Satellite image of Site 13 area boundaries (red)

December, 2017

LARC444/553 (Girling) City of Vancouver 13

Enhancing Green Networks and Fabric FINAL REPORT

Site 13

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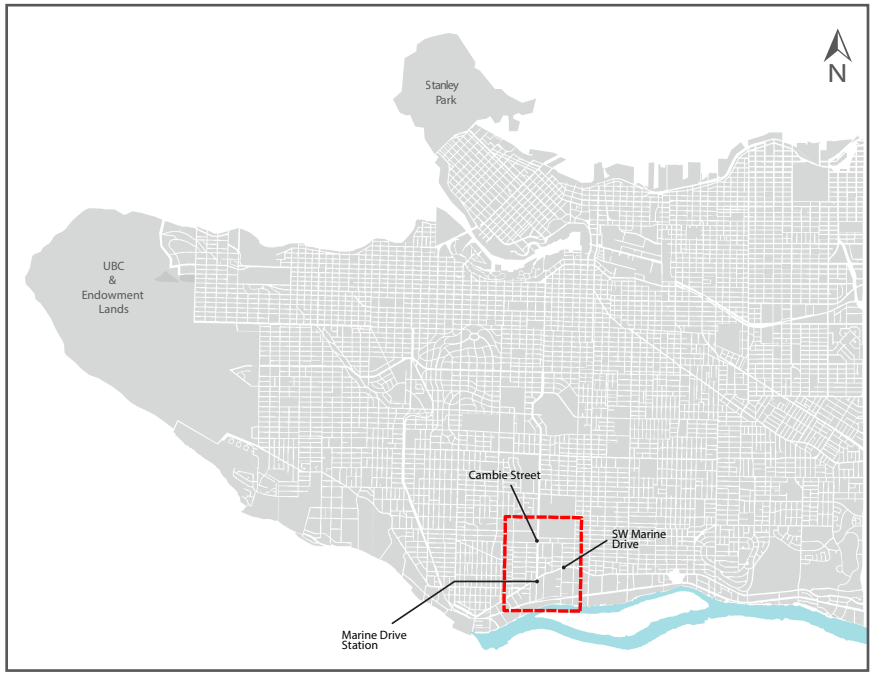
Context of Site 13

Site 13 is located in the most southern portion of the Cambie Corridor. SW Marine Drive and Cambie Street run through the site, and it is also land-marked by Langara Golf Course, the Marine Drive Canada Line station, as well as the Marine industrial district.

Current corridors and networks in Site 13

0 250 500m

Context Map



Location of Site 13 in City of Vancouer

0 3200 6400m

Legend

- Local street bikeway
- Painted bike lanes
- Skytrain line
- Main arterial road
- Skytrain station

Existing Land Use Conditions

The land uses in Site 13 are highly fragmented and isolated from one another. Industrial land is most noticeably restricted to the south of SW Marine Drive, while low density residential land dominates the northern portion of the site.

Land Use Designations

- Commercial
- Civic
- Industrial
- Public land
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Mixed Use

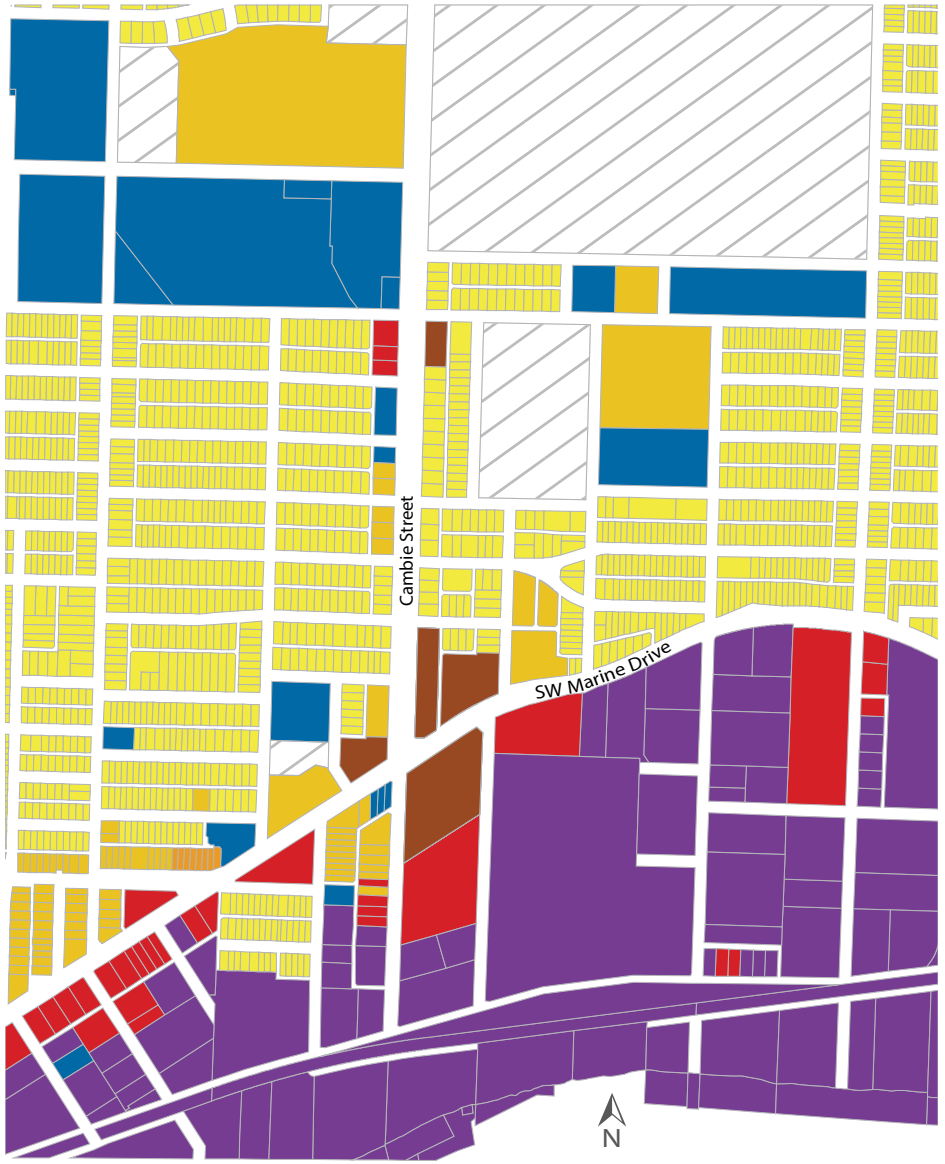
Share of Land Use

36%
Residential land (low, medium, high density)

