancouver's resilience through sustainable water management.

Livability:

- Enhance Vancouver's livability by improving natural and urban ecosystems.
- Mitigate urban heat island effect.

Performance target:

- Capture and clean a minimum of 90% of Vancouver's average annual rainfall volume.



Climate Emergency Action Plan

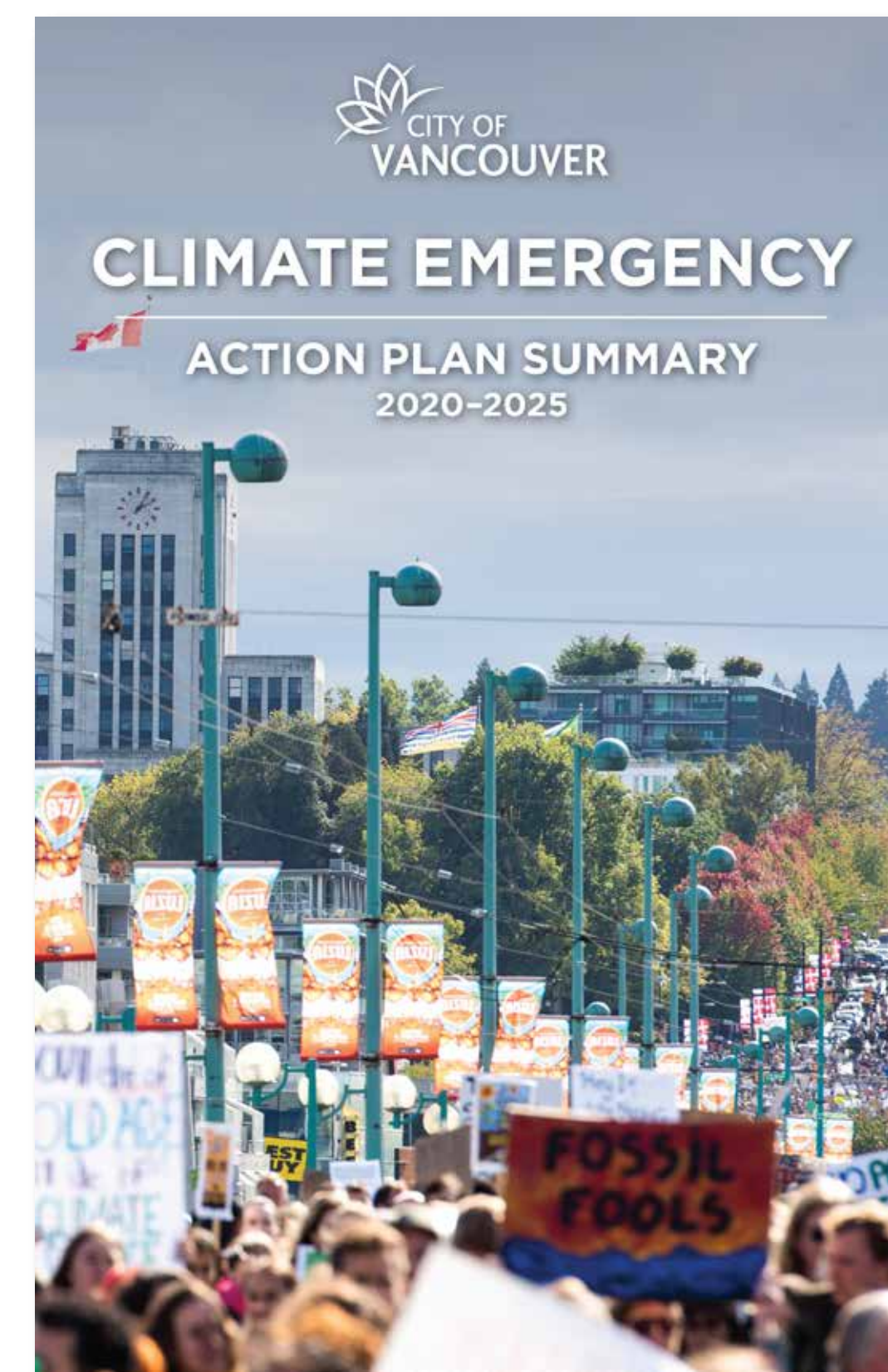
Targets relevant to this project:

Carbon sequestration:

- Remove and sequester at least 1 million tonnes of CO₂ by 2060.

Sustainable transportation:

- 90% of people will live within an easy walk/roll of their daily needs.
- 2/3 of all trips will be by active transportation and transit.



