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North Vancouver's waterfront** recreation
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December 2008** motivate
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Executive Summary

The Spirit Trail is a visionary project that will connect North Shore communities with a common, waterfront oriented alternative transportation route. The Trail, envisioned as a multi-use greenway, accessible to all, will provide a trail connection from Horseshoe Bay to Deep Cove. The Spirit Trail will contribute to reductions in greenhouse gas emissions and provide healthy recreation and transportation options for North Shore residents and visitors. As such, the Spirit Trail will fulfil many of the goals and objectives outlined in the City's sustainability-focused Official Community Plan.

For the City of North Vancouver the Spirit Trail will be in integral component of the City's evolving waterfront, contributing to a highly accessible and dynamic waterfront while retaining important port-related industries. The Spirit Trail will provide the much needed connections to existing and planned destinations along the City's waterfront.

The project an initiative of the North Shore Municipalities, the provincial government, First Nations, and other organizations, working in partnership to achieve the Spirit Trail vision. Once built the Spirit Trail will offer an alternative waterfront transportation route that will provide North Shore residents and visitors with safe and accessible recreational and commuting options.

The City of North Vancouver initiated a planning process for the 6.5 km of the Spirit Trail that runs through the City in the fall of 2007. This report details the analysis, planning and design of the City of North Vancouver Spirit Trail.

Phase 1 of the planning for Spirit Trail included a detailed analysis of the site

conditions, an public consultation process, and a proposal for the trail alignment. The overall analysis of the trail identified barriers to movement, challenging intersections, existing and potential points of interest, and route gaps. The proposed trail alignment was also placed within the existing greenway, bike way, and ecological corridor networks.

There are several challenges to accomplishing the goals set for the Spirit Trail. Several locations along the trail will require structural crossings such as overpasses or bridges to create the desired connections. Funding opportunities for these large capital projects are being pursued concurrently with the design and planning phases. These include an overpass at MacKay Creek over the CN Rail lines, a crossing on the E. 3rd Street hill above Heywood Street, as well as several other sites along the proposed alignment.

Challenging intersections, locations of gateways or key nodes, and the existing character of the trail has also been identified. In addition to barriers, there are several gaps in the trail that are preventing connections between the eastern and western portions of the Spirit Trail. These gaps are centred around the area east and west of Bewicke Avenue on the Squamish Nation lands and CN Railway lands. Already one of these gaps is being narrowed. The City of North Vancouver and the Squamish Nation are jointly constructing the first part of the Spirit Trail on the Mosquito Creek Marina waterfront and the project is expected to be complete by the end of 2008. Other gaps in the proposed trail alignment will require negotiation and agreements with private land owners, options for the closing of these gaps have been explored in this study.

A proposed trail alignment was presented to the community for input in 2008. The majority of the public was very enthusiastic about the trail with some neighbourhood concerns to be addressed as the project moves into the design phase. Stakeholders insights to the trail alignment have been incorporated into the proposed trail alignment found in this report. A detailed description of the public process and feedback is included in the appendix to this report.

The City Council approved the trail alignment in April 2008. The project then proceeded to conceptual design solutions for the trail.

During Phase 2 of the project, design solutions were proposed for the constraints identified during the first phase of the project. Solutions were proposed for typical sections as well as for the unique conditions that occur along the trail. Special attention was paid to areas where there were neighbourhood concerns about the trail.

Not only were the technical issues of the trail resolved during this phase, but an identity for the trail was also proposed. A vocabulary of nodes was developed to ensure that the trail is a connected series of experiences. These direct and inform the trail user as well as offer options to stop and enjoy different parts of the City. The identity of the trail will be informed by the city's waterfront location and natural character as well as an overlay of wayfinding elements and site furnishings that make the Spirit Trail a highly recognizable part of the City's fabric.

The second phase was presented to the public in two open houses during early June.



Introduction

In 2002 the City of North Vancouver adopted a Park and Greenways Strategic Plan as one tool to help it achieve its vision of a liveable, sustainable, diverse, and complete community. This plan recognized the need to improve connections between existing parks and open spaces through the development of greenways. In addition to the Bicycle Network, greenways provide options for people moving through the city. Greenways incorporate sidewalks, innovative stormwater management, urban forestry, naturalized landscapes, and recreational amenities.

Four greenways were identified: the Green Necklace, the Upper Levels Greenway system, the Ravine Greenway system, and the Waterfront Greenway system.

In 2007, the North Shore municipalities, City of North Vancouver, District of North Vancouver, and District of West Vancouver, collaborated on a proposal for a waterfront oriented trail that would connect Horseshoe Bay to Deep Cove. They called this trail, the Spirit Trail.

Through the City of North Vancouver, the alignment of the Spirit Trail will generally follow the route of the Waterfront Greenway system. It will connect the City to the District at both the eastern and western boundaries.

The City's proportion of the Spirit Trail, (approximately 6.5 km) will link familiar destinations and new landmarks along the waterfront. It will connect a many components of the City including parks, industrial areas, commercial hubs, and office parks. Spirit Trail will provide safe and convenient alternative transportation options across the City of North Vancouver. The trail will offer increased health and wellness

opportunities to residents and visitors as well as increase cycling acumen and ability.

This document synthesizes the planning and design work that has been completed to ensure Spirit Trail will be a safe and convenient amenity. The desire is that the Spirit Trail will showcase sustainable design practices and is fully integrated into the community.

The planning and design of the Spirit Trail has been guided by the following goals.

The trail should:

Be Waterfront Oriented



The alignment of the trail will be along the waterfront or with a waterfront view as much as possible.

Be Accessible to All



This includes walkers, cyclists, in-line skaters, and those with wheeled mobility aids.

Act as an Ecological Corridor



Wherever possible the trail should act as an ecological corridor connecting wildlife habitats and showcasing innovative green infrastructure.

Form a Linear Park



Connect existing park and public spaces by a linear greenway with park-like amenities.

Have a Unique Identity

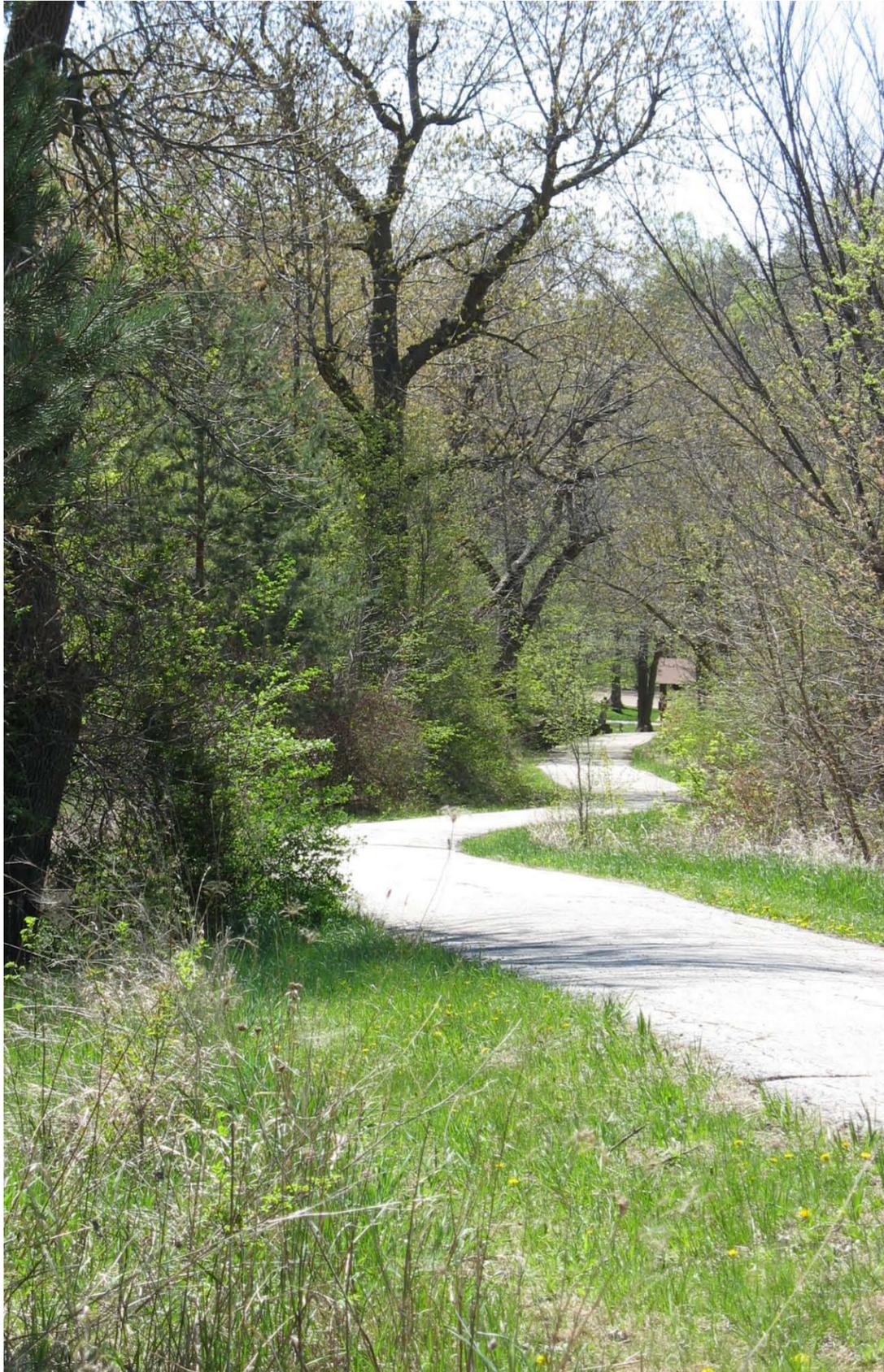


Users of the trail should always know when they are on the trail. The character of the trail should be a point of civic pride.

Separated from Traffic



Wherever possible the Spirit Trail should be separated from vehicular traffic. In addition, where space permits cyclists and pedestrians should also be separated from each other to increase safety.



Multi-use trail through a naturalized area.

Overall Analysis

The existing conditions along the proposed trail alignment are examined in the section of the report.

Regionally Significant Trails

This map shows the proposed alignment for the entire Spirit Trail in relationship, both in scale and connections provided, with other significant regional trails.

The Baden Powell Trail is a 42 km upper level trail that connects Horseshoe Bay with Deep Cove through the forested regions of the North Shore mountains. It has several access points and connects to other local trails.

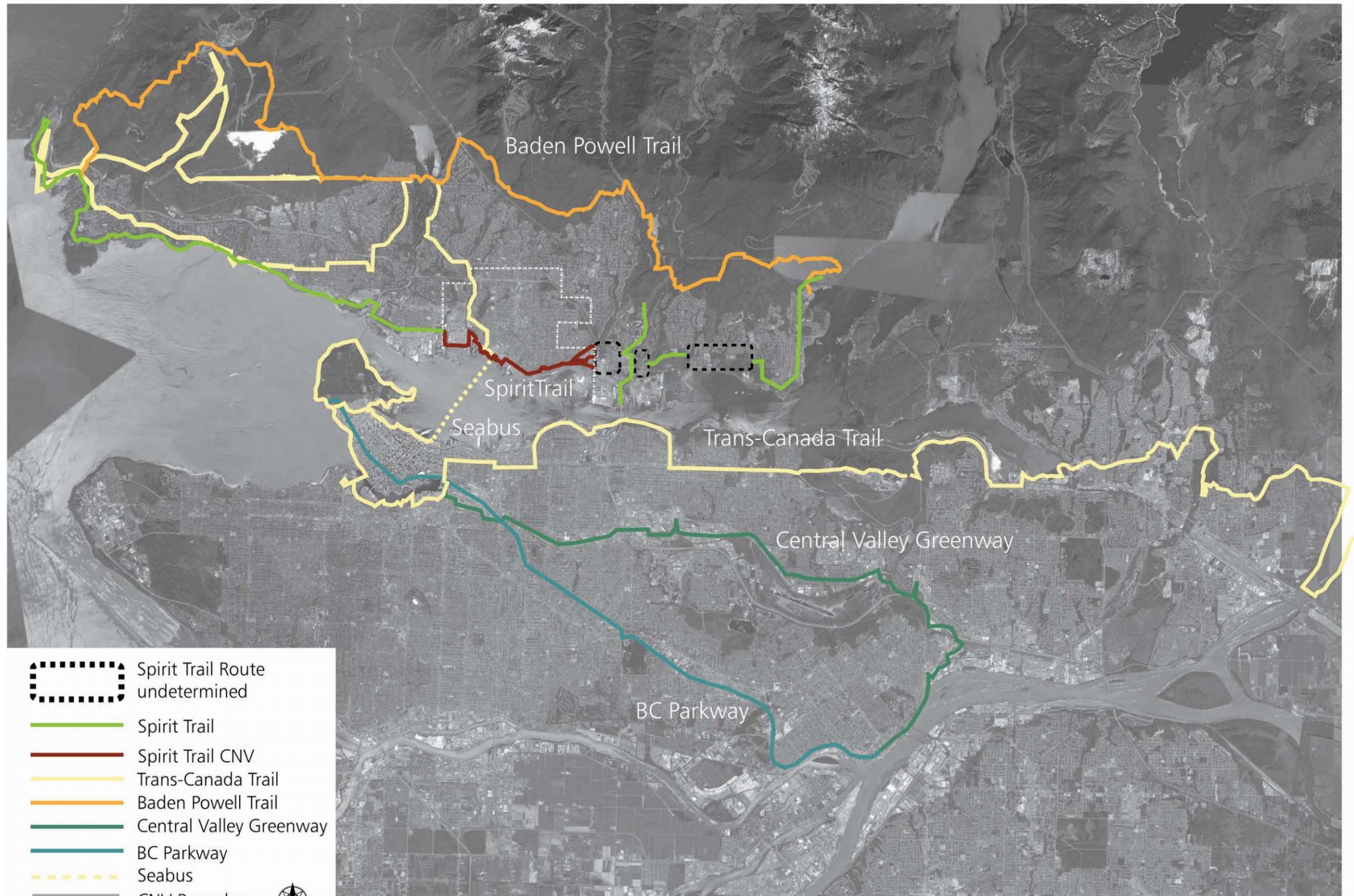
The goal of the Trans-Canada trail is to link communities, parks and wilderness areas from British Columbia to Newfoundland. It is a multi-use trail accommodating cyclists, walkers, horseback riding, cross-country skiing and where applicable snowmobiling.

BC Parkway is a 19 km linear parkway/trail connecting False Creek in Vancouver to the Quay in New Westminster. It provides a separated bicycle and pedestrian trail. It was built as legacy of Expo 86 and roughly follows the Expo Skytrain line. Updates for this trail are currently being studied.

Central Valley Greenway is a 25 km trail that approximates the route of the new Millennium Skytrain line. It is a pedestrian and bicycle trail that will connect existing Skytrain stations, bus routes, bike routes, and greenways. The trail incorporates public art, restored habitats, public amenities, improved safety, and sustainable design innovations.



CNV Spirit Trail - Regionally Significant Trail Systems



- Spirit Trail Route undetermined
- Spirit Trail
- Trans-Canada Trail
- Baden Powell Trail
- Central Valley Greenway
- BC Parkway
- Seabus
- CNV Boundary



Trail Locations are approximate.

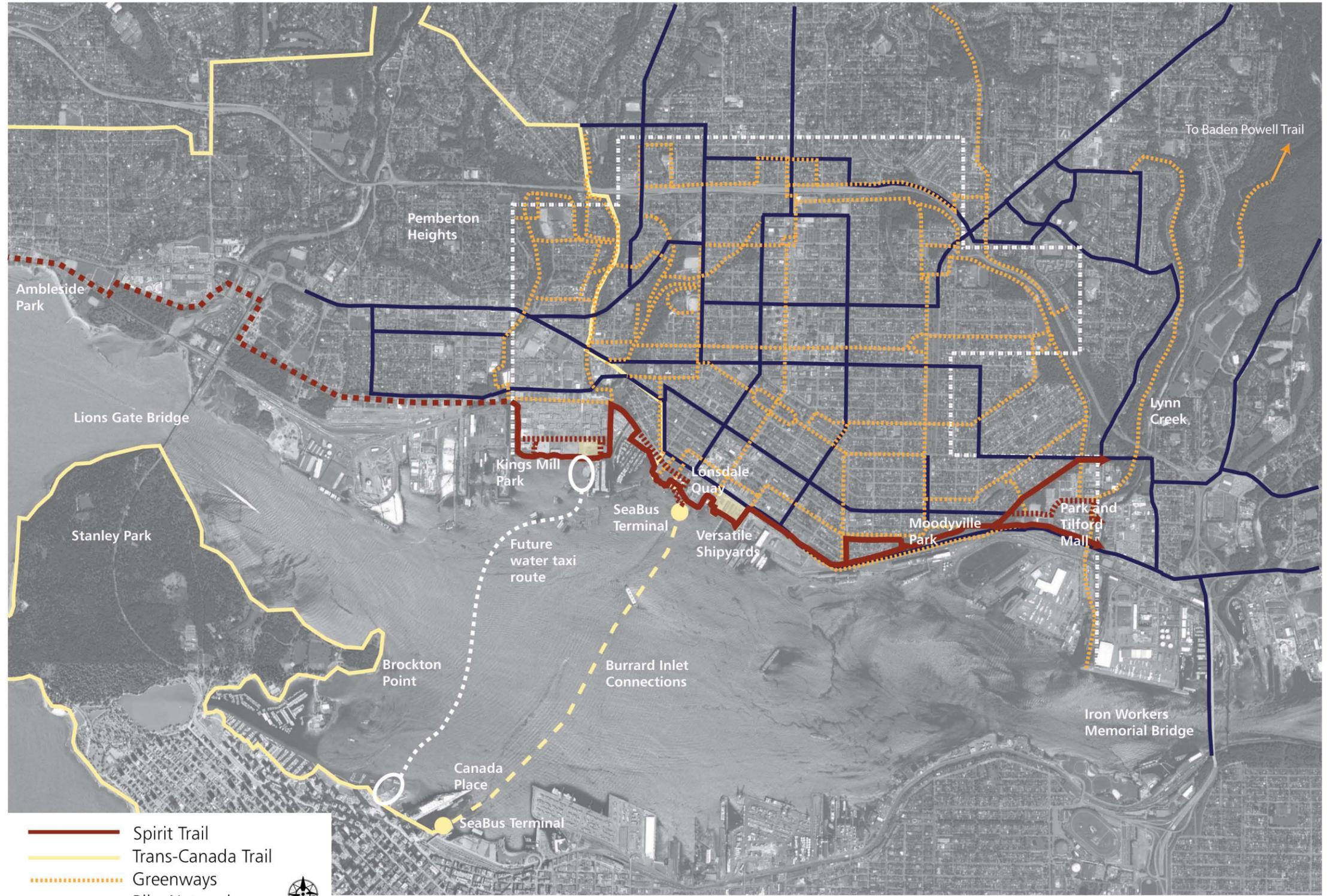
North Vancouver Alternative Transportation Network

The Spirit Trail is being planned to integrate with, and provide options for the North Vancouver bicycle network, the City's greenway system, and the Trans Canada Trail.

The alignment of the Spirit Trail located outside of the City of North Vancouver boundaries is approximate and will be further resolved when the Districts of North Vancouver and West Vancouver finalize their route planning processes.



Spirit Trail - North Vancouver Alternative Transportation Network



Site Analysis Overview

This map provides an overview of the site conditions along Spirit Trail.

The Main Route (red solid line) is the preferred primary alignment of the Spirit Trail. The Secondary Route indicated by the red dotted line is the alternate route for Spirit Trail. This alternate route provides redundancy which allows commuter cyclists to bypass slower routes, provides pedestrians with route options that may avoid waits at intersections and in some instances provides alternative access in areas that do not allow for a fully accessible trail.

Decision making points are areas where the user can either stay on Spirit Trail or leave the trail for another greenway or bike route. Wayfinding at these points will be important.

Problem intersections have been identified and specific design solutions will be explored in Phase 2 of this study.

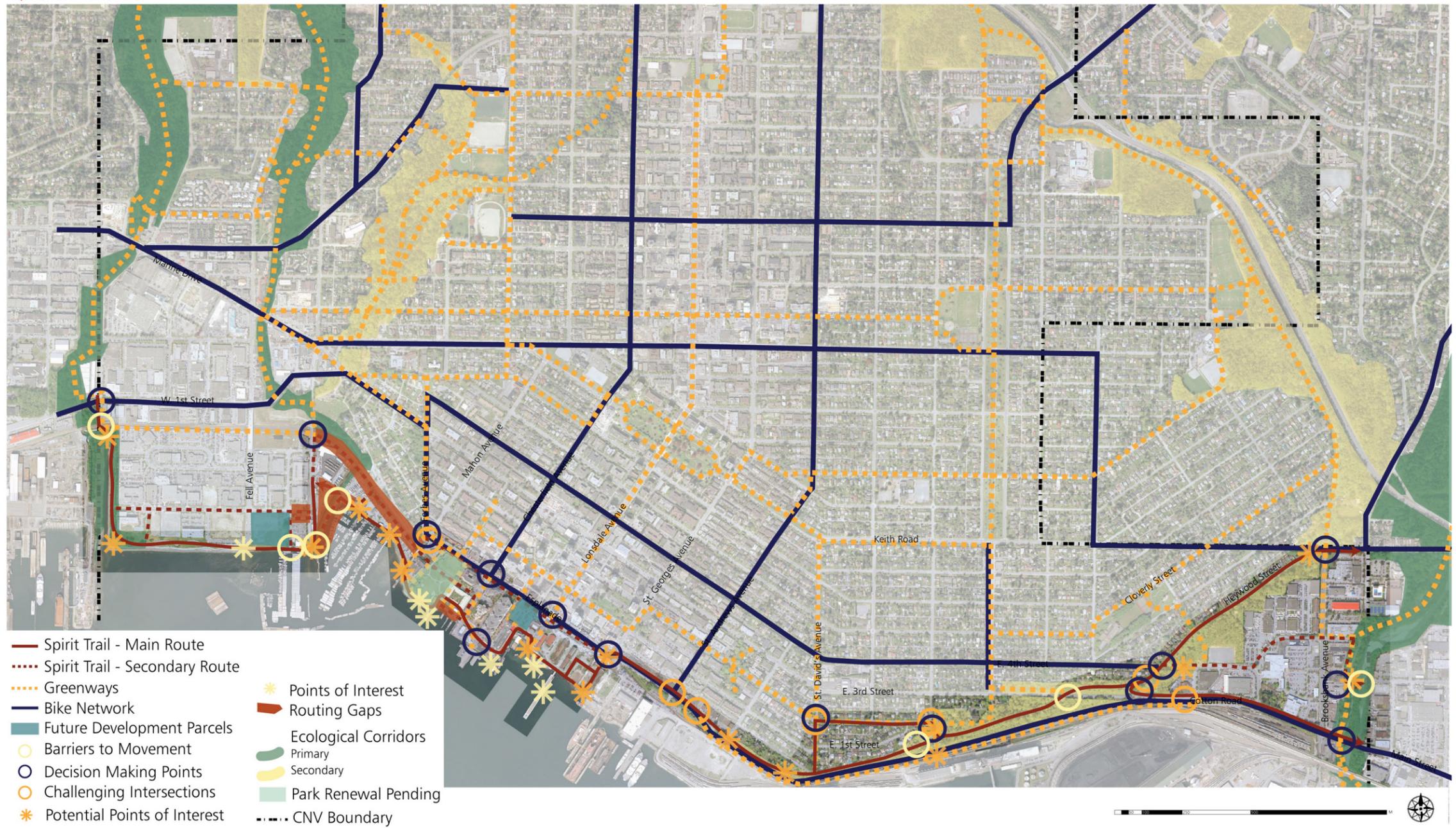
Routing Gaps are areas in which access issues have not been resolved to date. {There is currently no agreement in place with private owners to enable the western part of the Spirit Trail (Kings Mill Walk area) to connect to the eastern parts of the trail. The routing gaps between the Mosquito Creek Marina and Bewicke Ave must be addressed in order to connect the trail}.

Recommendations will be provided for future parcel development and park renewal areas in Phase 2 of this study.

Points of interest are major nodes of seating, historically important areas, and major plazas. Potential points of interest are locations where these types of programs could be expanded.



CNV Spirit Trail - Site Analysis Overview



Barriers to movement (creeks, railway tracks, and major roads), denoted by the yellow circle, are locations where crossings such as overpasses and bridges are required to connect parts of the Spirit Trail or to increase safety. These will be further examined in Phase 2 of this study.

Existing Stopping Points

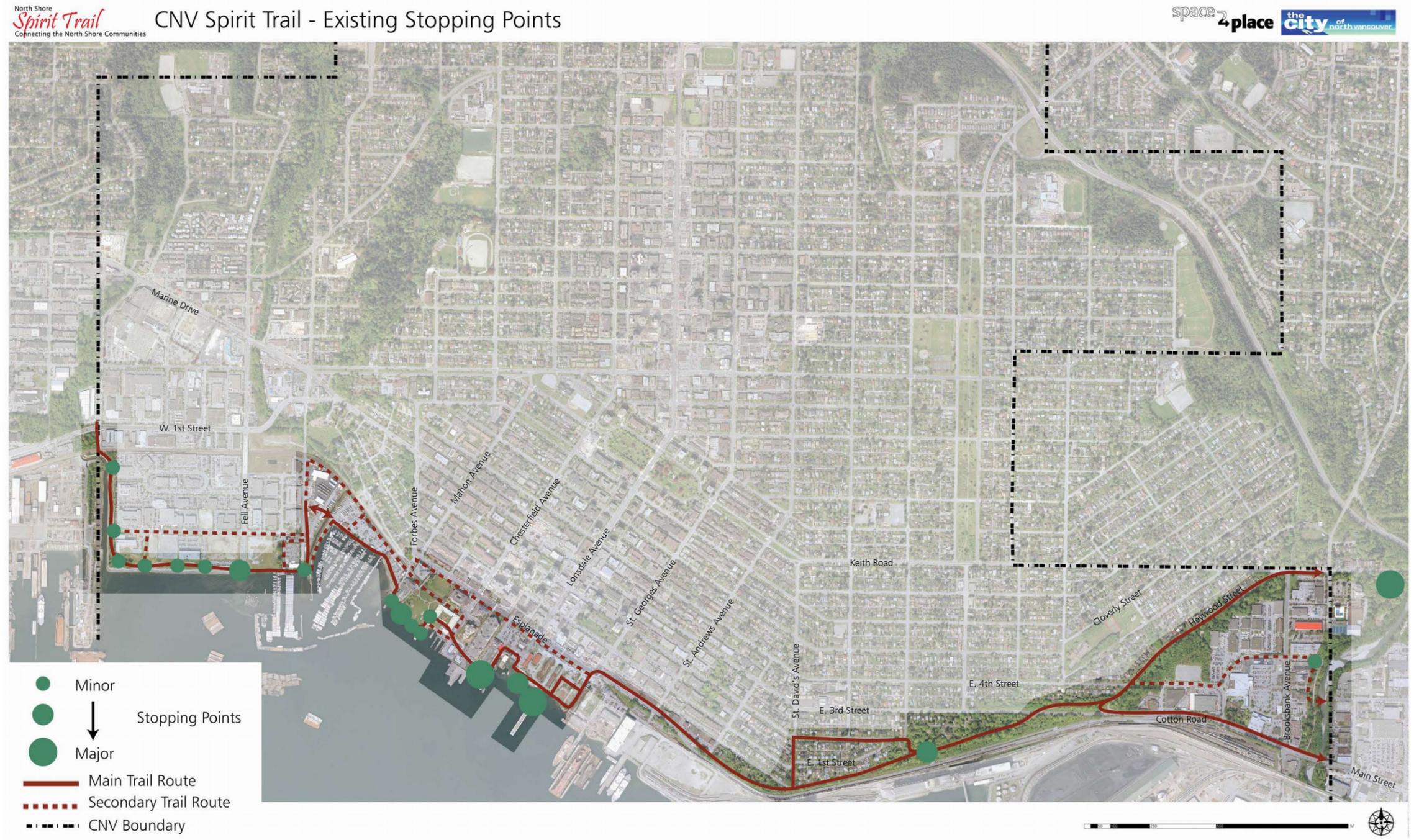
Locations of existing stopping points along the proposed alignment of Spirit Trail are identified.

Minor stops include benches, small lookouts, and amenities such as drinking water fountains.

Intermediate stops include areas with seating for multiple groups and locations of interpretive signage.

Major stops include large seating areas, plazas and main destinations along the trail.

Existing amenities along the Spirit Trail are almost entirely located on the western portion. There are currently long stretches of the eastern part of the trail without any amenities for rest stops making it difficult for some segments of the community to use and enjoy. Future design of the Spirit Trail should include a higher proportion of amenities along the eastern portion of the trail.

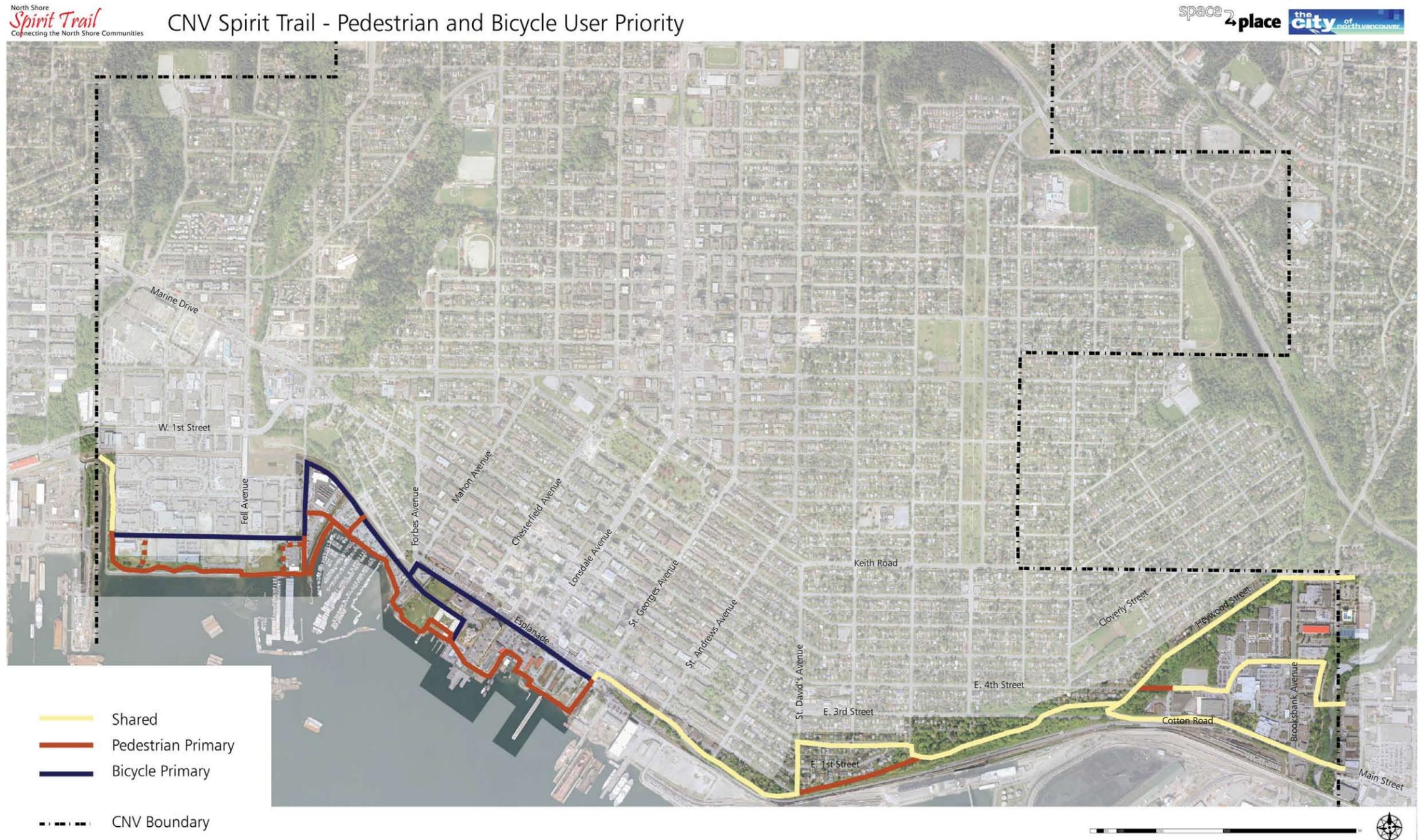


Pedestrian and Bicycle User Priority

The Spirit trail is divided up into areas that are shared by pedestrians and cyclists and areas designated primarily for pedestrians or cyclists.

Areas are designated Pedestrian Primary for two reasons: some areas have grades that do not allow for an accessible trail and locations which have a high volume of pedestrian users. Cyclists are allowed on these trails but may be required to carry their bikes up and down stairs or be required to dismount or ride slowly due to pedestrian volumes.

Areas designated as Bicycle Primary are parts of the trail where cyclists are given priority. These routes are encouraged for commuter cyclists and faster speeds are allowed. Pedestrians are allowed on these parts of the trail but priority is given to cyclists.



On/Off Street Spirit Trail

Parts of the trail that are designated to be on-street or off-street are displayed here.

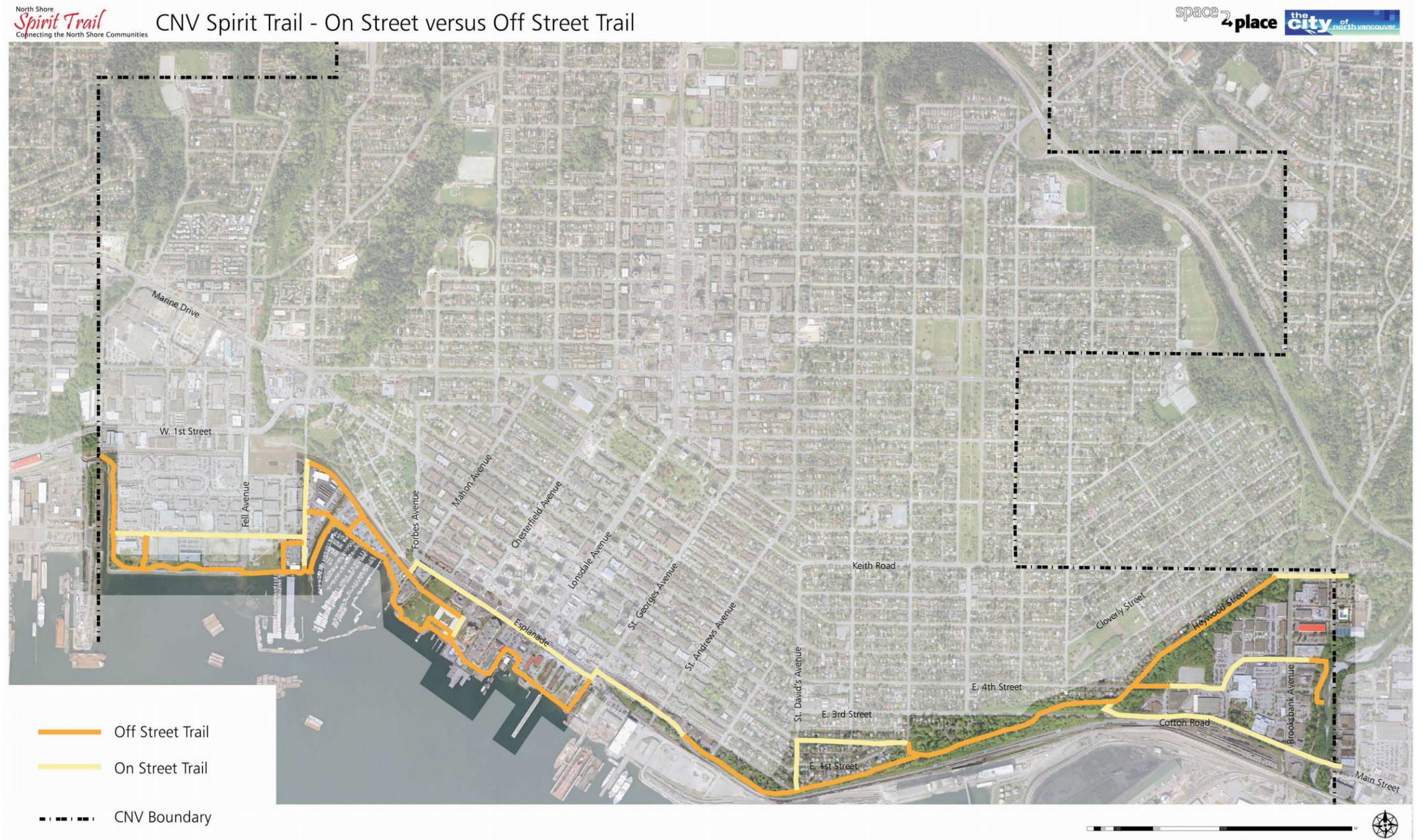
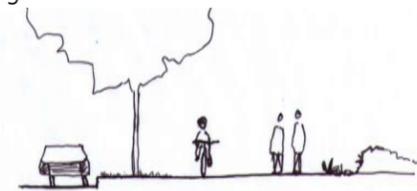
On-street parts of the trail may consist of pedestrian sidewalks (regular or enhanced) and on-street bike facilities. The bike facilities may include a lane shared with vehicles or a separate bike lane alongside of the vehicle lanes.

Off-street parts of the trail will consist of a pathway that is separated from vehicular traffic. This path may be separated or shared between cyclists and pedestrians.

Diagram of an On-Street Trail



Diagram of an Off-Street Trail



Walking Distances

This map shows approximate walking times along the Spirit Trail starting from the Lonsdale Quay.

From the Quay it takes approximately 1.5 hours to walk to the eastern edge of the City of North Vancouver and 35 minutes to the western edge.





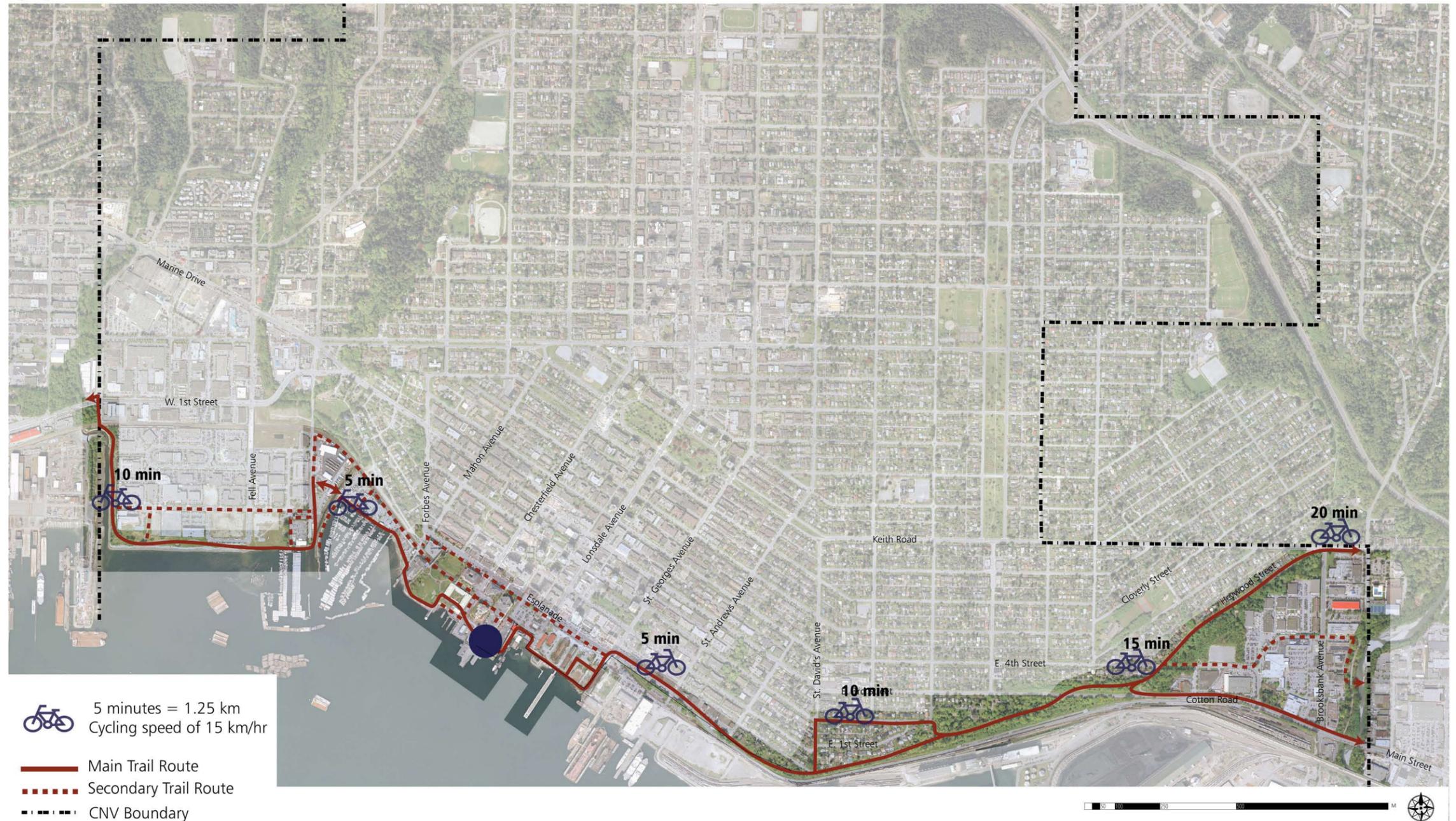
CNV Spirit Trail - Cycling Distances



Cycling Distances

This map shows approximate cycling times along the Spirit Trail starting from the Lonsdale Quay. These times assume an average speed of 15 km/hr which equates to a leisurely recreational speed of travel.

From the Lonsdale Quay it takes approximately 35 minutes to cycle to the eastern edge of the City of North Vancouver and 20 minutes to the western edge.



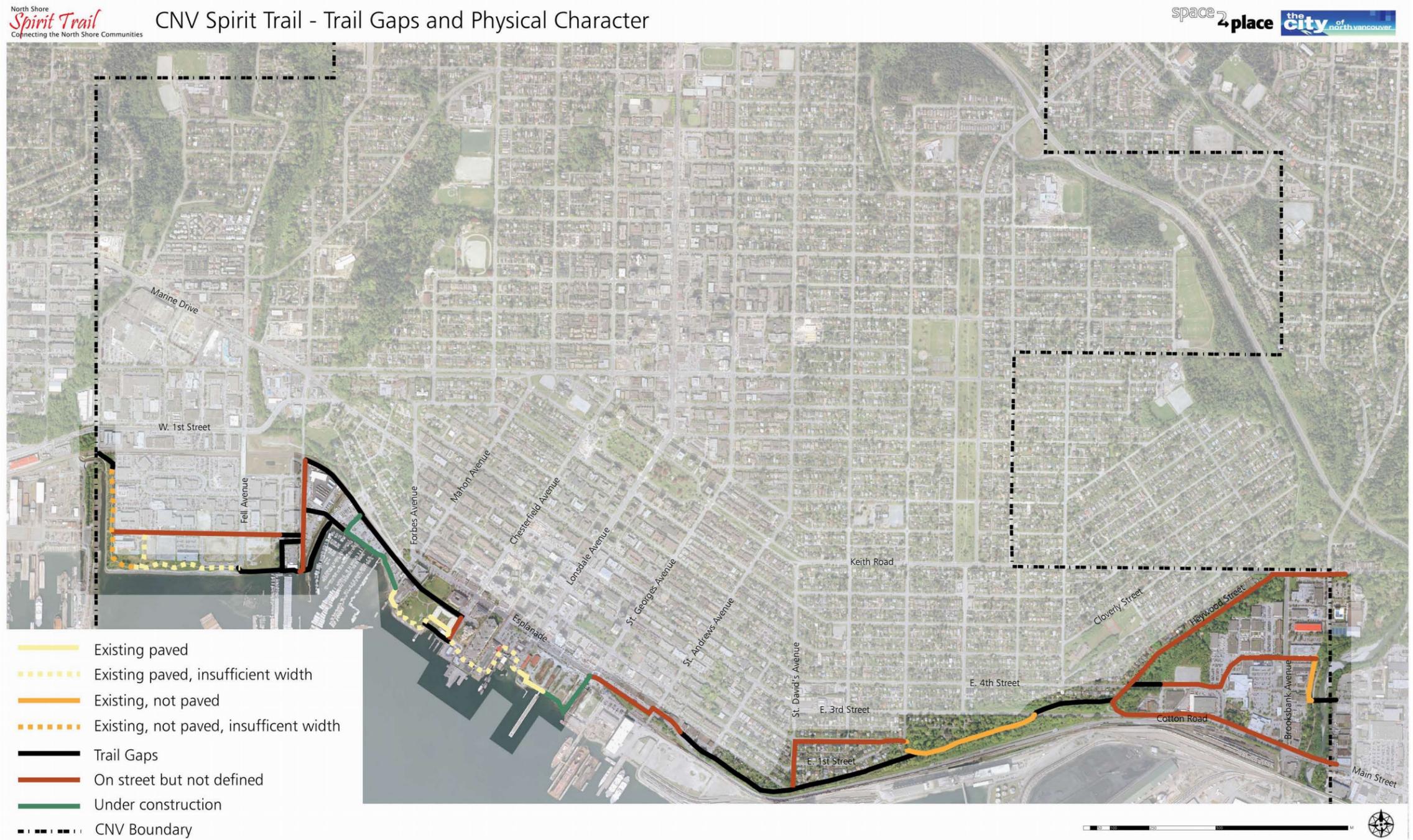
Trail Gaps and Character

The current condition of the Spirit Trail alignment is depicted here. Some parts of the Spirit Trail alignment overlap with existing trails or seawalls.

Black lines indicate areas in which there is no existing trail.

The solid yellow lines indicates part of the trail that are paved and are at least 4 m in width. These areas may or may not have the appropriate character of the Spirit Trail. Existing trails that are paved and at least 4 m wide represent less than 400 m of the proposed alignment.

“On Street but not defined” means that it is physically possible to move through these parts of the trail but there are not necessarily defined bike lanes or sidewalks. Where there are sidewalks they are mainly designed at a minimum width of 1.2 metres and directly adjacent to the street.





CNV Spirit Trail - Grade Challenges



Grade Challenges

Blue highlights on this map indicate areas in which grades are greater than 8% slope which is the maximum acceptable grade for wheelchair use.

These areas will be examined in greater depth during Phase 2 of this study. Options such as alternate accessible routes, stairs, and switch backs will be considered.





CNV Spirit Trail - Railway Conflicts



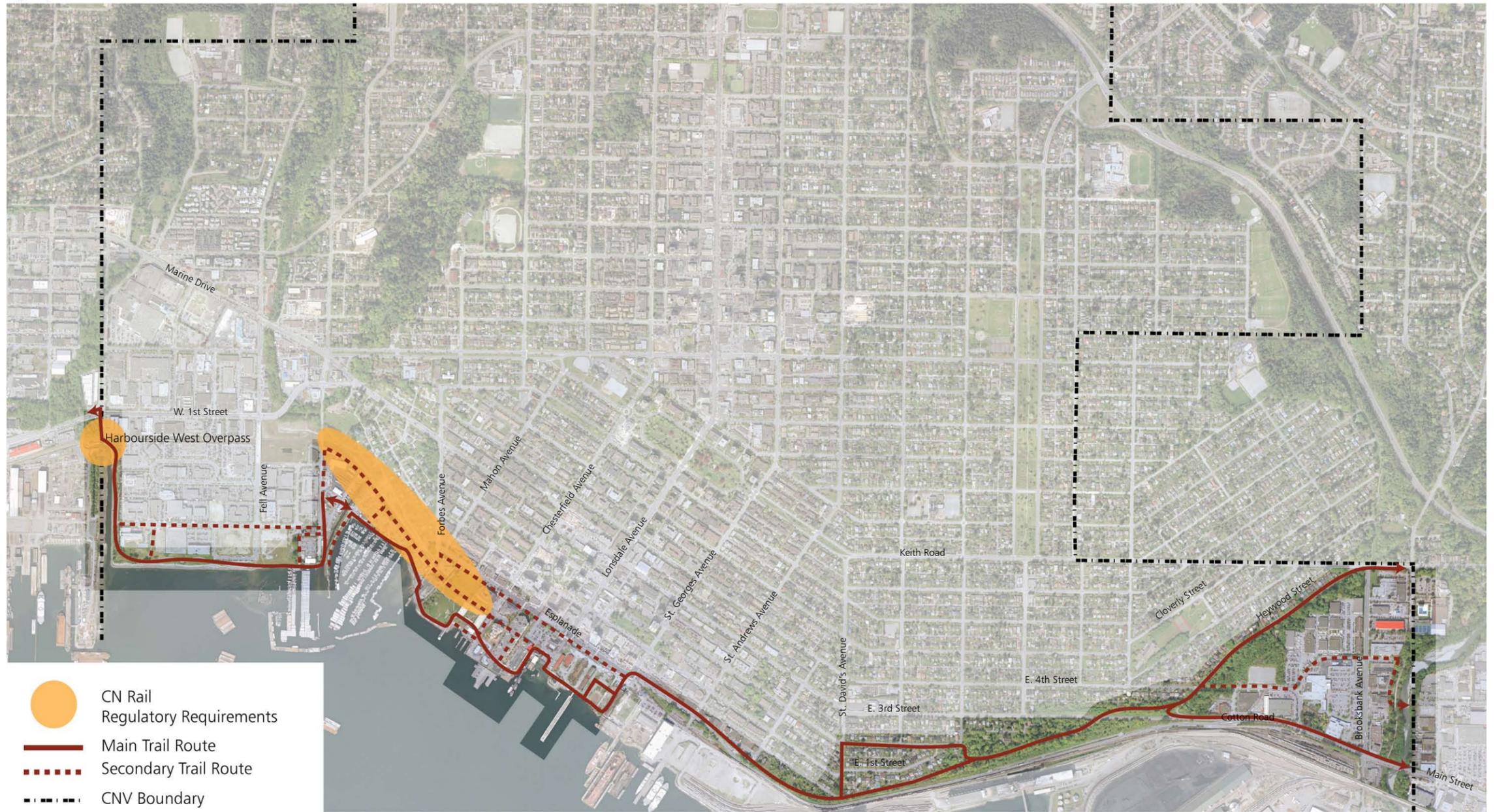
Railway Conflicts

Parts of the trail for which approval from CN Rail is required before the final planning and trail construction can proceed are highlighted here.