28%
Industrial land

16%
Civic land

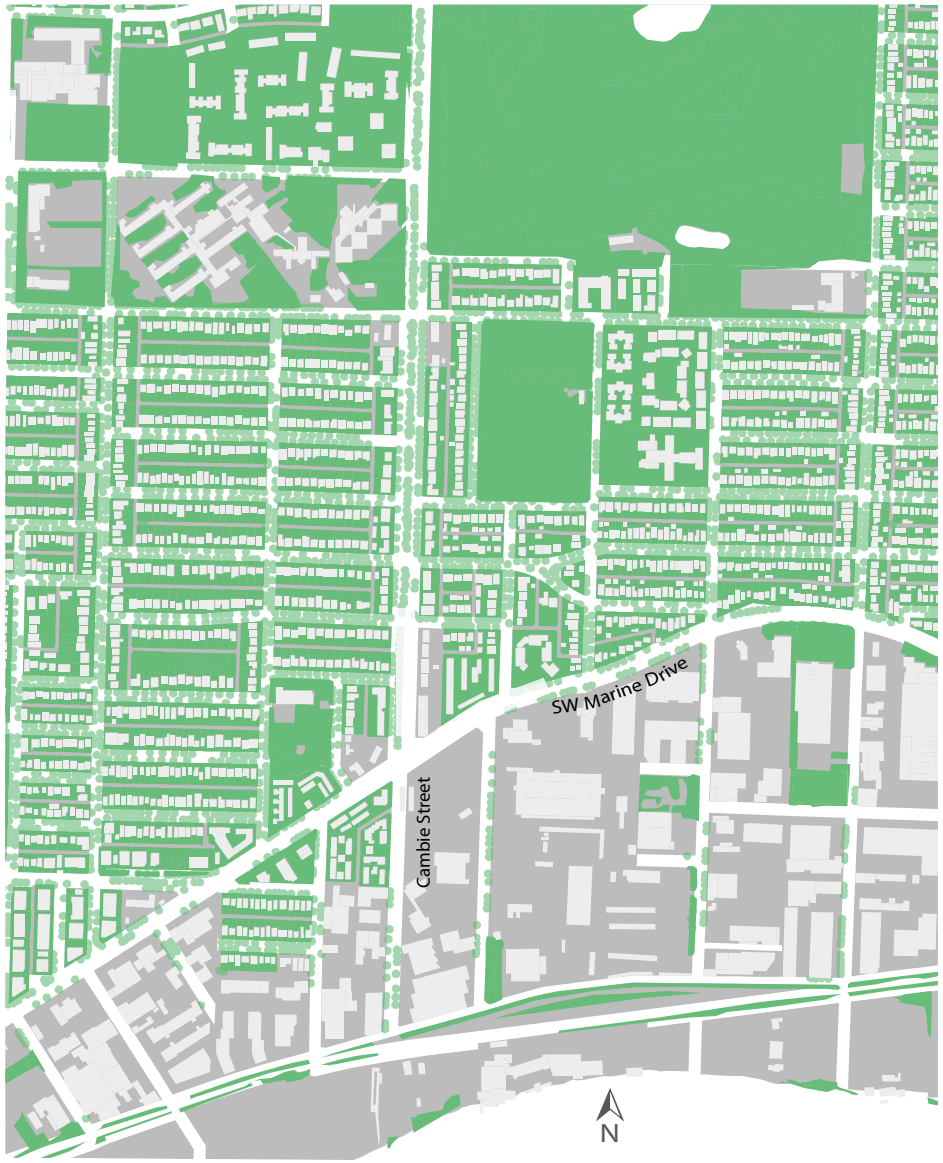
10%
Public land



Land use designations in Site 13

Existing Green and Grey Conditions

There is a sharp visual difference between grey and green landscapes within Site 13. Green cover includes private backyards and frontyards, street boulevards, and public green space. Grey cover includes the building footrpints, roads, and large cement surfaces (i.e., parking lots).



Green and grey conditions in Site 13

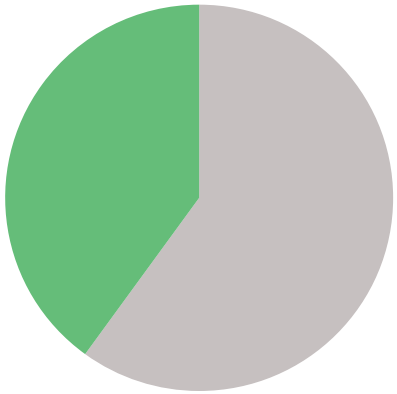
Cover Type

- Grey cover
- Green cover
- Street trees
- Building footprints

Share of Green and Grey Cover

40%
Green

Private lawns significantly contribute to the grey cover due to the dominance of low-density land uses



60%
Grey

The majority of grey space is attributed to the industrial area.

Typical green (left) and grey (right) landscapes within SIte 13

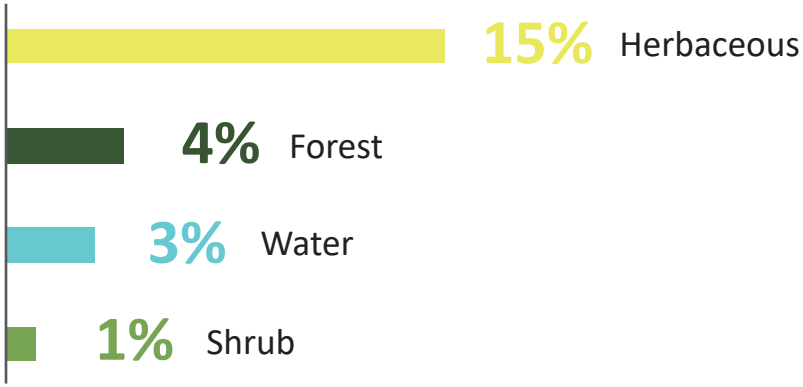
Existing Vegetation Conditions

Most vegetation in Site 13 is focused north of SW Marine Drive, while smaller or thin patches of vegetation are found in the industrial areas.