Transportation 2040

Policy Directions: **Walking (with or without mobility aid):**

- Make walking safe, convenient, comfortable, and delightful.
- Ensure streets and sidewalks support a vibrant public life and encourage a walking culture, healthy lifestyles and social connectedness.

Public space:

- Streets and sidewalks are not just spaces to move through, but places to be.

Cycling:

- Make cycling safe, convenient, comfortable, and fun for people of all ages and abilities.



The St. George Rainway is a part of the City's [Capital Plan \(2019-2022\)](#) and will also support the following City of Vancouver & Park Board strategies & motions:

Rainwater Management

- [Integrated Rainwater Management Plan](#)
- [Council Motion - Accelerate Combined Sewer Overflow Mitigation](#)

Environment & People

- [Climate Change Adaptation Strategy](#)
- [Van Play](#)
- [Urban Forest Strategy](#)
- [Biodiversity Strategy](#)
- [Healthy City Strategy](#)
- [Mount Pleasant Community Plan](#)

Streets & Transportation

- [Complete Streets Policy Framework](#)
- [5 Year Cycling Map](#)
- [Council Motion - 11% Road Space Reallocation for people-focused public space](#)

ST. GEORGE RAINWAY

Background | Transportation

Vehicle Access and Parking

Existing On-Street Parking Supply

Parking spaces on St. George Street have the lowest occupancy rate when compared to adjoining streets. Currently, the majority of on-street parking spaces in this area are unregulated, allowing any car to park on most streets for extended periods of time. This can cause issues for neighbourhood residents who cannot find parking close to home.

On-Street Parking Supply



Legend

Parking Regulation	Stall Quantity
Unregulated Parking	230
Restricted 8AM-5PM School Days	50
Residential Permit Parking	20
Passenger Zone	
★ Access to School Grounds	

On-Street Parking Vacancy



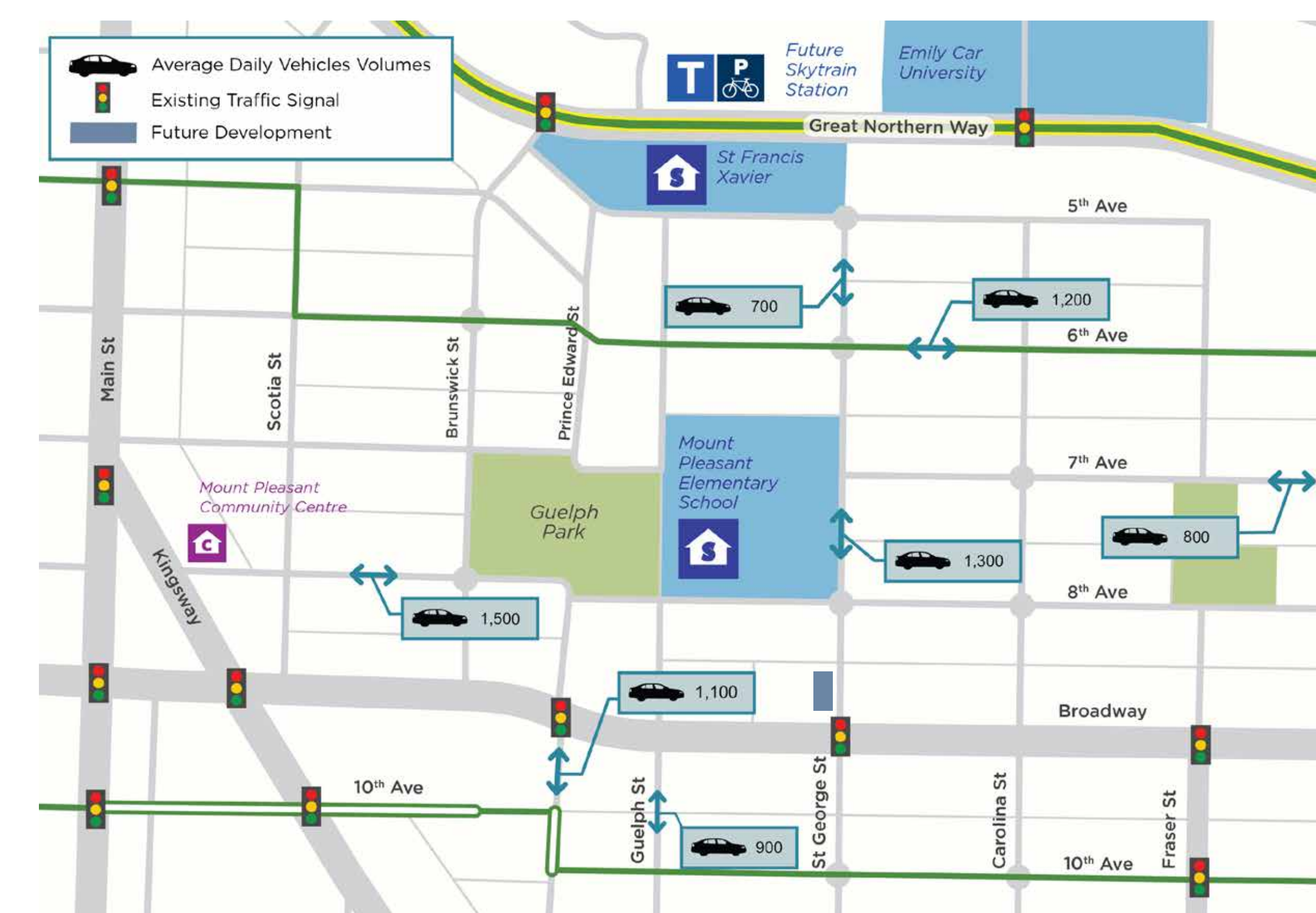
Source: June 22, 24, and 27, 2021. City of Vancouver study of on-street parking inventory and vacancy (collected 11am-3pm and 6pm-10pm).