CN Rail has indicated support for the two areas of the proposed alignment that involve their right-of-way.

CN Rail provided a letter in support for the City's CIPP (Cycling Infrastructure Partnership Program) funding application for a pedestrian/cyclist overpass over the rail lines at MacKay Creek.

CN Rail has also indicated its support of the trail along the rail lines from Chesterfield Ave to Forbes Ave.



Ecologically Sensitive Areas

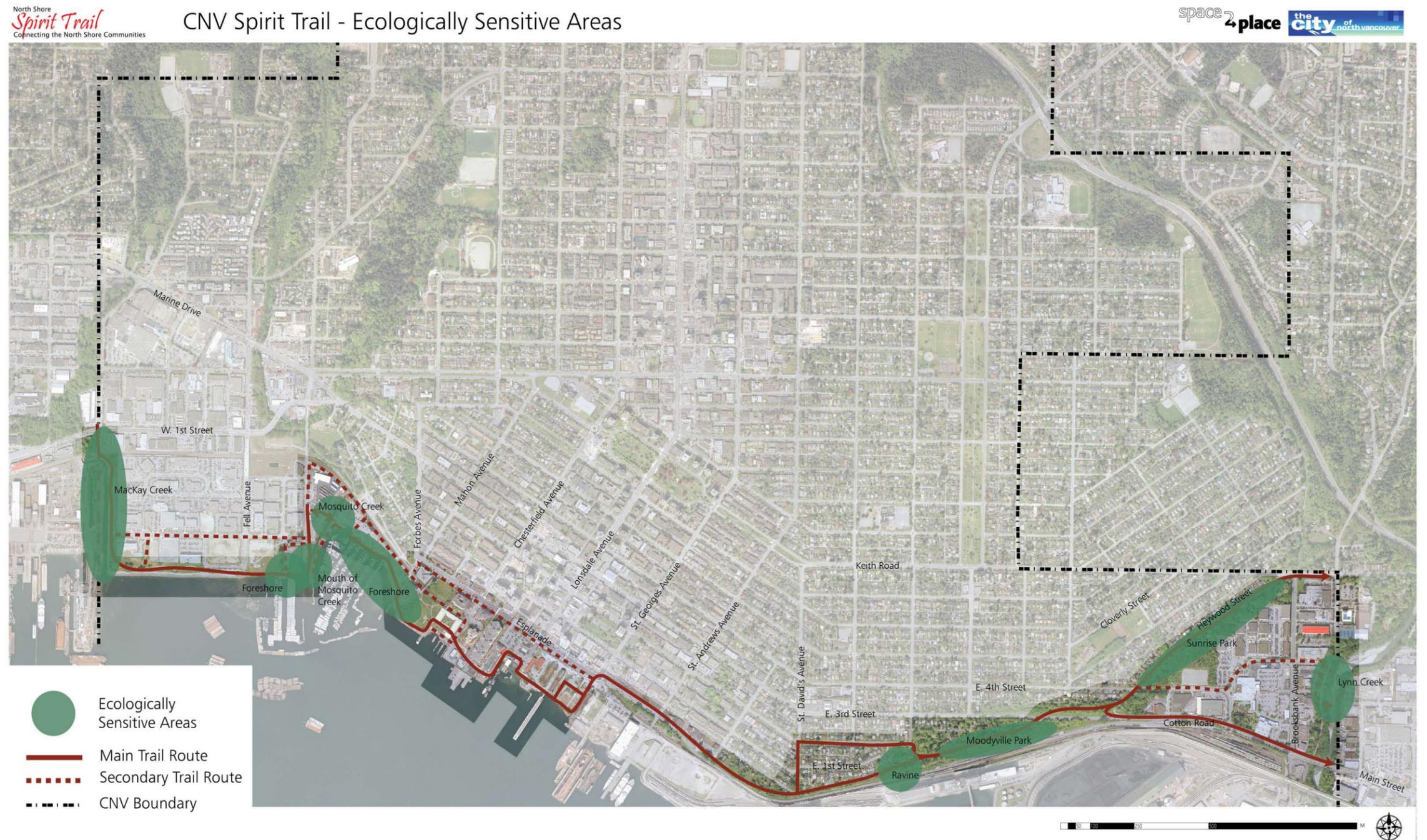
This map highlights parts of the trail that have special ecological importance. These parts of the trail add an uniqueness to the character to Spirit Trail. Spirit Trail offers the possibility for the trail user to have a coffee in the centre of the City and a short 30 minute stroll later to watch birds and other wildlife in a natural area.

Due to the importance of these areas, they are under the jurisdiction of multiple governing bodies and will require approval before the trail can proceed.

Parts of the trail that fall within a riparian zone will require the approval of the federal Department of Fisheries and Oceans as well as a variance from the City of North Vancouver's streamside protection by-law. For the sites along the tidal parts of MacKay and Mosquito Creek as well as other shoreline areas, the approval of BERC, Burrard Environmental Review Committee, may also be required.

Trail development will minimize impacts on any nearby raptor and heron nests, and trees with nests will be protected during trail development. The provincial Wildlife Act protects some raptor nests. Construction of the trail near the raptor nests should be undertaken outside of the nesting season if the nests are still in use.

Raptor nests have been identified along the length of the Spirit Trail.



Habitat Types

This map shows the broad patterns of vegetation along the trail route. It divides vegetation into: (1) deciduous forest such as red alder and big-leaf maple; (2) mixed forest with a range of deciduous and coniferous trees; (3) shrub areas such as Himalayan blackberry thickets; (4) unmaintained tall grass areas; (5) turf and landscaped areas which have been planted and are maintained. These areas may or may not have habitat value for wildlife.

It does not map individual street trees or vegetation in residential gardens which may also be important. Mapping is based on 2006 orthophotos.

The overall structure and composition of vegetation is a primary factor influencing wildlife use, plant diversity, and other important biodiversity values. Vegetation is also important for the aesthetic and experiential values along the Spirit Trail. The most important vegetation areas are the escarpment forests along the eastern portion of the trail, as well as the riparian forest or shrub communities along the lower reaches of MacKay and Mosquito creeks. Sunrise Park is an important bird area in the City.



CNV Spirit Trail - Habitat Types



Planning Criteria

The following criteria and objectives for the trail were developed as a tool by which to measure the planning and design decisions for Spirit Trail.

Ecological Integrity

Circulation and Programming

Feasibility

	Navigation	Context	Flexibility	
treading lightly	consistent flow	permeability	accommodate a variety of uses	cost effectiveness
enhance ecological corridors	clear definition of cycling and pedestrian	lots of connections	built in redundancies	ease of maintenance
reveal natural character	clearly marked multiple routes	recognition that its part of a system		longevity and durability of materials
microclimates	hierarchy of spaces			ease of construction
	easy navigation and wayfinding			property ownership
				CN regulations

Genius loci

Public Health and Safety

Genius loci				Public Health and Safety	
Place	Identity	Cultural	Experience	Health	Safety
trail as destination	unifying elements throughout the trail	embrace active industry and cultural character	visual and physical access to the water	promotion of public health	comfortable and safe
amenities	landmarks	respect First Nations Culture	connection to surroundings create an experience	community wellness	visible
where cyclists and pedestrians share the trail, nodes should be off the main route	shape of the trail is important - meaningful geometry	interpretive, revealing history providing learning opportunities both cultural and natural	diversity of experience	fitness	accessible
	infrastructure should be beautiful		trail as journey		where possible provide separated walking and cycling trails
	public art		hierarchy of spaces		awareness of municipal by-laws
	civic pride				



Key Findings

The key findings from the initial analysis phase of this work are summarized in this section. They are discussed in terms of critical opportunities and constraints.

Constraints

Physical Barriers and Gaps

These barriers and gaps require expensive structures such as bridges or overpasses to establish the flow of the trail.

Ownership or Right of Way Gaps

Unavailable land for trail access serves as a barrier to connectivity.

Difficult to Navigate

Wayfinding is awkward and it is easy to lose the trail.
Challenging intersections make navigation difficult.

Challenging Topography

Prevents the trail from being accessible to users of all abilities.

Opportunities

Waterfront Oriented

Prime locations within the City.

Opens up new opportunities for waterfront access in the City and Burrard Inlet.

Connects Major Destinations and North Shore Communities

Provides a strong lower level link across the North Shore.

Connects major destinations such as Lower Lonsdale, Kings Mill/Harbourside, the Squamish Nation Mission Reserve and Mosquito Creek Marina, Moodyville, and Park and Tilford Mall.

Primarily an Off-Street Trail

Provide safe options for alternative transportation that are family friendly and improve the overall experience of the trail for all users.

Diversity of Environments and Characters are found along the trail

Urban, historic, industrial, residential, and a variety of natural areas (riparian, upland forest, and marine foreshore) create a changing experience along the trail.

Capitalize on Strong Public Support

Workshops and meetings demonstrated overwhelming support for establishing the trail.

Create an Identity

Create an experience identifiable with North Vancouver.

Establish a series of destinations and experiences.

Enhance Habitat Connections

Provide refuge from the city and possibilities to connect with nature.

Increase habitat connectivity and site function.

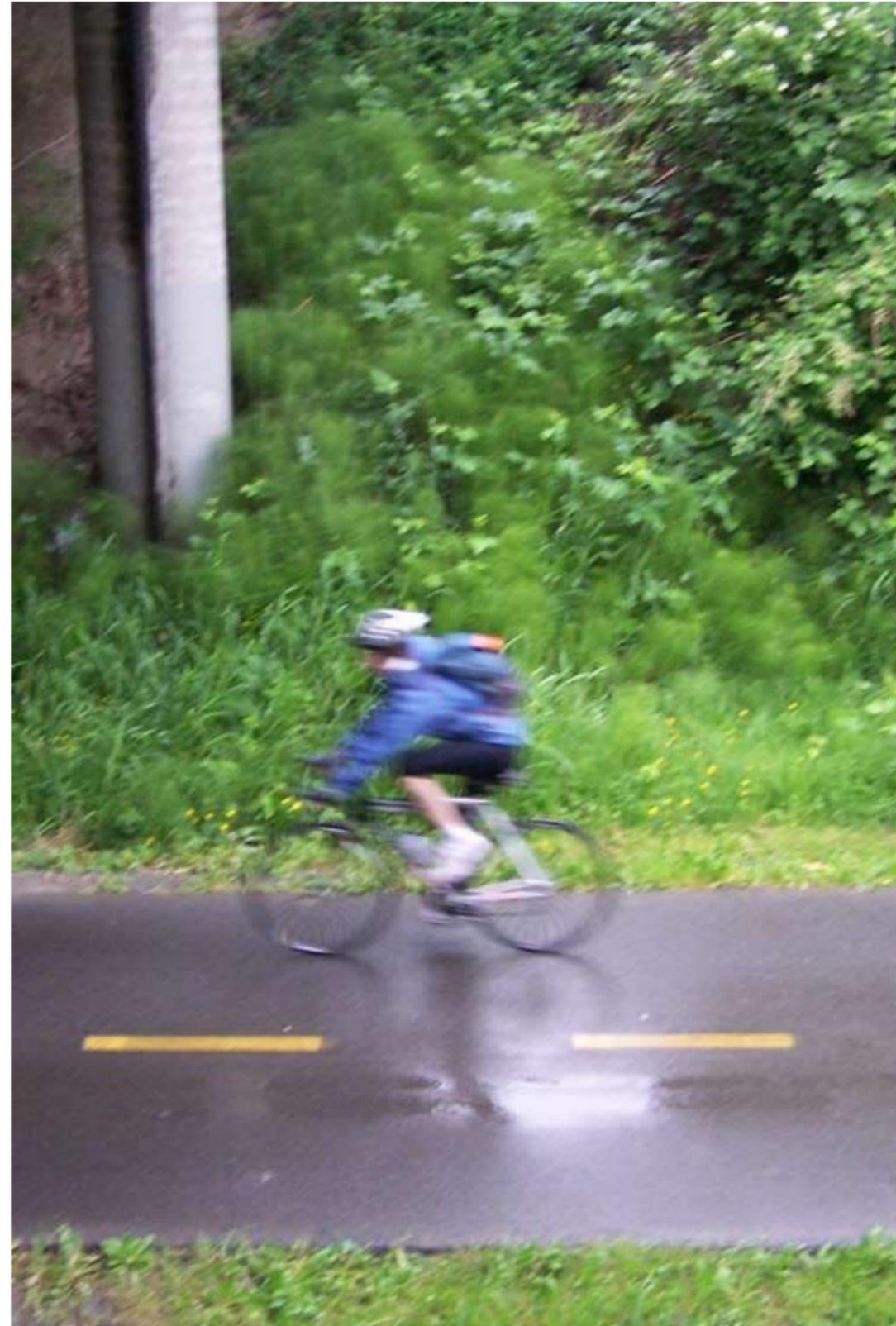
Precedents

This section of the report examines multi-use trails from around the world in order to understand common opportunities, constraints, and design solutions. In addition to a review of six multi-use trails, a collection of general images of trails is provided.

Victoria, BC Galloping Goose Trail

The Galloping Goose Trail runs from Sooke to Victoria to North Saanich on Vancouver Island and is over 60 km long. It is classified as a park corridor and accommodates cycling, hiking, in-line skating, and horse riding. Much of the trail system was a "rails to trails" conversion project.

- The trail passes through rural, urban, and semi-wilderness areas.
- It is a recreational as well as a cyclist commuter trail.
- The Galloping Goose is part of the Trans Canada Trail.

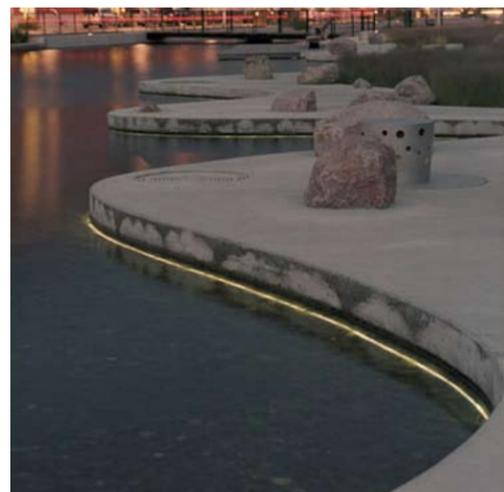
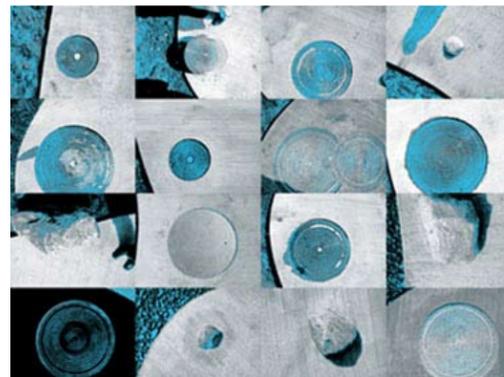


Malmö, Sweden

Anchor Park

Anchor Park is a 2.9 ha park in Malmö, Sweden constructed in 2001. It is built on a brownfield site that had previously been a shipyard and factory area. The area was turned into a new housing development that aimed at showcasing sustainable design practices. The area was designed to be a complete community where pedestrians and cyclists have the priority and vehicular use is limited. Three parks were designed to surround the residential core. Anchor park is one of these parks. It was designed as a water park that was inspired by the diversity of habitat types in Sweden. The park incorporates alder marshes, oak woods and salt-water biotopes that merge into one another.

- The pathway varies in width to create spaces off trail to stop or slow down.
- Infrastructure elements are unique and designed to be beautiful as well as functional.
- Rainwater is celebrated. For instance, reliefs are impressed into the concrete and the level of rainwater in these small pools reflects changing weather conditions.
- Lighting changes the experience from day to night.
- Sense of time is registered by subtle changes in water levels and vegetation changes.
- Individual elements such as one of a kind Swedish granite boulders, conical stumps, and uniquely shaped patches of grasses ensure variety along the pathway while providing unity to the park as a whole.



Metro Vancouver Central Valley Greenway

The Central Valley Greenway is a 25 kilometer multi-use pathway that links New Westminister to Stanley Park through Burnaby. More than 23% of Metro Vancouver residents live or work within 1.5 kilometres of the greenway. It is intended to be the spine of the Metro Vancouver greenway system and to encourage bicycle commuting.

- The CVG is a relatively flat, direct route between New Westminister and downtown Vancouver.
- It links to major Skytrain and bus routes that are equipped with bike racks.
- Structural crossings were needed to complete the trail.
- The character of the trail varies depending on its surroundings.



This part of the Central Valley Greenway is an off street trail with separated pedestrian and cyclist facilities.



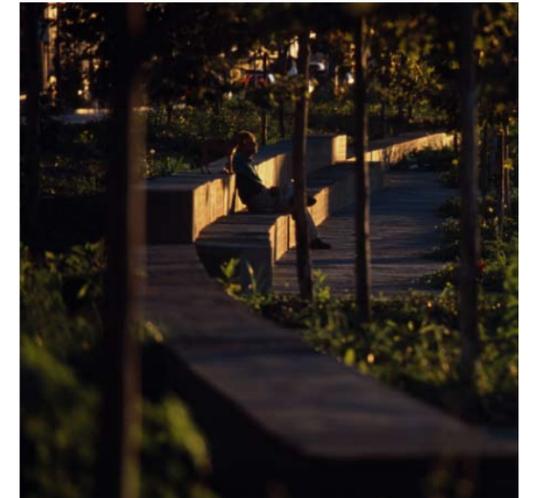
The design of the greenway incorporated vegetation along the trail which added habitat, mitigated stormwater runoff, and created a more appealing public realm.

Pittsburgh, PA

Allegheny Riverfront Park

Allegheny Riverfront Park was is composed of two linear sections one along the river and one upland. It invigorates a narrow section of land pinched between an expressway and the river. The lower level is planted with indigenous species that will regenerate after flooding. The upper section is an urban promenade. The entire park is accessible to all types of users: pedestrians, cyclists, wheel chairs and even boats. It is approximately 1.2 km long.

- There is an abundance and diversity of seating that takes advantage of the views.
- Local materials were used to connect to the region.
- Landscape architects and public artists collaborated to further reveal natural processes and create a unique sense of place.
- The lower portion of the park is designed to withstand floods and ice jams while allowing natural processes to take place.
- Ramps are used to create an accessible connection between the upper and lower sections. Part of the lower promenade is cantilevered over the river.



New York, NY Hudson River Park

Hudson River Park is a 8 km (5 mile) long waterfront park that links several different neighbourhoods in New York. This park is a major component of the redevelopment of former industrial lands. Several former piers are being redeveloped into major public spaces. A pedestrian path and bikeway run the entire length of the park. The busy bikeway is part of a larger network and currently attracts over 3000 people per hour on the weekends. Hudson River Park is New York City's second largest park next to Central Park.

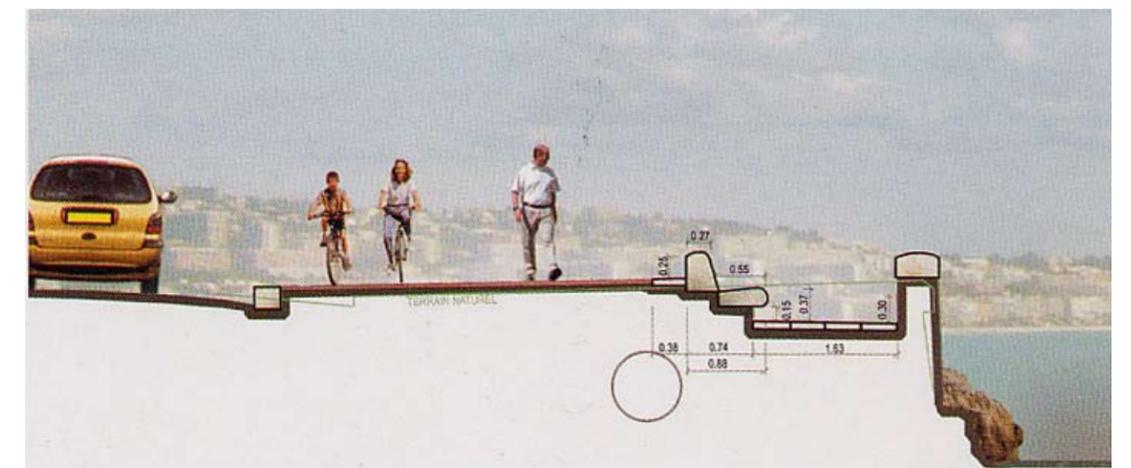
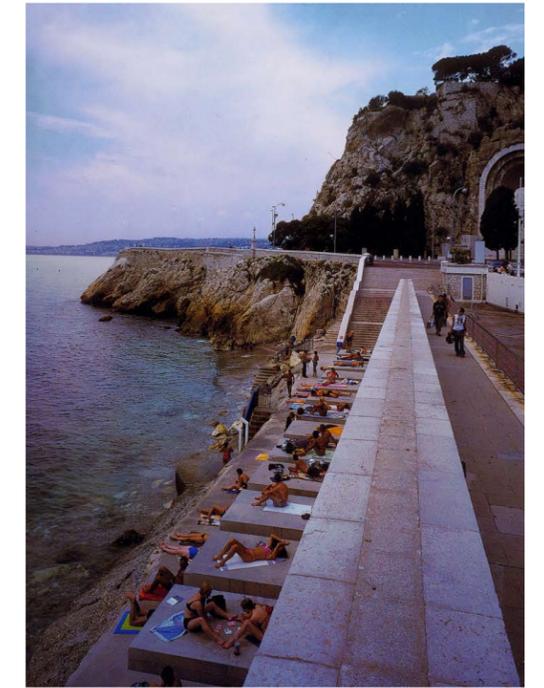
- Pedestrian path and bikeway are separated.
- Waterfront access is provided for a variety of activities including boating, fishing, and sunbathing.
- A diversity of programming is also included: community gardens, boating, ecological restoration, museums, cruise ship docks and soccer fields. Space for active and passive recreation is accommodated.
- Commercial activities are also integrated into the use of the park and waterfront.



Nice, France Rauba Capeu Pier

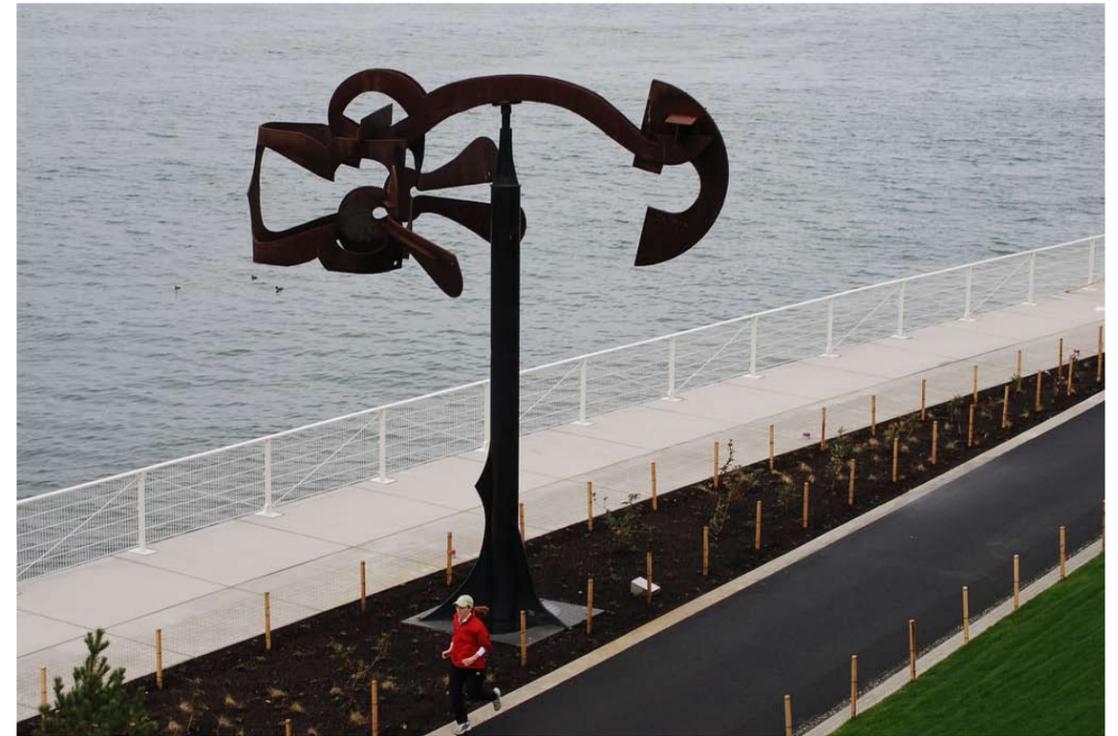
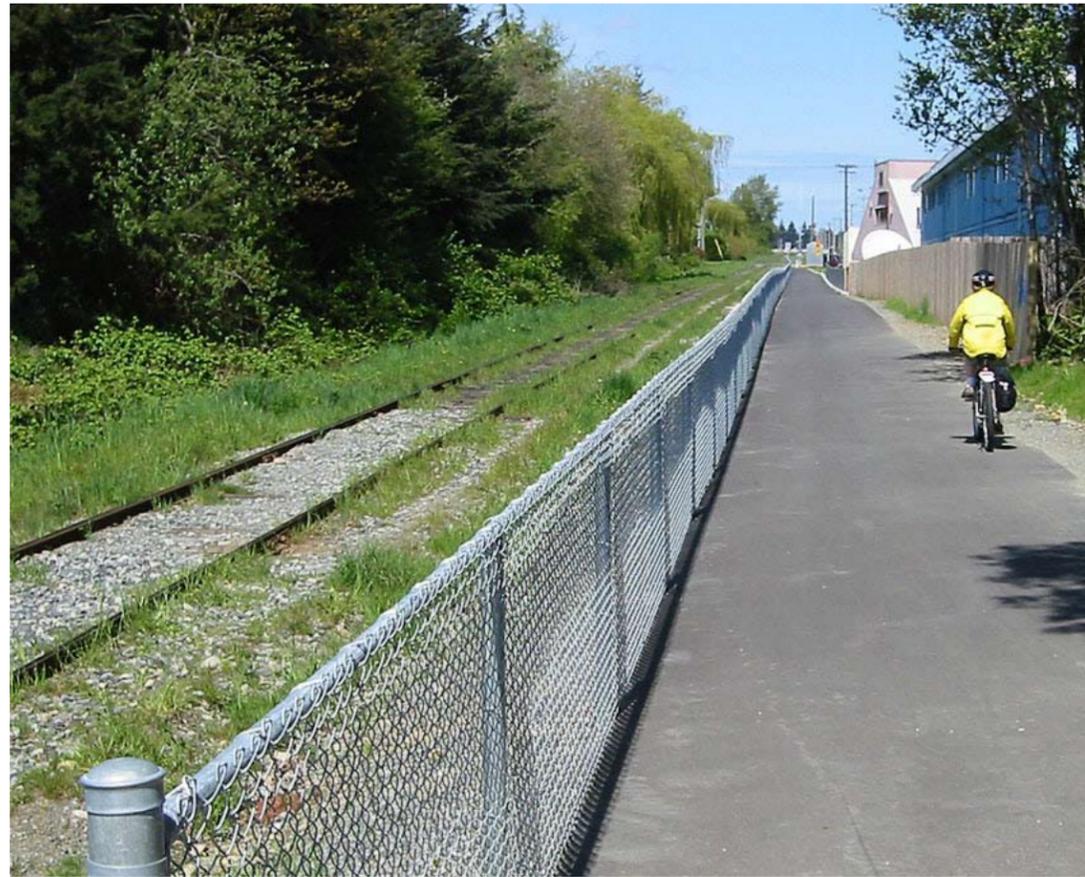
Raubu Capeu Pier is located along the rockiest part of the Nice waterfront. It was redesigned in 2003 to accommodate more public space as well as provide a bike and pedestrian route.

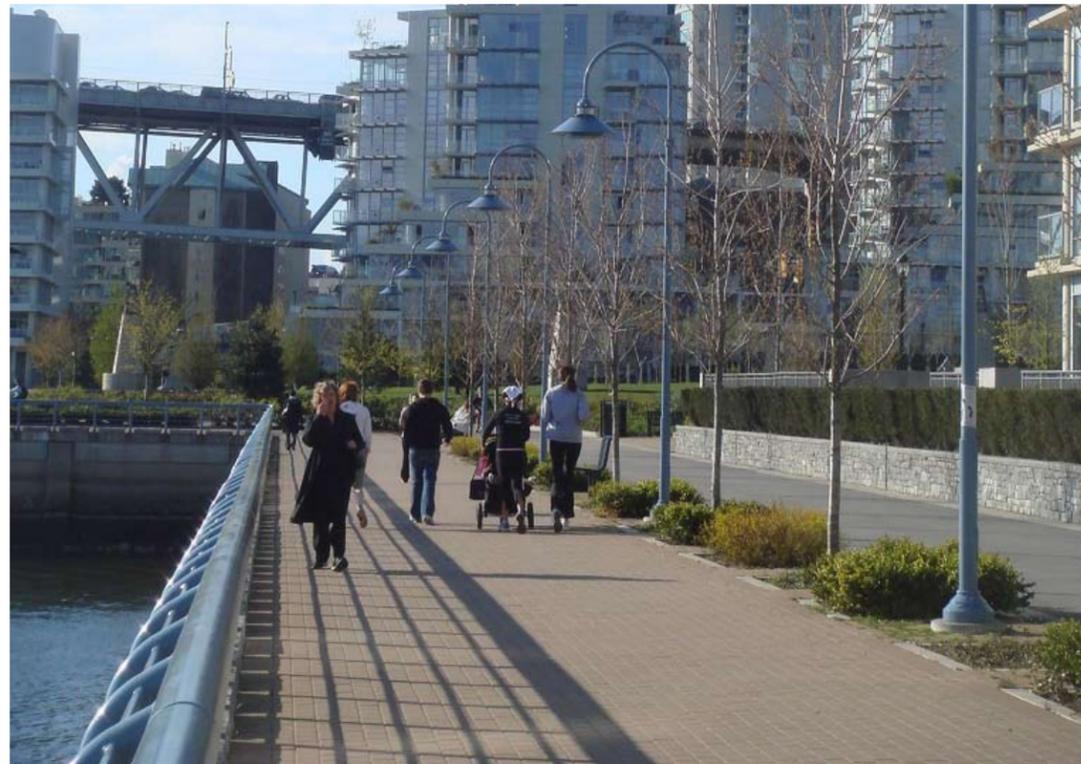
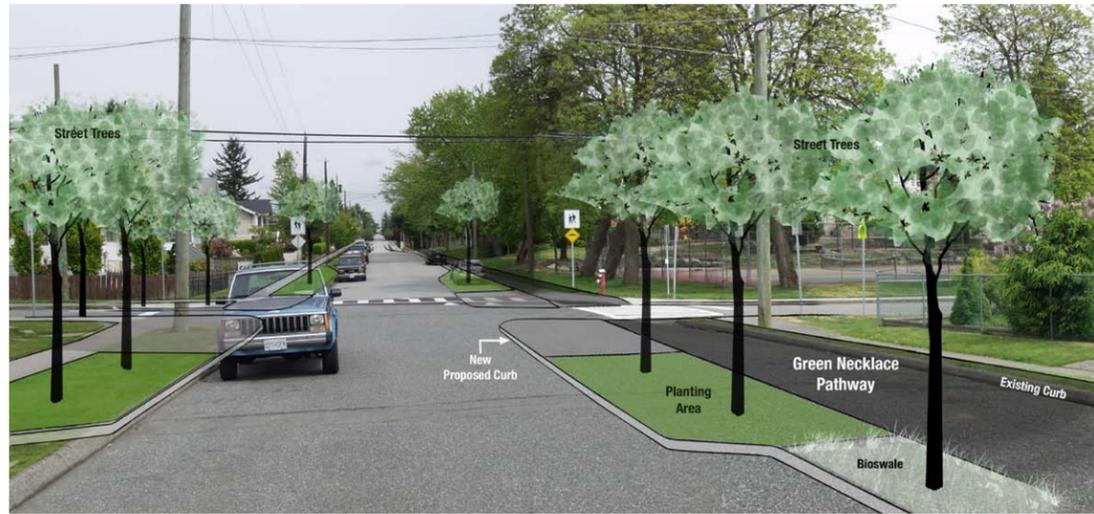
- Physical separation of a slow pedestrian route directly adjacent to the water and a higher speed bike route to the outer edge.
- Public spaces such as the swimming area and plazas provide spaces to stop along the waterfront.
- Particular attention was paid to lighting in order to create an active nighttime experience.
- This project showcases a thoughtfully designed waterfront edge.



Various Pathway Types

The following images represent different types of multi-use pathways that have been used in various projects.







Character Analysis & Conceptual Solutions

The Character Analysis section of this report examines the Spirit Trail in greater detail. In order to understand the character and issues along the trail, the trail was divided into sections. The Harbour Walk and Moodyville Trail reflect the City's desire to have a waterfront that services residents and visitors recreational needs as well as supporting waterfront port related activities associated with an active harbour.

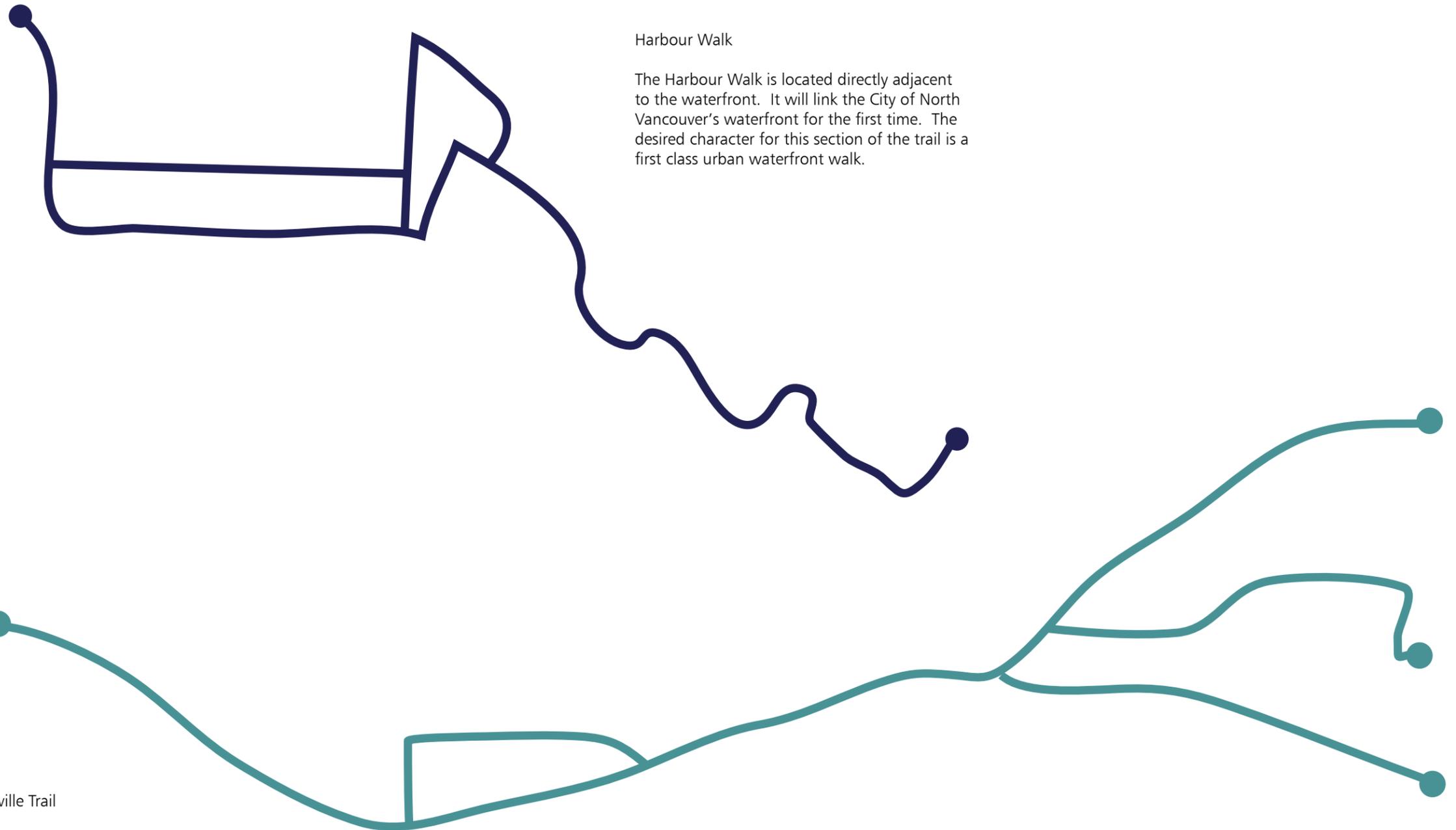
The trail was then divided up into eight neighbourhoods based upon physical characteristics and current identity of the Spirit Trail route across the City. Each of these neighbourhoods were further divided up into character zones. There are 17 different character zones along the trail. For each character zone the opportunities and constraints for the Spirit Trail alignment are discussed.

The conceptual design solutions for these districts and character zones are included in this chapter following the analysis of the character zones.

Harbourwalk and Moodyville Trail

The City of North Vancouver waterfront is part of a national harbour and important regional tourist destination. The Waterfront Project, being pursued in conjunction with other initiatives including the Spirit Trail, attempts to balance the need for waterfront recreational opportunities with industrial port-related activities. This mandate has helped shape the alignment of the Spirit Trail.

At a city wide level the Spirit Trail can be described in two major components: the Harbour Walk and the Moodyville Trail. The Harbour Walk is unique in that it is located directly along the waterfront. All of the land required for the Harbour Walk has not yet been secured but with a variety of funding partners and private partnerships the Harbour Walk will connect the western parts of the City in the future. The Moodyville Trail on the eastern half of the City is above the waterfront with views over the port-related industries. This part of the trail will have a quieter, park-like character with waterfront views. Together these two will make up the Spirit Trail through the City of North Vancouver.



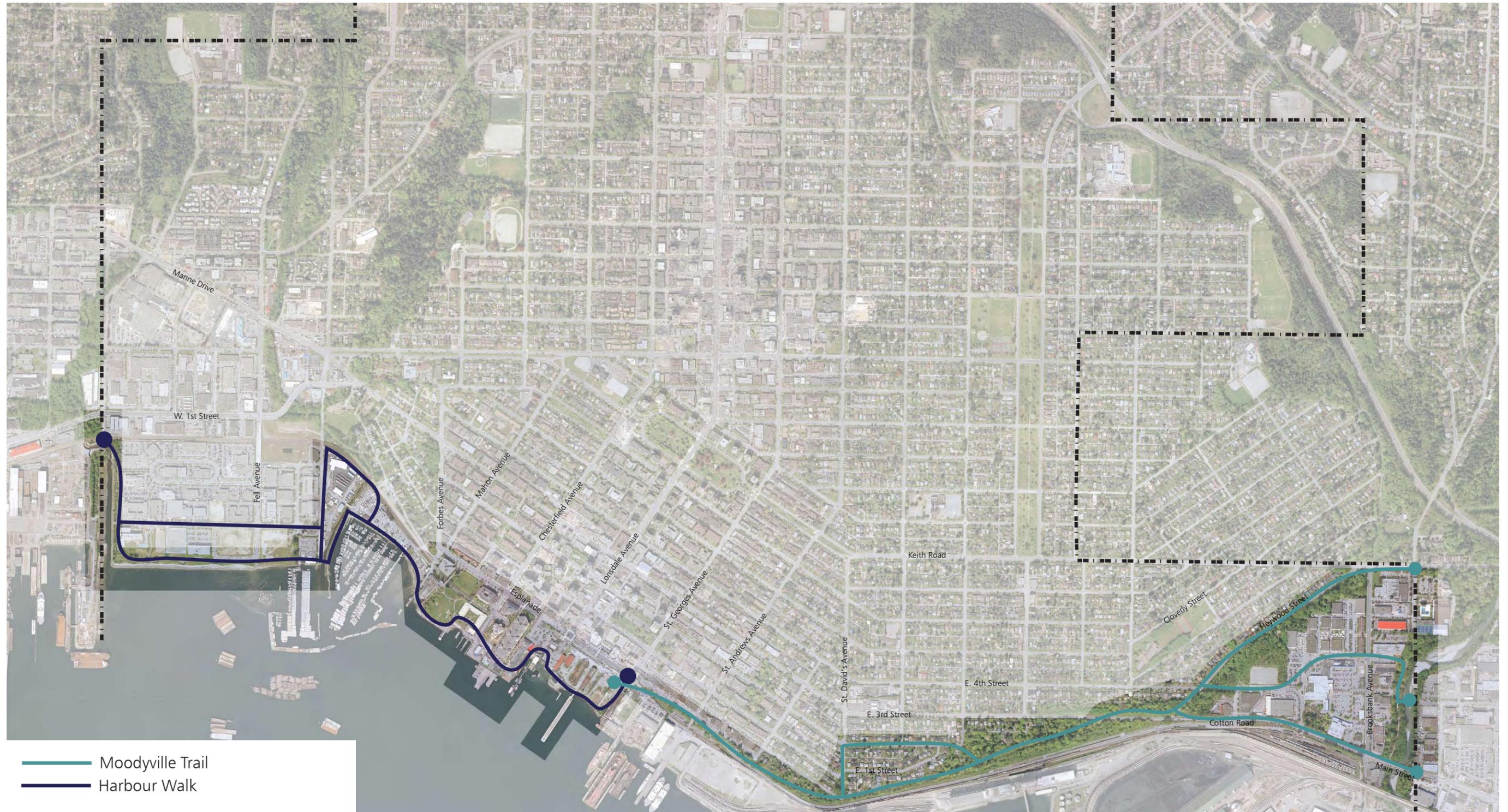
Harbour Walk

The Harbour Walk is located directly adjacent to the waterfront. It will link the City of North Vancouver's waterfront for the first time. The desired character for this section of the trail is a first class urban waterfront walk.

Moodyville Trail

The Moodyville Trail will connect the eastern portions of the City with a more natural, park-like trail experience that connects to the waterfront with excellent views. This part of the trail will enhance existing green corridors and improve the green character of residential neighbourhoods.

CNV Spirit Trail - Harbour Walk and Moodyville Trail



- Moodyville Trail
- Harbour Walk

- - - - - City of North Vancouver Boundary



Trail Neighbourhoods

In order to make the trail more manageable easier to evaluate and design, it was further divided into neighbourhoods and character zones. There are a total of eight neighbourhoods and seventeen character zones. These are used throughout the report. Maps demonstrating these divisions can be found on pages 38 and 40.

North Shore
Spirit Trail
Connecting the North Shore Communities

CNV Spirit Trail - Neighbourhood Boundaries

space2place the city of north vancouver



Kings Mill

Kings Mill Park makes up the majority of this entirely waterfront (ocean and creek) area. Existing paths already provide connections through this area. The location provides stunning views and despite the fact that the area is accessible only by automobile and is surrounded by light industrial areas and a business park is a popular park destination.

Harbourside

The Harbourside section through the Harbourside Business Park is an alternative, more direct route aimed primarily at commuter cyclists. It avoids the slower pedestrian oriented waterfront walk and provides more direct access to the proposed overpass over CN Rail.

Marina

The first part of Spirit Trail will be built in the Marina neighbourhood. In 2007 the Squamish Nation, who operate the Mosquito Creek Marina, and the City of North Vancouver came to an agreement to jointly build this first leg of the Spirit Trail on the Marina waterfront. Surrounding this part of the trail is the Mission Reserve and industrial lands. This neighbourhood also contains several gaps in the trail alignment and further work is required to connect the eastern and western portion of the Spirit Trail.

Lonsdale

The Lonsdale neighbourhood is the City of North Vancouver's urban heart. Sections of the trail are existing with a significant portion of the seawall promenade being added to the waterfront as part of the redevelopment of the former Versatile Shipyard site. There are excellent views of downtown Vancouver and the Pier offers a rare sight of looking back at North Vancouver and the North Shore mountains.

Esplanade

The two blocks from St. Georges Ave. to St. Patricks Ave. along Esplanade are characterized by small automotive businesses to the north and an open vegetated area to the south. The vegetated area includes an escarpment running above the railway line. This part of the trail is within a busy transportation corridor and is a key connection from the waterfront parts of the trail to the more naturalized parts of the trail.

Moodyville and Sunrise

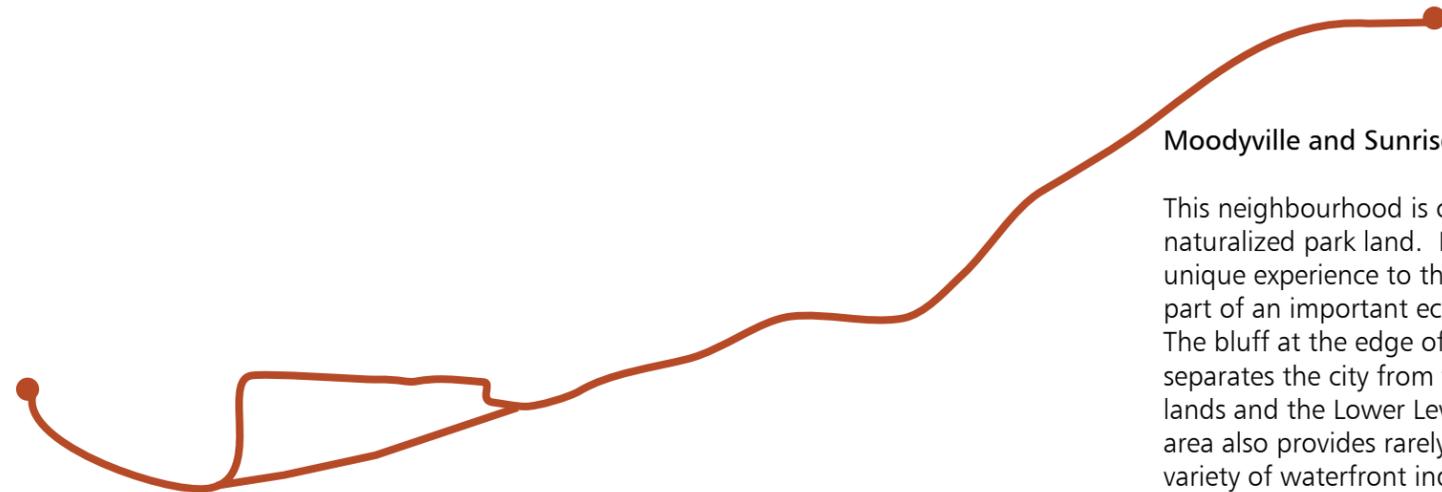
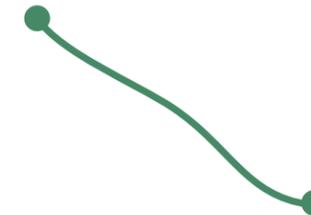
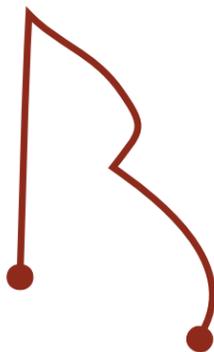
This neighbourhood is characterized by naturalized park land. It provides quite a unique experience to the trail user and is part of an important ecological corridor. The bluff at the edge of the natural area separates the city from the industrial lands and the Lower Level Road. This area also provides rarely seen views to a variety of waterfront industries.