Vegetation Type

- Water
- Forest
- Shrub
- Herbaceous

Composition of Site



Vegetation in Site 13 is mostly classified as herbaceous (78% of the total vegetation is herbaceous). Since this is a very urban area, most of the vegetation can be considered altered and semi-natural. There is limited forest cover, mostly concentrated around the Langara Golf Course. For these metrics, we excluded vegetation found on private properties.

Vegetation in Site 13, excluding street trees

Existing Tree Canopy Conditions

Site 13 is dominated by deciduous trees, with nearly 5% of street trees being classified as coniferous. This information reflects public trees only, however, private residential properties were observed with mostly deciduous trees while the Golf Course had mostly coniferous trees.

Tree canopy in Site 13, excluding trees on private property

Type of Tree Canopy

- Deciduous canopy
- Coniferous canopy
- Mixed canopy
- Forest

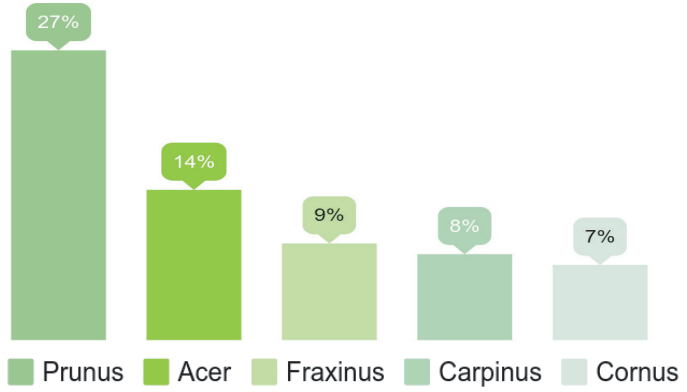
Tree Canopy Composition

95% Deciduous

5% Coniferous

17 ha of tree canopy cover

Top Tree Genuses



Existing Street Tree Conditions

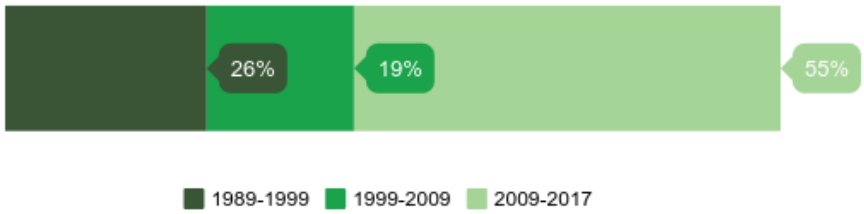
This is a relatively young urban forest, with more than 50% of the street trees planted within the past decade. Recent planting efforts over the last decade have likely led to the increase in tree planting initiatives on city owned property.

Street Tree Diametre

- > 46 cm
- 24 - 46 cm
- 15 - 24 cm
- 7.5 - 15 cm
- < 7.5 cm

Street Tree Diametre & Abundance

Tree Planting Timeline



Street trees in Site 13

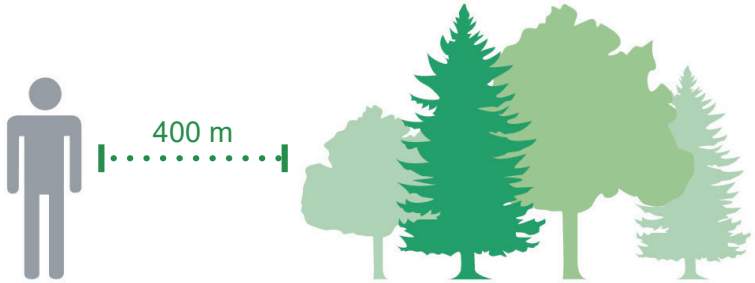
Current Proximity to Green Space

The five-minute walking indicator is often used to illustrate the health or well-being of a community, and the ability for pedestrians to reach features (in this case, natural spaces) using active modes of transportation.

400 metre buffer around vegetation within Site 13

Habitat Type & Naturalness Legend

- 400 metre Buffer
- Riparian
- Freshwater Wetland
- Natural Vegetation
- Semi-Natural Vegetation
- Altered Vegetation



84%

of site is within 400 metres of natural or green space

Not all residents and/or employees are within a five-minute walk (or 400 metre distance) from green space, such as parks and large vegetation features. As stated in the Marpole Community Plan, this area has limited open, green spaces, especially due to the industrial lands to the south where green space is limited.

Existing Biodiversity Conditions

Almost all of the habitat sites and hotspots are situated to the north of our site, more specifically, around the Langara Golf Course.

Habitat Sites & Corridors

- Riparian
- Freshwater Wetland
- Urban Park
- Habitat Hotspot
- Habitat Site
- Habitat Corridor

Current Conditions

1.6 km of habitat corridors

1.8% of site has habitat value

1 habitat hotspot

Interestingly, our only habitat hotspot is located within the Golf Course pond, while the habitat sites and corridors are around the patches of coniferous forest. Site 13 lacks habitat value. A large range of natural habitat cannot exist, in part, because of the amount of grey space and traditional land uses (e.g. residential) within Site 13.

Habitat sites and hotspots in Site 13

Opportunities for Site 13

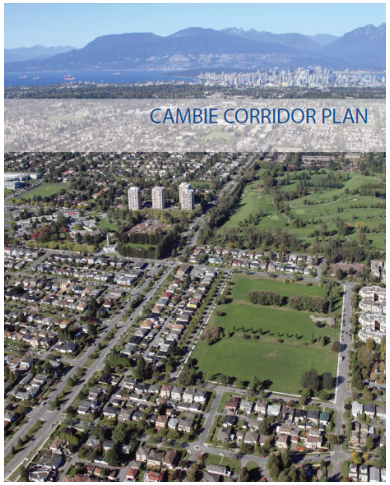
Given the previous analysis of Site 13, there are several challenges within the area. However, there are many interventions that can be introduced to Site 13 to improve the urban forest and foster a healthy community.