Legend

— % — Parking vacancy during typical weekday (green represents higher vacancy)

Car Volumes

Currently, there are high volumes of motor vehicle traffic on this stretch of St. George Street, reducing safety and accessibility for cyclists of all ages and abilities (AAA). Amplifying these current high volumes, it is important to note the impact that the new development on the corner of Broadway and St. George Street will have on the Rainway. While the new development will primarily use their own underground parking, accessed from the lane south of 8th Avenue, this new influx of residents is anticipated to increase the area's traffic volumes. High volumes of vehicular traffic are particularly concerning since a majority of the local students from Mount Pleasant Elementary walk to/from school (only 30% of them are driven).



Vehicle volumes based on 24-hour average mid-week day (Tues, Wed, or Thurs) CoV portable hose counts, from which bikes are filtered out.

ST. GEORGE RAINWAY

Background | Transportation

Connections to Existing and Future Cycling Routes

St. George Street from 6th to 15th Avenue would provide a safe and accessible cycling connection to the Mount Pleasant Community. This route was identified in the City's Five-Year Cycling Network Upgrades with a future extension from Broadway to 15th Avenue. It would fill a major gap in the cycling network, linking a number of existing and future routes including 10th Avenue, Off-Broadway, and the Central Valley Greenway.

Currently, there are no viable north-south cycling routes that connect the north-east corner of the community to Broadway. Given the proximity to Emily Car University, Broadway, and the future Skytrain station at Great Northern Way, the St. George Rainway is needed to accommodate safe and comfortable cycling.



*Note: detailed alignment of future bike routes is subject to change.
Source: <https://vancouver.ca/files/cov/5-year-cycling-network-map-additions-and-upgrades-2018-to-2022.pdf>

Designing for All Ages and Abilities

The City's goal is to create infrastructure for people who cycle that is safe and comfortable for all ages and abilities (AAA).

AAA goals that will guide the design for the St. George Rainway include:

- Target motor vehicle volumes below 500/day and speed limits at 30 km/hr on local street bikeways.
- Street widths that allow for parking and safe passing.
- Design intersections thoughtfully to reduce conflicts, increase visibility, and provide clear direction of movement.