Park and Tilford

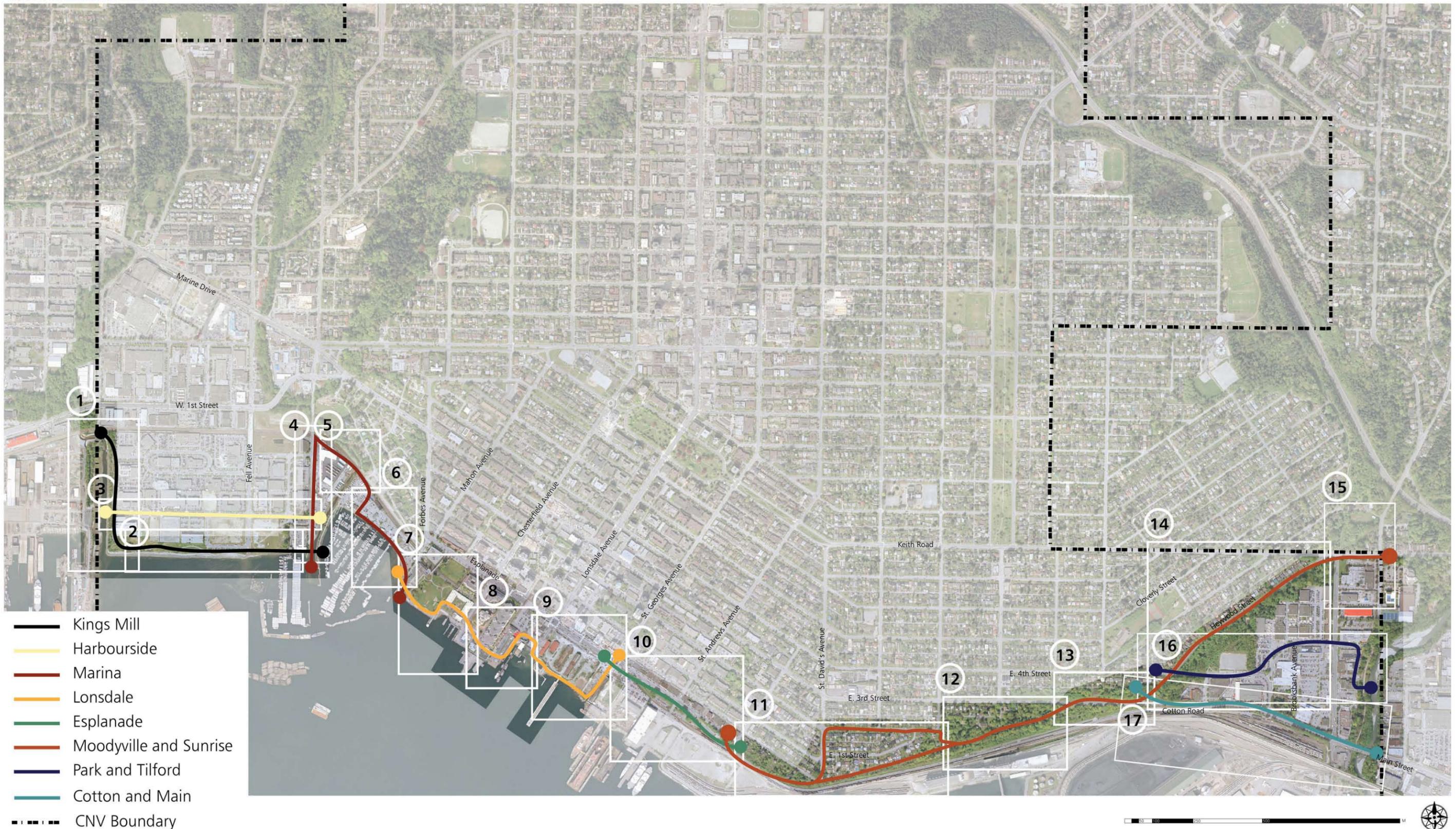
This auto dominated area is home to Park and Tilford Mall and light industrial uses. The middle arm of the Spirit Trail through this area will offer a route away from the busy vehicle arteries and may connect to the District of North Vancouver at a future pedestrian crossing over Lynn Creek.

Main and Cotton

Main and Cotton separate Park and Tilford mall from the rail yard. It is a busy, vehicle dominated area that provides important connections to the Lynn Creek trail system, the District of North Vancouver, and to the Iron Workers Memorial Bridge.



CNV Spirit Trail - Neighbourhood and Character Boundaries



These icons are used to note conditions found along the Spirit Trail during the analysis phase of the project.

Icon Legend

-  Crossing
-  Ownership
-  Existing Trail is too narrow
-  Important Issue
-  Pedestrian only path
-  Views
-  Interpretive Signage
-  Bicycle Path
-  Environmental
-  Bicycle/Pedestrian Pathway
-  Node or resting point

These icons are used to mark recommended locations and types of nodes that were determined during the conceptual design of the Spirit Trail.

Icon Legend

	Intersection	Trail Head	Rest Point
urban			
primary			
secondary			
tertiary			
street			
primary			
secondary			
tertiary			
park			
primary			
secondary			
tertiary			

More information on the quality of these nodes can be found in the Tool Box chapter of this report.

Neighbourhood - Kings Mill

Section 1 - Riparian

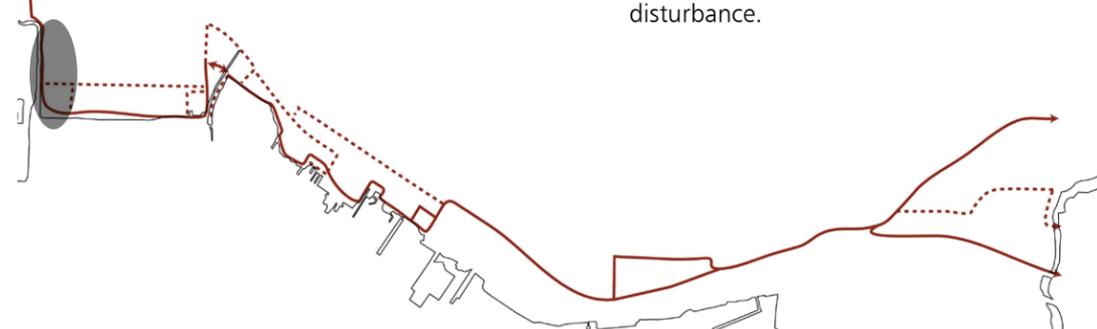
General Description

Section 1 is characterized by young riparian vegetation. This character is unique along the CNV Spirit Trail. MacKay Creek was re-routed in 2006 to the current channel and the creek edge is lined with riprap along its length. Currently, a trail of crushed gravel, approximately 2.5 m wide, goes through this zone. There are great views of the mountains and the trail is well used by a diversity of groups. The existing trail dead-ends just before MacKay Creek meets the railway line.

There are two wooden viewing platforms that provide visual access to the water and stopping points along this trail. There are also points of informal access to the creek which are causing erosion problems.

The riparian vegetation is fairly young and consists of mainly indigenous species. Management of invasive plant species has been fairly successful at keeping this area natural but invasives, specifically Scotch broom are still a problem. The construction of the trail and overpass, and the potential for habitat compensation works, provide an excellent opportunity to significantly upgrade the riparian zone along MacKay Creek. There is potential to increase habitat value in this area.

This is a major connection point to link the CNV Spirit Trail to the District of North Vancouver.



Opportunities

- Unique riparian character.
- Ability to link to MacKay Creek trail system, westerly Spirit Trail connections, Capilano Mall, and surrounding business parks.
- Pedestrian overpass could act as an important gateway between the City and District of North Vancouver.
- There are several opportunities for interpretive signage along this part of the trail.
- Fencing could be considered in conjunction with trail upgrades to reduce the off trail use and vegetation destruction by people and dogs through this sensitive area.

Constraints

- The existing trail falls within the riparian zone which is protected by CNV streamside protection regulations. Compliance with this bylaw will be evaluated during detailed design.
- The MacKay Creek channel is considered to be sensitive fish and wildlife habitat; DFO approval will be required for any disturbance.



From the future overpass location there are excellent views of the mountains to the north and of MacKay Creek and downtown Vancouver to the south.

2



An overpass is required to connect the CNV Spirit Trail to the DNV Spirit Trail. Currently there are indications that pedestrians are making the illegal and treacherous crossing of the three sets of CN rail tracks.

5 9 10



CN right of way

District/City Boundary



The edge of the creek is lined with riprap. There are some areas along the creek are exhibiting erosion.

4



The trail in this section is made of crushed rock and is approximately 2.5 metres wide. A variance of CNV bylaws and approval from DFO will be required to change the trail character within the riparian zone. Opportunities for environmental restoration/enhancement could occur in aquatic and riparian areas.

11 12

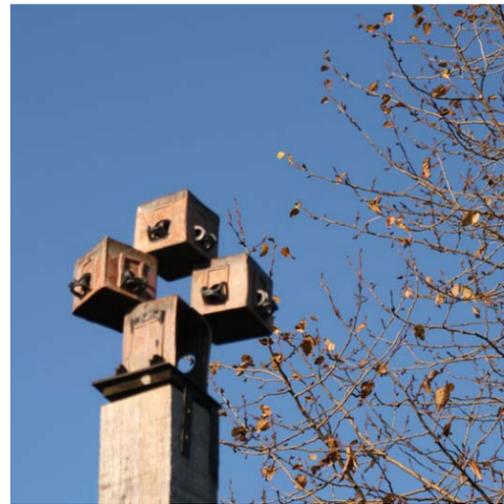


Bodwell School



An existing node is located at the boundary between two character zones. It is simple, composed of a picnic bench and small pathway off the main trail but has the potential to become more substantial. This node is located adjacent to Bodwell High school.

1 3 6 7 8



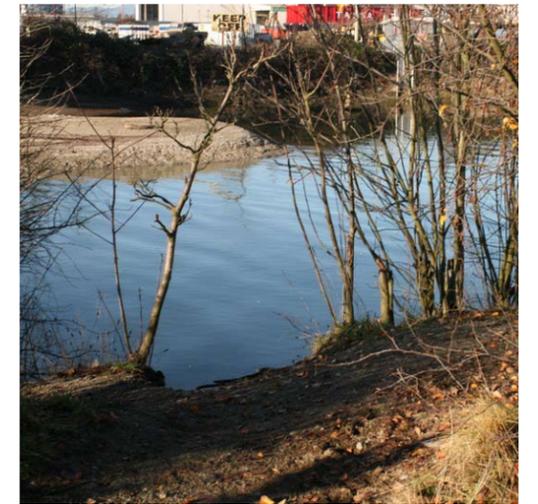
1 Public Art.



2 Mountain View.



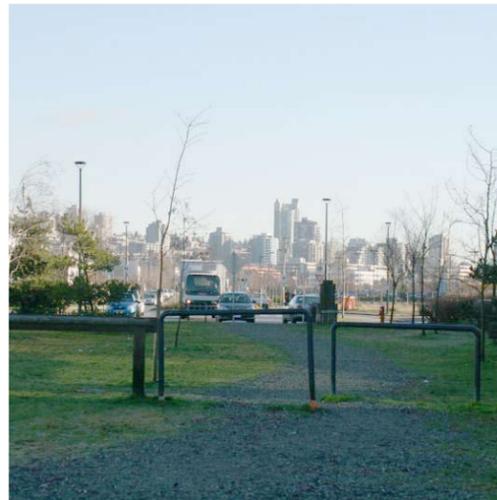
3 Interpretation of bird house project.



4 Informal access to creek + erosion.



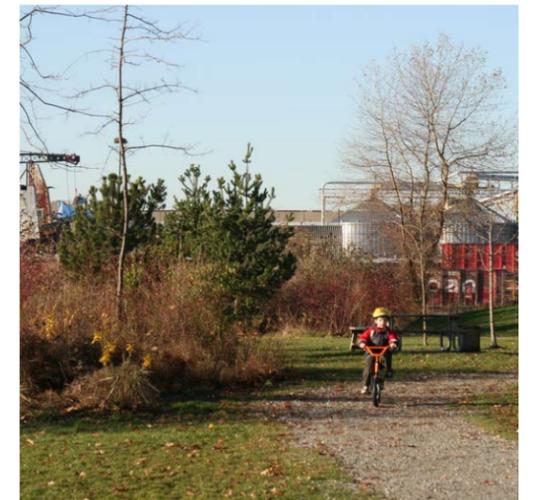
5 Existing viewing areas of MacKay Creek.



6 Entry to trail near Bodwell school.



7 Amenities within existing node.



8 Trail is well used.



9 View south from future overpass.



10 View north from future overpass.



11 Typical vegetative character of trail.



12 Entrance to Automall from the trail.

Neighbourhood - Kings Mill Section 2 - Waterfront

General Description

Section 2 is directly adjacent to the water. It is open with excellent views of Vancouver and the North Shore Mountains including the iconic Lions. A shared 3 m wide trail exists along ~500 m of the site. The remaining part of the trail is privately owned by a developer and the Burrard Yacht Club. The existing trail is surfaced with asphalt and has some small stopping points along it. The adjacent areas are mainly composed of turf grass. Although the trail is along the water's edge, there is no direct access to the ocean. The existing trail is well used despite the lack of any nearby residential neighbourhoods.

Small pockets of vegetation along the trail are mainly composed of indigenous low growing species. The foreshore is very uniform and has low habitat diversity.

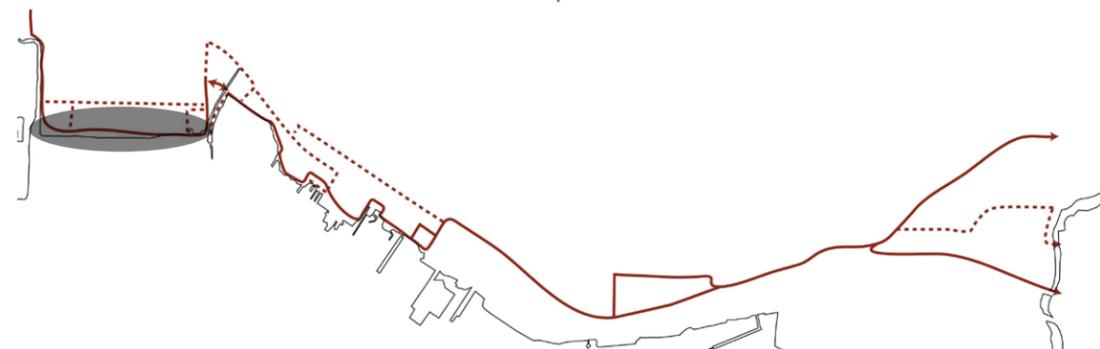
Currently, the design of resting points and the pathway are not particularly notable but due to the physical setting, this section could become a memorable part of the Spirit Trail.

Opportunities

- Space is available for a separated bike and pedestrian trail.
- Existing entry node is well located to be turned into a destination.
- The views and proximity to water could make this section distinctive.
- Room for environmental improvement along foreshore.

Constraints

- Existing trail geometry is weak.
- No current access to the water.
- No residential population, currently people must drive to access this part of the trail.



Small resting points along this path are accompanied by dense plantings of mainly indigenous species. However, open lawn areas are the typical treatment along the trail.

The bird house public art project starts in this section and continues to Section 1.

10

There are opportunities for additional plantings along the marine foreshore to improve environmental values.

In this section, the trail is shared by pedestrians and bikes, is surfaced with asphalt, and is approximately 3 m wide. In the entry ways or resting nodes brick pavers are used instead of asphalt on the ground plane. This area has a poor interface with the waterfront.

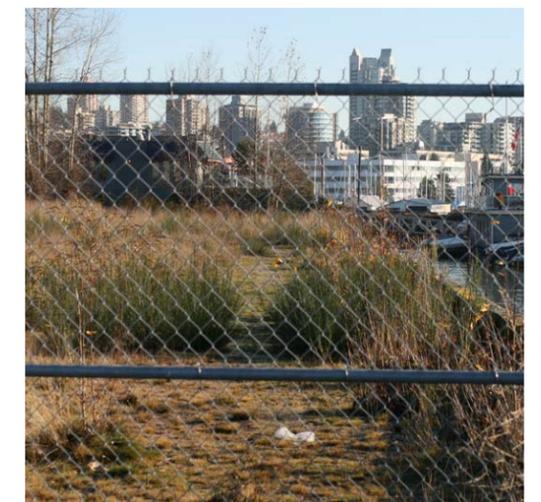
1 5 8 12

Development of empty sites has the potential to further animate the waterfront.

There are spectacular views from this location of the Lions to the north, of downtown Vancouver to the south, and Lonsdale Quay to the east.

The small entry node consists of a picnic bench, grassy open area, and public art pieces.

2 3 4 6 9 11



7 View of Lower Lonsdale.



1:2000



This site is developer owned. A divided trail integrated with the development is being proposed.

7

City owned right of way will provide a connection for the trail.



This area of the proposed trail is owned by the Burrard Yacht Club. They have indicated they would be interested in discussing the possibility of access through their site. A major barrier exists, the marine grid. A special crossing structure would be required to make the connection along the waterfront.



1 Typical waterfront treatment; riprap and turf.



2 Brick pavers with concrete edge at nodes.



3 Current parking design reduces effective trail width.



4 Railing at entry node.



5 Example of site furnishings.



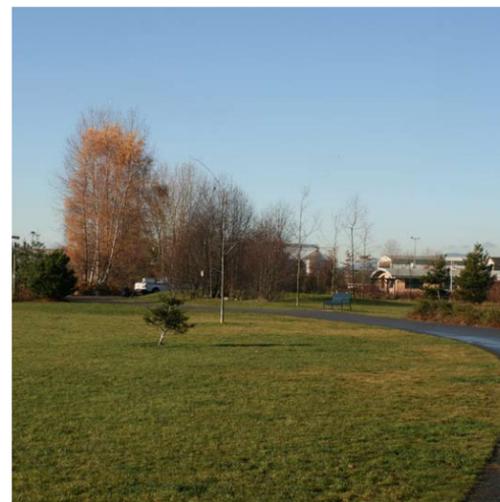
6 Public art embedded in concrete edging.



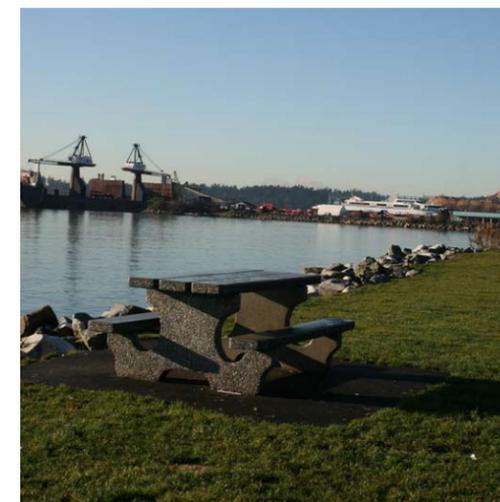
8 Typical surface treatment.



9 View of the Lions.



10 Open unprogrammed lawn areas.



11 Picnic bench.



12 Existing site furnishings and rest areas may need to be reconfigured.

Neighbourhood - Harbourside Section 3 - Harbourside Drive

General Description

Harbourside Drive is a wide two lane street with parallel parking on both sides. It is lined with young street trees. Harbourside Drive offers an alternative for commuter cyclists to avoid the slower, more pedestrian oriented waterfront route. Currently, the street is mainly used by employees of the various businesses in the office park and by people test driving vehicles from the Automall. The width of the road encourages fast vehicle speeds.

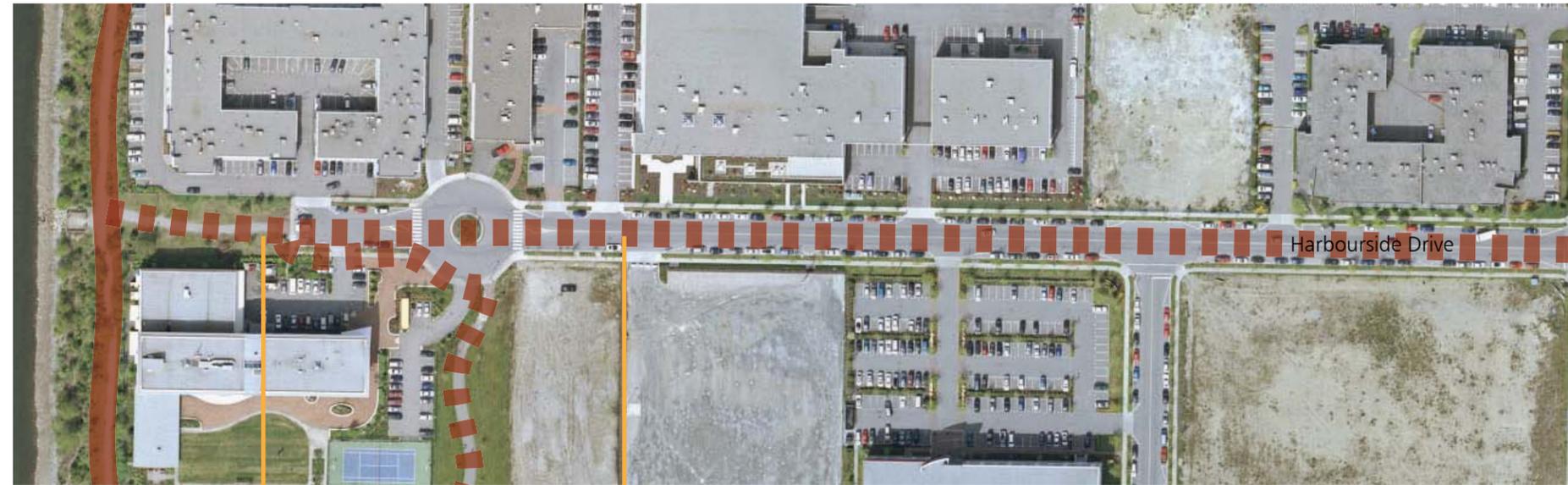
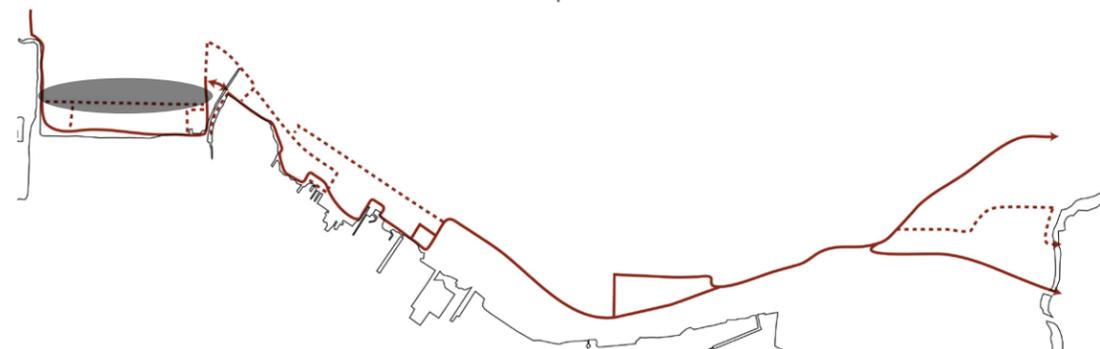
There are several cafe's or small restaurants along Harbourside Drive that could act as a destination for the western part of the trail.

Opportunities

- To provide a direct, faster route for bicyclists.
- The road is wide enough to allow for a bike lane.

Constraints

- Access from Harbourside Drive to Bewicke Avenue is through private property.



The alternative bike route can use an existing gravel pathway to connect back to Spirit Trail. This connection could be updated to comply with the trail standards for Spirit Trail.



There is no existing bike lane on Harbourside Drive but the road is sufficiently wide to accommodate one. Parallel parking does occur on both sides of the street.



This intersection is a four-way stop. Vehicle speeds off of the Fell overpass are high. This area is currently under a traffic study review. Some traffic calming measure may be required.



Access from Bewicke Ave. for bikes and pedestrians to Harbourside Drive could occur through this privately owned parcel. If this site is to be developed, access would need to be negotiated.

1



There are excellent views of the north shore mountains from this location.

5



3 Parallel parking exists on both sides of Harbourside Drive.



6 Wide roads encourage high speeds.



1 Trail access could potentially be provided through this lot to Bewicke.



4 Typical sidewalk (less than 1.5 m wide).



7 Entrance from Harbourside Drive to Spirit Trail lacks identity or character.



2 Wide streets with trees present options for an enjoyable on-street trail experience.



5 Excellent views of the Lions.



8 Connection from Harbourside Drive to waterfront portion of Kings Mill Walk.

Concept Section 1



Key trail head identifies the start of the City of North Vancouver's Spirit Trail and directs trail users to the waterfront route.

New pedestrian/cyclist overpass over CN Rail. The new overpass will connect not only the City and the District of North Vancouver to the waterfront, but will enhance connections of the Marine Drive neighbourhood.

A

Trail (see section B) to be widened to 4 m and paved. It will follow existing alignment to minimize impact on riparian area. Riparian habitat compensation will be implemented to offset any impacts. Options that evaluate compliance with the CNV stream protection bylaws and DFO regulations will be explored during detailed design.

B

Identify the link to bike route with signage.

Primary rest area at the western end of Kings Mill Walk will mark the end of the urban waterfront section of the trail. It will provide a transition into a natural area and act as a turn around point for urban waterfront walk.

Off Street Spirit Trail
On Street Spirit Trail

	Intersection	Trail Head	Rest Point
urban			
primary	I	T	R
secondary	I	T	R
tertiary			R
street			
primary	I	T	
secondary	I		
tertiary	I		
park			
primary	I	T	R
secondary	I	T	R
tertiary		T	R

A Proposed Pedestrian/Bicycle Bridge over Rail Lines at MacKay Creek
View to the North



View to the South



Key Facts

Total Length of Structure:	216 m
Length of Bridge span	172 m
Max Slope of Ramps	1:12
Min Clearance over Railway	7.01 m
Net Habitat Loss*	122 m ²

* Note: This number was determined by:	
Area of bridge deck on south side of track	254 m ²
Area reclaimed by removal of existing path	-132 m ²
Net Loss of Habitat	122 m ²

This habitat will need to be compensated for within the riparian zone of MacKay Creek. This number should be considered approximate. A more accurate assessment will need to be determined during the detailed design phase of this project.

B MacKay Creek

In order to provide an accessible and multi-use trail standard with connections to the new overpass, it is recommended that the existing trail along MacKay Creek be upgraded to a 4 m paved trail that follows the existing alignment. Habitat compensation, in the form of riparian enhancements and stormwater management, will be implemented to offset the impact of this new development. Existing vegetation will be retained, invasive species removed, and the upgrades will be designed to minimize impact on this area. It is proposed that the entire length of the trail including the proposed overpass be lit with full cut-off, dark sky compliant, pedestrian scale fixtures. This will provide a lit connection from West 1st Street to Kings Mill Park.



Concept Sections 2 & 3

East of Bodwell School a wide r.o.w. connects Harbourside Drive with Kings Mill Park; redesign this area to show clear connection to the park and reflect a park-like waterfront experience.

Spirit Trail will be integrated into an urban waterfront edge of this development site. The hotel site is proposed to have a 10m wide Spirit Trail r.o.w. on the waterfront edge. The trail will be in the form of a separated use trail with urban waterfront character; trees, seating and other furnishings.

Access to be negotiated with property owner when redeveloped. See section for minimal trail requirements.



Off Street Spirit Trail
 On Street Spirit Trail

	Intersection	Trail Head	Rest Point
urban			
primary			
secondary			
tertiary			
street			
primary			
secondary			
tertiary			
park			
primary			
secondary			
tertiary			

Add creative play area for children. **A**

Separated pedestrian and bike trail. **B**

C

Re-align pathways to establish an open field for informal play + activities: kite flying, picnics, and games.

Provide a clear visual at the terminus of Fell Avenue that will act as a major trailhead of the Spirit Trail and main entrance to Kings Mill Park to the West and the urban seawall proposed to the east. Seating, public art and other furnishing will fill out this important node. This is also one of the few areas along the CNV Spirit Trail where access to the water is possible.

A link across the Burrard Yacht Club (BYC) is desired but access to this private facility is not currently confirmed. This link will provide a key connection from Bewicke Park, the urban waterfront of the hotel site, and to Kings Mill Park. Crossing of the BYC lands will need to account for the Club's boat repair facility, which could be accommodated by a swing bridge or other means. This feature could have the potential to be an iconic, identifying feature along the City's waterfront should an access agreement be reached. Detailed design should consider security and privacy concerns of the BYC.

Provide pedestrian loop through existing vegetation to offer a variety of experiences in the park.

Redesign plantings to optimize views from the trail. **D**

Potential pier location at the foot of Fell Avenue could provide a location for water taxi service to connect to Vancouver and other points along Burrard Inlet. **E**

Identify connection to bike route with park signage.

F

A Children's Play Area

Using the Spirit Trail development process to enhance or create a diversity of destinations or nodes is one of the objectives of the implementation of the Trail. A creative play environment for children would add a key destination and much needed diversity along this section of waterfront. It should include unique and creative landscape based elements for children of all ages as well as appropriate and well placed seating to allow for oversight.



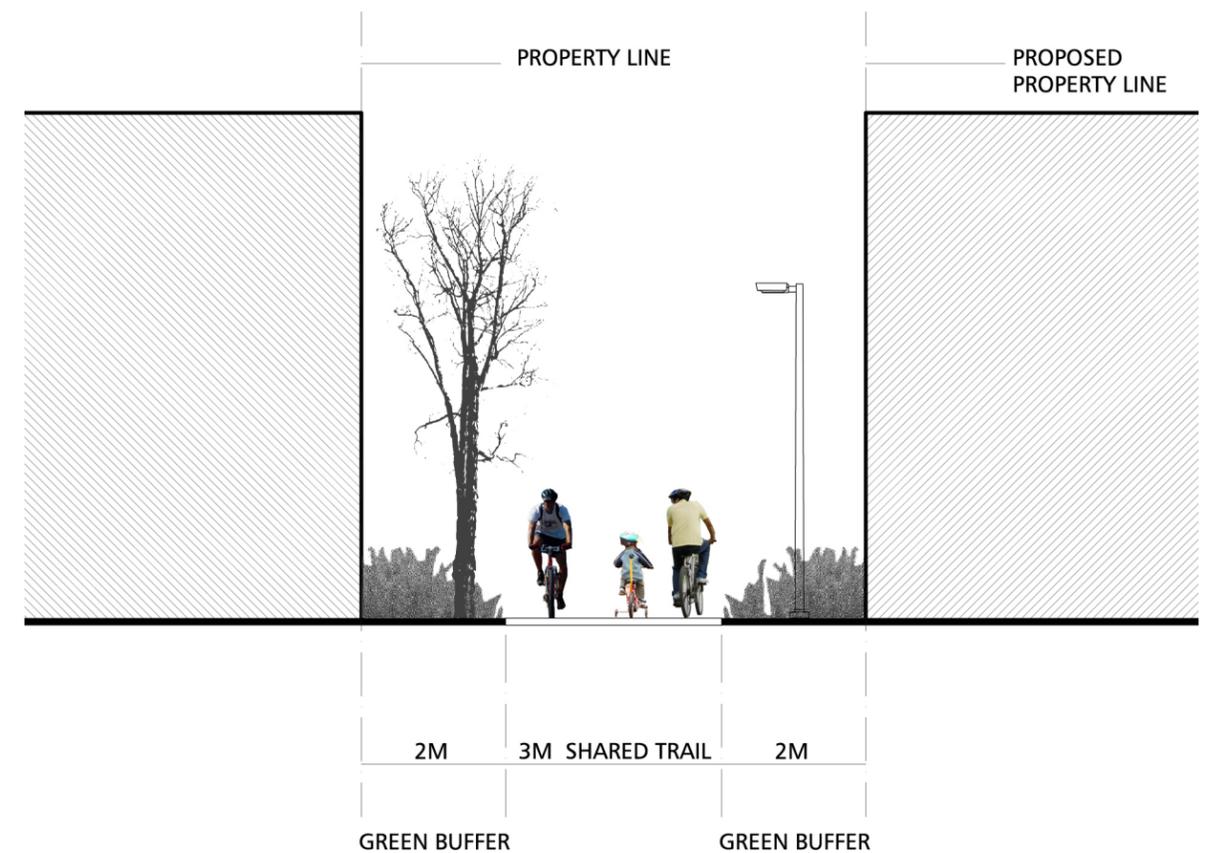
B Separated Trail Precedent



Based on its current use it is anticipated that the popularity of the City's waterfront open spaces will increase. It is recommended that in places where area is available the trail should be separated to allow pedestrians to meander next to the water and faster wheeled traffic to move more quickly along a different but adjacent path.

C Trail Connections

There are several areas along the trail where access must be negotiated with private land owners or where there is not adequate space available for the standard trail dimensions. In these special circumstances, the trail standard will be altered to allow for connections. The diagram to the right illustrates the desired dimensions for these circumstances.



D Inappropriate shoreline plantings.



Planting design along the waterfront should be redesigned with more appropriate selections. Canopy trees and lower vegetation should surround seating areas to emphasize the waterfront experience. Larger vegetation including coniferous and shade trees could be planted away from seating areas or on the north side of the trail. Any designs that consider tree removal will have to be reviewed and approved by the City.

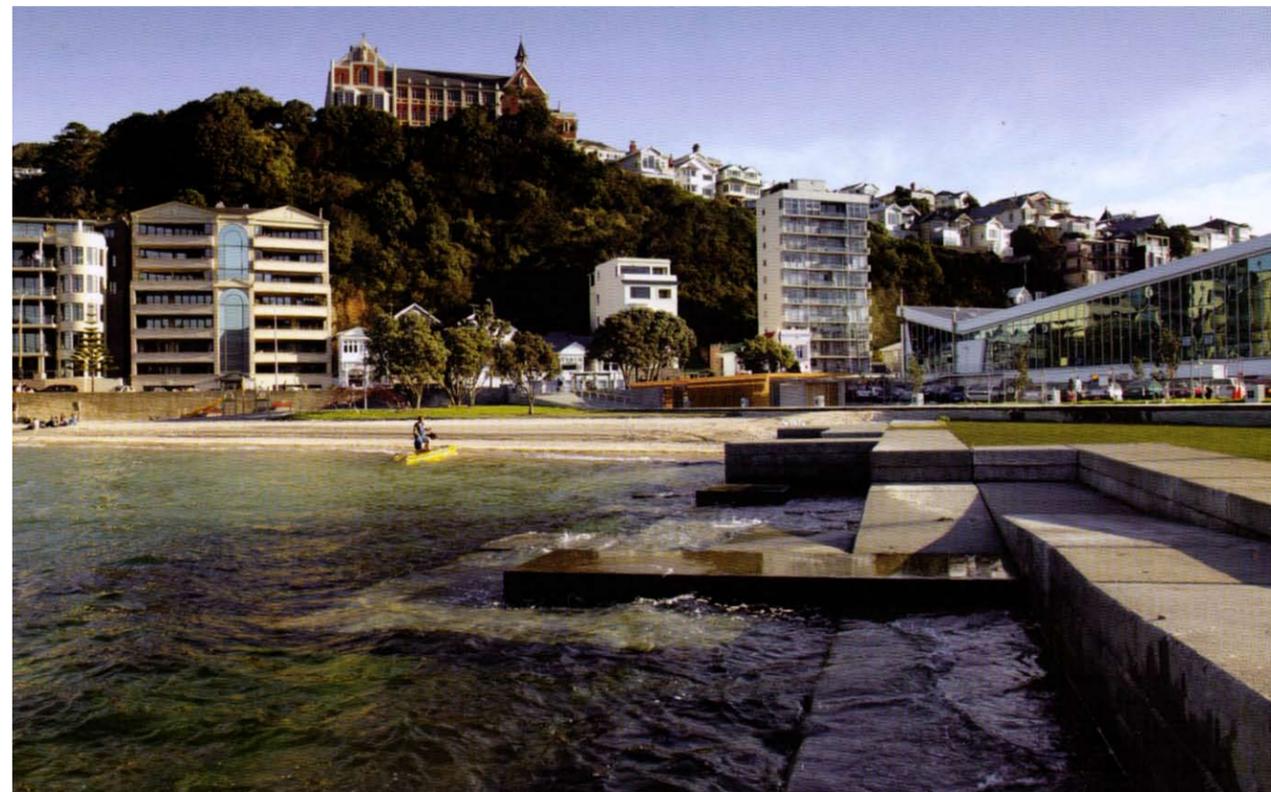
E Water access precedents. Access to the water will need to support marine habitat protection and enhancement.



Existing waterfront access near Lonsdale Quay

Access to the water is an universal desire that can be accommodated in a variety of design approaches from the more formal access seen along the waterfront in Wellington, New Zealand to a more natural example already existing the along the waterfront in the City of North Vancouver.

Water access in more confined, controlled manner can take the pressure off other waterfront areas and retain these for more conservation purposes.



Wellington, New Zealand

D Foot of Fell Avenue



Ferry service in False Creek. A water taxi service, such as this, could link Kings Mill Walk with downtown Vancouver.



The foot of Fell Avenue presents an opportunity to create a landmark element which marks the terminus of Fell Ave and highlights the trail and connection to the waterfront.

Neighbourhood - Marina Section 4 - Bewicke

General Description

This section of Spirit Trail is surrounded by light industry. The road is unpaved and in poor condition. There are no sidewalks or existing pedestrian/bicycle facilities and there is currently no access from Bewicke Ave. to Kings Mill Walk. The buildings along Bewicke present large blank walls to the street. Overall this section is unwelcoming to pedestrians and cyclists.

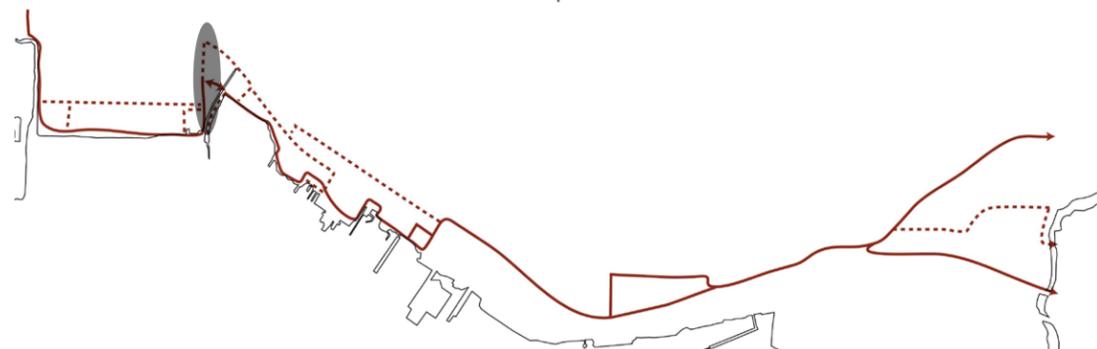
Bewicke Avenue terminates at Bewicke Park, a small waterfront park at the mouth of Mosquito Creek with untapped potential.

Opportunities

- Possibility for a shared vehicle, pedestrian, and bicycle green street treatment of Bewicke Ave.
- Development of Bewicke Park as a destination or node along the trail.

Constraints

- Several businesses only have access to their facilities from Bewicke Ave.
- All routes from Bewicke to Kings Mill require negotiation with a private land owners.
- The wall and riprap at the foot of Bewicke Avenue may need to be upgraded.



1:2000



Existing at-grade rail crossing.

11



Arrow indicates access points along Bewicke for businesses. There is a potential to consolidate entrances.

2 9 10



Privately owned property, access may be negotiated if the property is developed.

3



Existing City of North Vancouver right of way. Trail connection should be developed through here.

1 6



An existing small node, Bewicke Park has good views of the Yacht Club and downtown Vancouver. The park has potential to become a key node along the trail as well as increase habitat potential.

5 7 8 12



This area of the proposed alignment is owned by the Burrard Yacht Club. This private property and marine slip is a major barrier to movement. A special crossing structure would be required to make the connection along the waterfront. Access would need to be negotiated with the Yacht Club.

4



1 View of future development site from CNV r.o.w.



2 Entry feature to private business on Bewicke Ave.



3 Access through this private property would connect the trail.



4 Foot of Gostick Place. Proposed trail runs both north and south of this site.



5 Bewicke Park existing site condition.



6 Condition of existing right of way.



7 Bewicke Park.



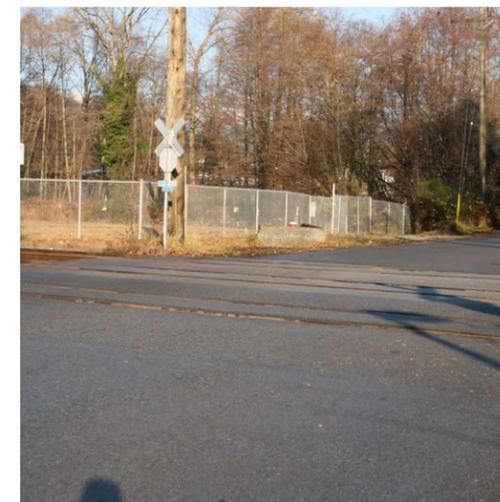
8 View from Bewicke Park.



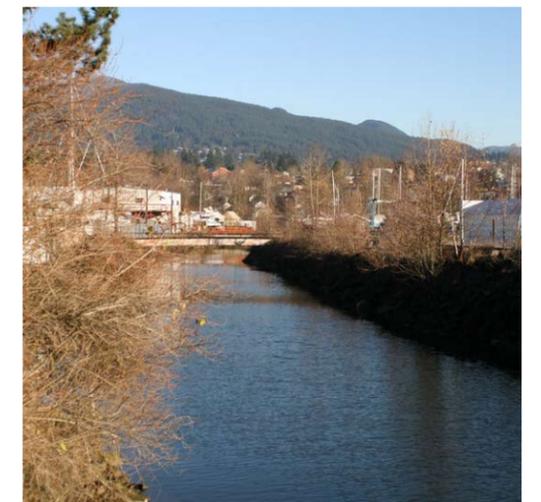
9 Existing Bewicke Avenue surface.



10 Typical building condition along Bewicke Avenue (zero setback).



11 Bewicke at grade rail crossing.



12 View of Mosquito Creek from Bewicke Park. Riparian zone is limited.

Neighbourhood - Marina

Section 5 - CN Railway / Squamish Nation

General Description

Section 5 consists of two parts. The first part of the route is along the CN railway from the Squamish Nation Mosquito Creek Marina to Bewicke Avenue. The properties adjacent to the railway are occupying land that is considered to be within the CN right of way. There is less than 1.5 m in some locations between the fences and the rail lines.

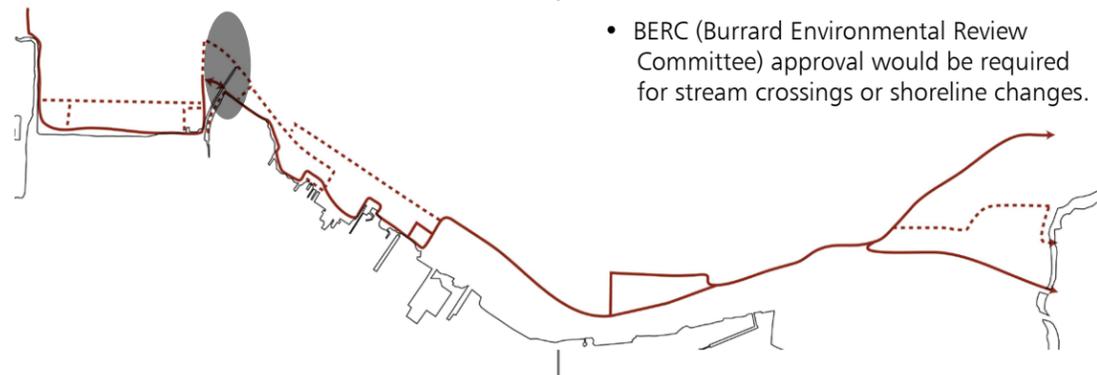
The second part of this section would provide a waterfront route continuing along the Marina and possibly along Mosquito Creek. This could provide a more direct route with a higher degree of visual and sensory interest. The riparian zone along this section of Mosquito Creek would benefit from enhancement and rehabilitation where possible. This route follows a more favourable waterfront 'edge' route.

Opportunities

- Either route would provide a critical connection between Squamish Nation Mosquito Creek Marina, Bewicke Ave. and Harbourside Business Park.
- Waterfront route along Mosquito Creek could allow for riparian rehabilitation of this salmon bearing stream.
- Use of the spit leaves more developable land open to the Squamish Nation

Constraints

- A trail along the railway would require uses adjacent to the railway to move their fencing, equipment, and any other items.
- One or two more water crossings would be required with the waterfront trail option.
- There may be some NAV Canada restrictions to a crossing over the mouth of Mosquito Creek. This will be examined further in detailed design.
- Both routes require negotiation with the Squamish Nation and CN Rail.
- BERC (Burrard Environmental Review Committee) approval would be required for stream crossings or shoreline changes.



Bewicke Avenue at-grade rail crossing.

1 3 5



Riparian Forest along Mosquito Creek.



CN Railway policy recommends a 30 m setback and 2 m high berm along recreational facilities.

Adjacent users have occupied part of the CN r.o.w.

2 4



Squamish Nation lands.



Connection to Bewicke Ave. should be coordinated with any Squamish Nation future plans.



An electrical building has been recently added in front of the Marina Office. This reduces the amount of room available for the trail.



There are opportunities for enhancement of riparian and wildlife environments along the spit with development of a trail.



Fish habitat in intertidal portion of Mosquito Creek.



A waterfront route would require 1-2 new crossings depending on whether the existing bridge could be shared with the trail.

6

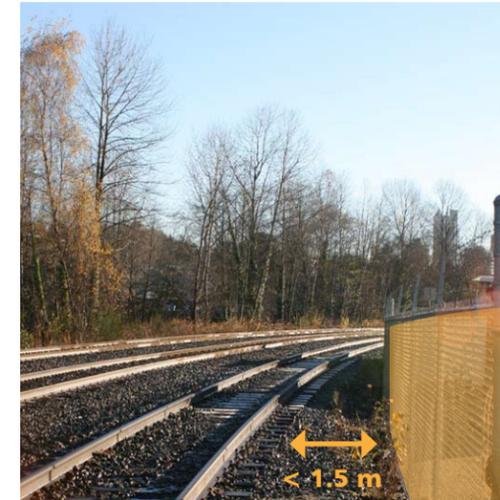


Gas lines run along the ground on the spit to the floating gas station.

1:2000



1 View of Fell Ave overpass from Bewicke-CN crossing.



2 Minimal buffer exists between CN row and existing uses.



3 Mosquito Creek.



4 Three sets of CN Rail lines run through this area.



5 Bewicke - CN at-grade crossing.



6 View of Mosquito Creek from Bewicke Park.

Neighbourhood - Marina

Section 6 - Squamish Nation

General Description

Section 6 of the trail is expected to be complete in 2008. The Mosquito Creek Marina is undergoing a redevelopment and expansion. Most of the buildings and structures within the proposed trail alignment are temporary and portable.

Currently, the waterfront area is an extension of the parking lot. There is little vegetation and an abundance of paved surfaces. The water's edge is lined with riprap. There are excellent views to the mountains and historic St. Paul's church to the north and of Vancouver to the south.

Opportunities

- Many of the buildings and structures are movable allowing for flexibility in alignment and to optimize marina operations.
- The eastern end of this section provides unique opportunities for beach access, an interesting stopping point, and a Squamish Nation gateway. There is also the opportunity to 'green' the marina and create a linear park-like edge on the water.

- This location provides exciting possibilities to showcase local First Nations art.

Constraints

- There are existing structures and utilities that will have to be worked around or relocated. This can be cost intensive.



Historic St. Paul's Church.



Negotiation with CN and Squamish Nation will need to take place to continue the trail to the west.



Trail alignment will consider view of historic St. Paul's church.

11 12



A new gathering space will be created at corner of Marina office with seating and the totem pole.

5 7 8 9



Alternate route would be the main cycling route. Negotiation would be required with CN Railway.

1



Existing location of Marina cafe.

2 3



Main pier.

4 10



Existing shoreline may require updated armoring to make it stable. Any filling of the shore requires environmental approvals.



Unique beach access opportunity.

6



1:2000



1 Mosquito Creek Marina Entrance.



2 Marina cafe building will need to be pushed back from water's edge.



3 Re-orientation of cafe will allow for a larger outdoor space.



4 Fence will need to be moved back.



5 Two large conifers will be retained.



6 Unique opportunity for beach access.



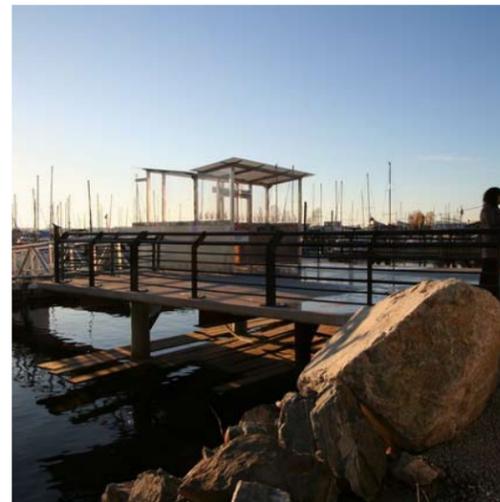
7 Other structures to be moved back.