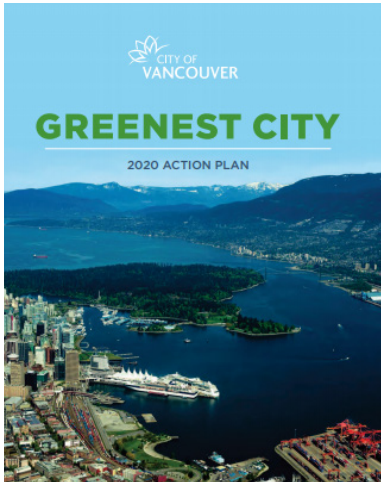
The following city-wide goals will form the basis of the propositions presented in this report:

Ensure everyone is within a five-minute walk of a park, greenway, or natural space
(Greenest City 2020 Action Plan)

Restore or enhance 25 hectares of natural areas by 2020
(City of Vancouver Biodiversity Strategy)

Plant 150,000 new trees by 2020
(Greenest City 2020 Action Plan)





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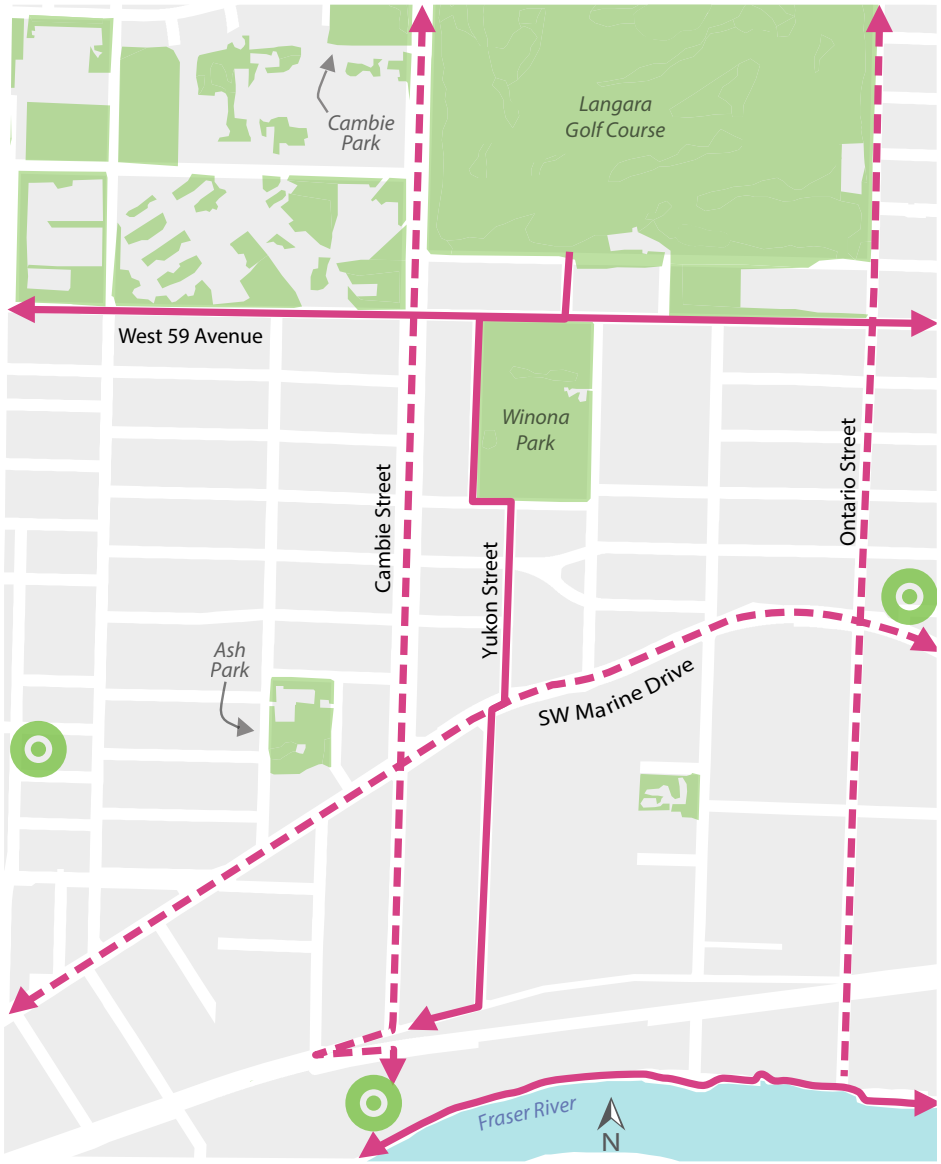
Improving Transportation Networks & Access to Green Space

One of City of Vancouver's goals is to ensure everyone is within a five-minute walk (400 metre radius) of a park, greenway, or natural space. The proposed outcomes from the propositions below is for 100% of people in Site 13 to be within this radius.

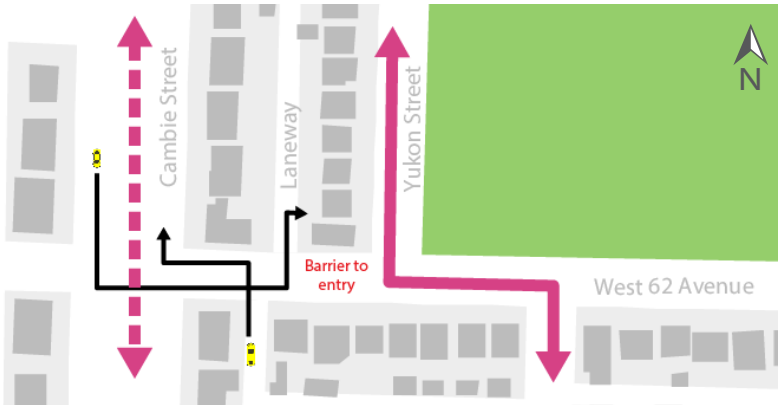


Proposed greenway network and parks

Propositions

1. Using the 45 metre rights-of-way for greenways and green infrastructure
2. Restore the Fraser River shoreline with public access
3. Transform vacant or underutilized land into parks
4. Add additional pocket parks
5. Close non-arterial streets (that run near habitat corridors) to automobile traffic

Closed Street Concept



When a street is closed to cars, they must access houses via laneways

Legend

- Greenway (Closed Street)
- Greenway (Shared Street)
- Urban Green Space
- Direction of Car Traffic
- Proposed Park Site

0 250 500m

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Enhancing Biodiversity & Habitat Connectivity

Propositions to enhance biodiversity and habitat connectivity reflect the City of Vancouver's goal of restoring or enhancing 25 hectares of natural areas by 2020. The below propositions would provide an additonal 10 hectares of habitat value to Site 13.