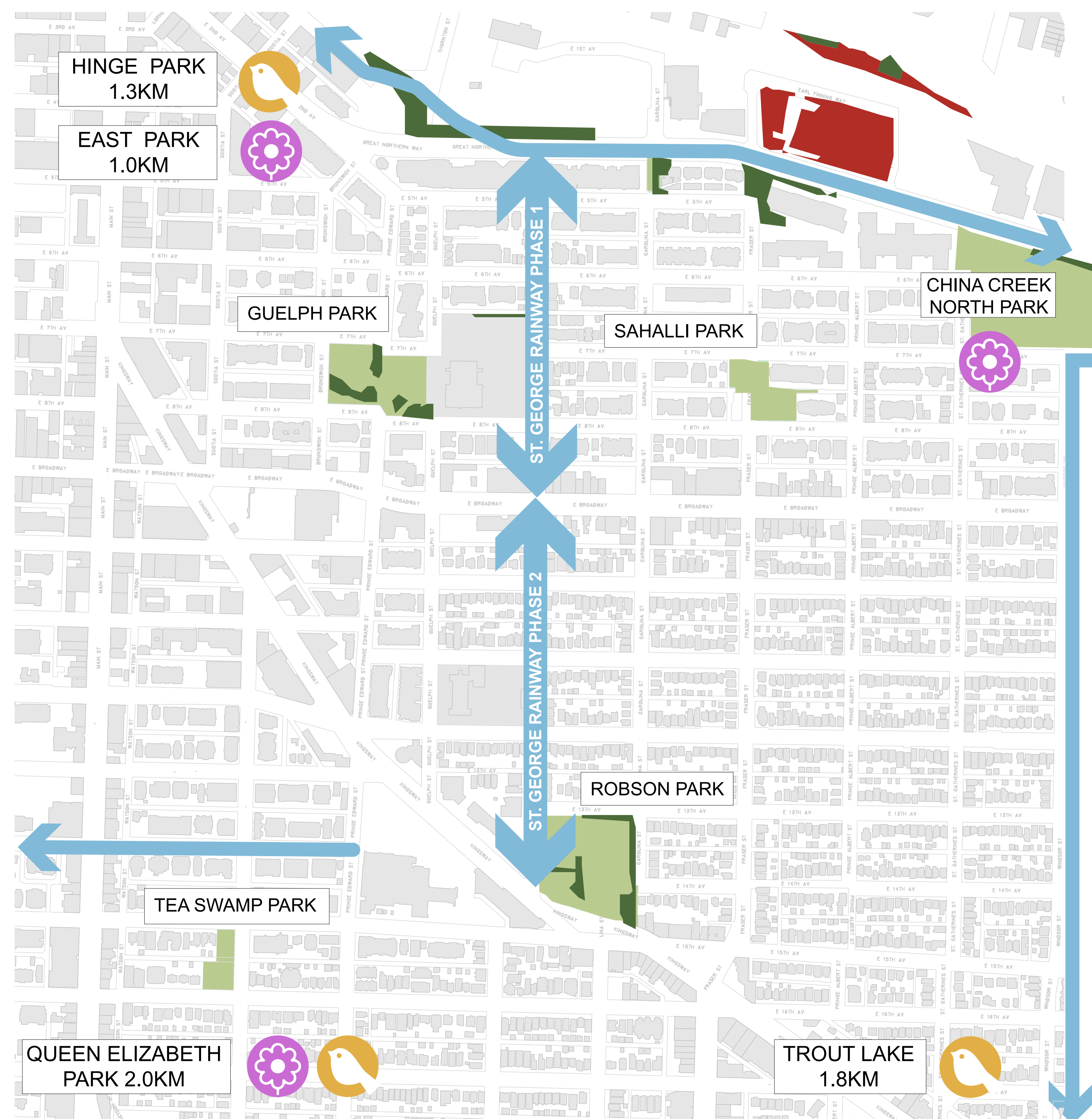


Source:

ST. GEORGE RAINWAY

Background | Biodiversity and Planting

Biodiversity and Habitat Connectivity



Linear green rainwater infrastructure projects, like the St. George Rainway, provide the opportunity to connect habitat patches and mitigate the effect of fragmentation on biodiversity. Close or well-connected habitat parks and hotspots create a habitat network, increasing the resources available to local fauna.

St. George Rainway will provide connections between existing parks, proposed greenways, and priority habitats, including forests and meadows, improving habitat value and connectivity for birds, insects and pollinators.

Priority Habitats

As identified in the City of Vancouver Biodiversity Strategy (2016)

- Forest
- Meadow

Habitat Connectivity

- Proposed blue-green system alignments
- Bird hotspot
- Pollinator Park

Tree Canopy Cover



Planting new street trees along the Rainway will help manage urban rainwater runoff, provide habitat, and help mitigate urban heat island effect. The project area currently has 10% tree canopy cover, which is lower than the city average of 18%.

The City has set the ambitious goal to grow the urban forest canopy cover to 30% by 2050. Planting trees in the Rainway could increase canopy cover in this project area by as much as 13%. With tree planting in this area limited to the east side of St. George Street - due to a water main conflict along the western boulevard - the Rainway presents an excellent opportunity to support and grow a healthy urban canopy cover.