8 Existing totem pole may be relocated to a more prominent location.



9 New seating node to be created at corner of trail.



10 New marina access point.

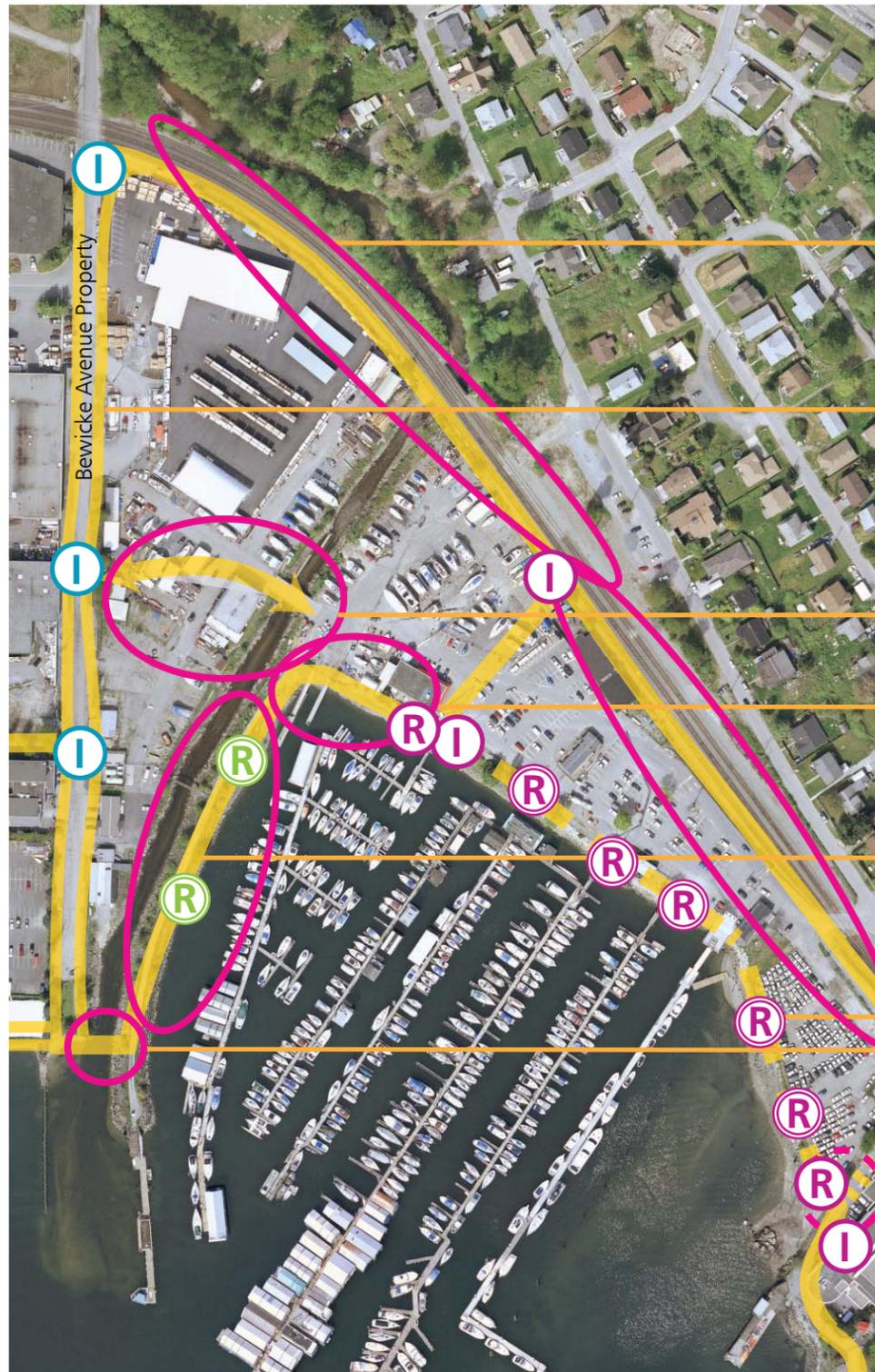


11 Front of Marina office.



12 View of historic St. Paul's church.

Concept Sections 4, 5 & 6



	Off Street Spirit Trail
	On Street Spirit Trail
	Intersection Trail Head Rest Point
urban	
primary	
secondary	
tertiary	
street	
primary	
secondary	
tertiary	
park	
primary	
secondary	
tertiary	

Long term connections across the Squamish Nation Lands and the CN Rail right of way could take place on several different routes. The following presents some of these concepts.

A more direct commuter oriented route could be implemented along the CN right of way along side the Squamish Nation Lands.

Bewicke Avenue property could be redesigned as a green corridor with separated pedestrian and a traffic calmed road suitable for bicycles. This would provide access to Bewicke Park on the waterfront. As well as provide access for adjacent businesses. **A**

Circled routes are suggested connections and are the City of North Vancouver's desired completion of the trail. Any connections will need to be negotiated with the Squamish Nation and will be planned to support the Nation's vision for this area.

Access to be negotiated with the Squamish Nation and Mosquito Creek Marina. A connection from the Marina across Mosquito Creek will ensure continuous waterfront movement.

Development of a trail along the spit could be accompanied by habitat enhancement along Mosquito Creek. Fuel lines that serve the fuel bar potentially could be located underground to accommodate the trail.

The first part of the Spirit Trail to be constructed will be along the Squamish Nation Mosquito Creek Marina (dashed line). Expected completion is fall of 2008. **C**

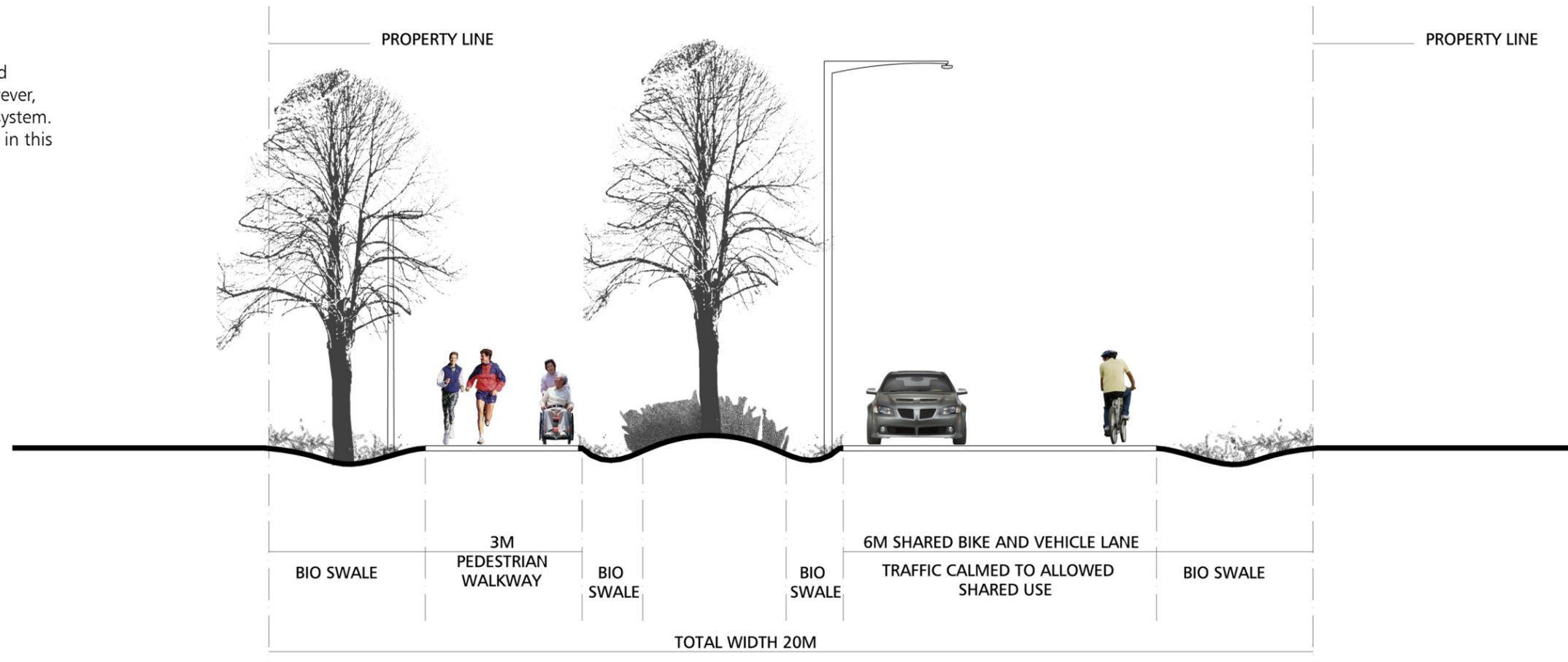
A potential pedestrian/cyclist bridge over Mosquito Creek would connect the Squamish Nation Mosquito Creek Marina to the western portion of the trail including Bewicke Park, the Burrard Yacht Club and Kings Mill Park.

Location of public art installation at entrance to Squamish Nation lands.

B

A Bewicke Avenue Property

Bewicke Avenue Property is essentially flat and provides optimal conditions for cycling. However, this area currently does not have a drainage system. Bioswales could be used to improve drainage in this area.



B Gateway marking the entrance to
Squamish Nation Land.

The Squamish Nation and the City of North Vancouver have joined together to build the first portion of the Spirit Trail through part of the Squamish Nation Mosquito Creek Marina. The *Gateway to Ancient Wisdom*, a public art piece, will mark the entrance of the Spirit Trail on to Squamish Nation lands. Public art will be integrated into the trail project add interest to the trail. The gateway is being designed and built by Sky Spirit Studio - Wade Baker and Mary Tasi.



Early conceptual graphic of the gateway designed by Wade Baker and Mary Tasi.

This contemporary stainless steel and red cedar sculpture represents the concept of "entering traditional territory" as one enters Mosquito Creek Marina/ Squamish Nation land from the North Vancouver waterfront. It is made up of the Sun and two Thunderbirds that represent a male and female chief; a balance of leadership. There are many legends about the Sun and the Thunderbird amongst the Northwest Coast people. The Thunderbird is considered to be the most powerful of all the mythical creatures as it can fly to the sun and back bringing ancient knowledge from the Creator. The two Thunderbirds on either side of the gateway also mirror the twin peaks of the North Shore Mountains - or the Twin Sisters.

The concept behind the piece is a re-interpretation of the historical architecture of the Coast Salish people. The "Big House" where the Chief and several extended family members lived always had houseposts in front of the entrance doors. The Coast Salish culture is visual and oral. Stories were shared orally and family milestones and important events were artistically carved into cedar houseposts and other markers.

The philosophical context of the sculpture is about returning to ancient wisdom and ancient knowledge that has been lost in our recent industrial era.

C Squamish Nation Mosquito Creek
Marina Trail

Illustration of the Mosquito Creek Marina Trail. The trail will provide a linear park experience with trees, plantings and seating areas enhanced with public art. An existing totem pole and memorial bench are to be integrated into this new open space.

The trail section through the marina will create an attractive and welcoming outdoor people space along the marina waterfront, including the opportunity for expanded outdoor dining.

Existing marina functions will be protected and enhanced through the development of the waterfront trail.

Design Concept the Squamish Nation Mosquito Creek Marina Trail



The Spirit Trail at Mosquito Creek Marina - Preliminary Concept Plan

Neighbourhood - Lonsdale

Section 7 - Forbes/Waterfront Park/Chesterfield

General Description

Section 7 consists of the area in Waterfront Park, the zone that connects the park to the SeaBus terminal and Quay, Forbes Avenue and Chesterfield Court. The park has an urban character of grass and shade trees, the seawall has numerous benches and public art features, the Goldsworthy Pier provides water access and excellent views to Vancouver. The finishes and site furnishings in the park are somewhat dated and in need of coordination and updating. Overall the park circulation does not take full advantage of the site, the seawall design cuts the remainder of the park off from the waterfront.

The metal sculpture, Cathedral, in the park is a notable feature.

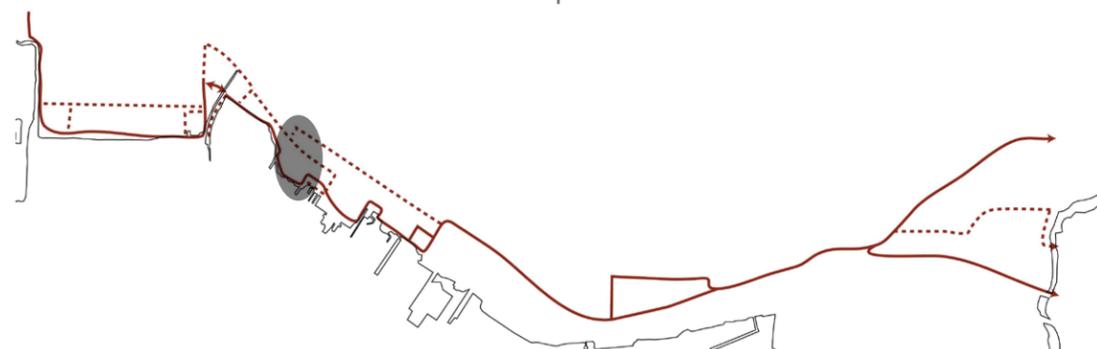
The park is well used for festivals and public events.

Opportunities

- Waterfront Park will be redeveloped in the next five of years. North-South connections, upgraded play areas, improved provision for festivals and events will be key considerations.
- The existing paved surface along the rail lines through Waterfront park may advance the development of the secondary alignment further. Opportunity to improve the seawall connection to the park and beyond.
- Consider connections between the north and south portions of the park.

Constraints

- The waterfront route directly adjacent to the SeaBus terminal requires negotiation with Translink.
- The scope of the redevelopment for Waterfront Park is currently undetermined.
- The park is cut off from the surrounding community by rail lines, Esplanade and adjacent buildings.



- 

Esplanade may be an option for bicycles to bypass the Lonsdale waterfront route. This route is already an existing and committed bike way. Bikes could reconnect with the Spirit Trail at the foot of Forbes Ave.
- 4



There is an existing 5 m wide stretch of asphalt separated by a chain link fence along this part of the railway. There is one fence behind 33 Chesterfield Place that would need to be removed to allow access. This would provide a good route for bicycles.
- 1

Trans-Canada Pavilion



A diversity of existing nodes, public art, and interpretive signage can be found along this area. There are no unifying elements.
- 2 3 5 6 8 10 11



- 9



The current trail alignment is in close proximity to 33 Chesterfield, a multi-family residential building. There is no physical or visual separation from these residences.
- 7



The trail is too narrow along this zone and is currently signed for pedestrians only.
- 12

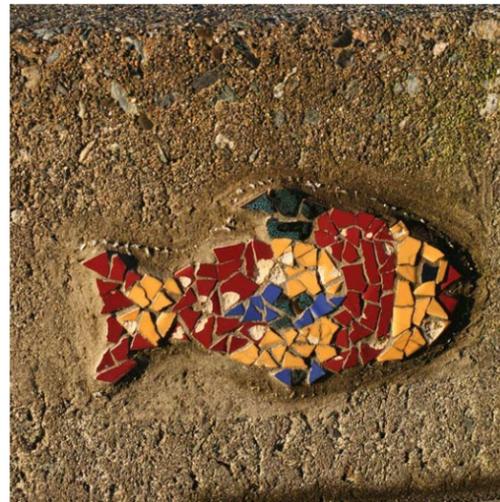


A waterfront alignment would require access from Translink. This route would provide a superior experience to existing route.

1:2000



1 Existing pavement adjacent to railway.



2 Public art embedded into concrete blocks.



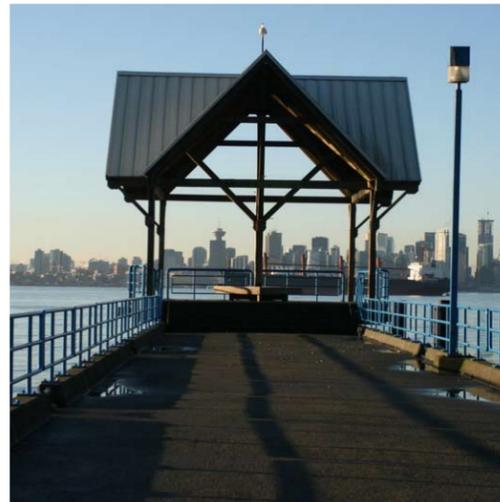
3 Waterfront Park North.



4 Foot of Forbes Ave.



5 Existing waterfront trail.



6 Goldsworthy Pier.



7 Narrow pathway.



8 Public art in Waterfront park.



9 CNV r.o.w. in front of 33 Chesterfield.



10 Existing site furnishings.



11 Paving and bollards.



12 Exit from SeaBus terminal.

Neighbourhood - Lonsdale

Section 8 - Lonsdale Quay

General Description

Section 8 of the Spirit Trail is located in the area around the Lonsdale Quay. It is an area that already attracts a great number of visitors and transit users. The SeaBus terminal is an important gateway to North Vancouver and the Spirit Trail, however current navigation and wayfinding in this area is unclear. Wooden boardwalk and steel are the prevalent materials used here as remnants or reminders of past industrial uses.

Translink is planning to undertake some aesthetic and safety upgrades to the SeaBus terminal. Connections to the Spirit Trail to the west will be considered in any future improvements in the area of Carrie Cates and Chadwick Court. Future plans for the foot of Lonsdale should consider multi-use trail integration.

Opportunities

- SeaBus entrance has the potential to be a major gateway to the Spirit trail.
- Explore potential for East-West connections.

Constraints

- Parts of existing boardwalk are too narrow for both bike and pedestrian lanes.
- Legibility of East-West connections at the SeaBus are poor.
- Does pedestrians use in this area preclude bicycle use?



The trail goes through the covered area of the Lonsdale Quay that is adjacent to bus terminal. The City and Translink are planning to update this area. Updates will likely include improvements to lighting and site furnishings. The entrance to the SeaBus terminal is an important gateway to the trail and the City but current navigation and wayfinding in this area is unclear.

1



A possible Spirit trail alternative route for bicycles is to use the existing bike route along Esplanade.

8



Possible conflict with entrance to bus terminal.

2



The trail alignment passes through the parking lot of the Cates Tugboat facility. Future plans for the foot of Lonsdale should consider multi-use trail options.

12



The pedestrian route along side the Lonsdale Quay is very narrow.

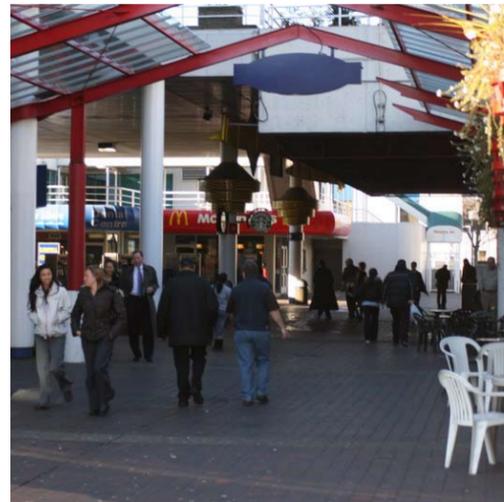
4 5 11



Existing plaza at Lonsdale Quay. Currently the walkways in this area exclude cyclists.

3 6 7 9 10

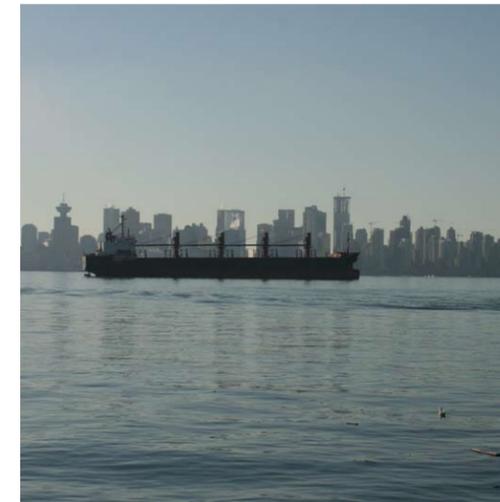




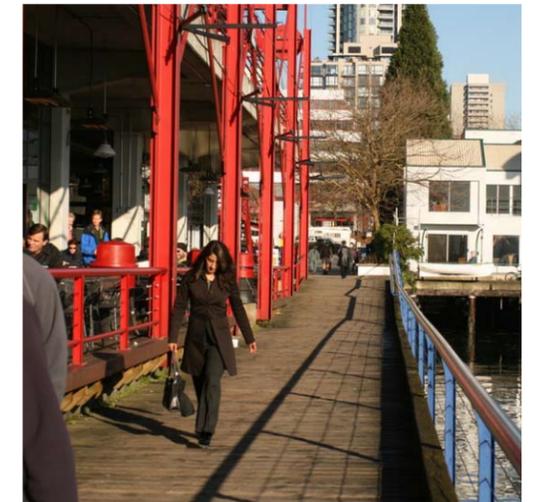
1 Entrance to Quay from SeaBus terminal.



2 Bus terminal entrance behind Lonsdale Quay.



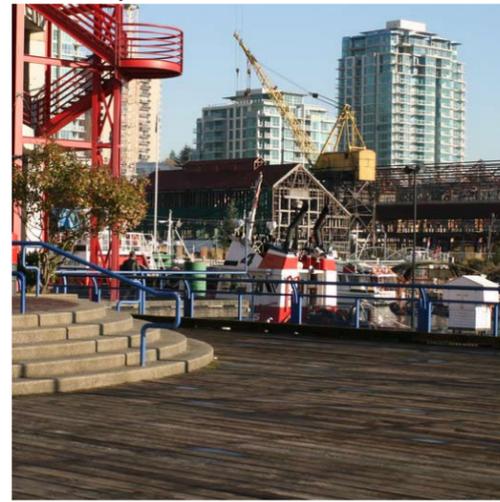
3 View from Lonsdale Quay Plaza.



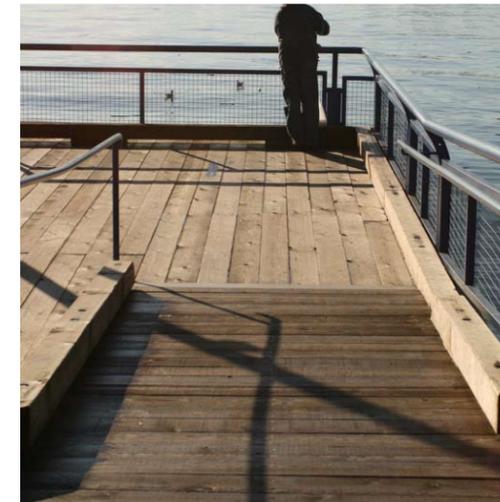
4 Narrow pedestrian route along side of Quay.



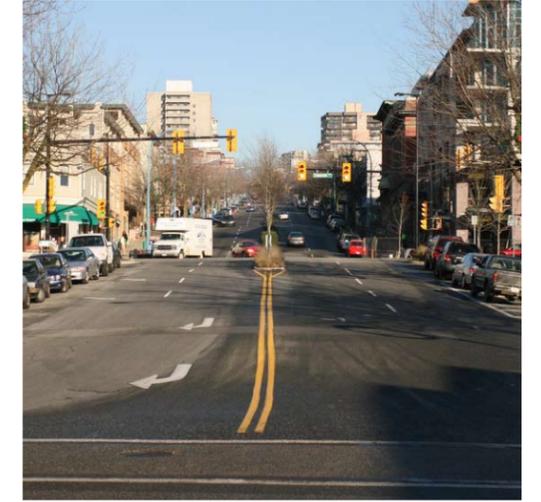
5 East side of Lonsdale Quay.



6 Plaza in front of Lonsdale Quay.



7 Materials of the Lonsdale Quay Plaza.



8 Corner of Esplanade and Lonsdale Ave.



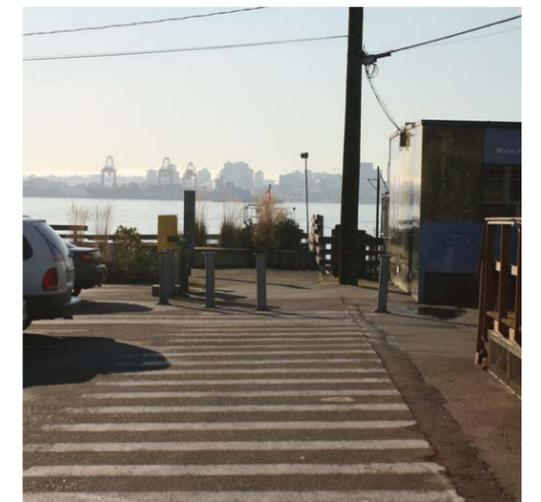
9 Lonsdale Quay Plaza.



10 Public art in the Lonsdale Quay plaza.



11 Sample of paving materials.



12 Trail alignment through parking lot.

Neighbourhood - Lonsdale Section 9 - Versatile Shipyards

General Description

The western portion of what was the Versatile Shipyards area is currently being transformed into a mix use development and the eastern portion of the site be retained for heavy industrial use. Phase I of the redevelopment of the western portion has been completed and consists of new waterfront walkways and piers that are open to the public. Phase II is underway and will consist of a hotel and convention centre, new public plazas, additional waterfront walkways, retail space, and residential units.

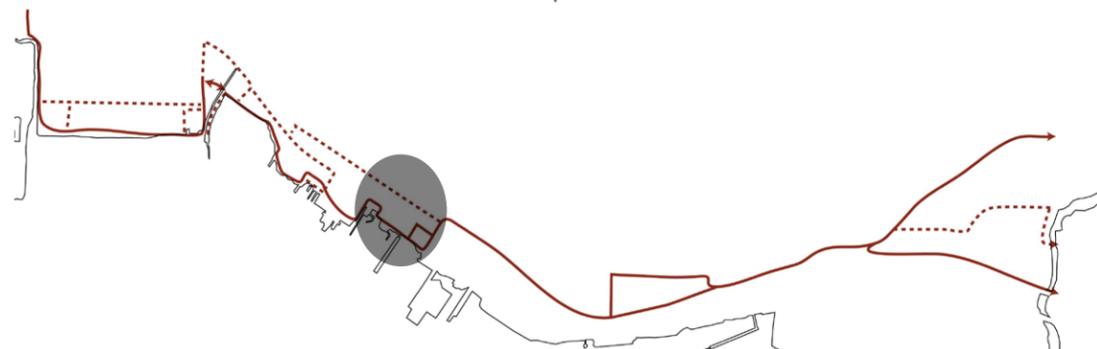
The public realm in Phase I has been designed with a high level of detail and was inspired by the previous industrial character of the area. There are several custom made furnishings including benches, bollards, bike racks, light fixtures, and waste receptacles that reflect this heritage.

Opportunities

- Area is under redevelopment.
- The new pier improvements could help to determine the character of adjacent sections of trail.

Constraints

- Many design decisions have already been made.



This area of CNV, previously the Versatile Shipyards site, is currently under redevelopment. In this area trail planning will consist of recommendations on width, separation, and wayfinding.

6 8



The public realm is being built in phases. The built portion reflects the former industrial character of the site.



1 2 3 4 5 7 8

1:2000



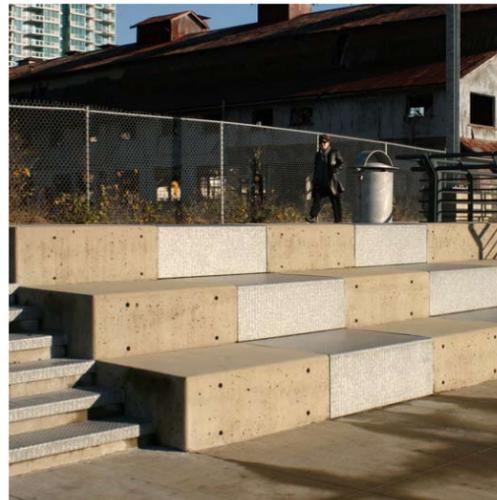
1 Site furnishings on the Pier.



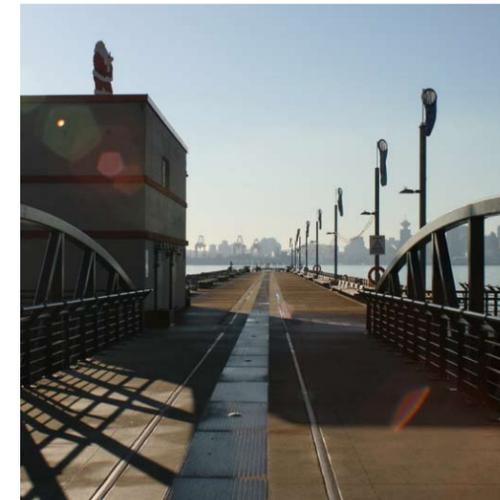
2 Bridge and planting details.



3 Access to water's edge.



4 Waterfront classroom.



5 Pier and view.



6 Custom Bench.

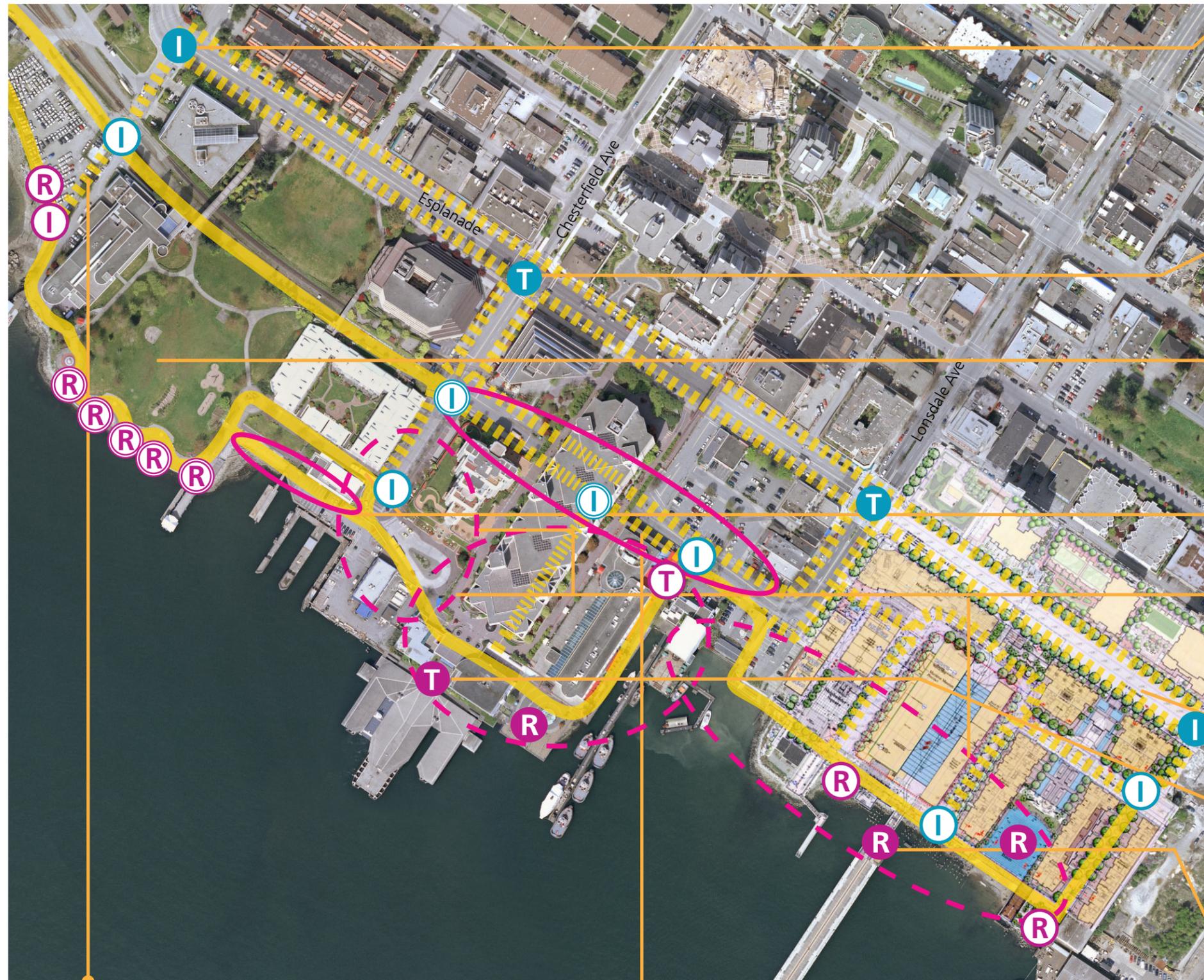


7 Hardscape materials along Esplanade.



8 Intersection of Esplanade and St. Georges.

Concept Section 7, 8 & 9



Off Street Spirit Trail
 On Street Spirit Trail

	Intersection	Trail Head	Rest Point
urban			
primary			
secondary			
tertiary			
street			
primary			
secondary			
tertiary			
park			
primary			
secondary			
tertiary			

Intersection at Forbes and Esplanade could be improved to include a safer crossing option that allows cyclists to more easily get on or off of Spirit Trail.

Primary trail head marks the entrance to Spirit Trail from major streets directing users to the most appropriate route. It may also be used as a meeting point for residents and visitors.

Future park redevelopment to consider a separated trail.

Potential for a more prominent waterfront connection. Short term connection exist between buildings.

Identity elements to be incorporated into these areas to identify the Spirit Trail.

Commuter cyclists to make use of existing on street bike lanes on Esplanade.

The SeaBus will be the major staging area of the Spirit Trail for visitors to the City. It will be critical that Spirit Trail wayfinding has a prominent location here.

Primary rest points in this area are existing or soon to be built. Small additions to these spaces will make them identifiable as parts of the Spirit Trail.

Foot of Forbes Ave should be considered for upgrades as a connector between two east-west routes. Lighting, wayfinding, pavement treatments should be used to indicate the trail.

Potential for improved pedestrian and cyclist connections along Carrie Cates Court with improved lighting, pavement markings, streetscape improvements.

A SeaBus Trail Head

The SeaBus Terminal is a major staging area to the Spirit Trail and should be well marked. One option is to take advantage of the existing architectural elements to mark the trail. It is important that some wayfinding is at eye level for the average pedestrian.



Existing condition at SeaBus Terminal.

B Pedestrian and Bicycle Routing

The ideal routing for pedestrians and bicycles through the Lonsdale area is shown in the adjacent diagram.

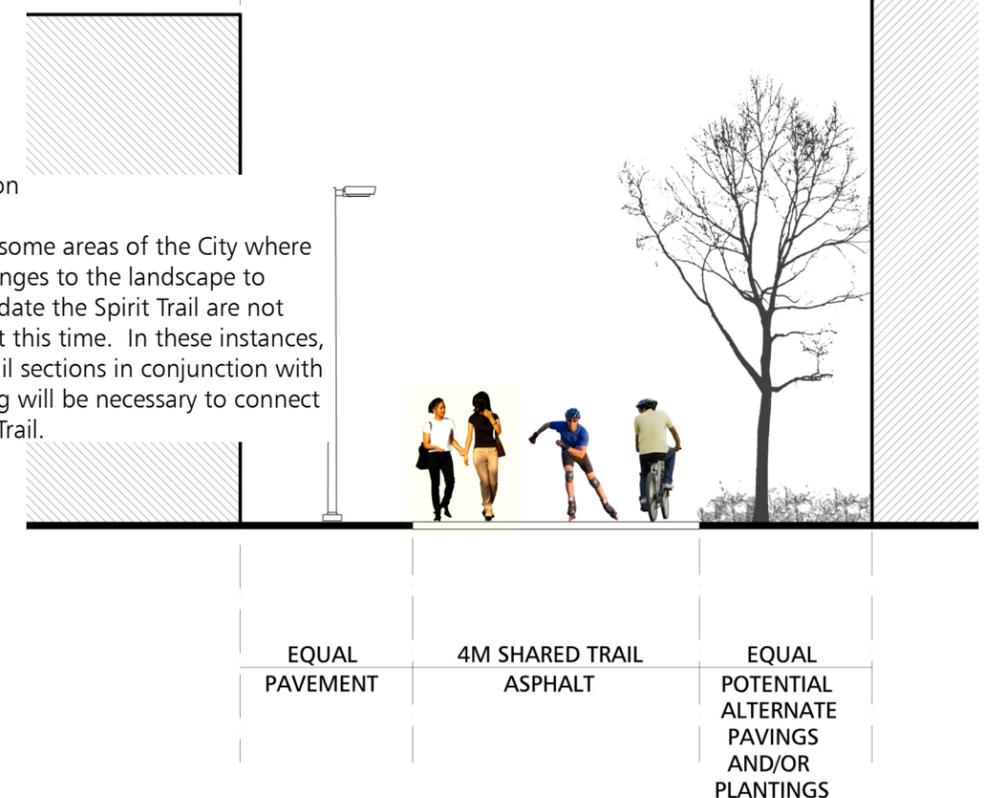
- Primary pedestrian route
- - - Primary cyclist route



Trail marking precedent from Korea.

C Trail Section

There are some areas of the City where major changes to the landscape to accommodate the Spirit Trail are not possible at this time. In these instances, altered trail sections in conjunction with wayfinding will be necessary to connect the Spirit Trail.



Trail section in between a residential complex and office building.

Neighbourhood -Esplanade Section 10 - St. Georges to St. Patricks

General Description

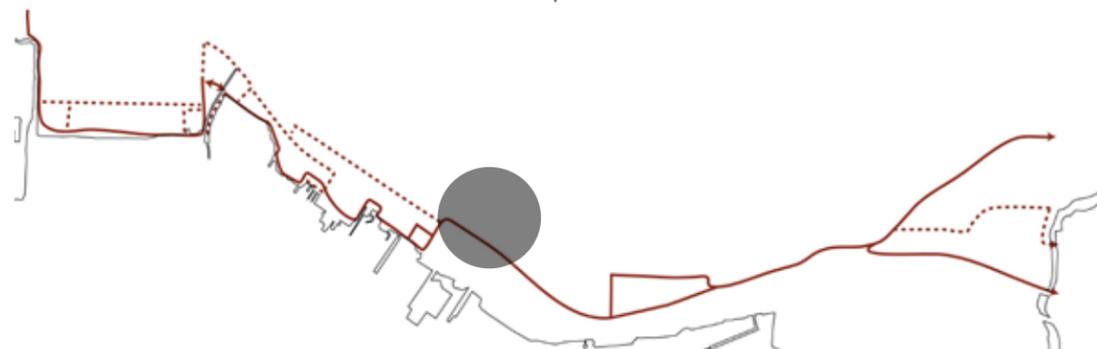
The two blocks between St. Georges Ave. and St. Patricks Ave. are lined with small automotive businesses along the north side of the street. The south side of the street is covered with naturalized vegetation with an escarpment below. Dumping of garbage is currently a problem in this area. This section of the trail may require a temporary solution as the area is in a state of flux with various redevelopments happening. Guidelines will help inform the trail through this area as changes occur.

Opportunities

- The area is in transition which offers opportunities to integrate new trail design into this industrial area.
- Opportunity to create an entrance/trail head to the Moodyville section at the foot of St. Patricks Ave.

Constraints

- It may be some time before the Vancouver Port Authority moves ahead with plans that would see improvements to Esplanade.
- Escarpment on the south side limits options for trail alignment.
- There are several major road crossings along this section.





1:2000



The alternate route for bicycles around the Lonsdale Quay may start at St. Georges Ave. using the existing on street bike route along Esplanade.



St. Georges Ave. and Esplanade intersection requires further study to determine possible pedestrian and cyclist connections and amenities.



No existing sidewalks. Road edge being used for parking. Area for trail through vegetation is limited due to the escarpment.



St. Andrews Ave. and Esplanade intersection requires study with respect to pedestrian and cyclist safety. This uncontrolled intersection is expected to become busier over time as traffic increases to the Port. The Spirit Trail will connect to the St. Andrews bike route at this point.



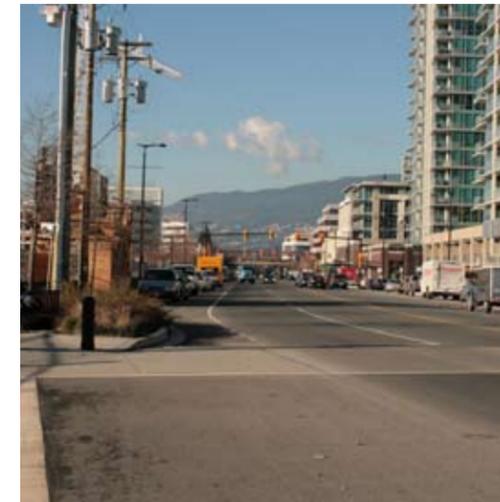
Esplanade and Lower Level Road intersection requires further study as there is currently no safe way to cross here. Vehicles move at high speeds through this area.



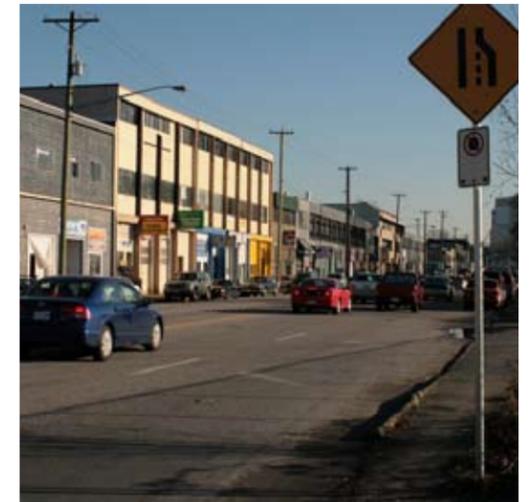
Entry point to the Moodyville Sunrise neighbourhood. Possible location of a gateway/trail head.



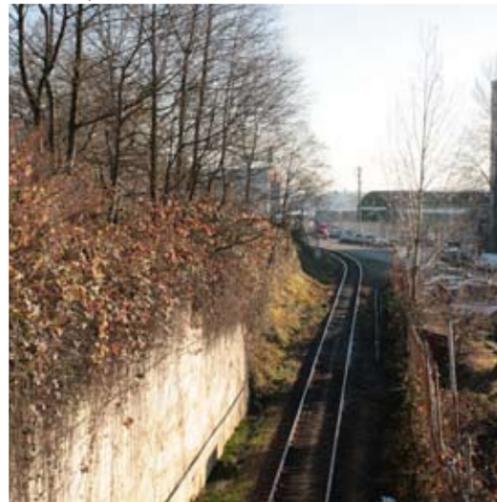
1 Intersection of St. Georges and Esplanade.



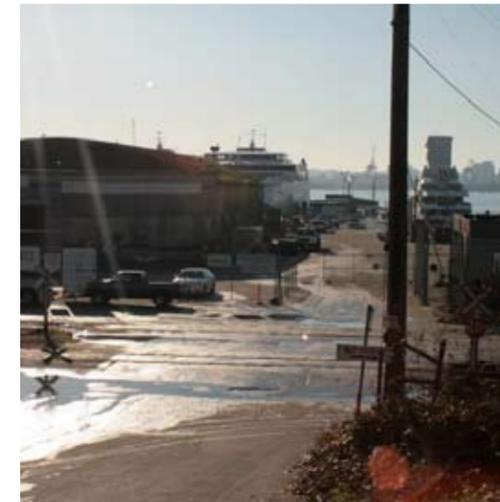
2 View west on Esplanade.



3 View east on Esplanade.



4 Escarpment above Lower Level Road.



5 Access to Port.



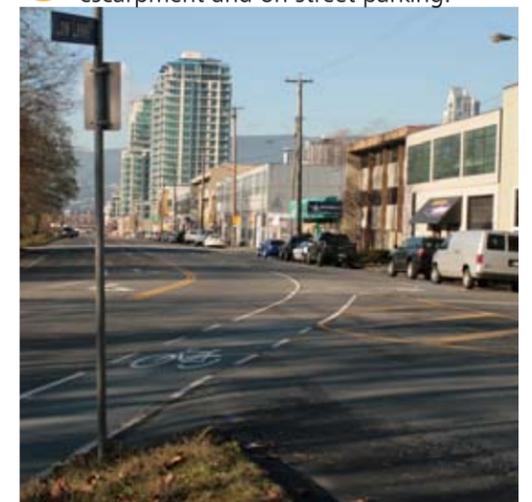
6 Naturalized vegetation along escarpment and on street parking.



7 Parking lot below escarpment.



8 Esplanade and Lower Level Road (east).



9 Intersection of Esplanade and Lower Level Road looking west.

Neighbourhood - Moodyville and Sunrise

Section 11 - Waterfront Escarpment

General Description

This part of Spirit Trail runs south of Moodyville. Along the majority of this area there is an existing informal trail. This section of the Spirit trail is unique in that there is a well established overhead tree canopy consisting of deciduous forest species. There are several viewpoints to Burrard Inlet as well as views of the industrial activity of the Port. These industrial views are relatively rare and include the grain elevators, the railway, and coal piles.

Sections of the trail are parallel to some backyards and along the lane behind Alder Street. Any design solution for these areas would require consultation with the neighbourhood. There are many ways to mitigate any potential conflict between trail users and neighbours. For example, fencing could be applied along private property to keep users on the trail, bollards could be used to separate vehicular and pedestrian/cyclist traffic, and grade separation could be employed to designate the trail. Solutions will be chosen for each part of the trail that address the unique site conditions.

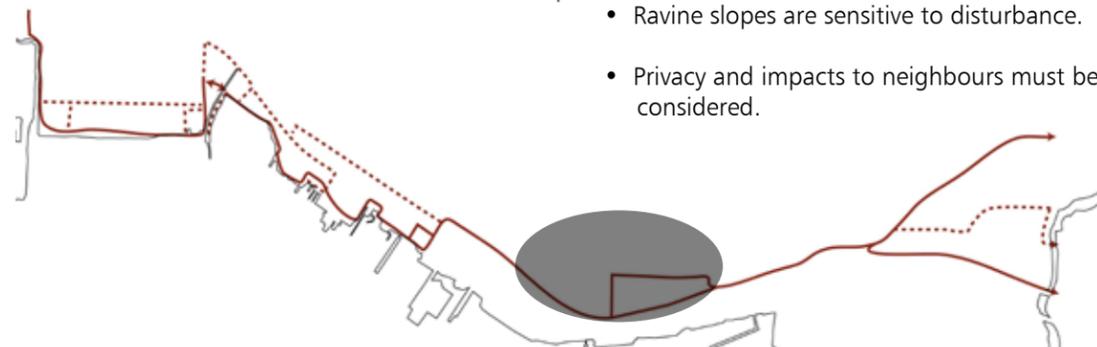
There is sufficient width to accomplish the desired Spirit Trail goals in this area.

Opportunities

- The escarpment provides viewing opportunities and good separation from Lower Level Road and the CN Rail Line.
- The ravine presents options for a unique experience along the trail. A lookout can be created to take advantage of the views and industrial character.
- The CNV already has access to all of the land in this section of the trail.
- Metro Vancouver is open to shared use of their utility right of ways for trails.
- There is lots of opportunities for habitat enhancement through the removal of invasive species.

Constraints

- The right of way through this section is relatively narrow in some sections and quite steep limiting the alignment possibilities.
- The ravine limits options for a shared bike and pedestrian path through this section.
- Ravine slopes are sensitive to disturbance.
- Privacy and impacts to neighbours must be considered.



Some of the residential lots have expanded past their property lines and into CNV land. Public consultation should ensure these residents have been included and notified.

Buffering may be required near residential properties.



The forest canopy opens up to views of Burrard Inlet and Vancouver.



The wheeled trail will go north here through the residential neighbourhood and rejoin the main trail through an existing entrance to Moodyville Park.



Due to the ravine and watercourse, this part of the route will likely be pedestrian only.



Potential lookout within the ravine section. Ravine and escarpment are environmentally sensitive. Detailed trail design and construction will incorporate environmental values.



1 Existing pedestrian crossing in ravine.



2 Some residential lots are directly adjacent to the proposed trail location.



3 Views to Burrard Inlet and Vancouver.



4 Some residential lots are separated from the trail r.o.w. by distance or grade.



5 Typical existing trail conditions.



6 Existing stairs in ravine.



7 This lot is owned by CNV. Trail is proposed to go through this backyard.



8 Proposed alignment goes through this lane for a pedestrian trail connection.



9 Existing relationship between the lane and residences.



10 This steep hill connects the Spirit Trail for wheeled users.



11 Metro Vancouver waste water main.



13 Trail for wheeled users to go along East 2nd Street.



14 Existing entrance to Moodyville Park from at the end of E. 2nd St..



15 Existing entrance to Moodyville Park just off of E. 2nd St.



12 Connection to Moodyville trail would require regrading to accessible standards.

Neighbourhood - Moodyville and Sunrise Section 12 - Moodyville Park

General Description

Section 12 of the trail runs through Moodyville Park and Metro Vancouver waste water right of way. It consists of a mixed forest and is the most naturalized part of the trail. The existing trail appears to be well used by walkers despite the fact that it is not well connected to the neighbourhood.