Proposed habitat sites, hoptspots and corridors

Propositions

1. Restore the shoreline of Fraser River
2. Increase wetland areas in the Langara Golf Course
3. Enhance habitat value of existing and new parks
4. Improve habitat corridors and connections

Proposed Outcomes

1.9 km additional habitat corridors

5.27% of site will have habitat value

10 ha of additional habitat sites

3 additional habitat hotspots

Legend

- Proposed Habitat Corridors
- Urban Park
- Existing Habitat Sites
- Existing Habitat Hotspot
- Proposed Park Sites
- Proposed Habitat Sites
- Proposed Habitat Hotspot

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Enhancing the Tree Canopy

Propositions to enhance the tree canopy stem from the City of Vancouver's goal of planting 150,000 new trees throughout the city by 2020. The below proposition are based on adding approximately 4,000 trees to Site 13.

Propositions

1. Increase street trees in the industrial areas
2. Focus planting along greenways and habitat corridors
3. Increase tree cover in parks
4. Enhance the diversity of tree species

Corridors of Tree Planting Focus

Proposed transportation network (left) and proposed habitat corridors (right). See page 12 and 13 for the legends.

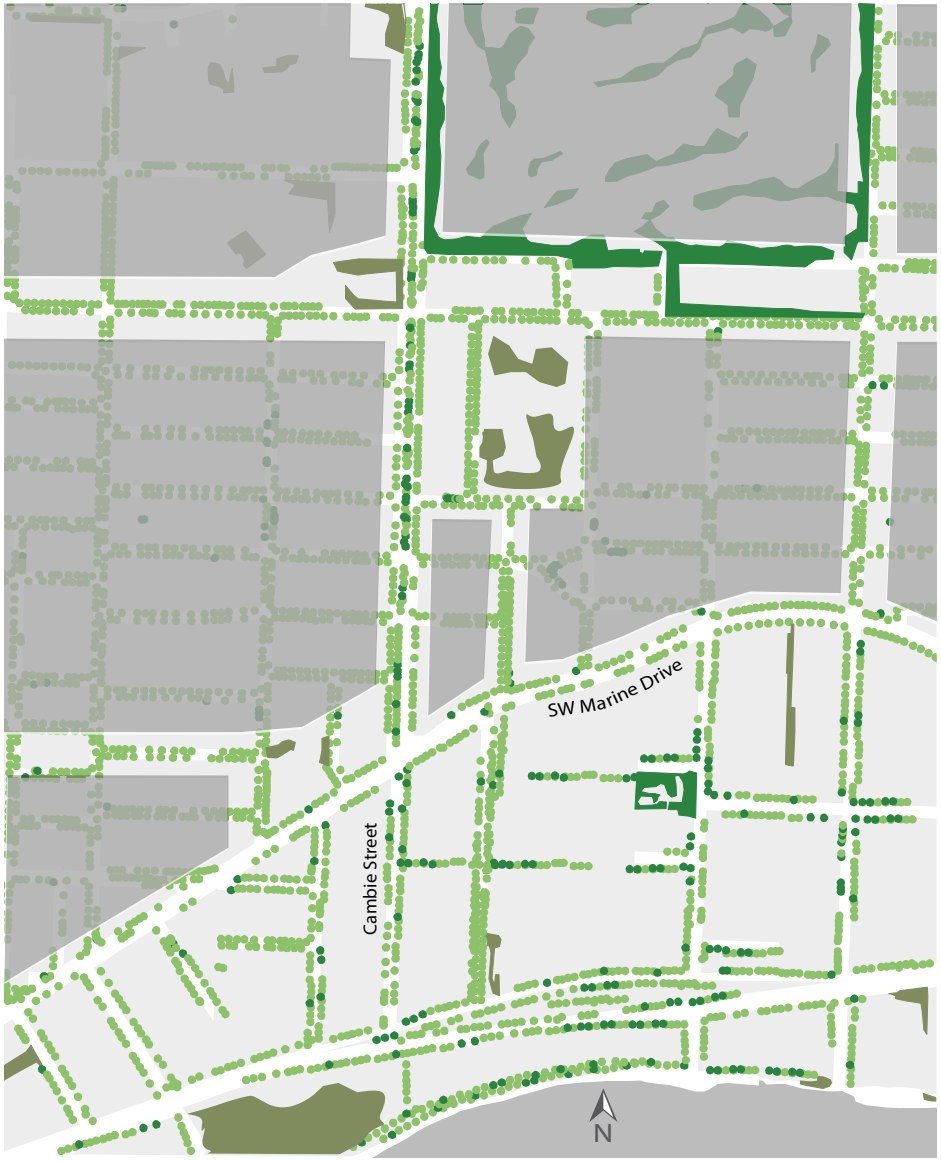
Proposed Outcomes

25 ha of additional tree canopy cover

14 ha of additional street tree canopy cover

Legend

- Deciduous canopy
- Coniferous canopy
- Mixed canopy
- Forest



Proposed street tree and public tree canopy

0 250 500m

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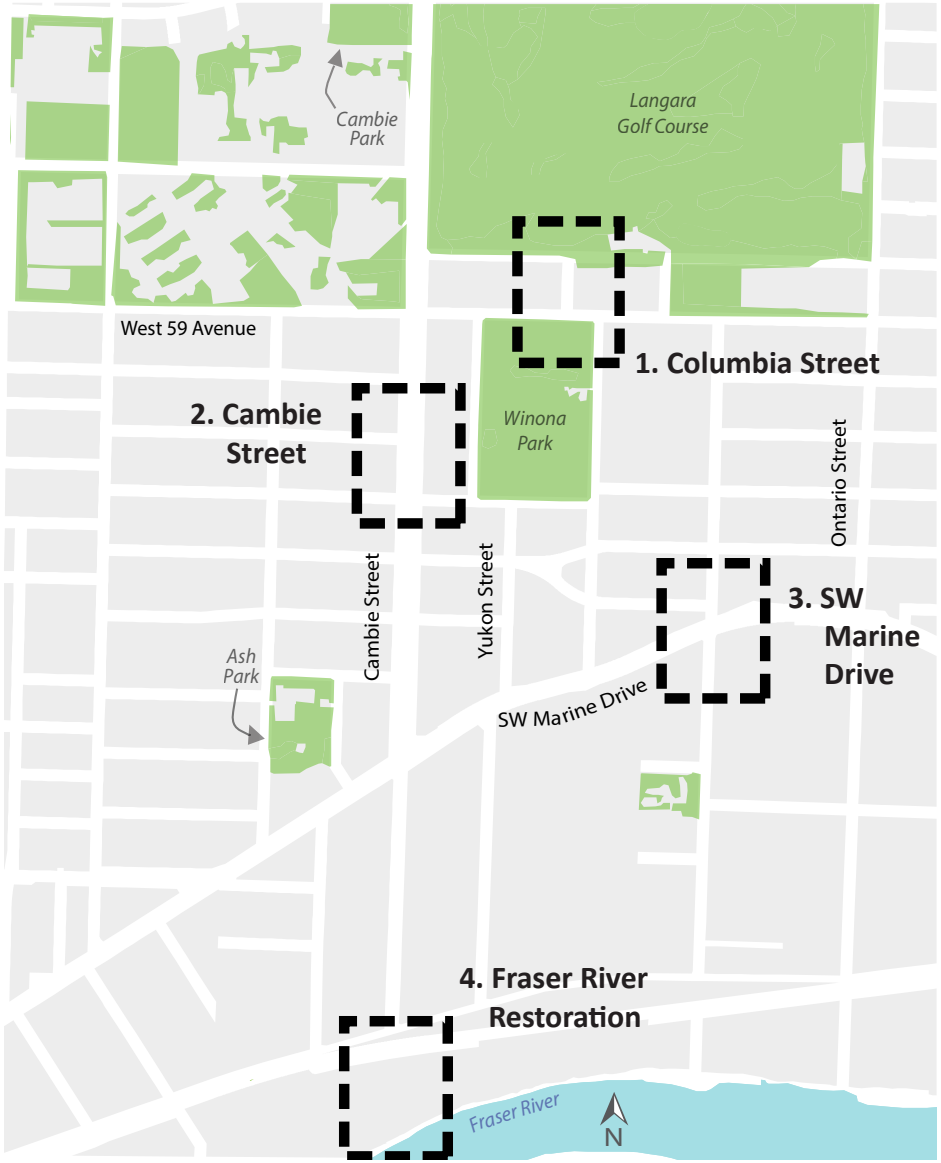
A Closer Look - Four Zoom Studies