The existing informal trail passes through an important patch of intact habitat containing mainly indigenous vegetation with significant amounts of invasive species. This section of the Spirit Trail, traversing through a forested environment, is unique along the trail. This environment adds another level of diversity to the user's experience. Even though this part of the trail is not directly adjacent to the water's edge, the user is still connected visually with excellent views.

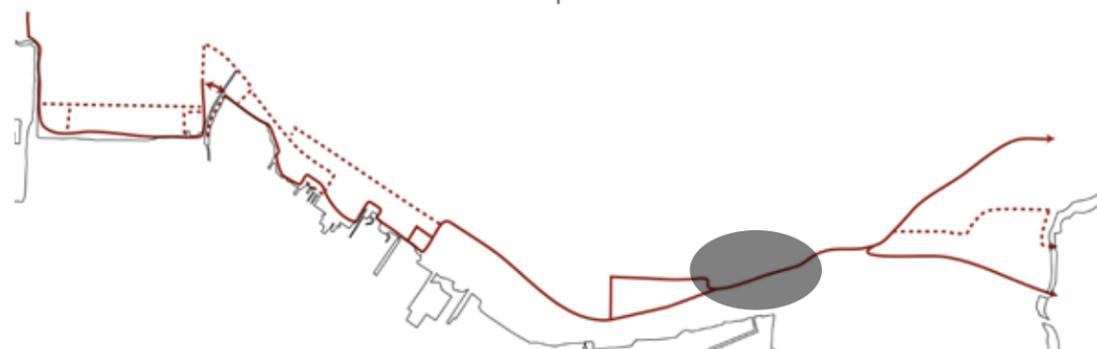
This area is also important for its historical context. Moodyville was the site of the first European settlers on the North Shore, the existing Moodyville interpretive walk overlaps the proposed Spirit Trail route.

Opportunities

- Unique experience of walking through a forest and being visually connected to the water.
- Tie into the history of the Moodyville townsite.
- Trail development may provide an opportunity for invasive plant management.

Constraints

- Environmentally sensitive. Care will need to be taken to minimize human and construction impacts on the other species that use this forest including native plants, amphibians, birds, and small mammals.
- There is a history of slope stability issues in the area, geo-technical studies will proceed all detailed design work.



1:2000



There is existing interpretive signage to explain the important history of the former Moodyville town site.

3 5 6



The existing trail runs along the top of an escarpment. Care must be taken to avoid disturbance during construction.

4

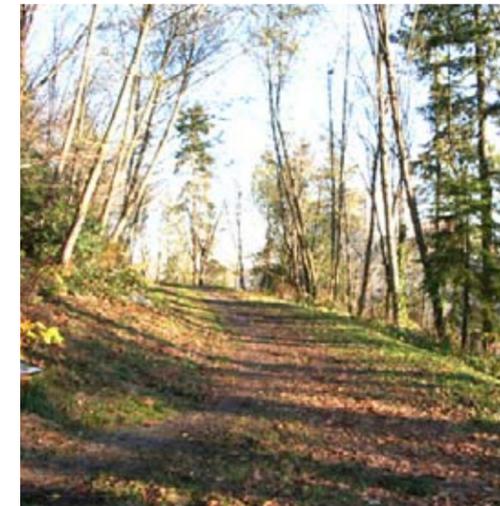


This part of the trail runs within the existing Moodyville Park and Metro Vancouver waste water r.o.w. It is already well used by walkers. This section is located within a mixed forest and is the most natural part of the trail.

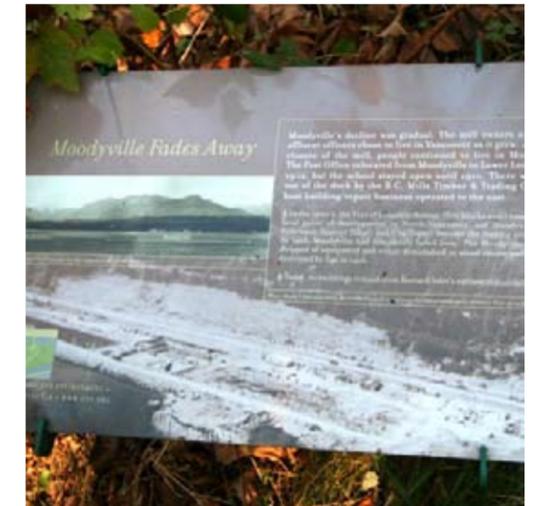
1 2 7 8 9



1 Typical character of existing informal trail.



2 Trail is lined with a mixed forest.



3 Interpretive signage exists to explain history of Moodyville town site.



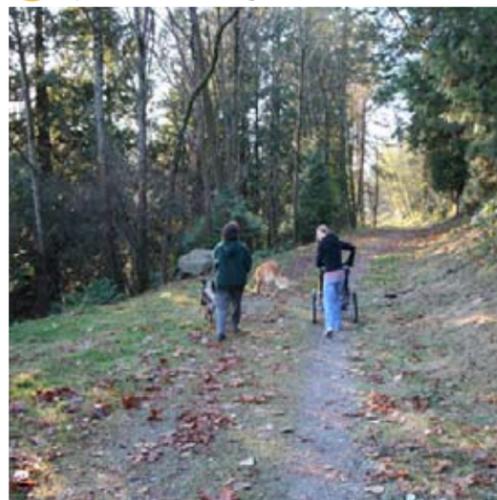
4 Standing water on the trail indicates potential drainage issues.



5 Views of the grain elevators and Burrard Inlet.



6 CNV owned residential building offers good overview to site.



7 Existing trail users.



8 Trail varies between open and semi-closed tree canopy.



9 Typical park bollards mark entrance to E. 3rd Street.

Neighbourhood - Moodyville and Sunrise

Section 13 - 3rd Street Hill

General Description

Section 13 of the trail runs along the north side of E. 3rd Street. E. 3rd Street is a busy, steep, three lane road. There is a significant grade difference between the north and south sides of 3rd Street. The vegetation along the north side is a combination of native deciduous trees and a mainly invasive understory.

This part of the trail is likely to be a flow through area rather than a place to stop and spend time.

A detailed study of crossing options at E. 3rd St. will be undertaken and discussed in phase 2 of this study.

Opportunities

- The crossing at E. 3rd Street could be an opportunity to showcase some dramatic or unique infrastructure.
- The trail follows the route of the flume that supplied water to the Moodyville town site. Possibilities for commemoration could create interesting trail features.

Constraints

- E. 3rd Street is a busy arterial and is a barrier to movement.
- Grades are substantially different between the north and south sides of E. 3rd Street.
- The slope of the land in this area creates challenges for an accessible trail.
- Slope stability has been an issue on the north side of E. 3rd St. Geo-technical assessment will be required prior to detailed design.



The trail must cross a three lane road on a hill. Structural crossing options, such as an overpass should be considered.

The grade difference between sides of the road is substantial.

① ② ④

③



1 E. 3rd Street is a three lane arterial at this point with high vehicle speeds and volumes.



2 Typical vegetation on the north side of E. 3rd Street.

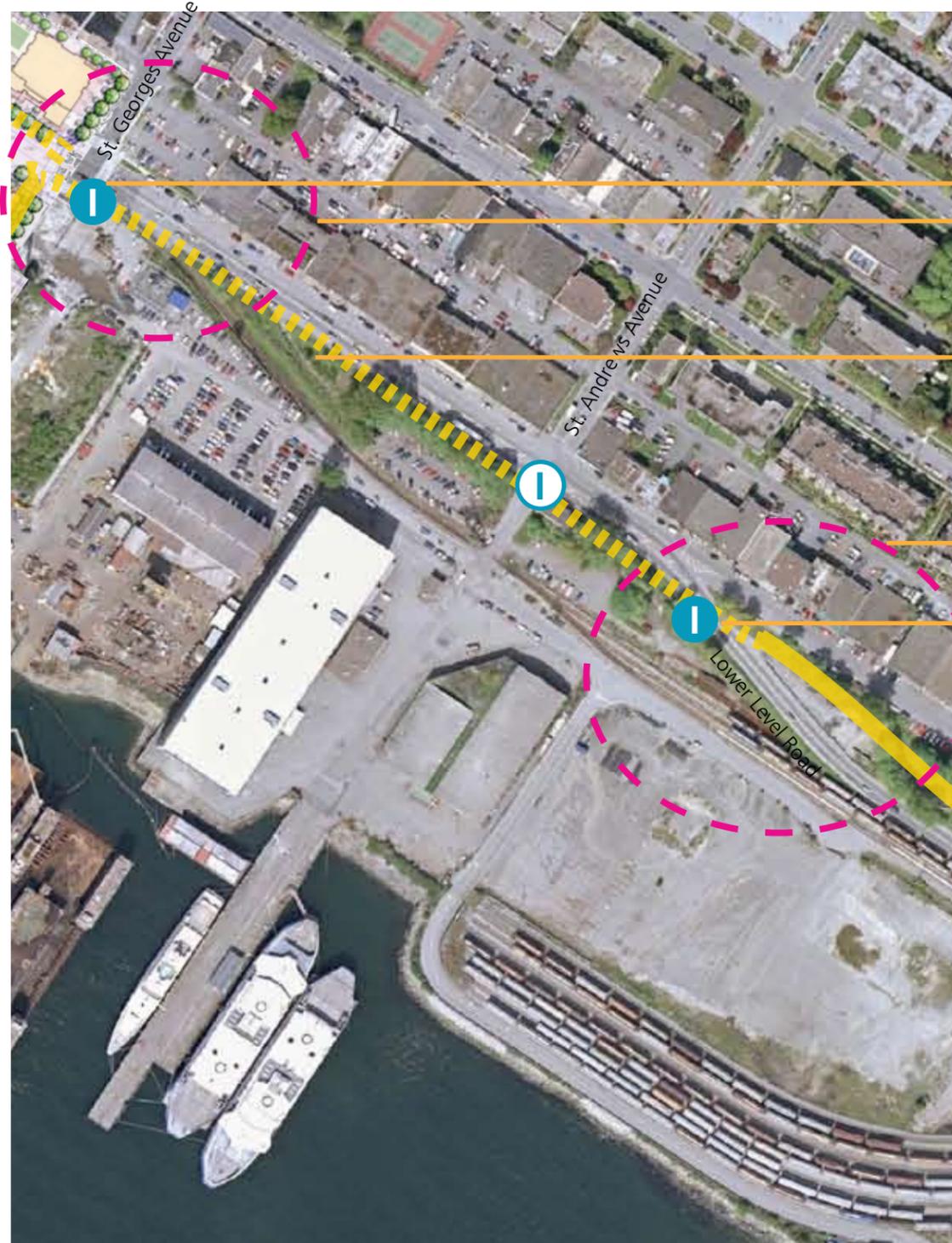


3 Grade difference from north to south sides.



4 View from corner of Spirit Trail and E. 3rd Street.

Concept Section 10



Intersection requires clear wayfinding for trail users.

Identity elements required in this area to reassure users of the trail location.

Future redevelopment of this area should allow for an off street bicycle and pedestrian trail. The short term solution should be to utilize existing on street facilities and develop and implement a clear wayfinding strategy through this area.

A

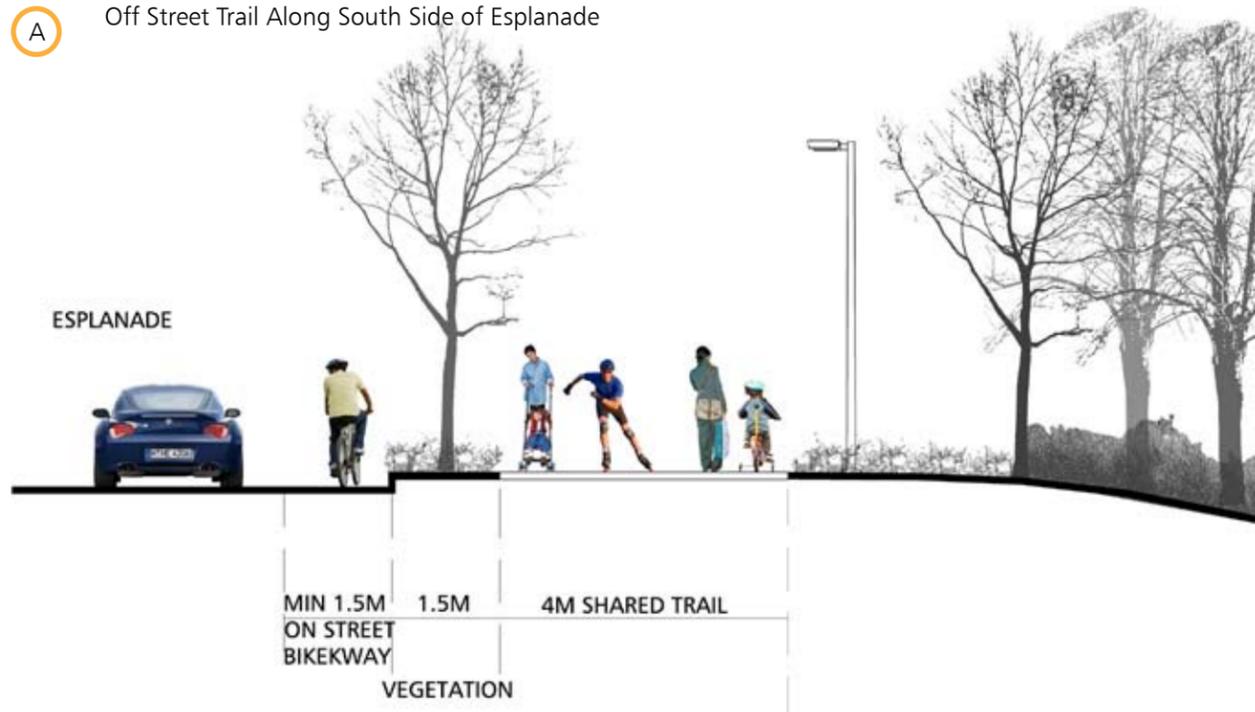
Identity elements required in this area.

The intersection at Esplanade and Low Level Road presents a major challenge for connection of the Spirit Trail. The long term solution should examine options for a pedestrian/cyclist overpass or underpass. These options will need to be explored in conjunction with any changes to Low Level Road and Esplanade and adjacent Vancouver Port Lands .

B

	Off Street Spirit Trail
	On Street Spirit Trail
	Intersection Trail Head Rest Point
urban	
primary	
secondary	
tertiary	
street	
primary	
secondary	
tertiary	
park	
primary	
secondary	
tertiary	

A Off Street Trail Along South Side of Esplanade



B Precedents for underpass and overpasses.

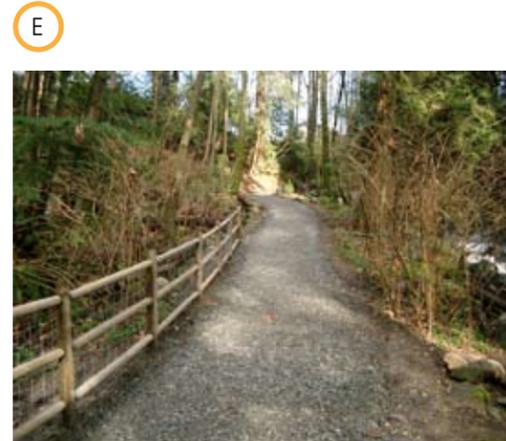


Concept Section 11



	Off Street Spirit Trail
	On Street Spirit Trail
	Intersection Trail Head Rest Point
urban	
primary	
secondary	
tertiary	
street	
primary	
secondary	
tertiary	
park	
primary	
secondary	
tertiary	

Design of trail in this area may require a fence or other barrier to keep users on the trail and maintain resident's privacy.



Precedent of the City's standard post and rail fence.

Design of the trail through the lane will include visual cues to separate vehicles from pedestrians such as a roll-over curb.



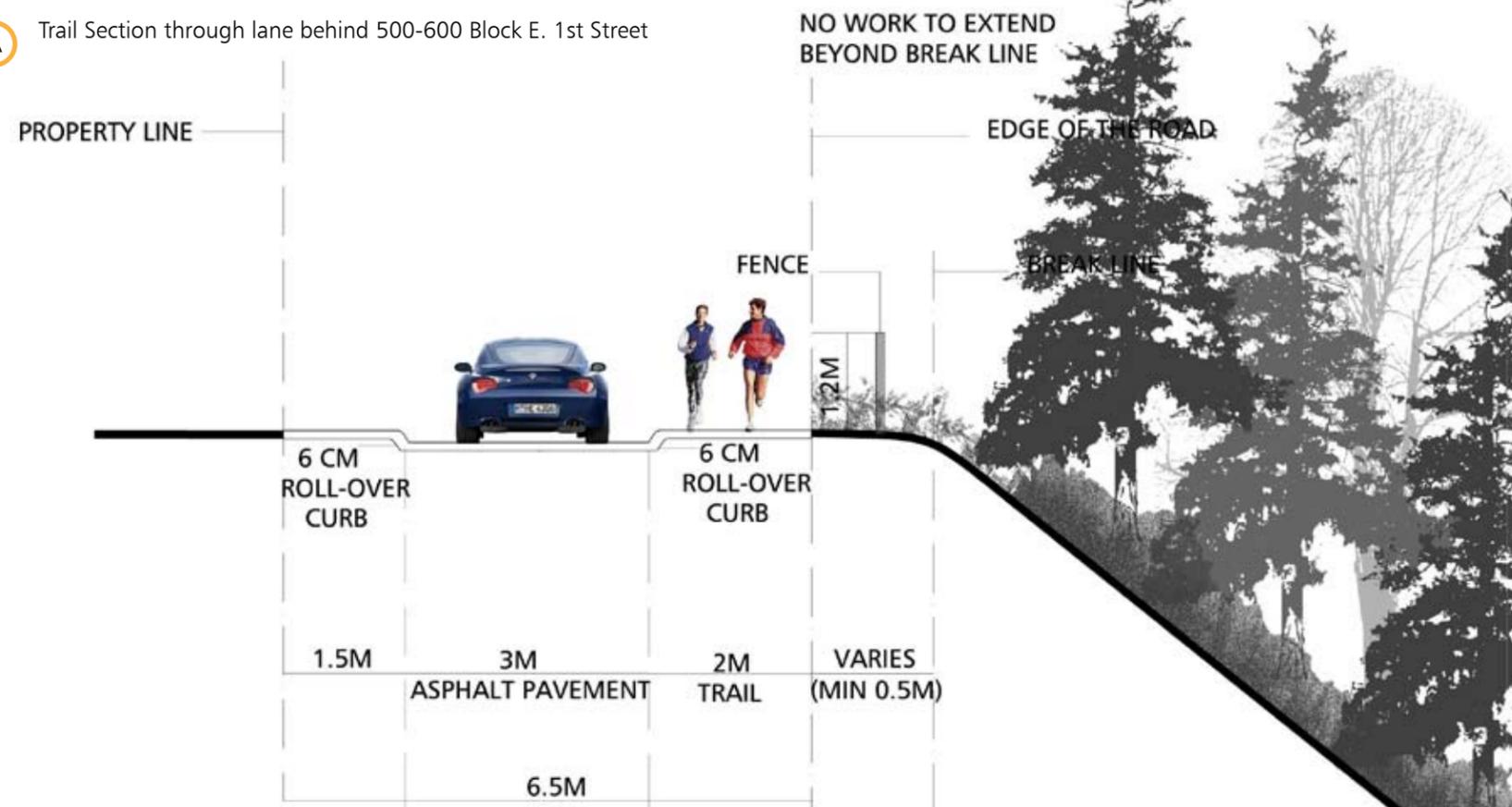
At this intersection wheeled traffic heads north along St. David's to E. 2nd Street. Pedestrian traffic heads east along the lane to the ravine and Moodyville Park.

The ravine will remain a pedestrian connection to Moodyville Park. The trail will be updated to include two small bridges and upgraded stairs. The new trail will follow a similar route to the existing trail but it will remain entirely on city owned property.

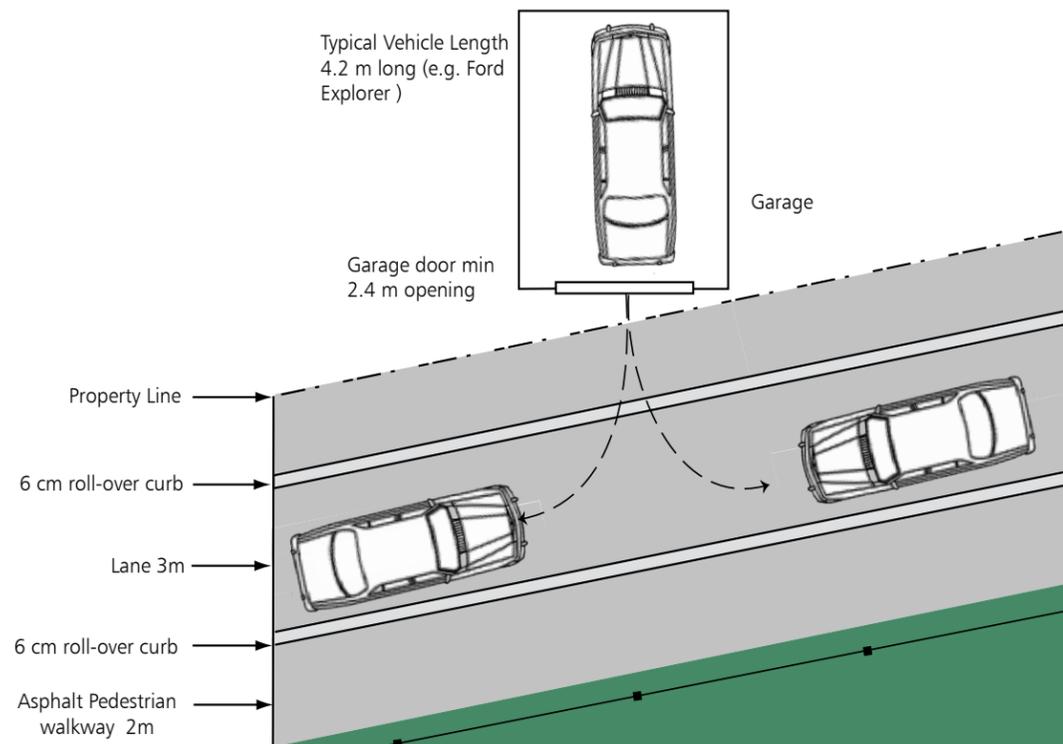


Traffic calming at Moody Avenue and E. 1st Street would make the entry to Moodyville Park and the portion of the trail along E. 2nd Street safer.

A Trail Section through lane behind 500-600 Block E. 1st Street



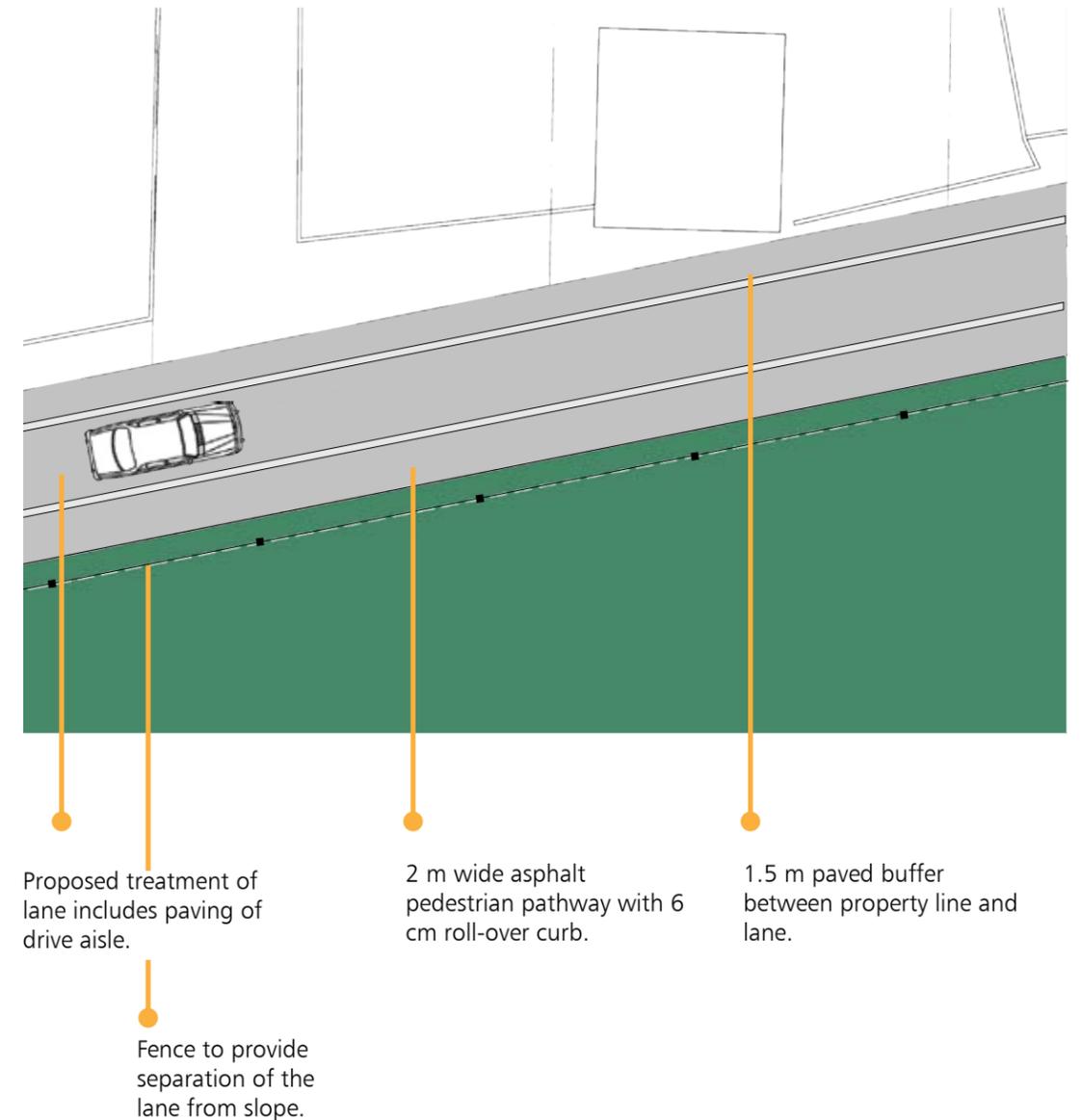
B Detailed diagram of proposed lane treatment behind 500-600 Block E. 1st Street



The existing lane behind 500-600 Block of East 1st Street ranges from less than 4 m wide to 5.3 m wide with an average width of 4.1 m. The proposed new treatment will provide a 6.5 m wide lane treatment with 4.5 m for vehicles (lane + buffer) and 2 m for pedestrians. A low roll-over curb will allow the pedestrian walkway to be used for vehicle turning access if necessary. This treatment provides enough turning room for SUVs and large cars. The roll-over curb will also function to alert drivers that they are in the pedestrian zone reducing any conflicts in this area.

The development of the lane will not exceed the top of the bank of the bluff therefore minimizing impacts to the existing slope.

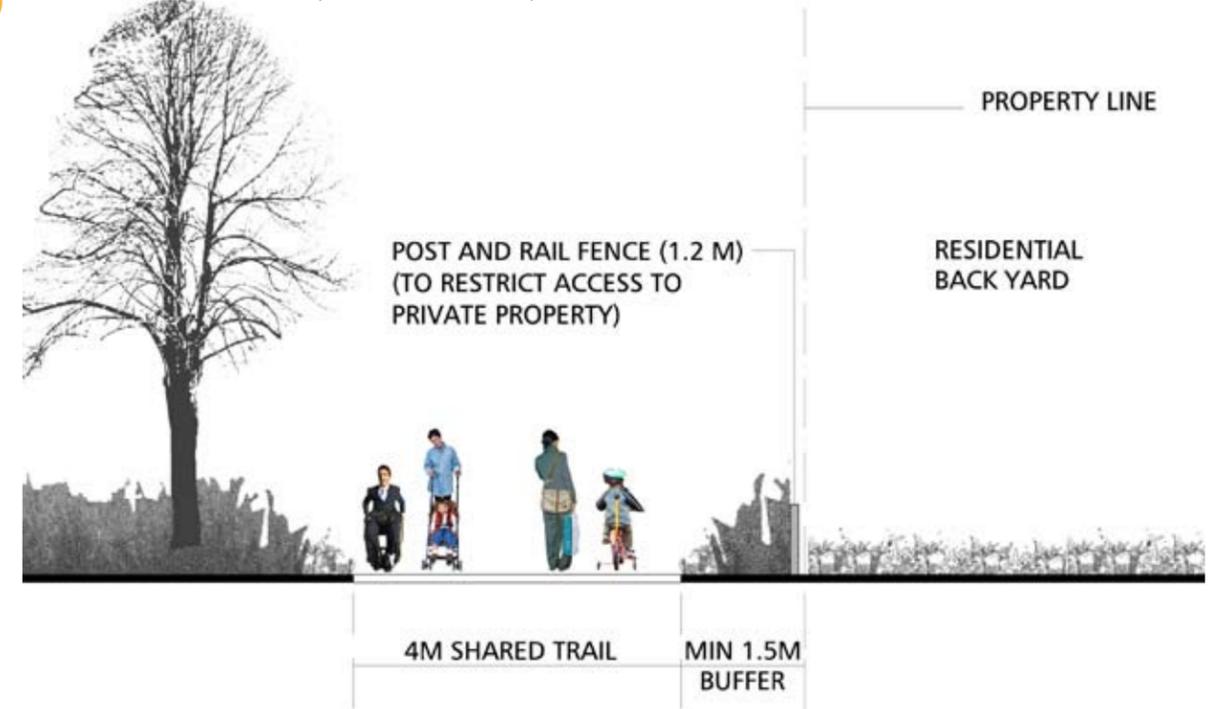
C Plan diagram of lane behind 500-600 Block E. 1st Street



D Perspective of lane behind 500-600 Block E. 1st Street



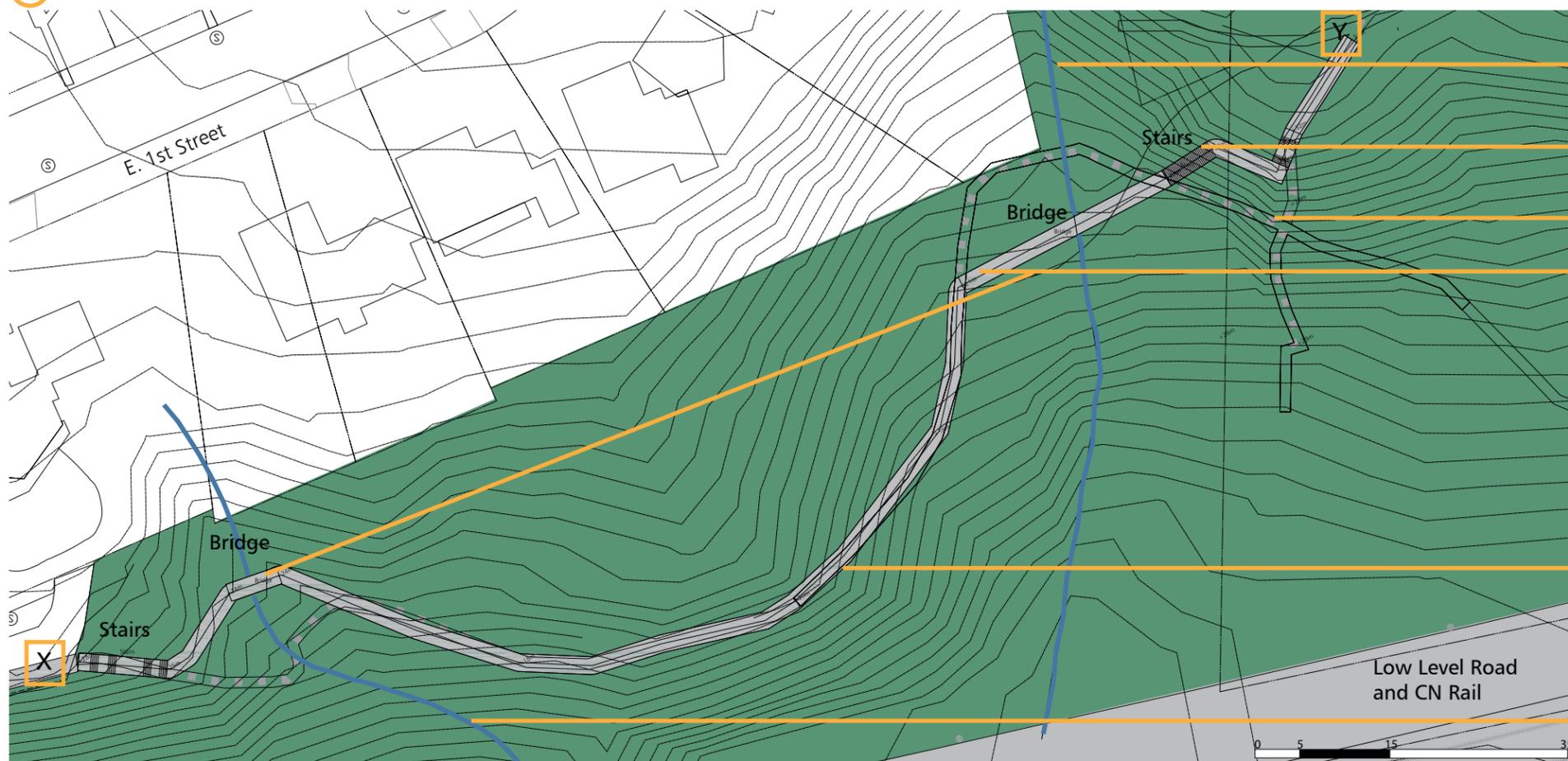
E Trail Section of Park Street (Behind Alder Street)



F Trail Section through Moodyville Ravine



G Concept Diagram of Pedestrian Trail through Ravine



Creek

Stairs will have this type of treatment through the ravine.

Existing pedestrian trail through ravine.

Small pedestrian bridges over the two creeks would provide safe access without damaging the water courses and the surrounding environment.

Upgraded 2 m pedestrian trail through ravine.

Creek



Stairs through Mahon Park.

H Section of the proposed profile along the centre line of the ravine trail from X to Y

← to lane behind E. 1st Street



Concept Section 12 & 13



	Off Street Spirit Trail
	On Street Spirit Trail
	Intersection Trail Head Rest Point
urban	
primary	
secondary	
tertiary	
street	
primary	
secondary	
tertiary	
park	
primary	
secondary	
tertiary	

This primary rest point should incorporate existing interpretive panels on this history of the Moodyville Townsite. This is one of the few primary rest points within the forested areas of the Spirit Trail. It will offer a different experience than rest points along the waterfront.

Connection from the street (Moody and E. 2nd Street) to the trail will require some alterations to the path alignment to achieve a connection at a maximum slope of 8%.

The natural character of the park is to be maintained or enhanced. There are two options for the surface of the trail. One is to keep the gravel trail which is in keeping with the natural character of the trail. The second option is to surface the trail with asphalt which will allow people of all abilities to use the trail.

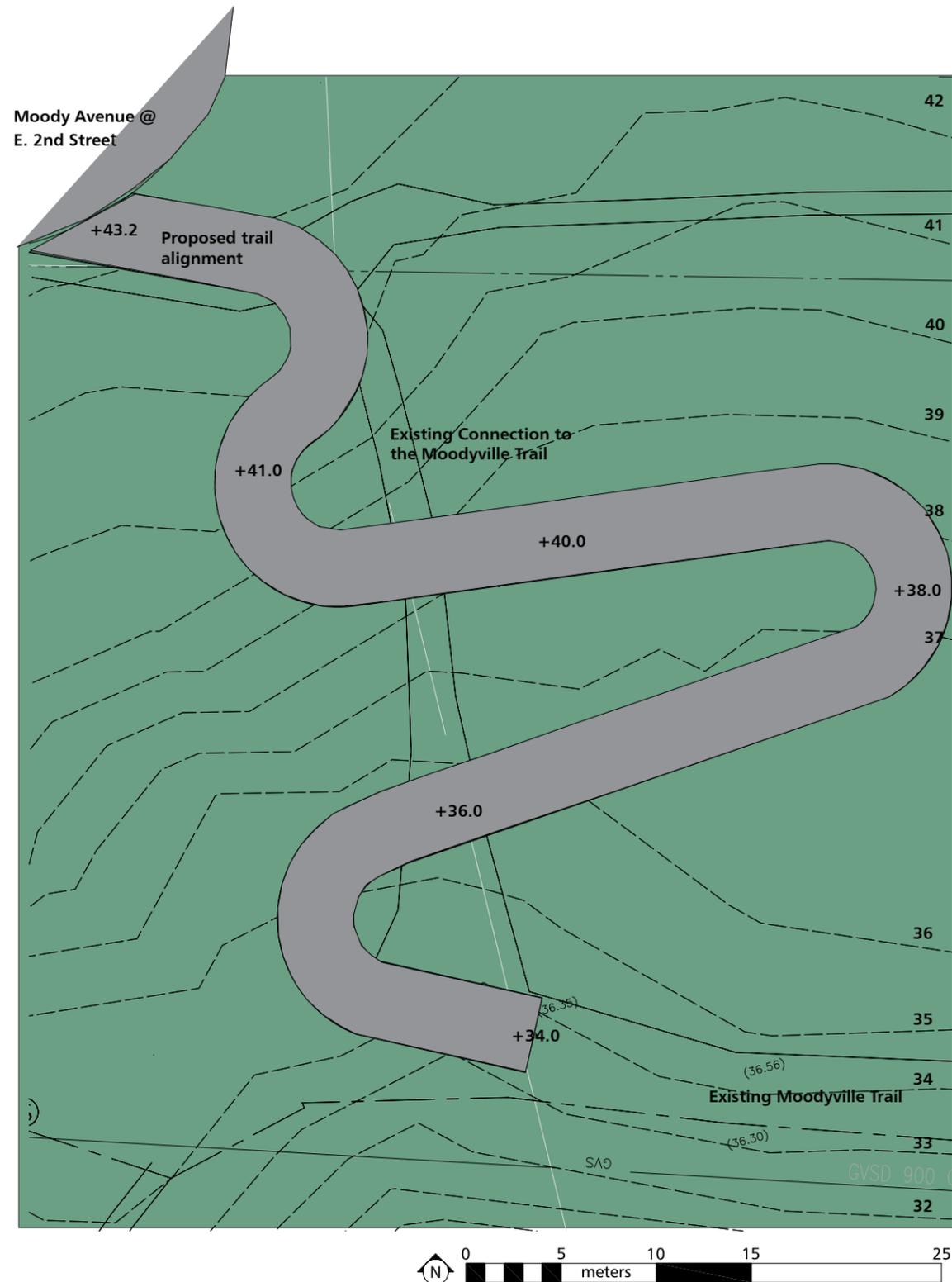
Construction in this section will need to be scheduled out of the bird nesting season. Trees to be removed will need to be shown in the detailed design plans.

Overpass is required to create an accessible crossing and connect the park experience along this part of the trail.

This area would need to be regraded to achieve an accessible switch back trail. Vegetation would need to be replaced.

A Proposed connection from Moody Avenue and E. 2nd Street to the Moodyville Trail

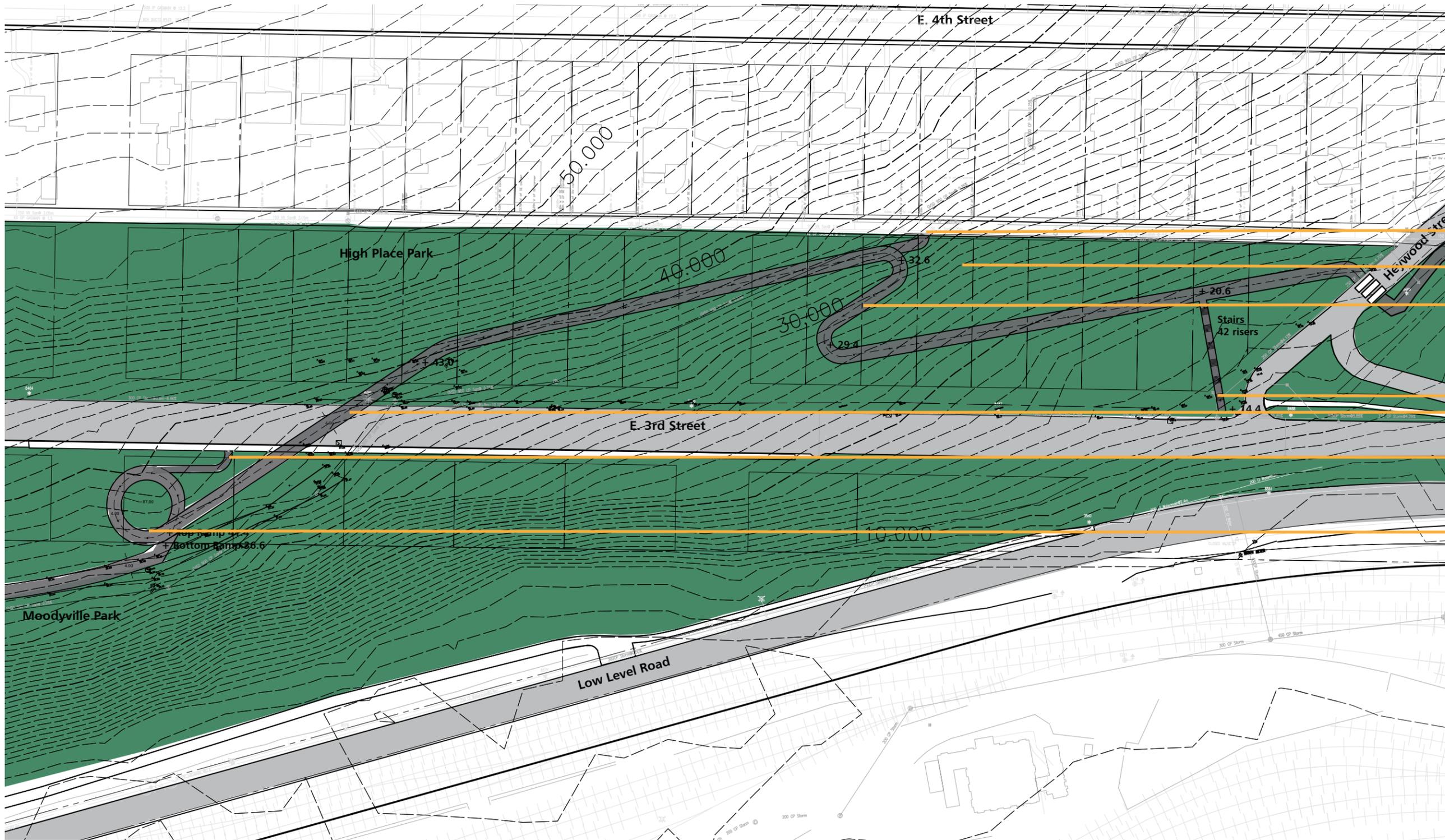
A conceptual grading study demonstrates a possible design of the required connection from the on street trail at Moody Avenue and E. 2nd Street to the existing trail through Moodyville Park. A more detailed grading study will be needed during detailed design. A tree survey should be completed prior to this in order to reduce possible impacts of trail development.



B Trail Section through Moodyville Park over the Metro Vancouver right of way.



C Overpass and Trail Concept for the E. 3rd Street Pedestrian and Bicycle Crossing and Connection to Heywood Street. This concept would achieve an accessible (8% grade) connection for the trail through this area.

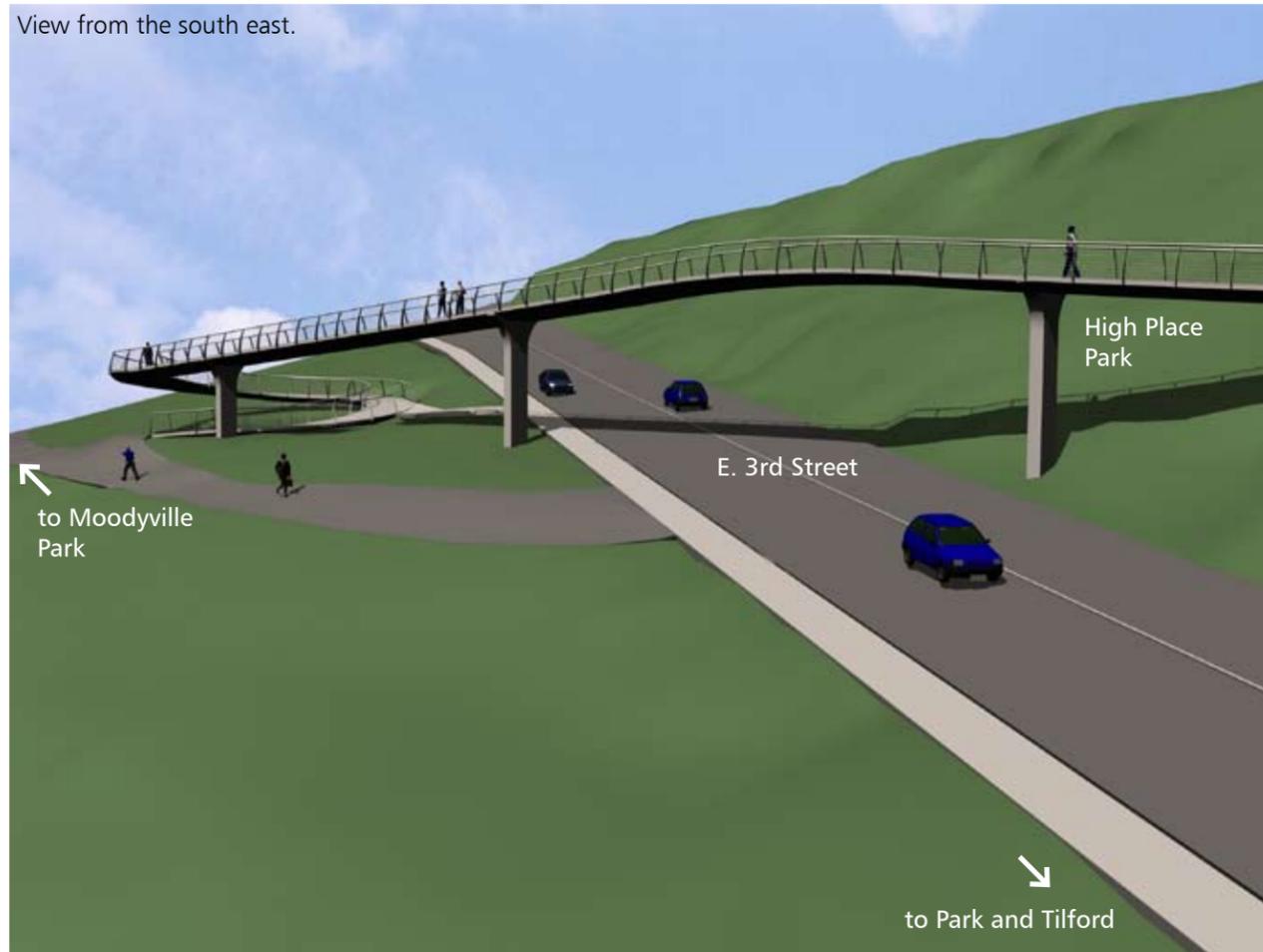


- Connection from lane to trail.
- Much of this area would need to be regraded to meet the 8% slope requirement. Revegetation would be necessary.
- Switch back provides 8% accessible slope through this area.
- Stairs link the existing sidewalk to the trail.
- Overpass provides safe connection over 3rd Street.
- Connection to the ramp from the street.
- Circular ramp minimizes disturbance of the park while creating an 8% grade connection to the overpass.

Model of Pedestrian/Cyclist Overpass at E. 3rd Street.

D

View from the south east.



E

View from the west.



F

View from the south west.



In order to provide a safe and accessible route over E. 3rd Street on the hill above Heywood Street, a pedestrian and cyclist overpass is required. Three views of a model demonstrates how this structure fits into the landscape and provides connections to the Spirit Trail and E. 3rd Street. The ramps and overpass are designed at an 8% maximum grade.

Neighbourhood - Moodyville and Sunrise

Section 14 - Heywood

General Description

Section 14 of the trail is proposed to run along southern edge of Heywood Street separated from the road along Sunrise Park. With the exception of a short length of road at the intersection of E. 3rd St. and Heywood the street is quite flat. On the northern side of the street residences are set up and back from Heywood Street. The southern side is comprised entirely of the frontage of Sunrise Park. This length along the park is only interrupted by two driveways accessing city owned rental properties. The escarpment comes within 5 meters of the street at some points. The street has low traffic volumes and good views of the mountains.

The park has several water courses flowing through it and a diversity of indigenous vegetation including several large coniferous trees making it an inviting experience to walk along this portion of the trail. There is one formal entrance to the park along Heywood Street and several informal trail access points.

Opportunities

- Heywood Street is a wide street with parking on both sides. There is ample room for an off street trail if the street is redesigned. A narrowed street has additional benefits as a traffic calming measure.
- Trail development may reduce garden waste dumping in natural areas.

Constraints

- Hydro poles run parallel to the street on the park side of Heywood Street. This would require moving the hydro poles or moving the trail to accommodate them.



Only the entrance to Heywood St. is steep. The rest of the road is flat.

1 10



Heywood Street is generally a wide, flat street with parallel parking on both sides. There are only two curb cuts on the southern (park) side of the street. There is ample room for the trail to be located around existing obstacles.

2 3 7 9



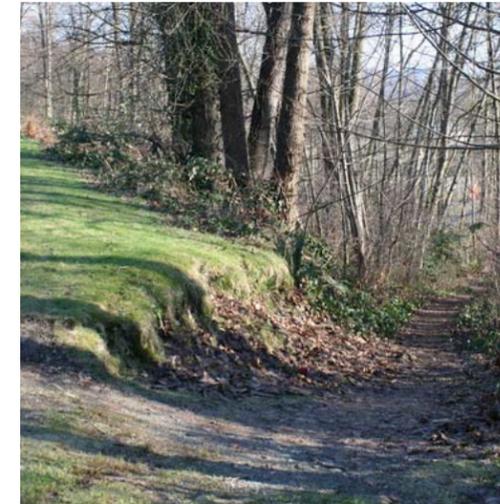
The residences on this street are mostly set up and back from the street. Many also have driveways. Parking demand appears to be low, there may be some opportunity to use the parking lane to provide greater trail separation.

There is an escarpment within Sunrise park that is quite close to Heywood Street in some sections.

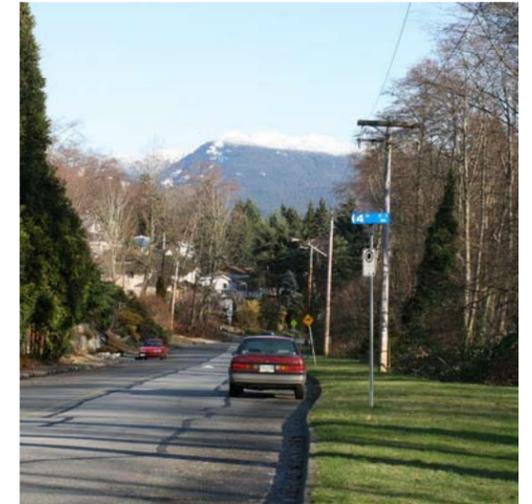
4 5 6 8



1 Entry from E. 3rd Street to Heywood Street.



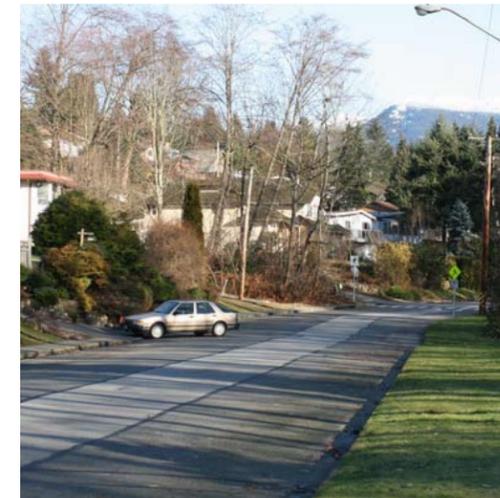
2 Informal access to Sunrise park from Heywood. Erosion issues.



3 Heywood Street is a wide, flat street with low demand parking on both sides.



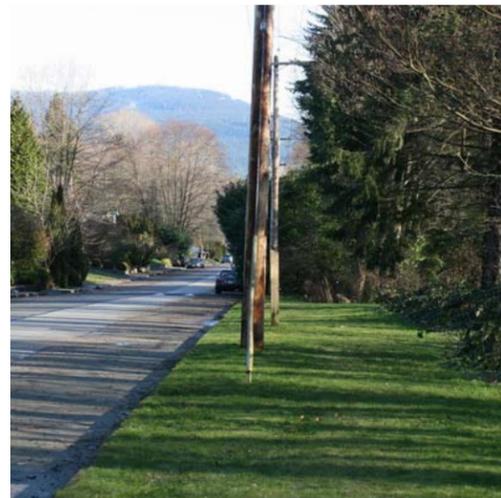
4 Residences in this area are mostly set up and back from the road.



5 Wide street with views of mountains in the background.



6 Access to Sunrise Park from the Kennard Avenue Greenway with bike trough.



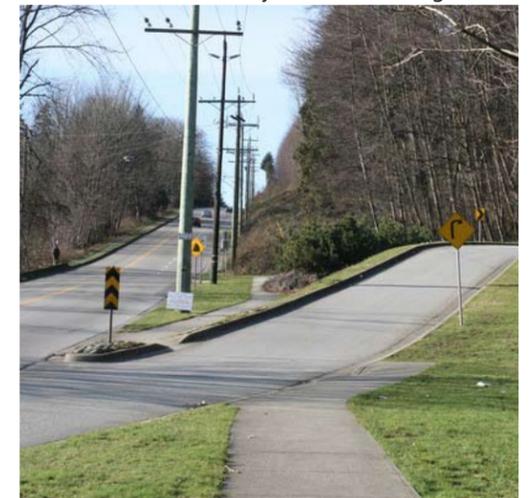
7 Hydro poles in the boulevard along the park side of Heywood St.



8 Sunrise Park contains a mixture of species including some large coniferous trees.



9 There are two driveways on the park side of Heywood Street.



10 Entrance from E. 3rd St. to Heywood St.

Neighbourhood - Moodyville and Sunrise Section 15 - Keith Road

General Description

The trail is proposed to run along Keith Road to connect to the existing bridge over Lynn Creek. Keith Road is a high volume, high speed, arterial road with a narrow right of way. Sidewalks and boulevards are narrow creating an unfriendly pedestrian environment. Currently, bikes share the lane with vehicles along this section of Keith Road. The road and sidewalks currently are steeper than 8% in some areas.

Due to the narrow right of way, there is not much space available for expansion of the pedestrian realm. Creative design solutions will be necessary to meet the accessibility goals for the Spirit Trail through this area.

Opportunities

- Provide a connection to the District of North Vancouver utilizing the existing bridge on Keith Road as well as link to Bridgeman Park and the Lynn Creek Trail system.
- Potential to connect to Salop Trail and the Upper Levels Greenway System.

Constraints

- Keith Road is a busy arterial with a narrow right of way and little room for expansion of the pedestrian realm.



This intersection is controlled by a light. The sidewalk along this area is no wider than 1.2m and is sometimes directly adjacent to the road way.

- 1 2 4 5



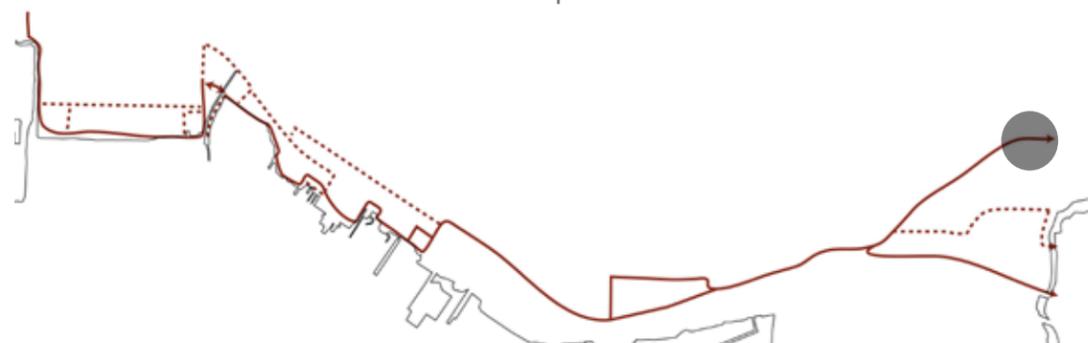
This intersection is controlled by a light. Currently, pedestrians must cross over to north side of street in order to cross the bridge.

- 6



Bridgeman Park (DNV) is a major node along the trail. It also offers a connection to the Lynn Creek trail system (red dotted line). There are picnic facilities, a children's play structure, benches, and a shelter.

- 3





1 Spirit Trail is proposed to run along Keith Road in order to cross the existing bridge over Lynn Creek as well as connect to Bridgeman Park and the Lynn Creek trail system.



2 Typical sidewalk treatment along Keith Road.



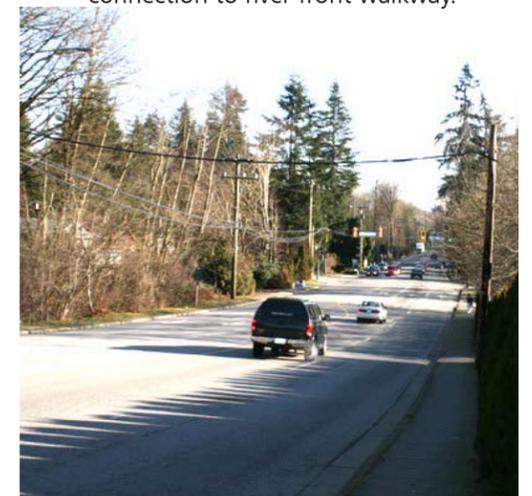
3 Entrance to Bridgeman Park and connection to river front walkway.



4 Narrow sidewalk and bus stop.



5 Narrow sidewalk directly adjacent to the road with no boulevard.



6 Typical view of road character in this section.

Neighbourhood - Park and Tilford Section 16 - Sunrise Park to Lynnmouth Park

General Description

It is proposed that the majority of Section 16 runs through Sunrise Park and a City right of way between Lions Gate Studios and Park and Tilford Mall. Currently, this area is used for parking, delivery, loading access and there is little provision for pedestrians or bicycles. Large trucks move through this area and there is an urban/commercial aesthetic here.

Part of the trail runs along the southern end of Sunrise Park. A 2.0 m sidewalk that has both paved and gravel portions provides safe passage for pedestrians. However, there is no bike lane at this time.

In order for this route to be viable, a connection from Heywood Street down the hill, under the hydro corridor to Sunrise Park is necessary. There is a significant grade change that will need to be addressed but ample room is available to provide options in the detailed design phase.

Opportunities

- This route could provide a low vehicle volume option between Lynn Creek and Heywood Street.
- The CNV has a right of way behind Park and Tilford mall.

Constraints

- The connection from Heywood Street to E. 4th St. is steep and will be a challenge to maintain accessible grades.



9

In order to make a connection to Heywood Street, the trail needs to go through this area which is quite steep.

7 8

An existing ~ 2.0 m wide unpaved sidewalk runs along the southern edge of Sunrise Park. Front-in parking is adjacent to the sidewalk.

3

Recent improvements in this area have increased pedestrian safety at this intersection.

4 5 6

CNV has a r.o.w. behind Park and Tilford Mall which is currently used for parking, loading, and delivery. There are no existing pedestrian or cyclist amenities.



The DNV has discussed, as a long term desire, a pedestrian and bicycle crossing over Lynn Creek at Crown Street. Section 16 of Spirit Trail is proposed to connect to the existing Lynn Creek trail system which would connect to this bridge. The Lynn Creek trail system is a fairly wide gravel pathway that runs quite close to the top of bank (in some cases within 2 metres).

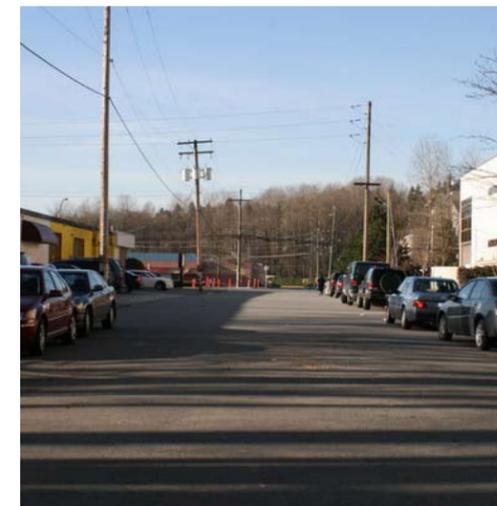
1 2



The intersection of the Spirit Trail and the Lynn Creek trail system is an ideal location for a resting node. The close proximity to the creek offers a rare natural sensory experience.



1 Typical treatment of the Lynn Creek trail system.



2 The entrance to Spirit Trail from the Lynn Creek trail.



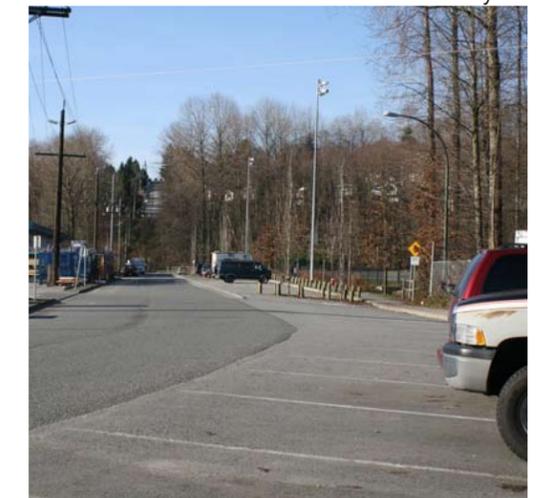
3 Recent improvements at E. 5th St. and Brooksbank Ave. have increased safety.



4 The wear pattern in planting bed of the r.o.w. indicates pedestrian use is desired.



5 The area behind the mall is primarily used for delivery.



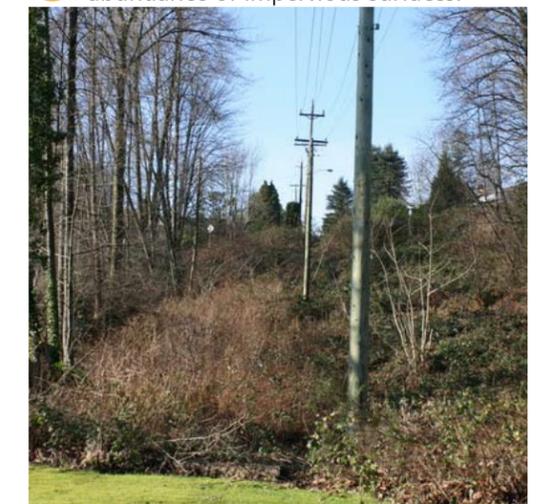
6 E. 4th Street is auto dominated with an abundance of impervious surfaces.



7 Typical sidewalk treatment at southern end of Sunrise Park.



8 Wood and gravel are the main materials along this part of the trail.



9 Slope separates E. 4th St. from Heywood Street.

Neighbourhood - Main and Cotton Section 17 - Main and Cotton

General Description

The proposed alignment of Section 17 of CNV Spirit Trail runs along side of Main/Cotton Street. It provides a connection to the eastern side of the District of North Vancouver. It may be an important route for commuter cyclists as it links the Ironworks Memorial Bridge (Second Narrows). This may also be an important route for cycle tourism and connections to the Central Valley Greenway.

Main/Cotton Street is a busy four lane arterial and truck route with narrow sidewalks and some bicycle lanes that vary from on street to off-street. The District of North Vancouver has been enhancing the pedestrian realm on the east side of Lynn Creek to include features such as wider sidewalks, street trees in boulevards, and public art.

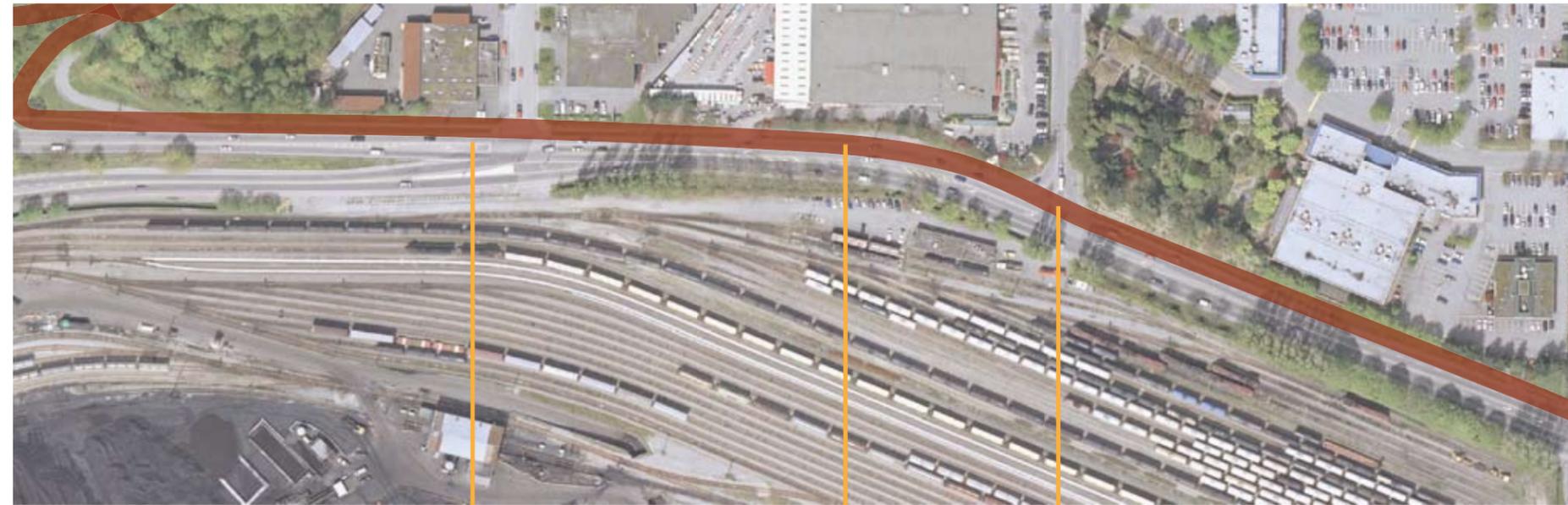
Currently within the CNV, the sidewalks south of Park and Tilford mall are designed to the minimum standard of 1.2 m. Grass boulevards are sometimes present. Where the sidewalk widens, it is shared with an off-street bike lane. The character is industrial with heavy traffic volumes. The challenge will be to create a comfortable and safe pedestrian and bike through route. This area will function primarily to the District of North Vancouver and the North Shore bike network.

Opportunities

- Provide a direct cycle connection from the Iron Workers Memorial Bridge to the Lower Level Bike route and the main arm of Spirit Trail.

Constraints

- In several locations there is not enough space between the street and buildings for an enhanced pedestrian sidewalk and an off-street bike route.



Three roads intersect at this point. Better coordination is required as on street cycling amenities would present a challenge to inexperienced users.

8



An off-street bike lane starts here and continues for one block.

The sidewalks adhere to the minimum design width of 1.2m. Where they expand to ~2.5m they share the space with a bike lane.

5 7 9



A controlled crossings exists here.

4 6





Spirit trail intersects here with the Lynn Creek trail system. This may be a potential location for a gateway or entry feature to the City.

- 1
- 2
- 3



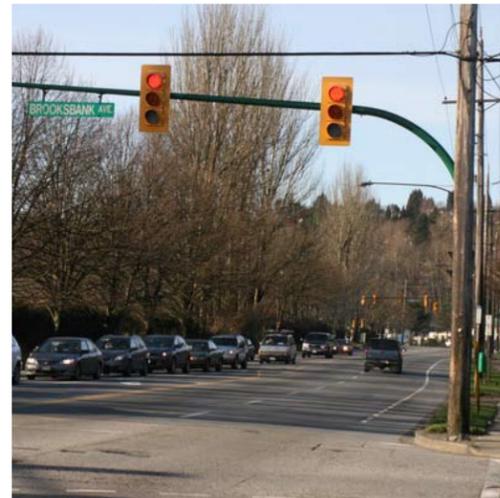
1 New pedestrian realm on the DNV side of Main/Cotton Street.



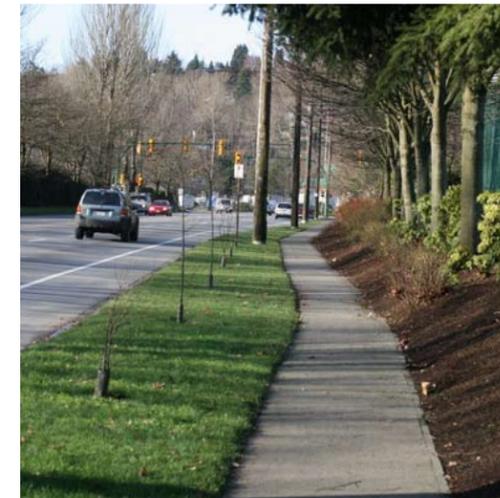
2 Existing pedestrian realm on the CNV side of Main/Cotton Street.



3 Existing Lynn Creek trail system.



4 Controlled crossing and start of bike lane at Cotton Dr. and Brooksbank Ave.



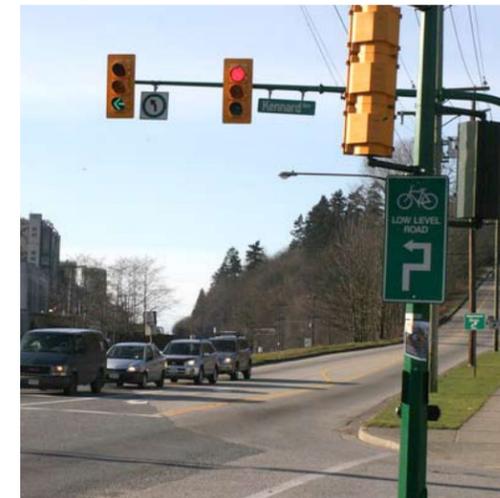
5 Typical sidewalk treatment along Cotton Drive.



6 Controlled crossing at Gladstone and Cotton Drive.



7 Start of off street bike lane just west of Gladstone.



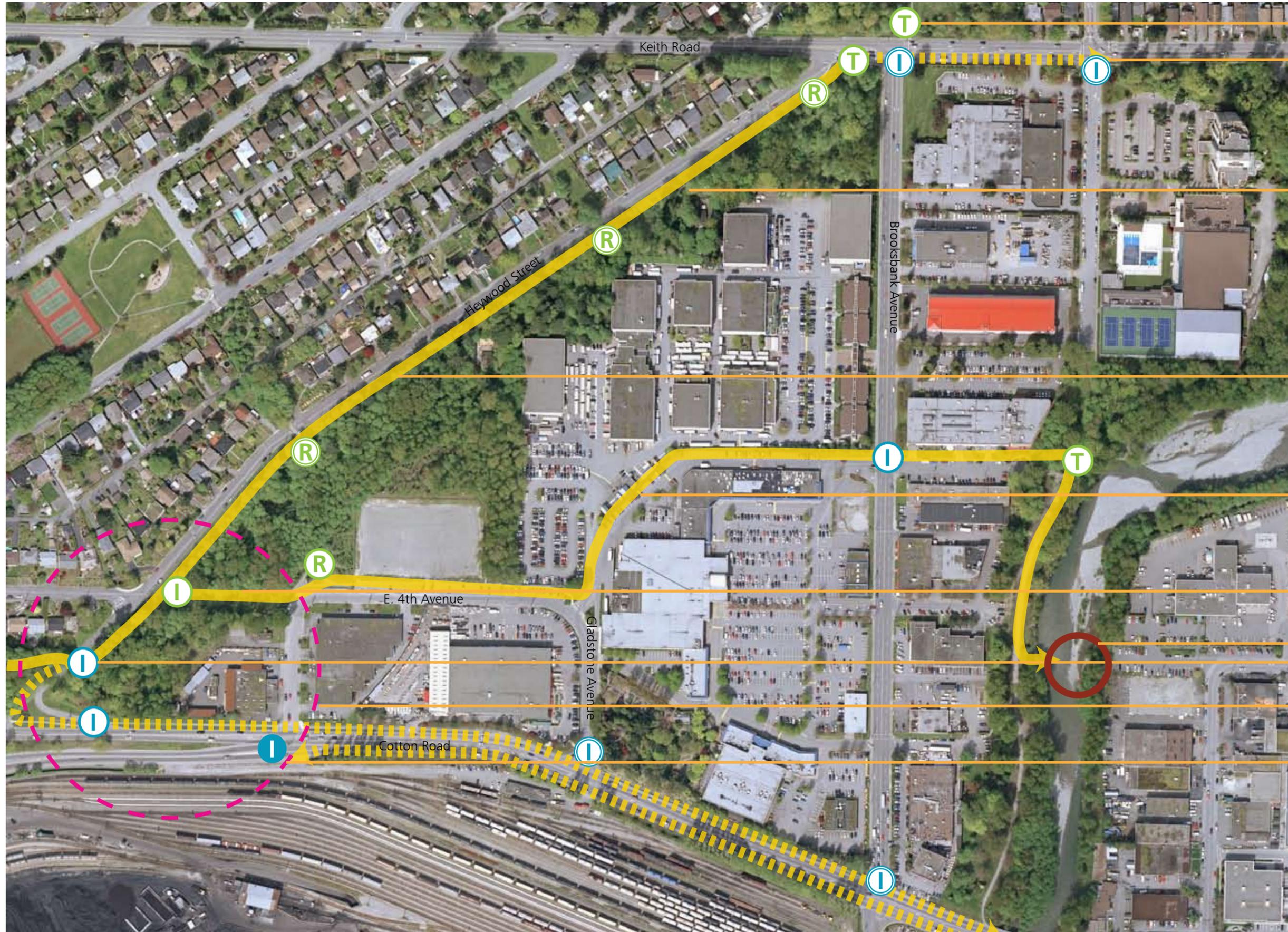
8 Intersection of Lower Level Road and E. 3rd St.



9 Sidewalk and connection to Heywood Street.

Concept
Section 14,
15, 16 & 17

	Off Street Spirit Trail
	On Street Spirit Trail
	Intersection Trail Head Rest Point
urban	
primary	
secondary	
tertiary	
street	
primary	
secondary	
tertiary	
park	
primary	
secondary	
tertiary	



Trail Head for Salop Trail.

Any future redevelopment in this area should consider space requirements for an off street trail adjacent to Keith Road or at minimum an expanded pedestrian realm.

Sunrise Park is important bird habitat within the City of North Vancouver. Trail development in this area will need to take place outside of the bird nesting season and impacts on raptor nests minimized.

A grade separated off street trail along Heywood Street will take advantage of the long stretch of uninterrupted park frontage.

A B C D

An off street trail utilizing the right of way behind Park and Tilford Mall should separate trail users from vehicular traffic.

E

Options for an accessible trail connection through this area appear to be possible; switch backs or other interventions will be explored in the detailed design phase.

Proposed Crown Street Crossing - District of North Vancouver.

Marked crossing and associated traffic calming measures required on Heywood where trail meets the road.

Identity elements required in this area to clearly identify the Spirit Trail.

Intersection at Low Level Road, E. 3rd Street, Cotton/Main needs further study to be resolved. Current bike amenities may prove challenging for inexperienced riders.

A Proposed Treatment of Heywood Street



Planting bulges replace some on street parking and will help in minimizing impacts to Sunrise Park. These areas also provide the opportunity to add more trees to this street. Further study in the detail design phase will determine parking needs.

Trail meanders to accommodate existing utility poles, create an interesting experience for the trail user, and to reduce impacts to existing vegetation within the park.

See diagram C for a close up of the proposed treatment shows tree placement in planting bulges and parking configuration.

Trail connection from Heywood St to Kennard and E. 4th St and to the E. 4th Street on street bike route via an accessible gradient switchbacking trail.

Install marked crosswalk at Heywood Street where trail crosses the road.

There are several options for the Spirit Trail along Main/Cotton. See F and G for detailed options.

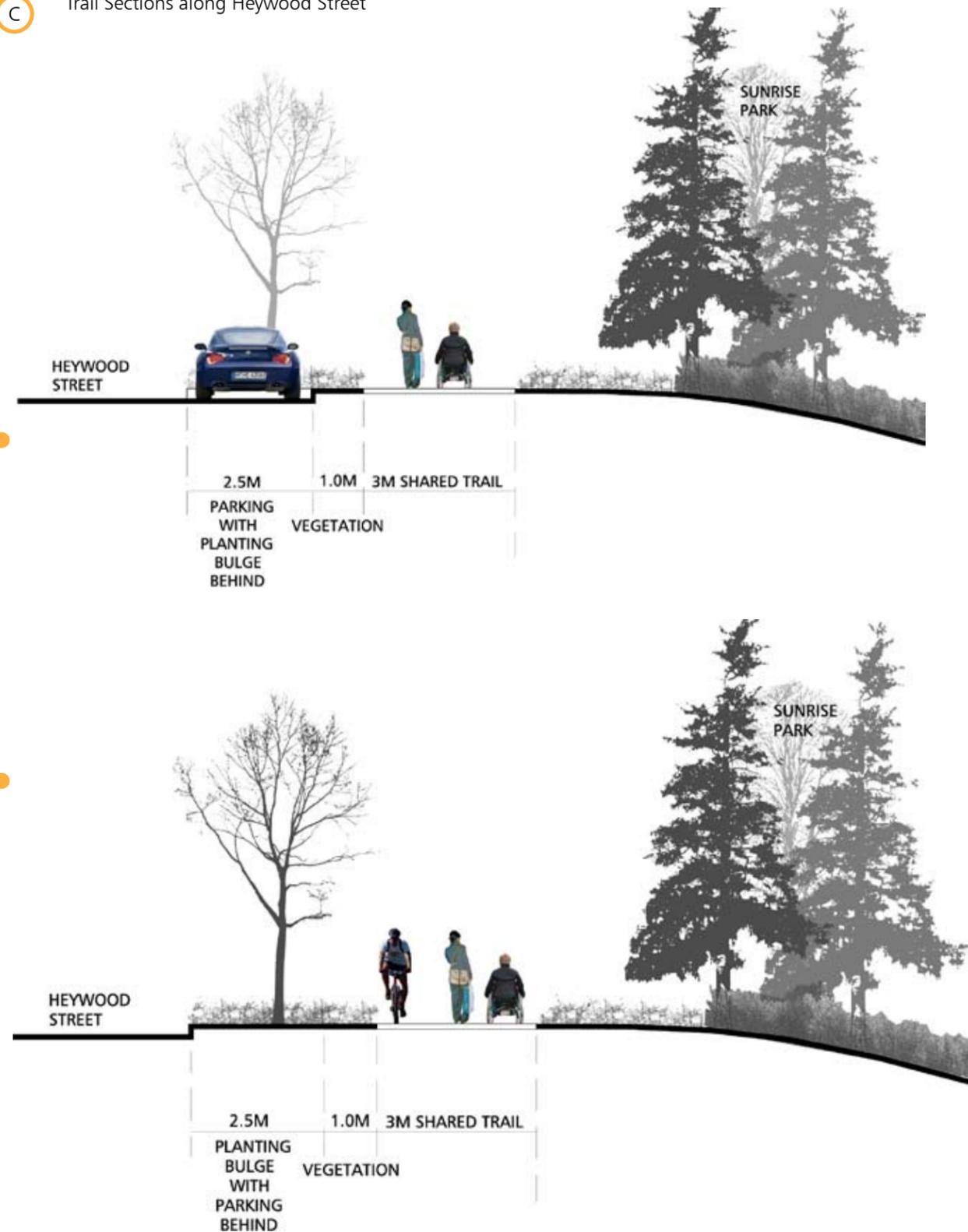
B Close up of proposed Heywood Street treatment.



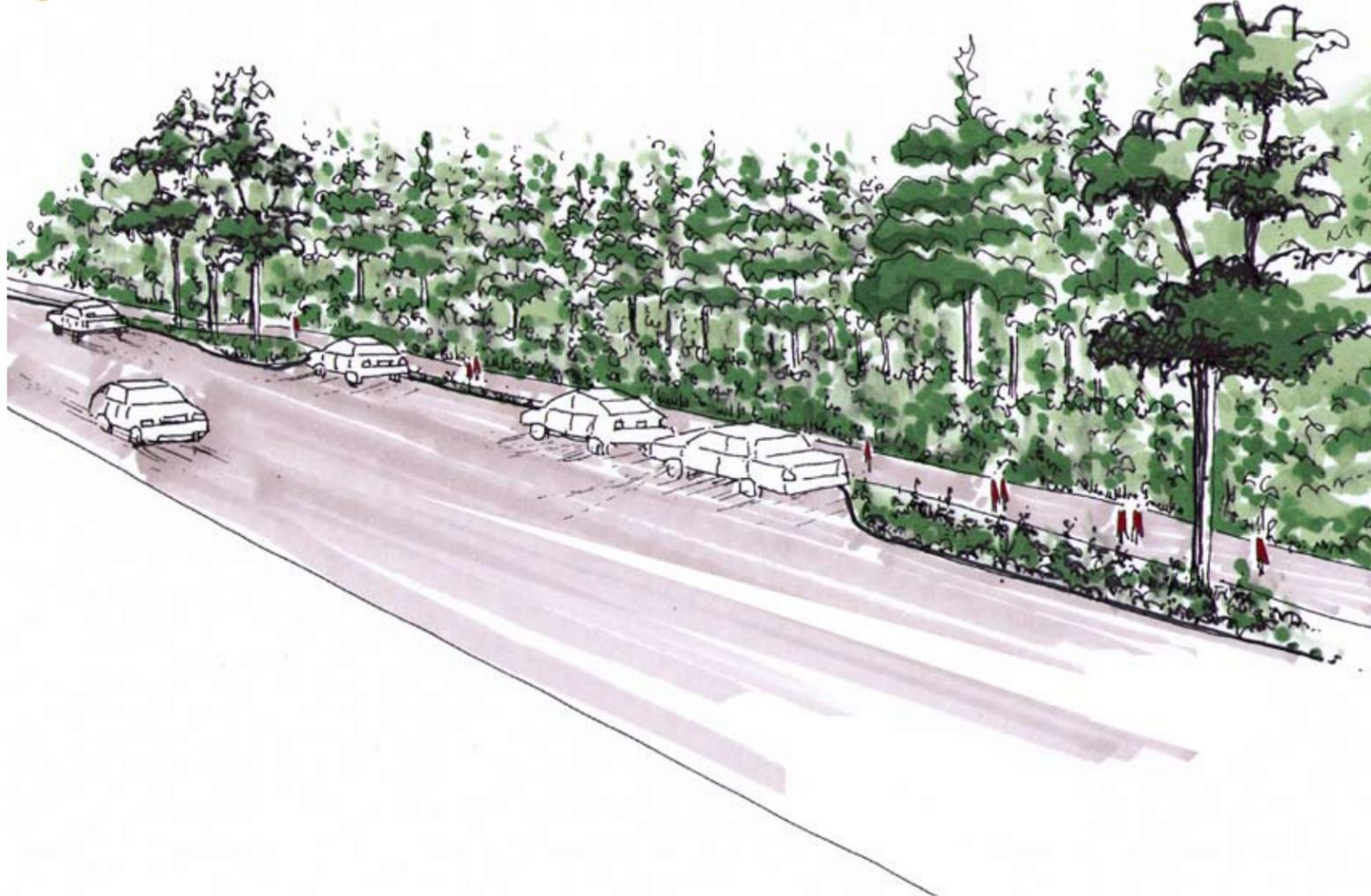
Trail in this area will be a 3 meter shared trail but the design will be flexible to allow for an expansion of the trail to 4 m if required in the future.

The removal of some on street parking will allow the trail to meander around existing trees and utility poles. The trail will be placed on the street and along the edge of the park without entering into the park. This minimizes the need to impact trees within Sunrise Park. It also acts as a traffic calming device.

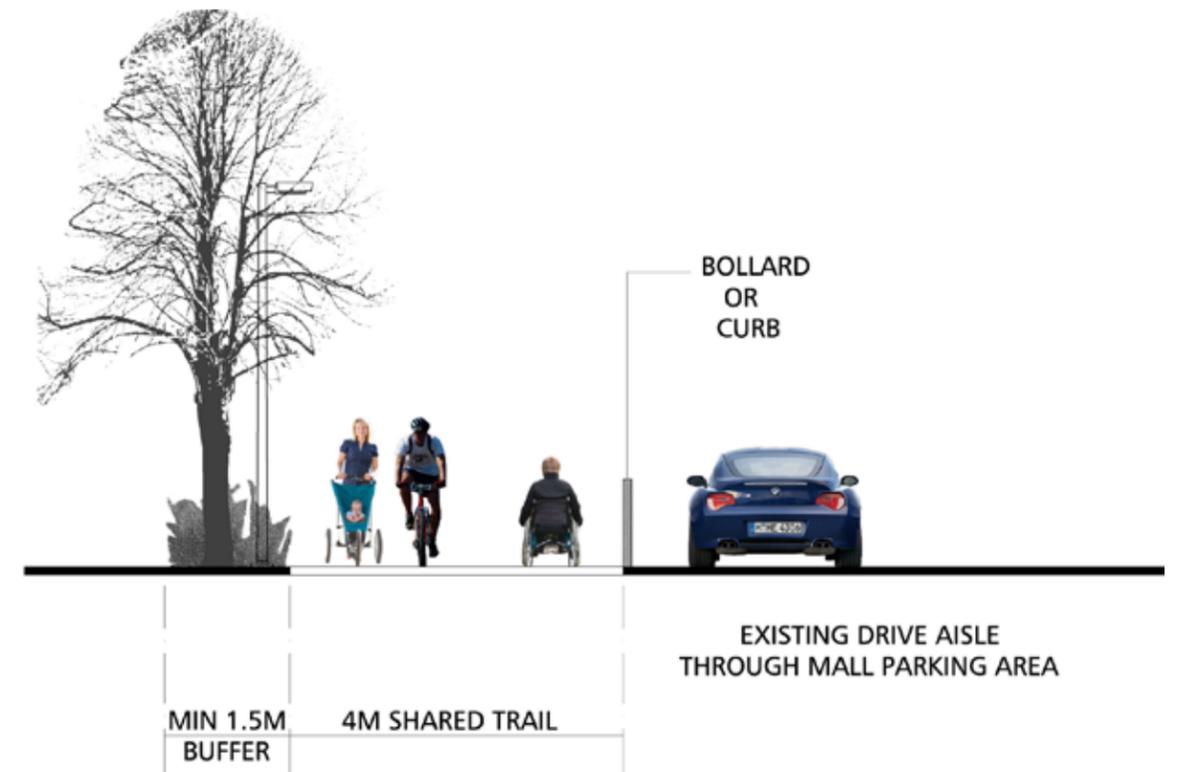
C Trail Sections along Heywood Street



D Illustration of a grade separated trail along Heywood Street with planting bulges.



E Trail Section along E. 4th Street and behind Park and Tilford Mall



F Options for Connections to the District of North Vancouver

The eastern connections of the Spirit Trail from the City of North Vancouver to the District of North Vancouver are not yet fully determined. The District of North Vancouver has not completed its planning process that will determine the route of the Spirit Trail through the District. Therefore, several options for connections between the City and the District are discussed here.

The first and most likely option goes through the Park and Tilford area and connects to the District over a future pedestrian bridge at or near Crown Street. This option allows for a mostly off street trail that is separated from major vehicular traffic. This route also coordinates best with the District of North Vancouver which has plans to create a commercial district along Crown Street which makes for a nice integration with Park and Tilford.

The second option is a route along Main/Cotton utilizing the existing bridge at Lynn Creek to connect to the District of North Vancouver. This corridor is quite narrow making it challenging to provide both on street bike lanes and an off street shared trail. Two alternatives are proposed for Main/Cotton. See diagrams labeled **G**

The third option is a route along Keith Road over the existing bridge. This route is important for connecting to neighbourhoods but the narrowness of the corridor, the distance from the water's edge, and the likely District of North Vancouver Spirit Trail routes does not make it an ideal candidate for the main Spirit Trail alignment.

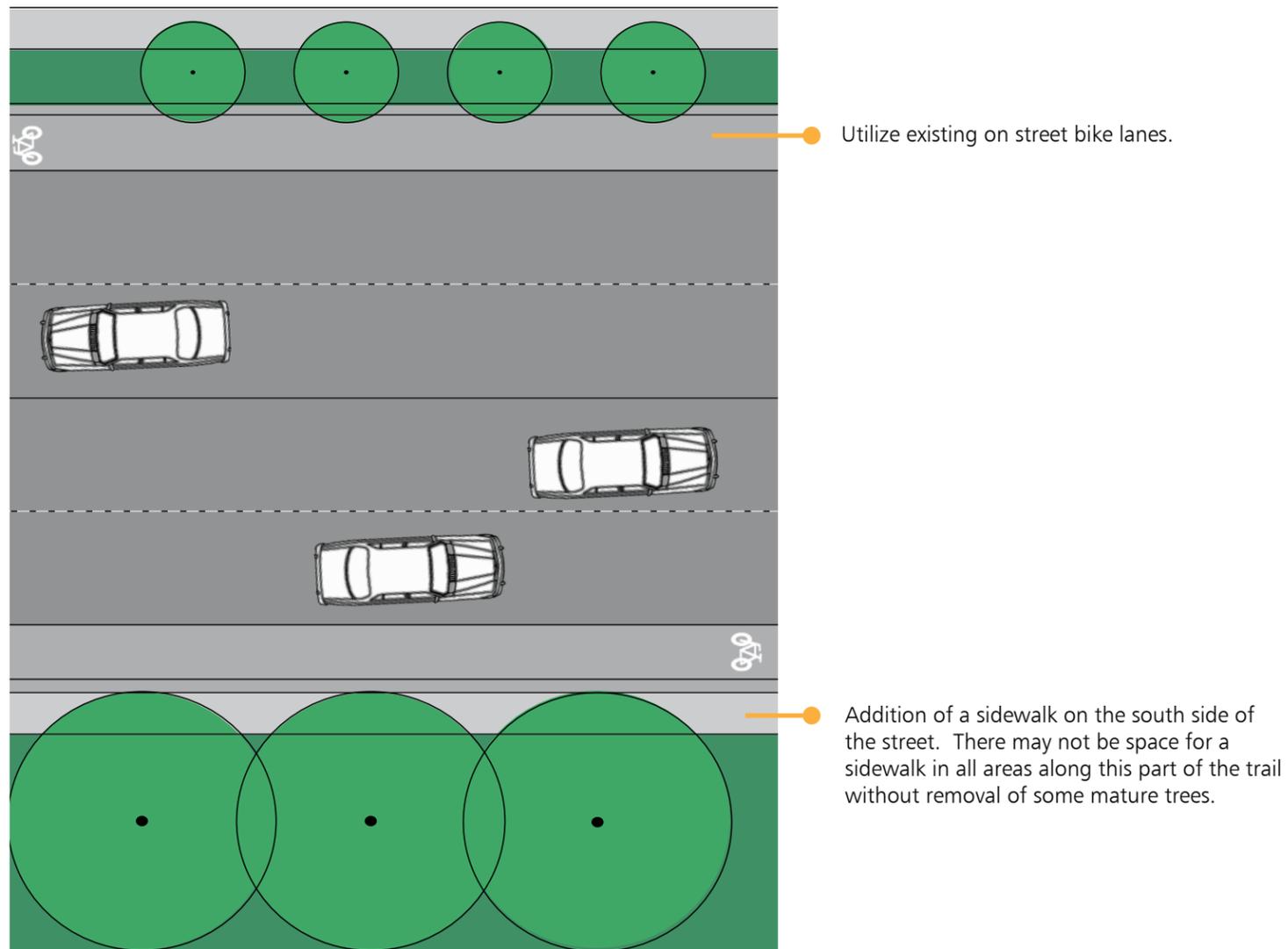


- Middle route offers a mainly off street route.
- Future possible crossing at Crown Street
- Dotted line indicates possible Spirit Trail route alignment in the District of North Vancouver.

G Options for the Spirit Trail along Main/Cotton

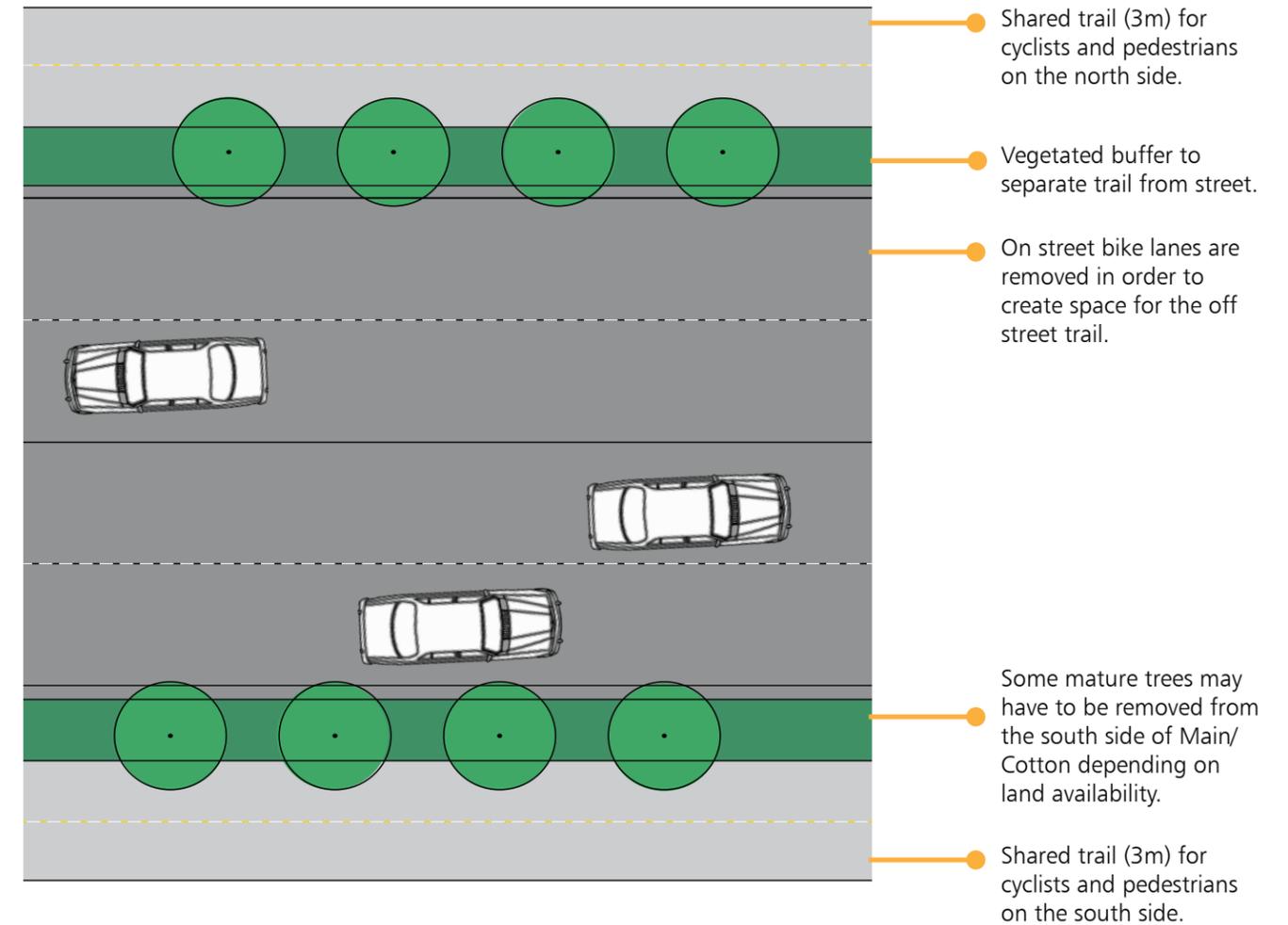
OPTION 1

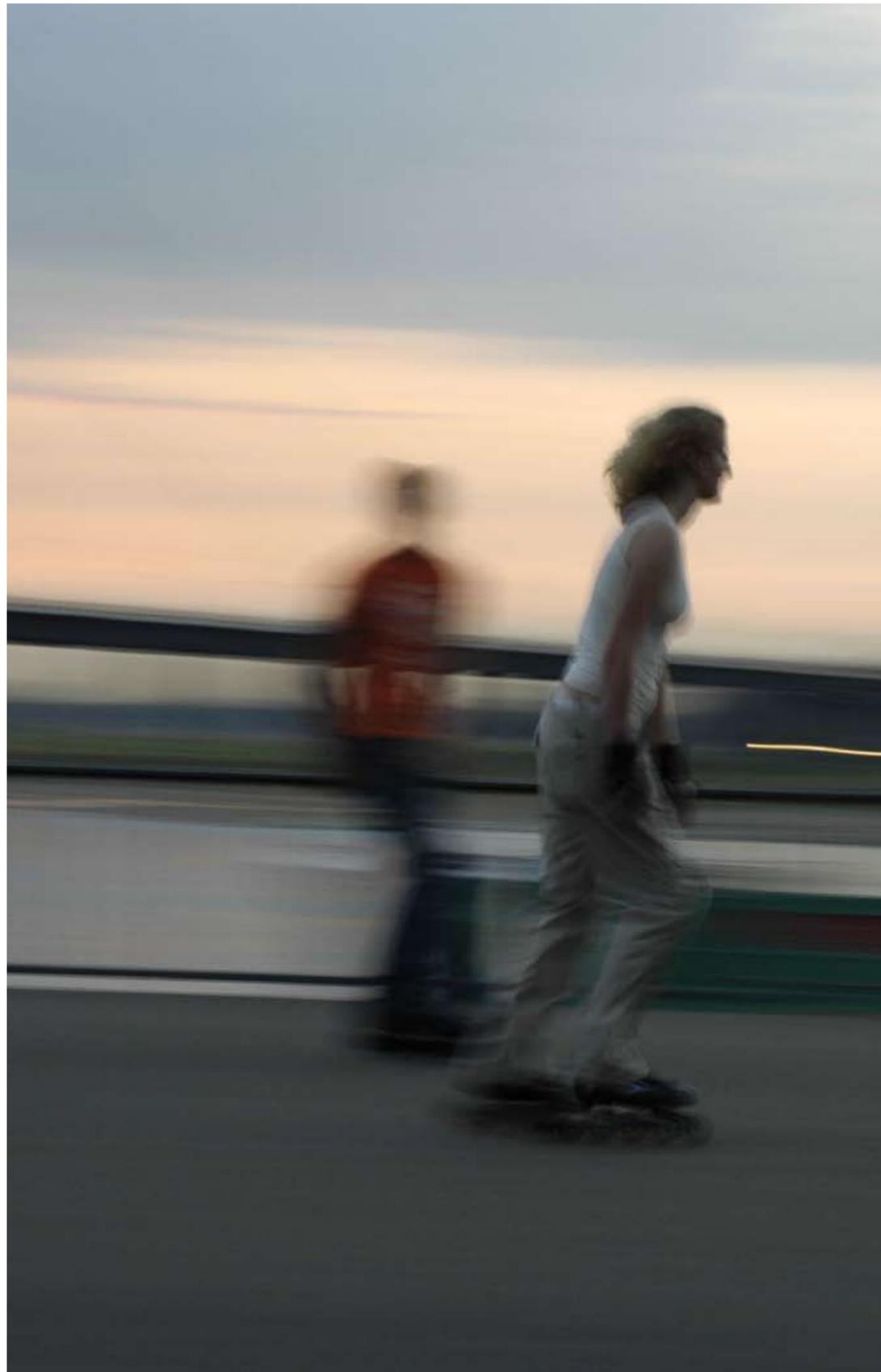
Existing condition along Main/Cotton with the addition of a sidewalk on the south side. This condition leaves the on street bike lanes in place.