Four areas within Site 13 will be investigated with more in-depth propositions and interventions. The ecosystem matrix below displays the focus of each zoom study and the ecosystem services that will be improved.



General location of the four zoom studies

Ecosystem Matrix

Zoom Study	Regulating	Provisioning	Cultural	Supporting
1. Columbia Street	Runoff mitigation: Bioswales Canopy Cover: Added street tree cover Wildlife Habitat: Increased green connectivity between habitat hotspots	N/A	Recreation: Enhanced park space Aesthetics: Increased plant cover Traffic calming: Planted Median	Biodiversity: Increased species composition
2. Cambie Street	Canopy Cover: Added street tree cover Wildlife Habitat: Connected green corridor Runoff mitigation – Bioswales	N/A	Traffic Calming: Planting Bioswales	Biodiversity: Increased species composition
3. SW Marine Drive	Urban Heat Island Mitigation: Increased shade tree cover in susceptible area Runoff mitigation: Increased plant cover in impervious areas	N/A	Aesthetics: Added plant cover in low vegetated area Recreation: Green pedestrian corridor	Biodiversity: Increased species composition
4. Fraser River Restoration	Carbon sequestration: Increased forest productivity Flood/Runoff mitigation: Increased riparian planting Erosion mitigation: River bank planting	N/A	Recreation: Park creation	Biodiversity: Increased species composition

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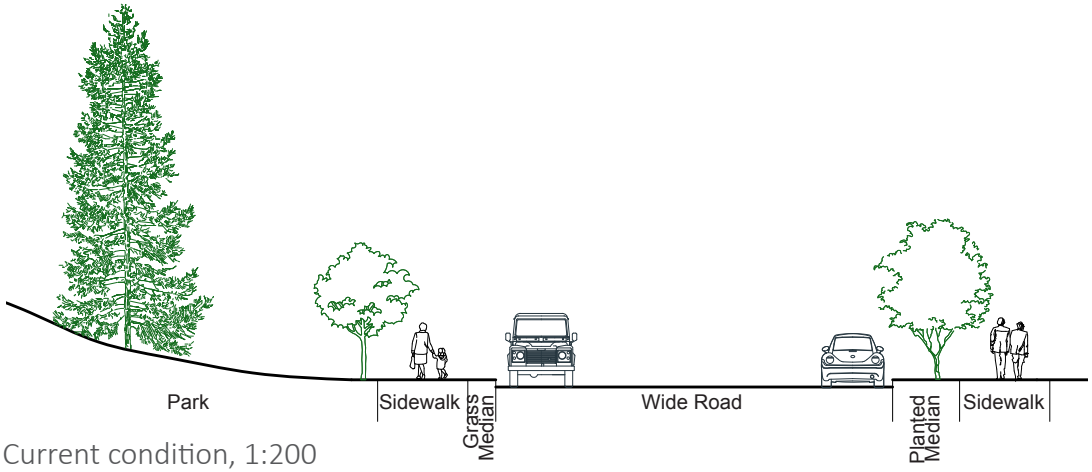
Zoom Study 1 - Columbia Street

This zoom study focuses on Columbia Street between 59th and 62nd Avenues (Langara Golf Course and Winona Park).