OPTION 2

Alternate option for trail along Main/Cotton with a redesigned streetscape that includes an off street trail for both cyclists and pedestrians.





Toolboxes

This section contains a set of tools that will help to determine the character of the trail as it gets built. Toolboxes were created for trail sections, nodes, node identity, vegetation, and lighting. These toolboxes are meant to create structure and provide unity for the design of the Spirit Trail while at the same time they are flexible and allow for creativity during the future detailed design phases of the project.

Trail Types

For the conceptual design phase the trail has been classified into three types: park, urban, and street. These three types of trail provide a diversity of experiences for the users. These designations also inform the design intent for each section of the trail. Vegetation, lighting, nodes, and trail character are all specific to each of the three designations.

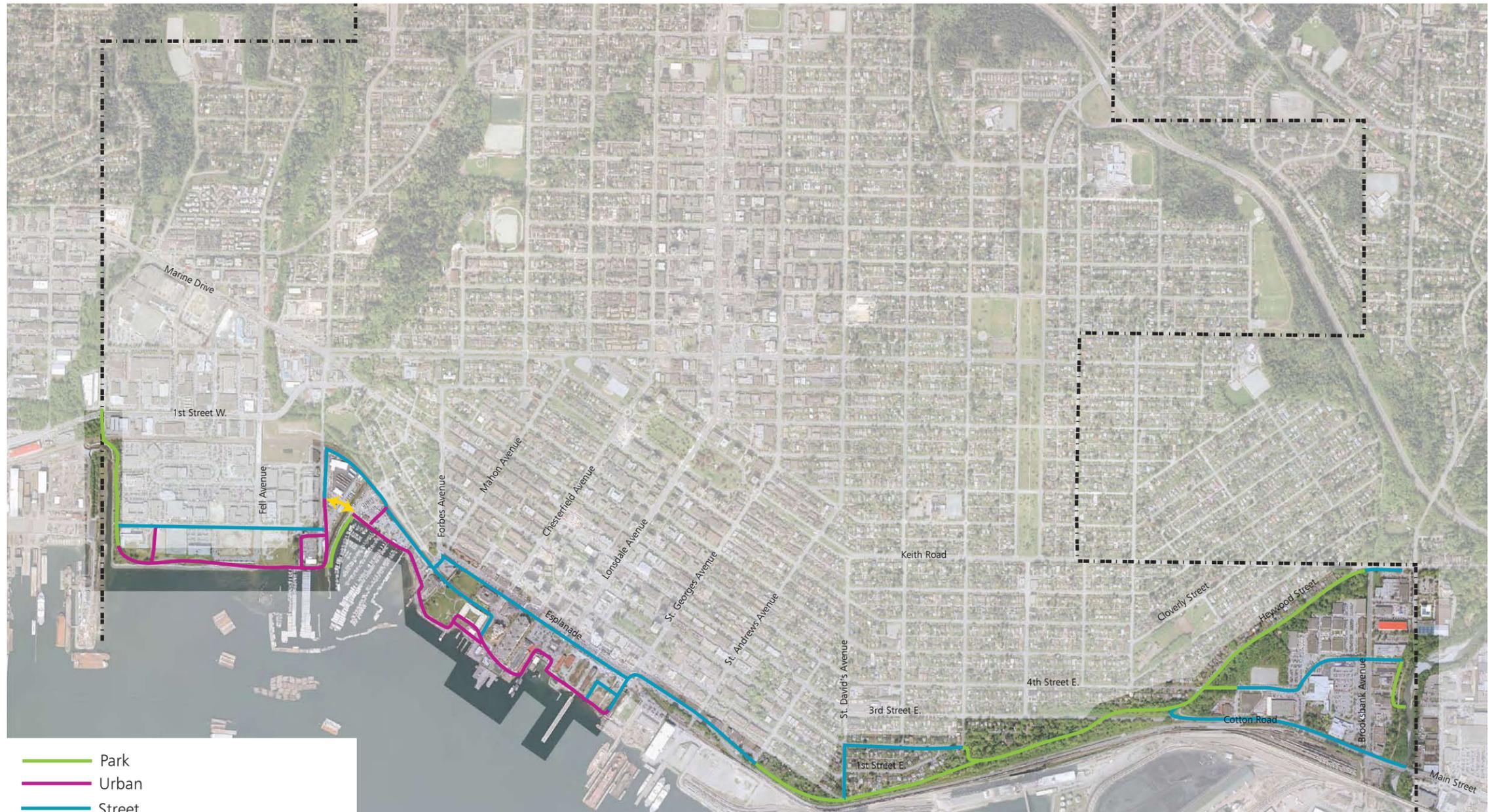
Park is defined as parts of the trail that are located in natural areas of the city. The goal will be to provide access to these natural areas to all users while maintaining or enhancing the natural character.

Urban is defined as the parts of the trail that are near the city centre and directly adjacent to the waterfront. These parts of the trail will have the highest degree of design detail. Parks located on the waterfront are included in this category because the design treatment, lighting and furnishings are to be consistent along the waterfront.

Street is defined as parts of the trail that are along a street or railway. The experience along these parts of the trail will be different than the off street components. They are intended for direct travel between destinations. There are fewer resting points along these parts of the trail.



CNV Spirit Trail - Trail Types



- Park
- Urban
- Street
- City of North Vancouver Boundary



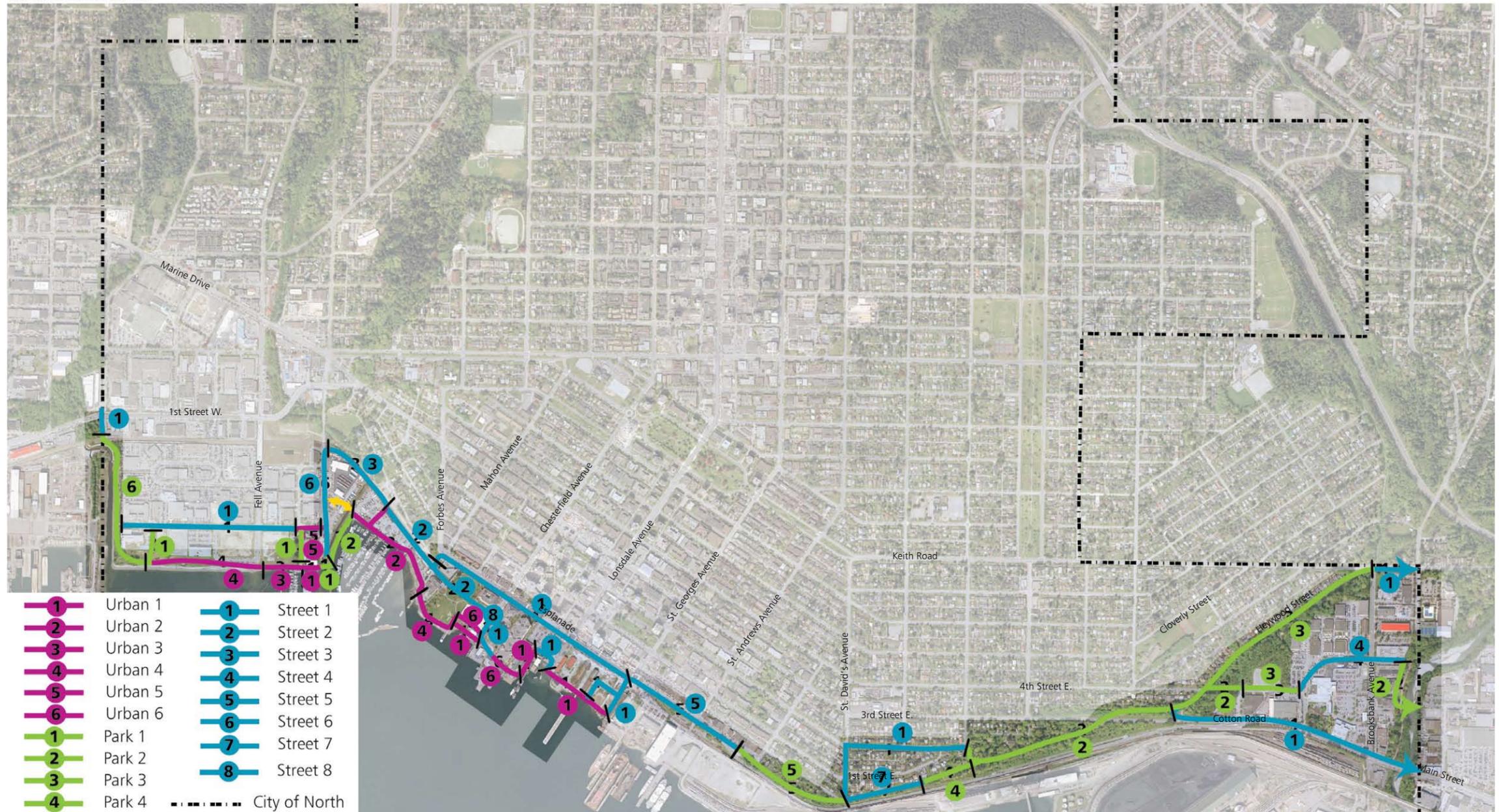
Trail Sections Location

This map locates each of the different types of trail sections along the length of the Spirit Trail. There are 19 different conditions or trail types that are found along the Spirit Trail within the City of North Vancouver. Some of these trail conditions are unique to one place along the trail whereas other trail conditions are represented in multiple places along the trail.

The trail cross sections grouped using the trail types: urban, park, and street. They are found in the following pages.



CNV Spirit Trail - Trail Section Types Location Map



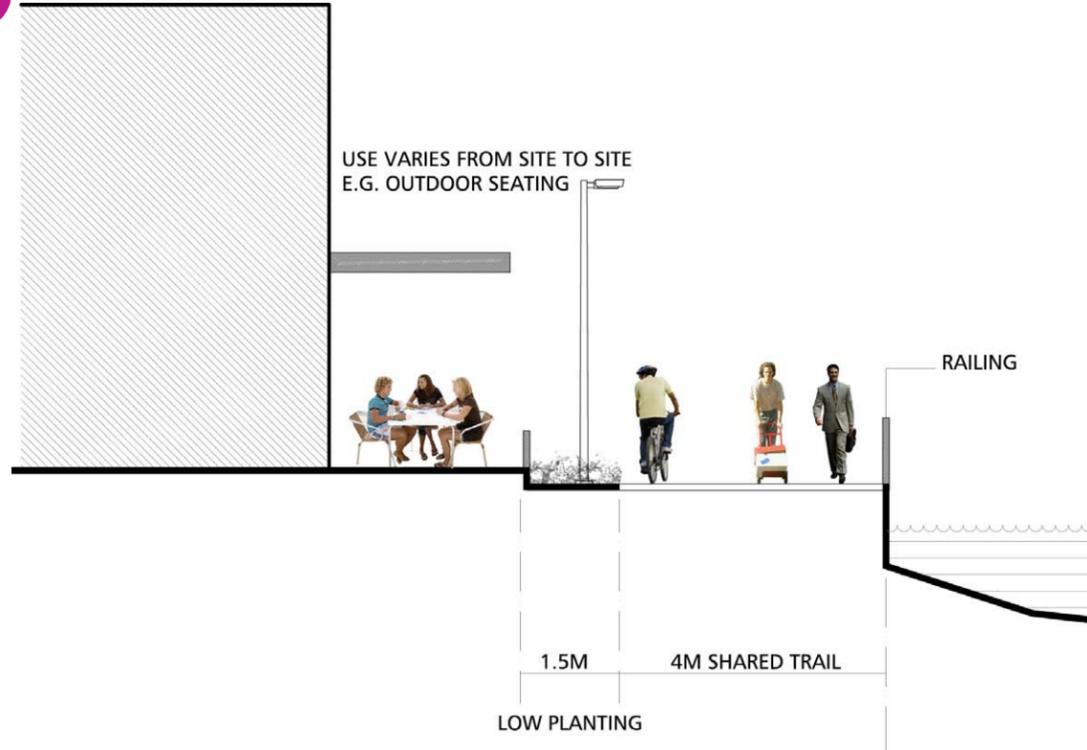
- | | | | |
|---|---------|--------|----------------------------------|
| 1 | Urban 1 | 1 | Street 1 |
| 2 | Urban 2 | 2 | Street 2 |
| 3 | Urban 3 | 3 | Street 3 |
| 4 | Urban 4 | 4 | Street 4 |
| 5 | Urban 5 | 5 | Street 5 |
| 6 | Urban 6 | 6 | Street 6 |
| 1 | Park 1 | 7 | Street 7 |
| 2 | Park 2 | 8 | Street 8 |
| 3 | Park 3 | | |
| 4 | Park 4 | | |
| 5 | Park 5 | | |
| 6 | Park 6 | | |
| | | --- -- | City of North Vancouver Boundary |



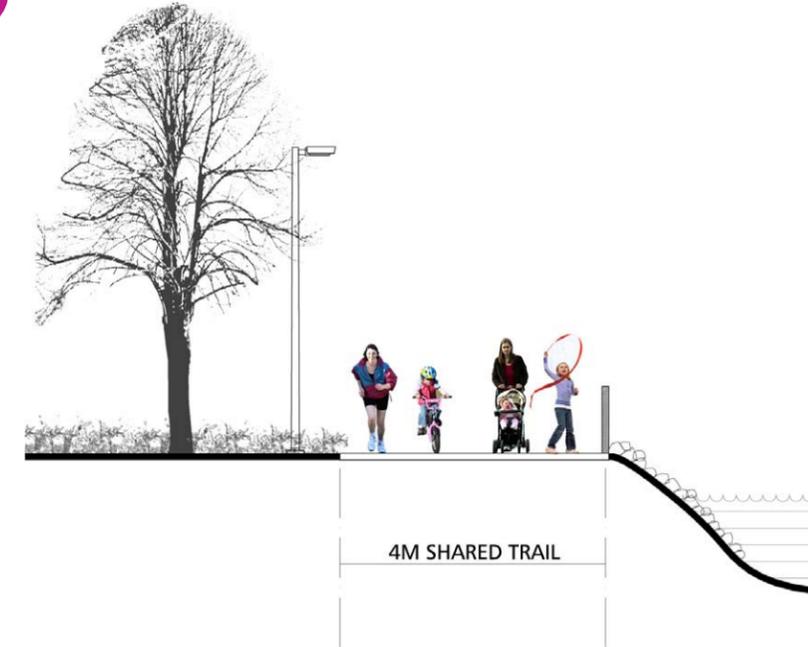
Trail Sections

URBAN

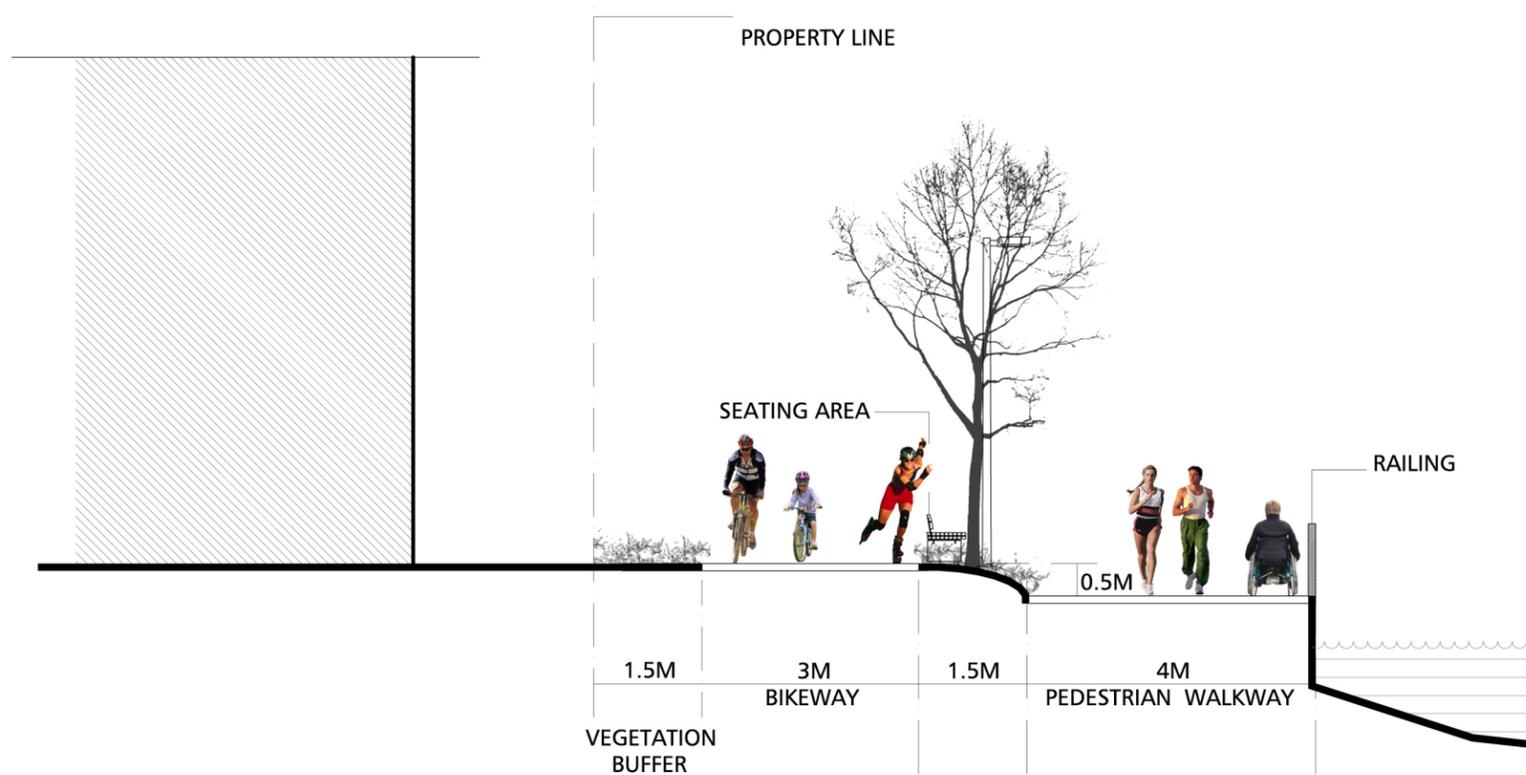
1 Waterfront trail with adjacent commercial amenities.



2 Shared waterfront trail with adjacent open space.



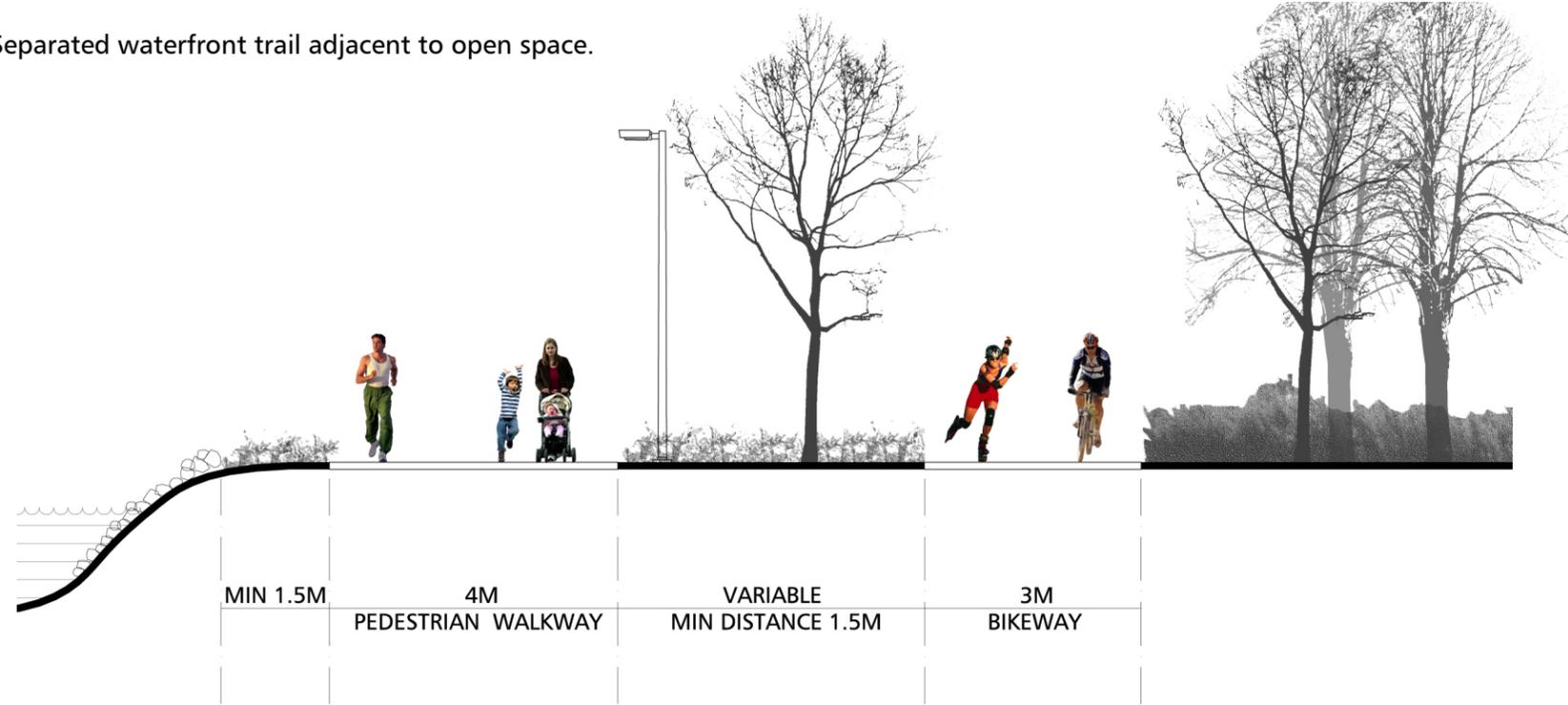
3 Waterfront trail adjacent to future hotel development side in Harbourside Business Park.



Trail Sections

URBAN

4 Separated waterfront trail adjacent to open space.



5 Trail between future buildings.



6 Trail between existing buildings.



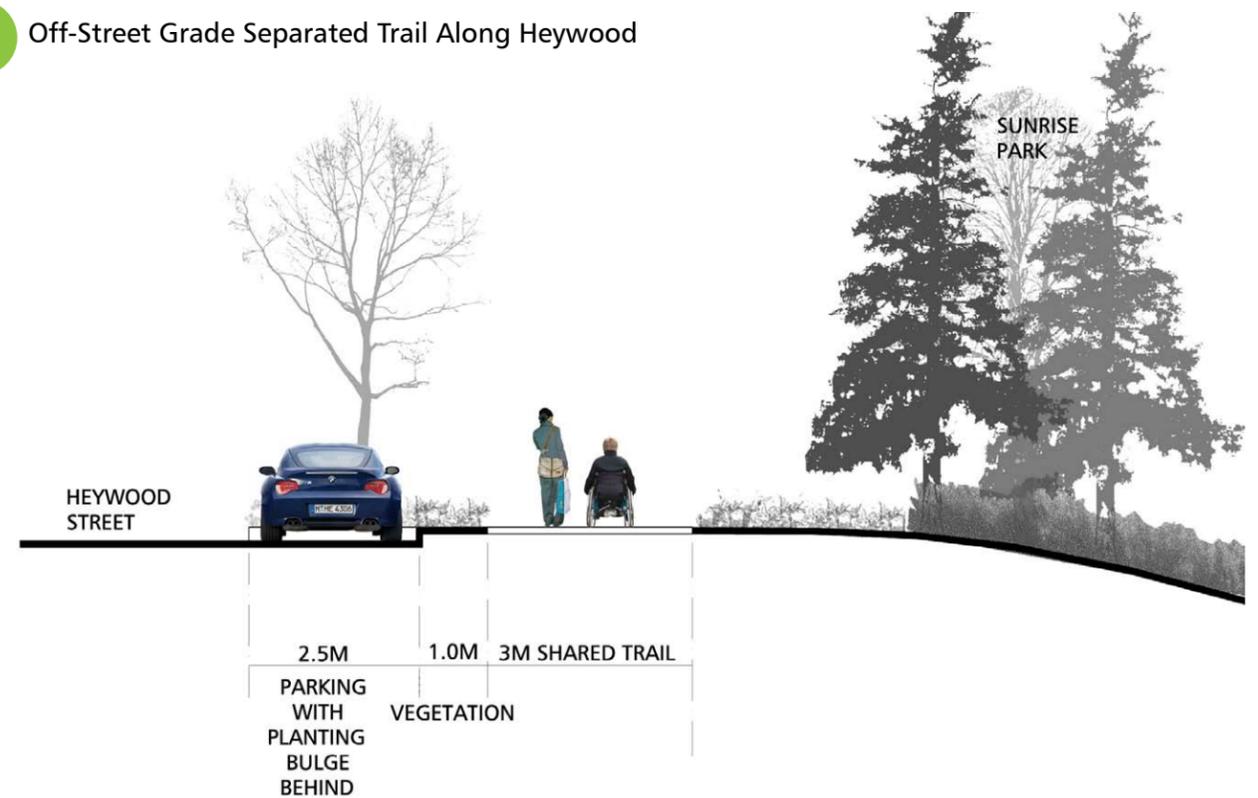
1 Shared Trail through Parks



2 Trail through Natural Areas



3 Off-Street Grade Separated Trail Along Heywood



Trail Sections

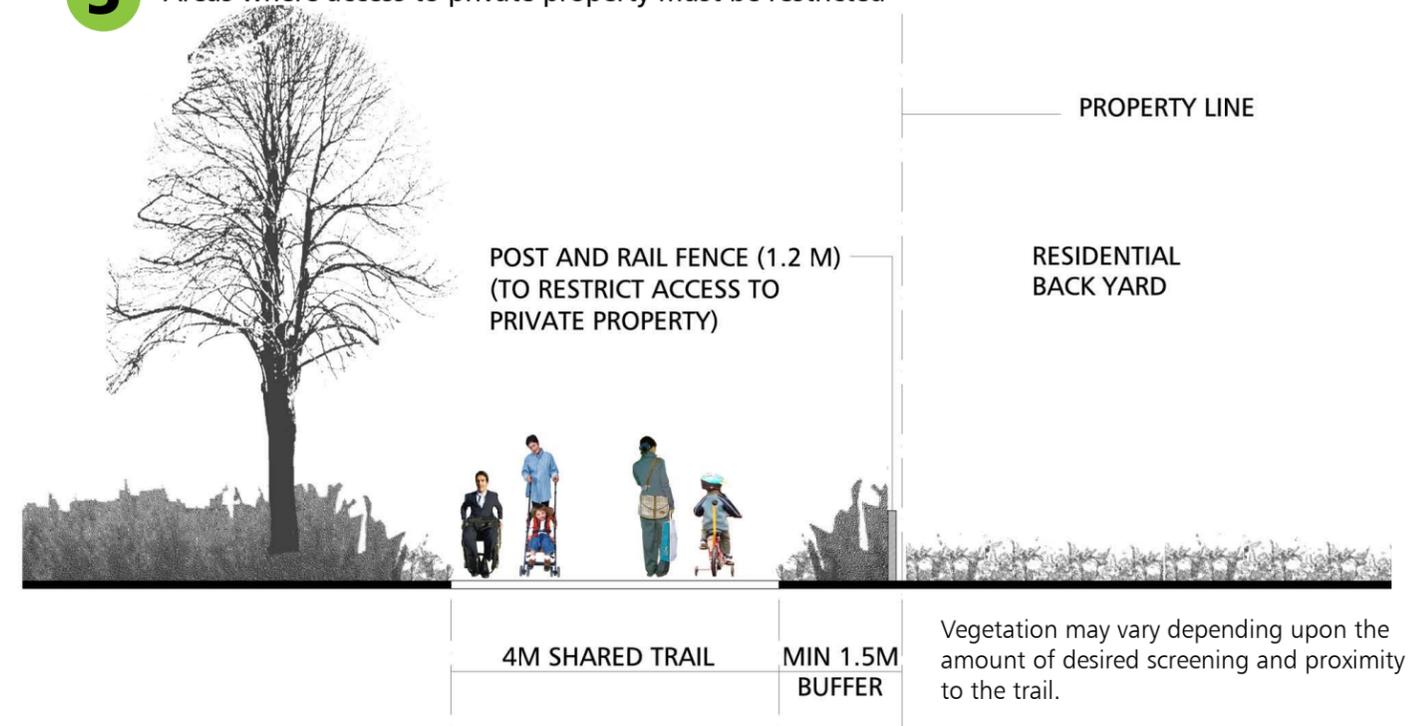
PARK

4 Pedestrian Trail Option Through Ravine



This part of the trail will be surfaced with compact gravel.

5 Areas where access to private property must be restricted



Vegetation may vary depending upon the amount of desired screening and proximity to the trail.

6 MacKay Creek Trail Section

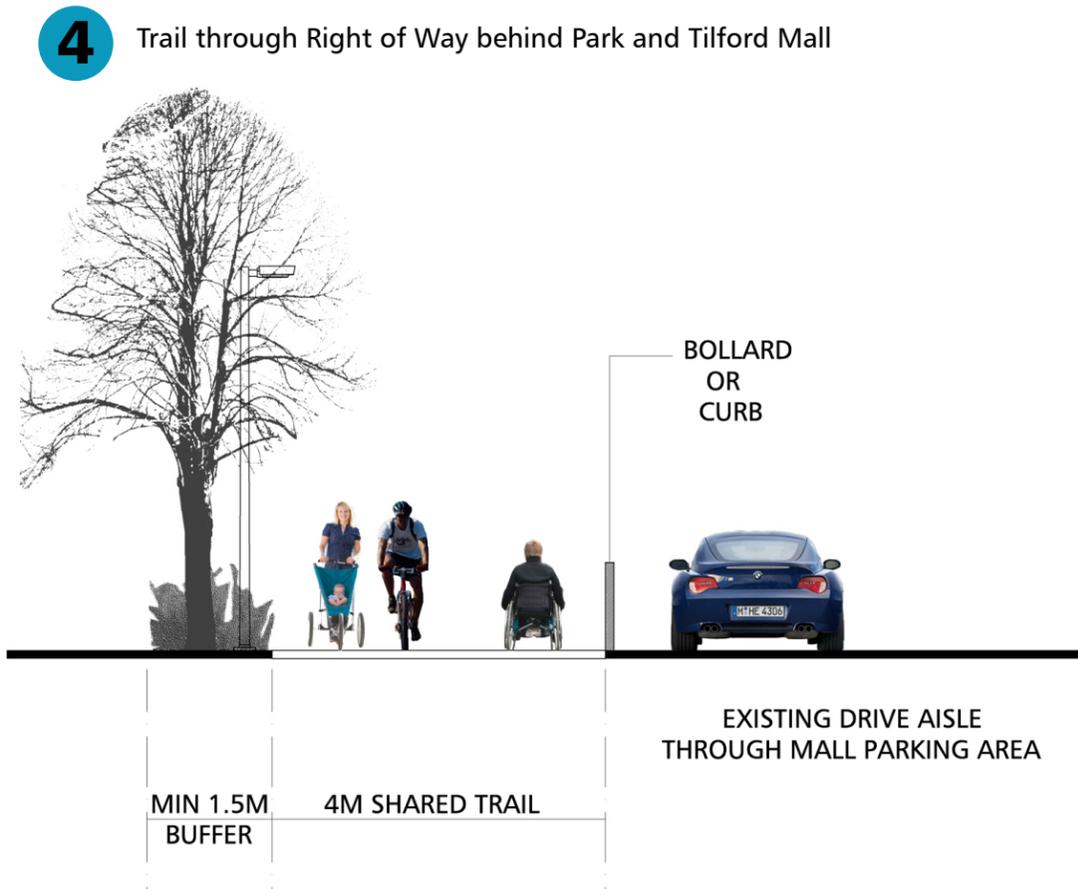
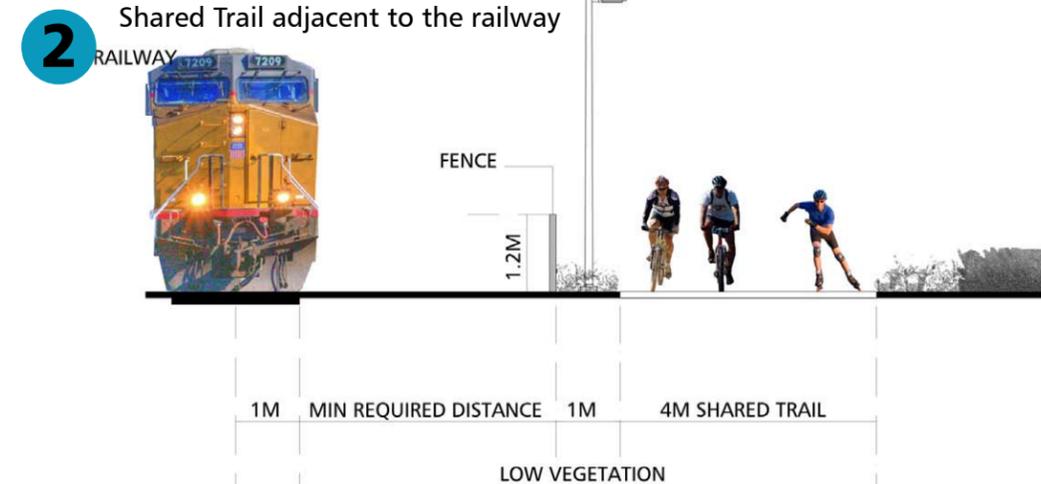
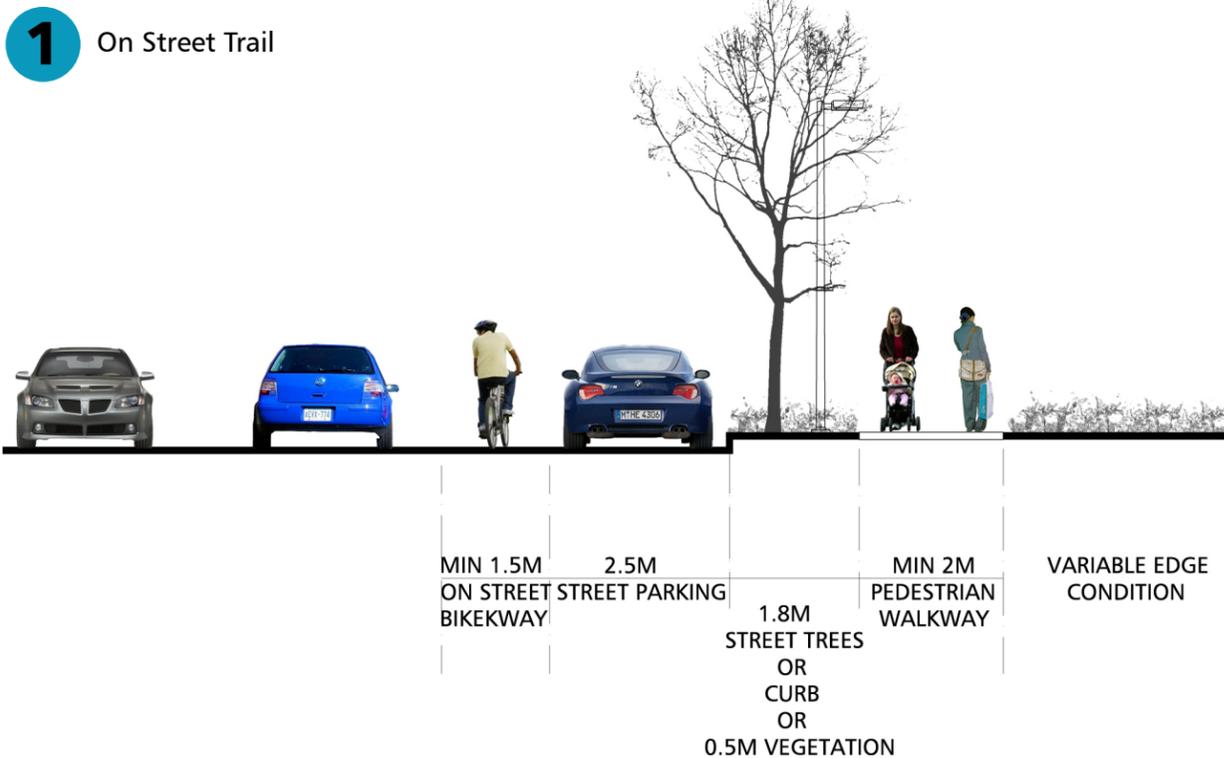


Trail Sections

PARK

Trail Sections

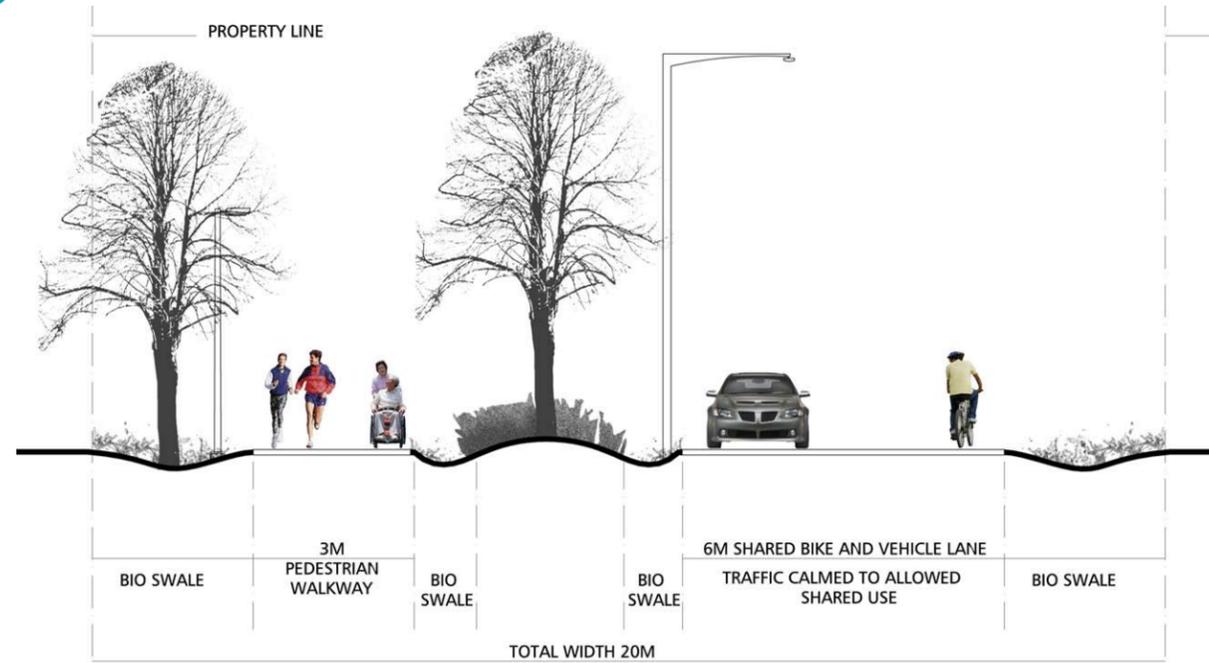
STREETS



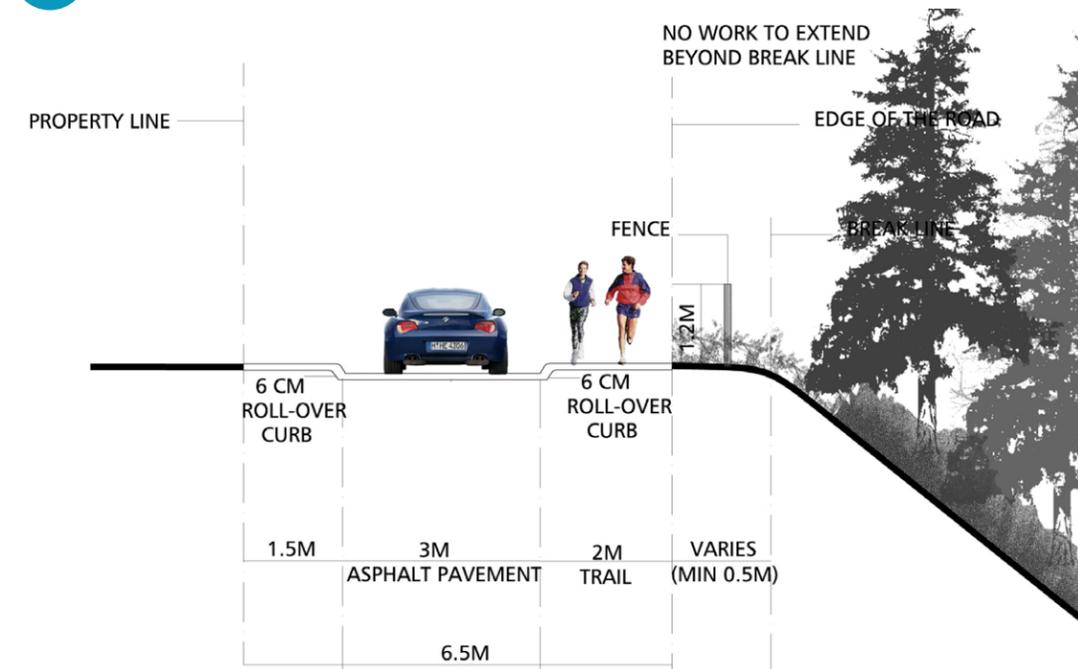
Trail Sections

STREET

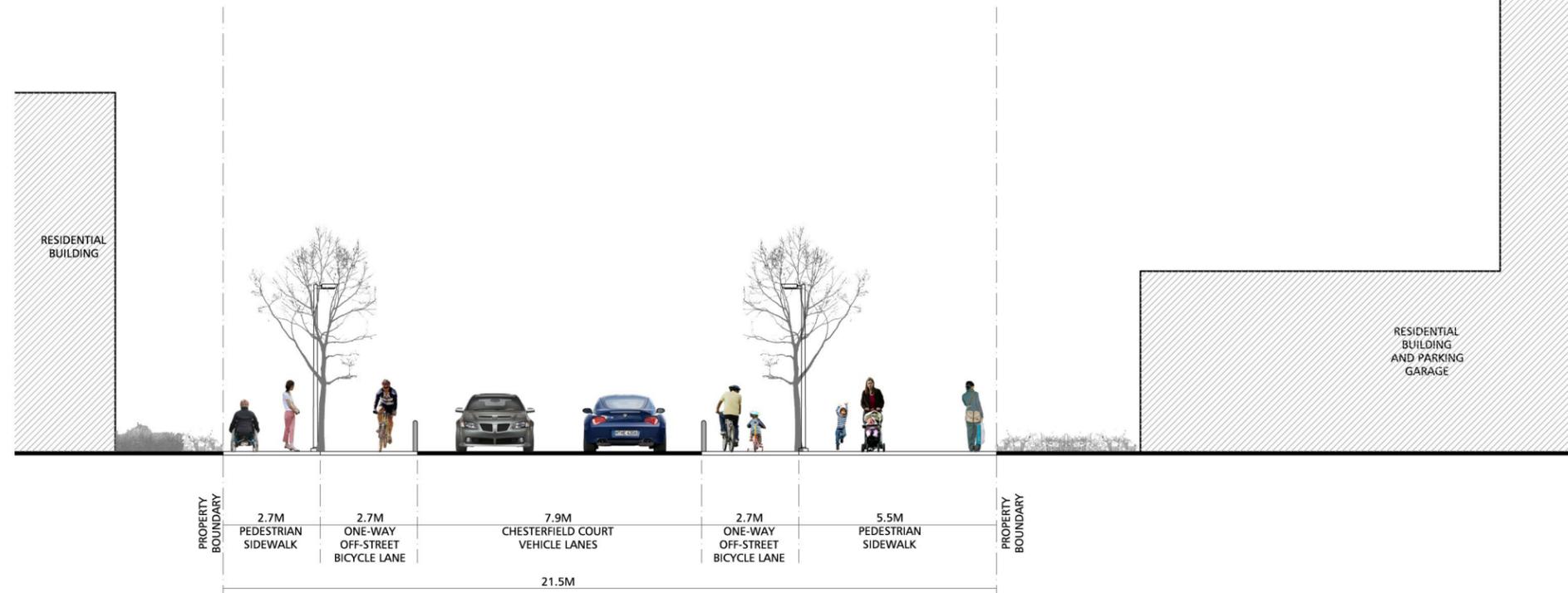
6 Treatment of Bewicke Avenue Property



7 Trail section for Lane behind E. 1st Street



8 Trail Section for Chesterfield Avenue



Nodes

Good trails are more than just a pathway. They are made up of a series of destinations, places to rest along the way, trail heads, and cross roads. Collectively these spaces are called nodes. Three types of nodes have been identified for the Spirit Trail: rest points, trail heads, and intersections. Nodes have been separated into three levels: primary, secondary, and tertiary based on the types of amenities that should be provided.