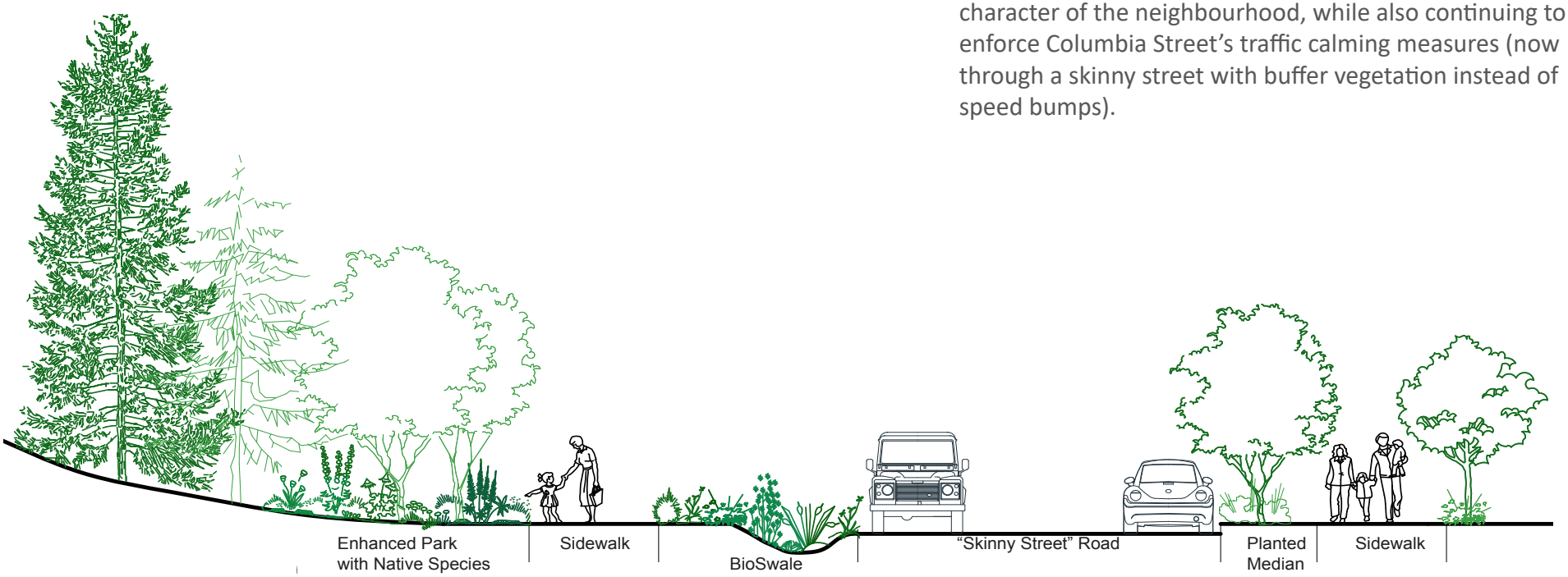
Team member: Michelle Whiticar



Current condition, 1:200

Goal: Create an ecological corridor and improve connectivity between Langara Golf Course and Winona Park. Potential habitat enhancement area.

How: Turn Columbia Street into an ecological corridor by narrowing the road for cars to provide room for habitat enhancement innitiative to the area. Creation of bioswales along the side of the road to aid with storm water runoff and filtration, adding gardens with a high diversity of native plant species to enhance habitat and improving/adding canopy cover along the edge of Winona Park. These initiatives would add to the character of the neighbourhood, while also continuing to enforce Columbia Street's traffic calming measures (now through a skinny street with buffer vegetation instead of speed bumps).



Proposed condition, 1:100

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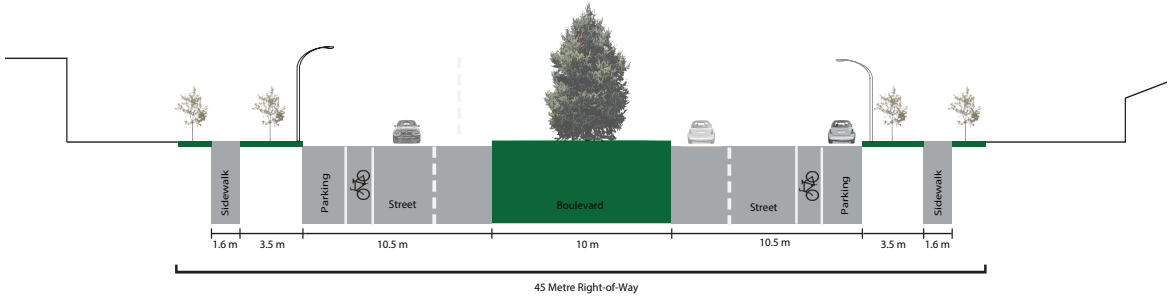
Zoom Study 2 - Cambie Street

This zoom study focuses along Cambie Street around West 60th Avenue. This area along Cambie Street includes both commercial and residential land uses that are characteristic of the south Cambie Street area.

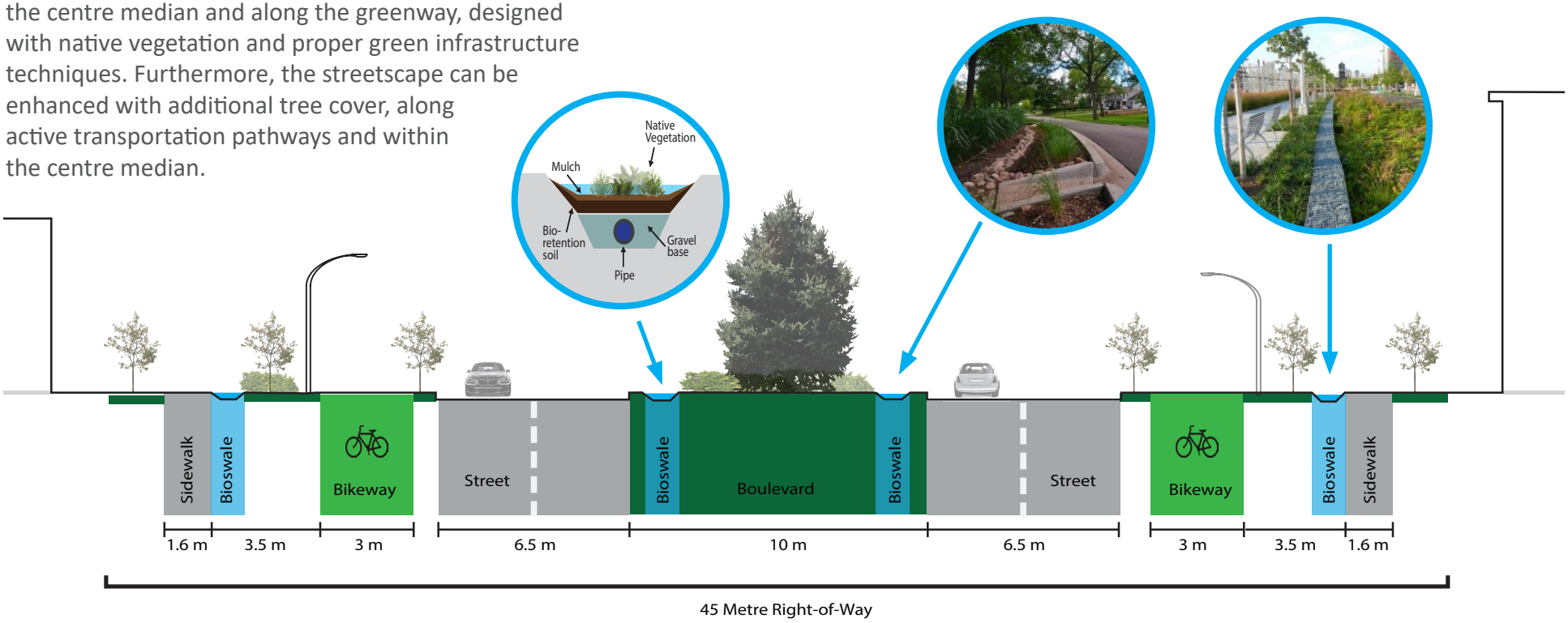
Team member: Jessica Lee

Goal: (1) Enhance community safety and access to commercial and community services through an off-street greenway, (2) support biodiversity through introducing green infrastructure.

How: Cambie Street has 45 metre right-of-way which can accommodate off-street greenways (improved bikelanes and sidewalks) by reducing car use to two lanes only. Bioswales can also be accommodated within the centre median and along the greenway, designed with native vegetation and proper green infrastructure techniques. Furthermore, the streetscape can be enhanced with additional tree cover, along active transportation pathways and within the centre median.



Cross section of current conditions along Cambie Street



Cross section of proposed street design and green infrastructure features along Cambie Street

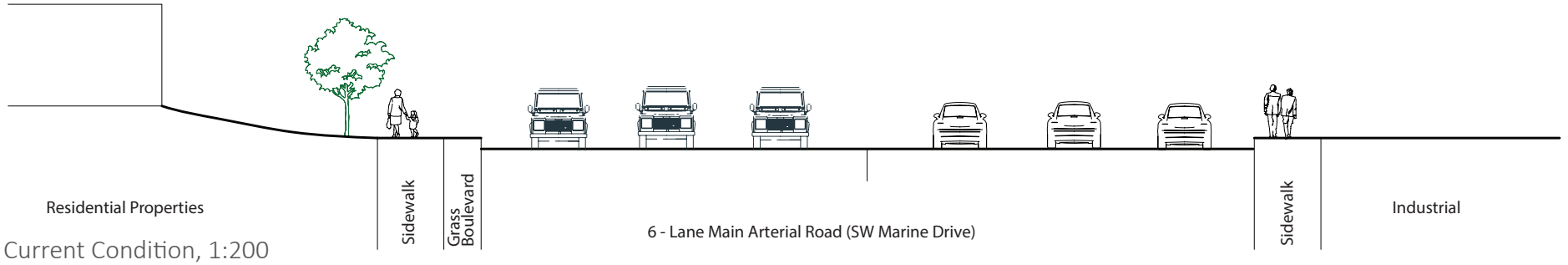
Zoom Study 3 - SW Marine Drive

SW Marine Drive is one of the largest main arterial roads in Site 13 and acts as the interface between low density residential and industrial land uses.

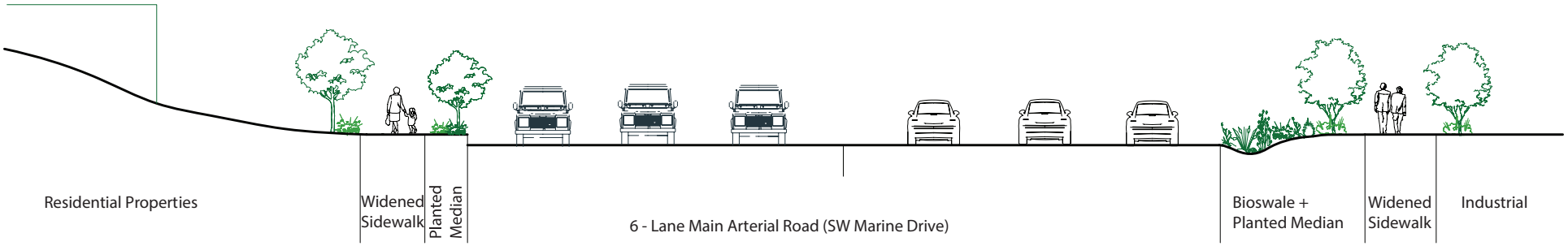
Team member: Vanessa Aragona

Goal: Turn SW Marine drive into a proposed green corridor with a greenway, increase pedestrian usage and create a green buffer for the industrial land uses.

How: Increase the street tree canopy coverage along SW Marine Drive and other connecting streets within the grey industrial area. Introduce bioswales along the industrial side of SW Marine Drive to assist with water infiltration and improve the ecosystem. Widen sidewalks to create safer pedestrian access. These adjustments would create a green pedestrian corridor within the grey industrial area of SW Marine Drive.



Current Condition, 1:200



Proposed Condition, 1:200

Zoom Study 4 - Fraser River Restoration

This zoom study proposed for the vacant 10-hectare lot on West Kent Avenue to be transformed into an urban forest/wetland restoration project along the Fraser River.

Team member: Alexander DeRoehn

Currently, the City plans to turn this land into parkland with the inclusion of bike paths. However, this study looks to improve upon the city's initial plans and use this opportunity to promote ecosystem resilience and watershed improvement.

The inspiration for this proposal draws heavily from the Jericho Park and Beach restoration projects between 2011 and 2013. Similarly, the Jericho project saw not only concrete removal and riparian restoration, but also the redevelop of a naturalized forest in Jericho park. This site would utilize similar measures to complete this project. Similarly, this proposal incorporates natural forest as well as riparian strengthening.

Drawing from Jericho park, this area would focus on natural riparian vegetation. Mostly through broadleaf species such as cottonwood, big leaf maple, and birch. The current plan would be to plant roughly 1,000 tree per hectare. This will support an increase in canopy cover. River edges would be strengthened with natural, low lying herbaceous and shrub vegetation to mitigate runoff from local industrial areas. This would prevent future runoff from making it into the Fraser river.

The ecosystem services focus of this site involves regulating and supporting services. Mostly through riparian habitat restoration, water quality and runoff improvements, as well as increasing tree canopy and biodiversity. Regulating services include the sequestration of carbon and water quality improvement. Supporting services include wildlife habitat and biodiversity.

Location of the focus area

Current conditions of the area