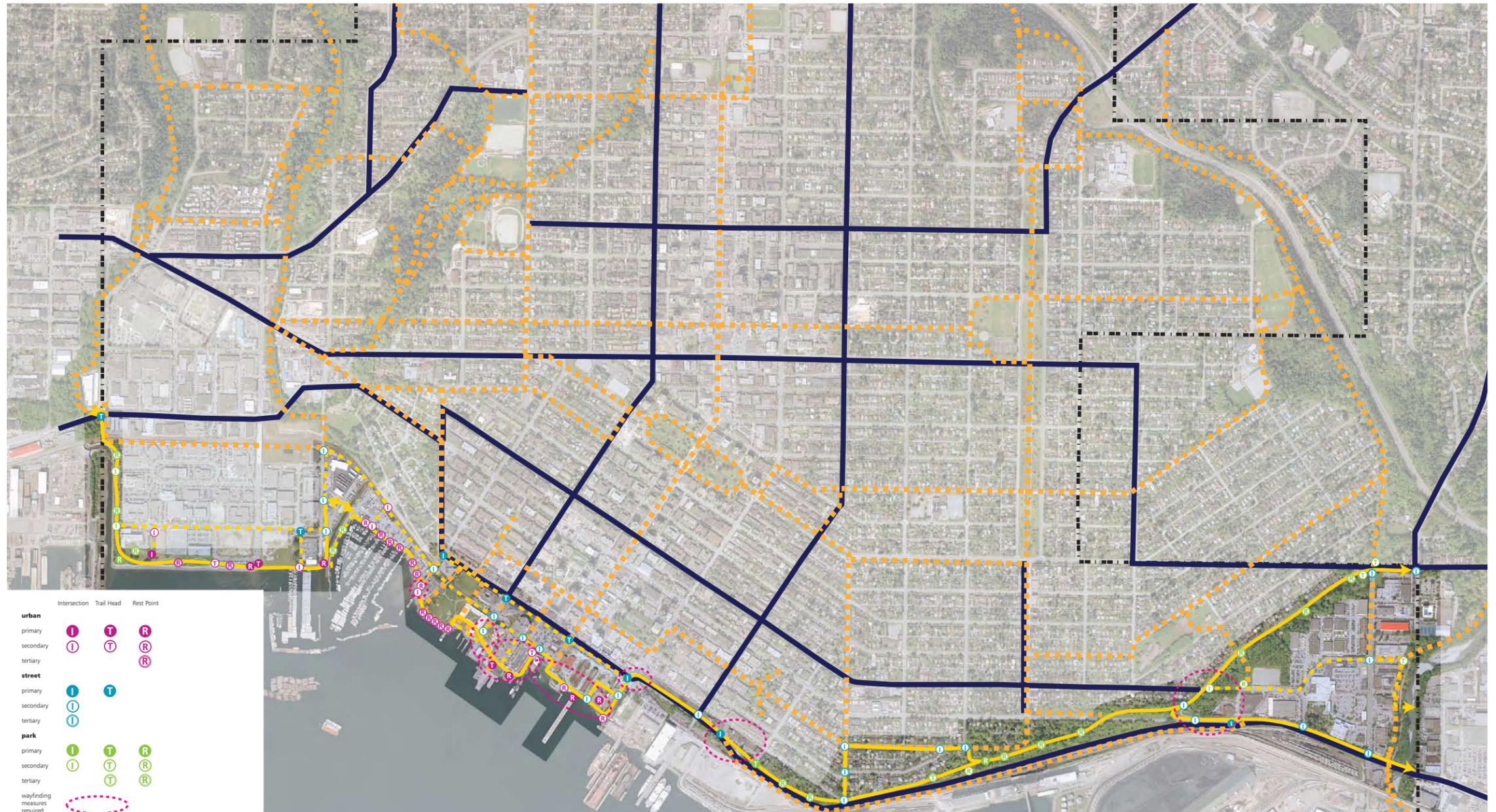
Nodes and amenities are diagrammatically represented in the following pages. There is also an explanation of these amenities found under the Vocabulary of the Nodes which describes the design intent of each amenity.

It is important to note that the identification of nodes at this scale is approximate. The quantity and/or character of the nodes can change with more detailed study at implementation phase or due to factors such as changes in adjacent land use.

North Shore
Spirit Trail
Connecting the North Shore Communities

City of North Vancouver Spirit Trail

space2place the city of north vancouver



	Intersection	Trail Head	Rest Point
urban			
primary	I	T	R
secondary	I	T	R
tertiary	I	T	R
street			
primary	I	T	
secondary	I	T	
tertiary	I	T	
park			
primary	I	T	R
secondary	I	T	R
tertiary	I	T	R
wayfinding measures required	[Dashed pink circle]		
CNV Boundary	[Dashed black line]		
Spirit Trail Main	[Solid yellow line]		
Spirit Trail Secondary	[Dashed yellow line]		
Greenways	[Dashed orange line]		
Bike Network	[Solid blue line]		

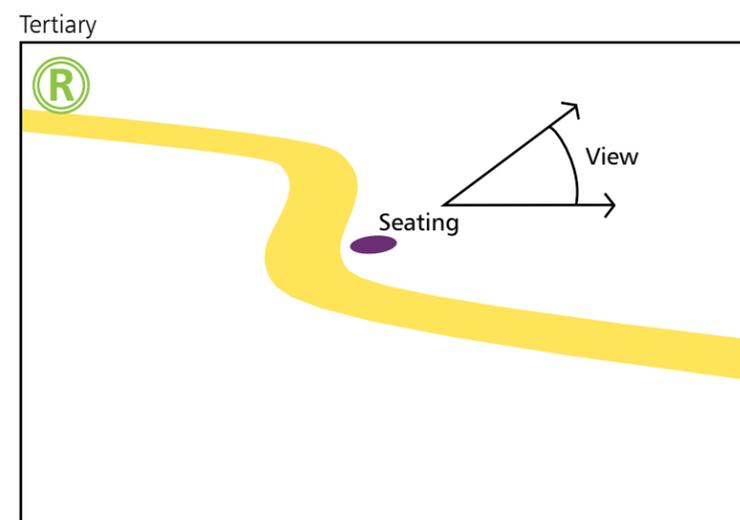
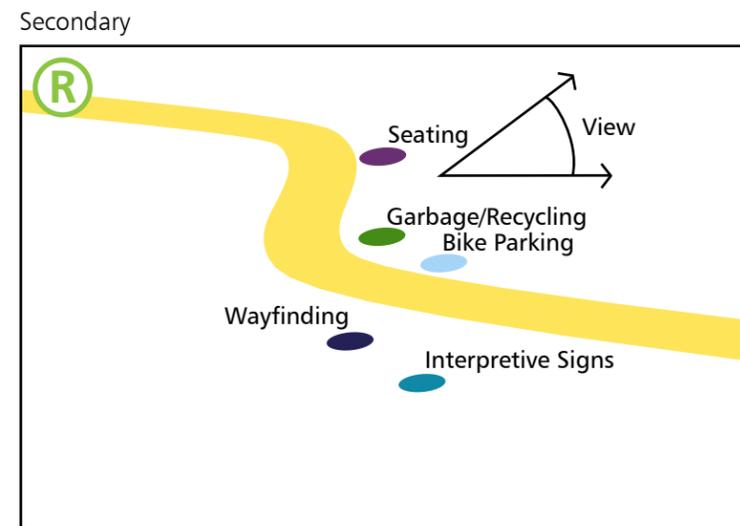
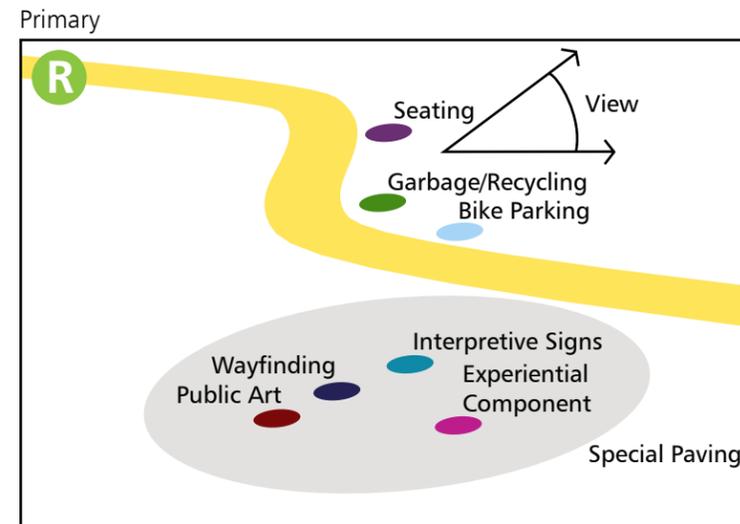
PARK

Rest Points are locations along the trail where it is desirable to stop. These vary in size and number of amenities to provide a diversity of experiences along the trail.

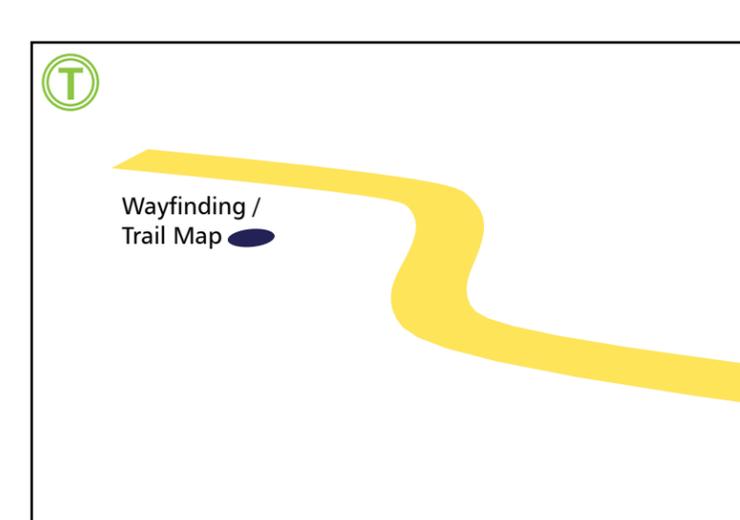
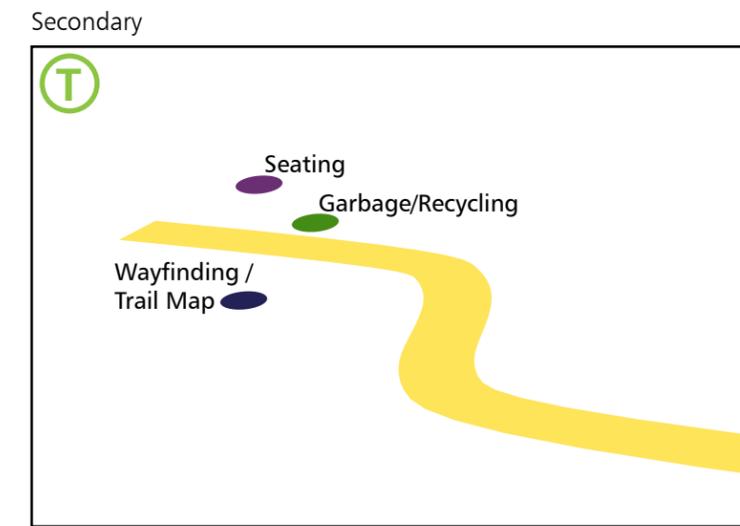
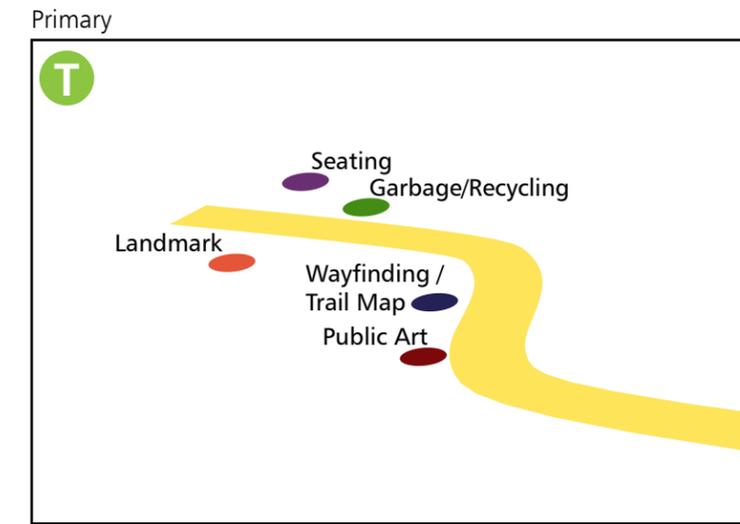
Trail Heads are places that act as main entry or egress point along the trail. These should orient the user to the trail and the City of North Vancouver.

Intersections are points where the Spirit Trail meets a road or another trail. At these locations it is important to create safe crossings for trail users as well as provide way to help people navigate the trail.

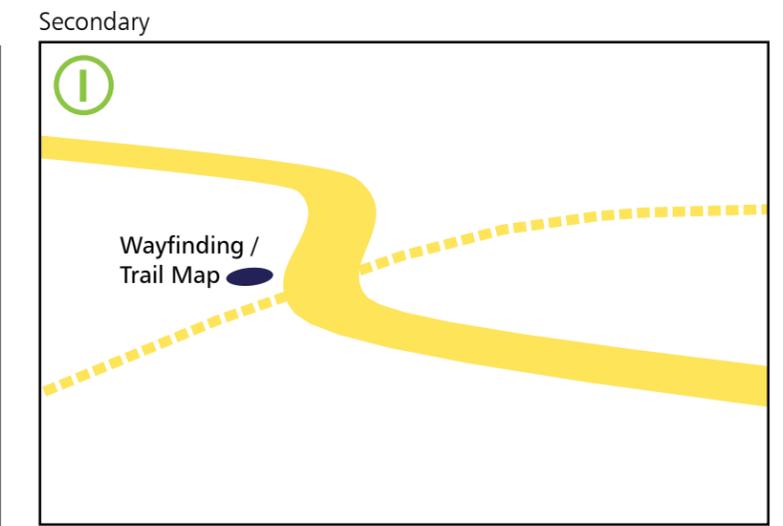
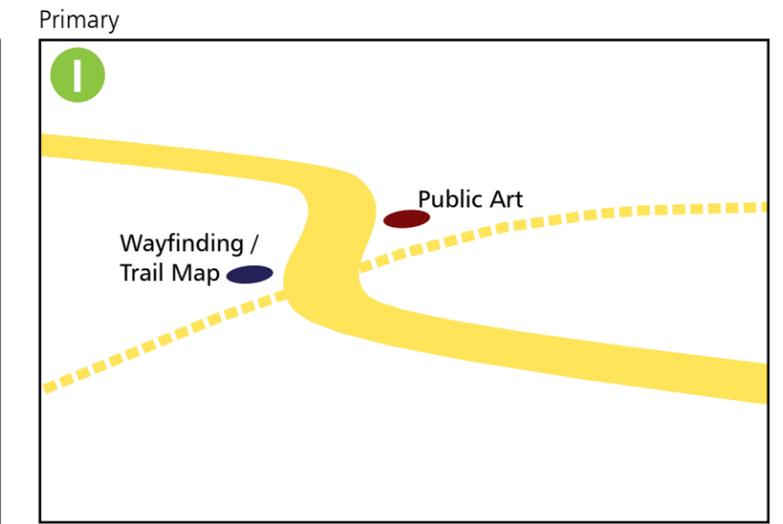
Rest Points



Trail Head



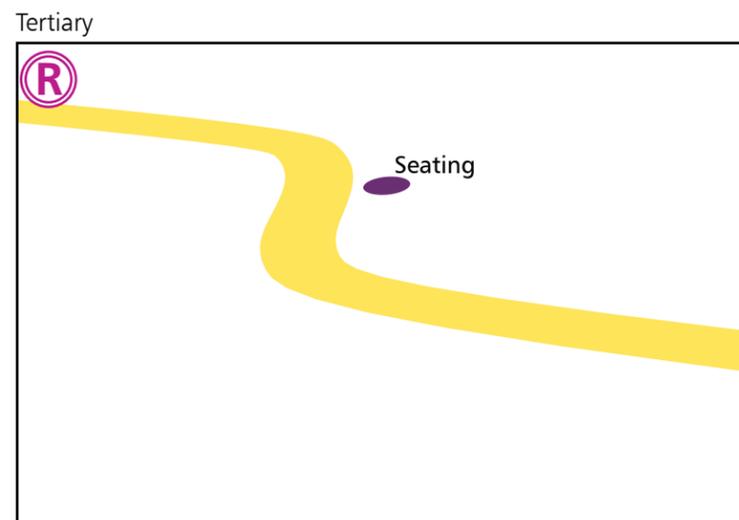
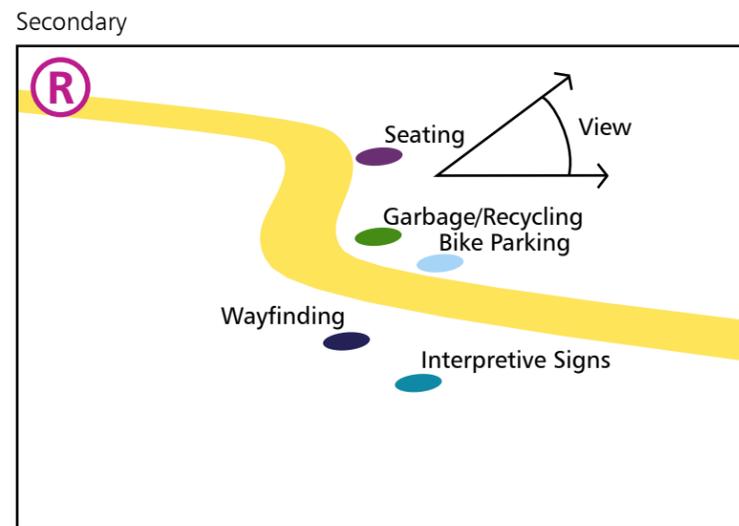
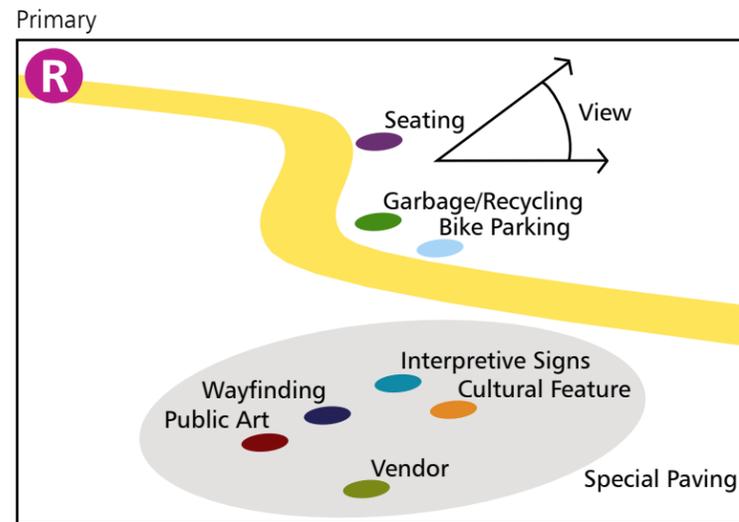
Intersections



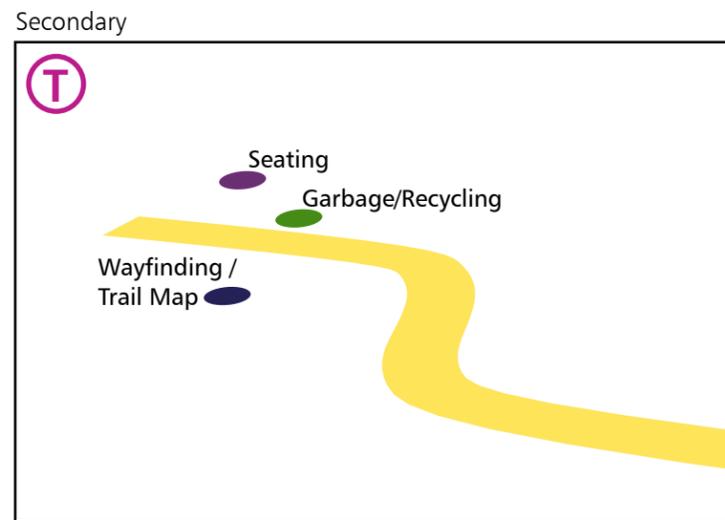
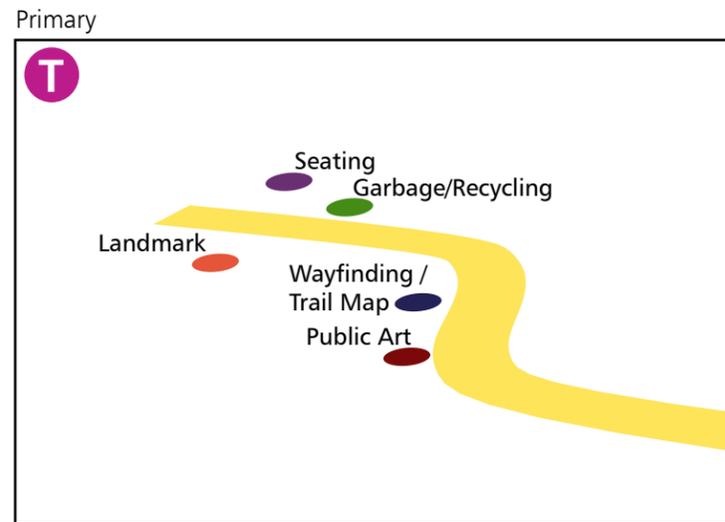
Nodes

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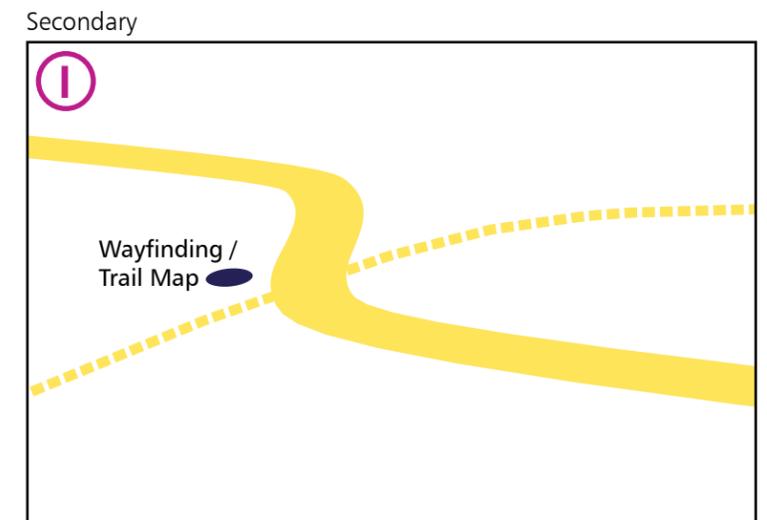
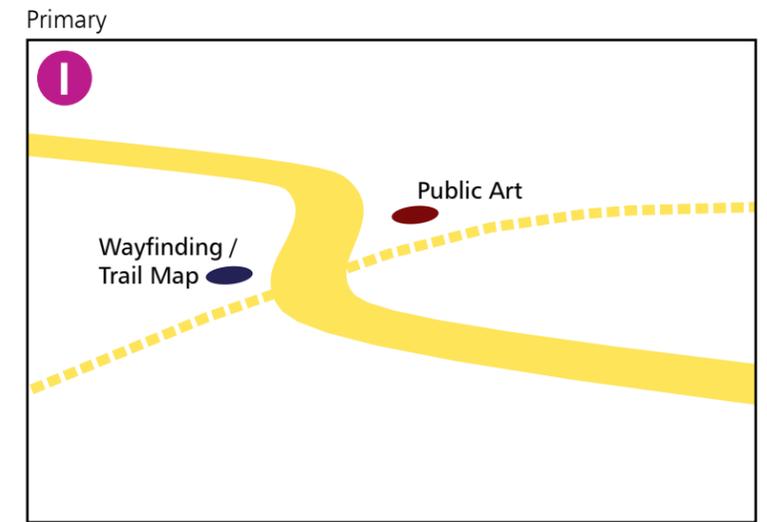
Rest Points



Trail Head



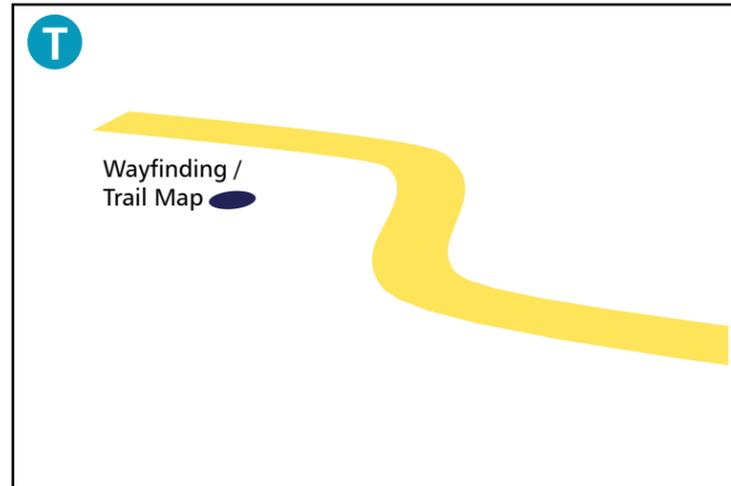
Intersections



STREET Nodes

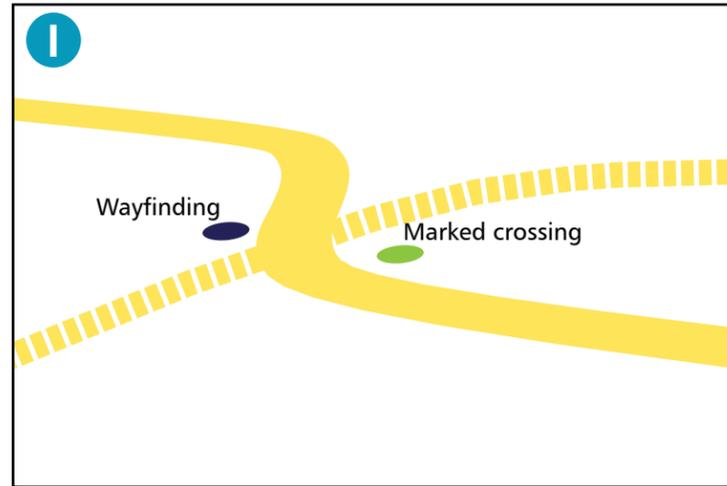
Trail Head

Primary

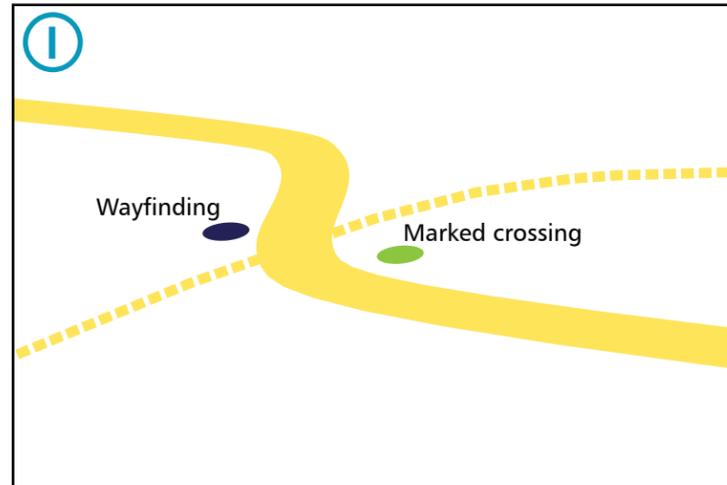


Intersections

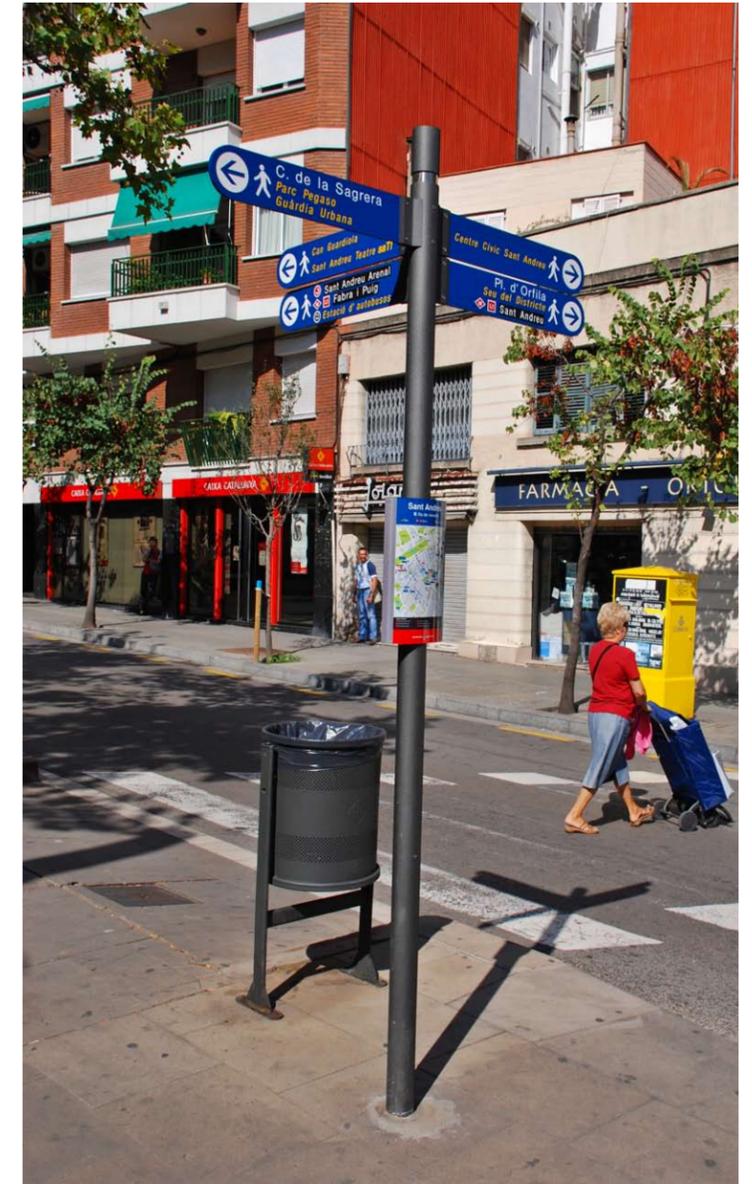
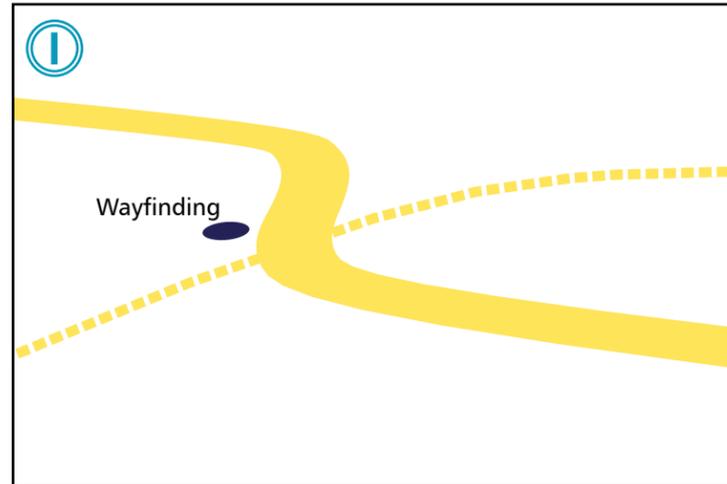
Primary



Secondary



Tertiary



Vocabulary of the Nodes

Bicycle Parking

Parking for bicycles should be located in easily accessible, highly visible areas next to places where people might choose to stop. Bike racks should be designed to support the frame of the bike.



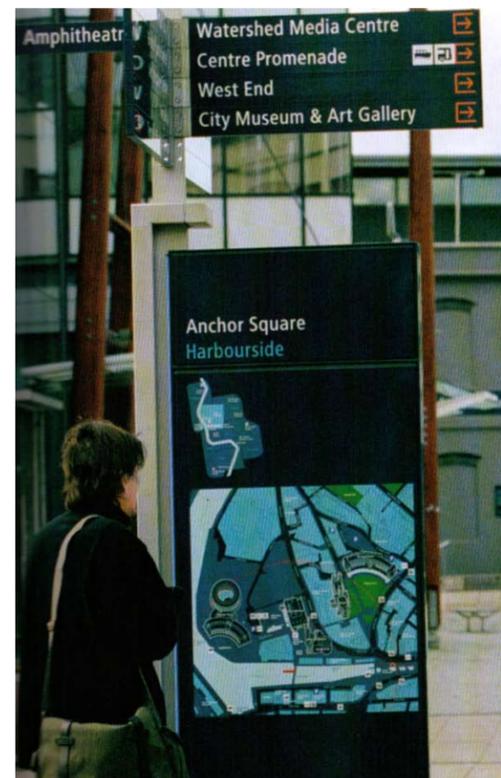
Garbage Receptacles

Garbage receptacles should be conveniently located to reduce the amount of litter in the city and along the trail. They should conform to the city standards by having an overhead cover and a side opening door. A recycling receptacle should also be considered either as an attachment to the garbage receptacle or as a separate unit.



Wayfinding

A wayfinding strategy is one of the most important parts of the Spirit Trail. It will allow users to navigate the trail and provide an identity for the trail. This identity will be important in raising the profile of the trail and increasing tourism opportunities. Wayfinding pieces should be simple, clear, and integrated into the fabric of the trail as much as possible.



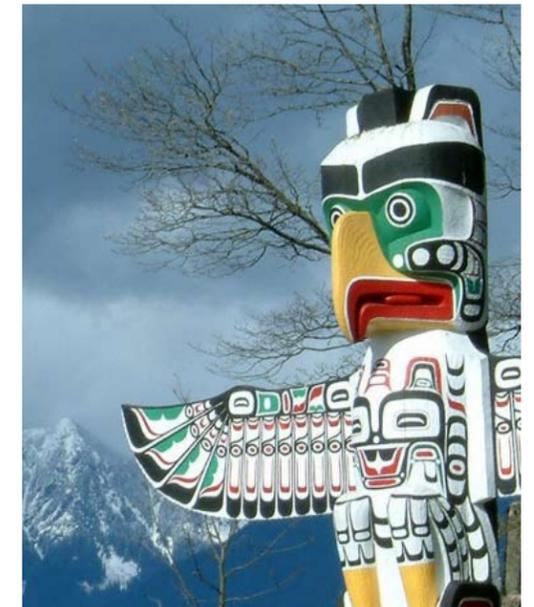
Public Art

Public art is an important component of any high quality public realm. Public art should be integrated into the design of the trail as much as possible. Art could also be used to punctuate important destinations along the trail. The City already has several successful projects that achieve this goal. These can be built upon along the Spirit Trail.



Cultural Features

There are many opportunities along the Spirit Trail to incorporate cultural features as the trail passes through First Nations land and other important historic sites. These areas could be commemorated or interpreted through a variety of methods. They can be integrated into specific details of the trail design or as stand alone pieces.



Landmarks

Landmarks help to locate oneself in the landscape. They can take on many physical forms including land forms, public art, bridges, architecture, etc. At principal trail heads effort should be made to create iconic landmarks. They provide trail users with an easily identifiable place to meet. Iconic landmarks can also help promote the city to visitors.



Seating

Providing areas to rest is a key component to a successful trail. Seating should be flexible in order to accommodate the diversity of trail users. It should allow people options to sit and enjoy the view or lay down and bask in the sun. Seating should be chosen to reflect the character of the trail.



Special Paving

The majority of the Spirit Trail will be surfaced with asphalt as it is the most comfortable option for all users. However, in special nodes, zones of conflict, or places with separated pedestrian and bike trails a different paving material should be used to provide the user with a visual cue to the change in use.



Experiential Component

The trail passes through many different characters from urban waterfront, naturalized park, industrial, to commercial. Nodes should be oriented to take advantage of these different experiences. These experiences include excellent views of the surroundings, people watching on the waterfront, interactions with nature, watching boats come and go, and discovering how industry works.



Marked Crossing

Where the trail intersects with roads it may be necessary to install a marked crossing to increase safety for trail users.



Interpretive Signs

Interpretive signs could be used to educate the trail user about important cultural or natural features along the trail. These signs could be integrated into the trail design. Areas with existing signs could be reorganized to offer a more inviting setting to promote exploration.

Views

As one of the main objectives of the Spirit Trail is that the trail is to be waterfront oriented. The trail nodes should take advantage of views of the waterfront but also the surrounding landscape as much as possible.



Urban

Planting along the Spirit Trail should utilize native species where ever possible to meet the objectives below.

Objectives for Urban section of the trail:

- Create Shade
- Separate pedestrian and bicycle traffic
- Define an edge
- Frame views
- Create shrub clusters that act as stepping stones for wildlife (birds and insects)

In some instances native species may not meet the site requirements. Care should be taken to choose non-native species that are not invasive, provide wildlife habitat, and contribute to the sense of place.

*The City of North Vancouver Street Tree Master Plan should also be consulted prior to choosing tree species for the Spirit Trail.

This plant list was developed by the City of North Vancouver.



Suggested Plant Species

	Botanical Name	Common Name		Botanical Name	Common Name
trees*	<i>Acer circinatum</i>	Vine maple	perennials	<i>Eschscholtzia californica</i>	California poppy
	<i>Betula papyrifera</i>	Paper birch	continued	<i>Eupatorium fistulosum</i>	Joe Pye weed
	<i>Pseudotsuga menziesii</i>	Douglas fir		<i>Fragaria chiloensis</i>	Coastal strawberry
	<i>Thuja plicata</i>	Western red cedar		<i>Fragaria virginiana</i>	Wild strawberry
	<i>Arbutus menziesii</i>	Madrone		<i>Heuchera micrantha</i>	Alumroot
shrubs	<i>Andromeda polifolia</i>	Bog rosemary		<i>Maianthemum dilatatum</i>	False lily of the valley
	<i>Amelanchier alnifolia</i>	Saskatoonberry	vines	<i>Telima grandiflora</i>	Fringecup
	<i>Arctostaphylos columbiana</i>	Manzanita		<i>Tiarella trifoliata</i>	Foamflower
	<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	grasses	<i>Lonicera ciliosa</i>	Western trumpet honeysuckle
	<i>Arbutus unedo</i>	Strawberry tree		<i>Andropogon gerardii</i>	Big bluestem
	<i>Arbutus unedo 'compacta'</i>	Dwarf strawberry tree		<i>Boutloua gracilis</i>	Blue gramma
	<i>Betula glandulosa</i>	Scrub birch		<i>Bouteloua curtipendula</i>	Side-oats gramma
	<i>Ceanothus gloriosus</i>	Point Reyes Ceanothus		<i>Calamagrostis x acutiflora 'Karl Forester'</i>	Feather reed grass
	<i>Ceanothus thyrsiflorus var. repens</i>	California lilac		<i>Calamagrostis x acutiflora 'Overdam''</i>	Feather reed grass
	<i>Gaultheria shallon</i>	Salal		<i>Calamagrostis brachytricha</i>	Korean feather reed grass
	<i>Ledum groenlandicum</i>	Labrador tea		<i>Chasmanthium latifolium</i>	Sea oats
	<i>Mahonia nervosa</i>	Dull Oregon grape		<i>Deschampsia cespitosa 'Schottland'</i>	Tufed hair grass Scotland
	<i>Myrica californica</i>	California wax myrtle		<i>Festuca marerii</i>	Atlas fescue
	<i>Pachystima myrsinites</i>	False box		<i>Helictotrichon sempervirens</i>	Blue oat grass
	<i>Ribes sanguineum</i>	Red-flowering currant		<i>Panicum vergatum 'Heavy metal'</i>	Panic grass
<i>Rubus spectalis</i>	Salmonberry		<i>Pennisetum alopecuroides</i>	Feather grass	
<i>Spiraea douglasii</i>	Hardhack		<i>Miscanthus sinensis 'Rotsiber'</i>	Red-silver miscanthus	
<i>Vaccinium ovatum</i>	Evergreen huckleberry		<i>Miscanthus sinensis 'Siberfeder'</i>	Silver feather miscanthus	
<i>Vaccinium parviflorum</i>	Red huckleberry		<i>Muhlenbergia capillaris</i>	Pink muhly	
<i>Vaccinium vitis-idaea</i>	Lingonberry		<i>Schizachyrium scoparium</i>	Little bluestem	
ferns	<i>Athyrium filix-femina</i>	Lady fern		<i>Sorghastrum nutans</i>	Indian grass
	<i>Blechnum spicant</i>	Deer fern		<i>Stipa tenuissima</i>	Fine stem needle grass
	<i>Polysticum mutinum</i>	Western sword fern			
perennials	<i>Achillia millefolium</i>	Yarrow			
	<i>Achlys triphyla</i>	Vanilla leaf			
	<i>Allium cernuum</i>	Nodding onion			
	<i>Aquilegia formosa</i>	Western columbine			
	<i>Camassia quamash</i>	Common camas			
	<i>Coreopsis verticillata 'Moonbean'</i>	Tickseed			
	<i>Cornus canadensis</i>	Bunchberry			
	<i>Dicentra formosa</i>	Bleeding heart			
	<i>Eriophyllum lanatum</i>	Orgeon sunshine			

Vegetation

URBAN

Park

Planting along the Spirit Trail should utilize native species where ever possible to meet the objectives below.

Objectives for the Park sections of the trail:

- Enhance diversity
- Create or Enhance vertical structure
- Replace invasive plants with native ones

Natural areas should use only native plant species.

This plant list was developed by the City of North Vancouver.

Suggested Plant Species

	Botanical Name	Common Name			
trees	<i>Acer circinatum</i>	Vine maple	ferns	<i>Blechnum spicant</i>	Deer fern
	<i>Acer macrophyllum</i>	Big leaf maple		<i>Athyrium filix-femina</i>	Lady-fern
	<i>Alnus rubra</i>	Red alder		<i>Dryopteris austriaca</i>	Spiny wood fern
	<i>Arbutus menziesii</i>	Madrone		<i>Polysticum mutinum</i>	Western sword fern
	<i>Cretageus douglasii</i>	Black hawthorn	perennials	<i>Achillia millefolium</i>	Yarrow
	<i>Fraxinus latifolia</i>	Oregon ash		<i>Achlys triphyla</i>	Vanilla leaf
	<i>Malus fusca</i>	Pacific crab apple		<i>Allium cernuum</i>	Nodding onion
	<i>Prunus emarginata</i>	Bitter cherry		<i>Anaphalis margaritacea</i>	Pearly everlasting
	<i>Rhamnus pershiana</i>	Cascara		<i>Aquilegia formosa</i>	Red columbine
	<i>Pinus contorta var. contorta</i>	Shore pine		<i>Armeria maritima</i>	Thrift
	<i>Pseudotsuga menziesii</i>	Douglas fir		<i>Arnica mollis</i>	Hairy arnica
	<i>Sorbus sitchensis</i>	Sitka mountain ash		<i>Aruncus dioicus</i>	Goat's beard
	<i>Taxus brevifolia</i>	Pacific yew		<i>Aster modestus</i>	Great northern aster
	<i>Tsuga hetrophylla</i>	Western hemlock		<i>Asarum caudatum</i>	Wild ginger
	<i>Thuja plicata</i>	Western redcedar		<i>Balsamorhiza sagitata</i>	Spring sunflower
shrubs	<i>Holodiscus discolor</i>	Oceanspray		<i>Brodiaea cornaria</i>	Harvest lily
tall +3.0m	<i>Osmaronia ceraiformis</i>	Indian plum		<i>Castilleja miniata</i>	Common red paintbrush
	<i>Physocarpus capitatus</i>	Pacific ninebark		<i>Cornus canadensis</i>	Bunchberry
	<i>Sambucus racemosa</i>	Red Elderberry		<i>Delphinium menziesii</i>	Menzies' larkspur
shrubs	<i>Amelanchier alnifolia</i>	Saskatoonberry		<i>Dicentra formosa</i>	Bleeding heart
med 1.5-3.0m	<i>Arctostaphylos columbiana</i>	Manzanita		<i>Dodecatheon pulchellum</i>	Shootingstar
	<i>Ceanothus sanguineus</i>	Redstem ceanothus		<i>Eriophyllum lanatum</i>	Orgeon sunshine
	<i>Ceanothus velutinus</i>	Snowbrush		<i>Erythronium oregonum</i>	White Easter lily
	<i>Mahonia aquifolium</i>	Oregon Grape		<i>Erythronium revolutum</i>	White Easter lily
	<i>Philadelphus lewisii</i>	Mock orange		<i>Fragaria chiloensis</i>	Coastal strawberry
	<i>Ribes sanguineum</i>	Red-flowering currant		<i>Fragaria virginiana</i>	Wild strawberry
	<i>Rubus parviflorus</i>	Thimbleberry		<i>Fritillaria lanceolata</i>	Chocolate lily
	<i>Rubus spectabilis</i>	Salmonberry		<i>Goodyera oblongifolia</i>	Rattlesnake plantaine
	<i>Spiraea douglasii</i>	Hardhack		<i>Helenium autumnale</i>	Mountain sneezeweed
	<i>Viburnum edule</i>	Highbush cranberry		<i>Heuchera micrantha</i>	Alumroot
shrubs	<i>Gaultheria shallon</i>	Salal		<i>Lathyrus japonicus</i>	Beach pea
low 0.5-1.5m	<i>Rosa gymnocarpa</i>	Baldhip rose		<i>Lilium columbianum</i>	Tiger lily
	<i>Rosa nutkana</i>	Nootka Rose		<i>Linnaea borealis</i>	Twinflower
	<i>Rosa woodsii</i>	Wood's rose		<i>Lupinus latifolius</i>	Alpine lupine
	<i>Symphoricarpos alba</i>	Snowberry		<i>Lupine polyphyllus</i>	Lupine
	<i>Vaccinium ovatum</i>	Evergreen huckleberry		<i>Lycium americanum</i>	Skunk cabbage
	<i>Vaccinium parviflorum</i>	Red huckleberry		<i>Maianthemum dilatatum</i>	False lily of the valley
shrubs	<i>Arctostaphylos uva-ursi</i>	Kinnikinnick		<i>Ranunculus occidentalis</i>	Western buttercup
>1.0m	<i>Empetrum nigrum</i>	Crowberry		<i>Sedum spathulifolium</i>	Broad-leaved stonecrop
groundcovers	<i>Mahonia nervosa</i>	Dull Oregon grape		<i>Sisyrinchium bellum</i>	Blue-eyed grass
	<i>Pachystima myrsinites</i>	False box		<i>Smilacina racemosa</i>	False Solomon's Seal
	<i>Vaccinium vitis-idaea</i>	Lingonberry		<i>Solidago canadensis</i>	Goldenrod
				<i>Tellima grandiflora</i>	Fringe-cup
				<i>Trillium ovatum</i>	Western trillium
				<i>Trientalis latifolia</i>	Star flower
				<i>Veratrum viride</i>	Indian hellebore
				<i>Viola sempervirens</i>	Trailing yellow violet

Vegetation

PARK



Street

Planting along the Spirit Trail should utilize native species where ever possible to meet the objectives below.

Objectives for the Street sections of the trail:

- Create Shade
- Separate vehicle traffic from pedestrian
- Help designate the greenway

In some instances native species might not meet the site requirements. Care should be taken to choose non-native species that are not invasive, provide wildlife habitat, and contribute to the sense of place.

*The City of North Vancouver Street Tree Master Plan should also be consulted prior to choosing tree species for the Spirit Trail.

This plant list was developed by the City of North Vancouver.



Suggested Plant Species

	Botanical Name	Common Name
A	<i>Blechnum spicant</i>	Deer fern
>.3m	<i>Polysticum mutinum</i>	Western sword fern
	<i>Potentilla fruticosa</i>	Shrubby cinquefoil
	<i>Sedum spp. 'Autumn Joy'</i>	autumn Joy Sedum
	<i>sedum spurium</i>	Stonecrop
	<i>Vaccinium vitis-idaea</i>	Lingonberry
groundcover	<i>Arctostaphylos uva-ursi</i>	Kinnikinnick
	<i>Fragaria chiloensis</i>	Coastal strawberry
	<i>Fragaria virginiana</i>	Wild strawberry
	<i>Euonymus fortunei</i>	Evergreen Euonymus
vines	<i>Lonicera ciliosa</i>	Western Trumpet Honeysuckle
ornamental	<i>Festuca mairei</i>	Atlas fescue
grasses	<i>Festuca ovina 'glauca'</i>	Blue sheep's fescue
	<i>Panicum virgatum 'Red Hybrid'</i>	Panic grass
	<i>Pennisetum alopecuroides</i>	Fountain grass
	<i>Shizachyrium scoparium</i>	Little bluestem
	<i>Andropogon gerardii</i>	Big bluestem
	<i>Bouteloua gracilis</i>	Blue gramma
	<i>Bouteloua curtipendula</i>	Side-oats gramma
	<i>Calamagrostis x acutiflora 'Karl Forester'</i>	Feather reed grass
	<i>Calamagrostis x acutiflora 'Overdam''</i>	Feather reed grass
	<i>Calamagrostis brachytricha</i>	Korean feather reed grass
	<i>Chasmanthium latifolium</i>	Sea oats
	<i>Deschampsia cespitosa 'Schottland'</i>	Tufed hair grass Scotland
	<i>Festuca marerii</i>	Atlas fescue
	<i>Helictotrichon sempervirens</i>	Blue oat grass
	<i>Panicum vergatum 'Heavy metal'</i>	Panic grass
	<i>Pennisetum alopecuroides</i>	Feather grass
	<i>Muhlenbergia capillaris</i>	Pink muhly
	<i>Schizachyrium scoparium</i>	Little bluestem
	<i>Sorghastrum nutans</i>	Indian grass
	<i>Stipa tenuissima</i>	Fine stem needle grass
B	<i>Ceanothus gloriosus</i>	Point Reyes Ceanothus
med 0.3-.6m	<i>Gaultheria shallon</i>	Salal
	<i>Vaccinium ovatum</i>	Evergreen huckleberry
	<i>Mahonia nervosa</i>	Dull Oregon grape
	<i>Lavandula angustifolia</i>	Lavander
C	<i>Buxus microphylla 'winter gem'</i>	Littleleaf Boxwood
Tall .5m-1m	<i>Ilex crenata</i>	Japanese holly
	<i>Symphoricarpos alba</i>	Snowberry
	<i>Viburnum davidii</i>	David viburnum

Vegetation

THE
STREET

GUIDANCE

URBAN

The Urban parts of the trail should be lit to extend the hours of use of this public amenity.

A fixture has been chosen for the first built portion of the trail along the Squamish Nation Mosquito Creek Marina. This is a contemporary fixture and could be used throughout the length of the trail depending upon existing site furnishings.

STREET

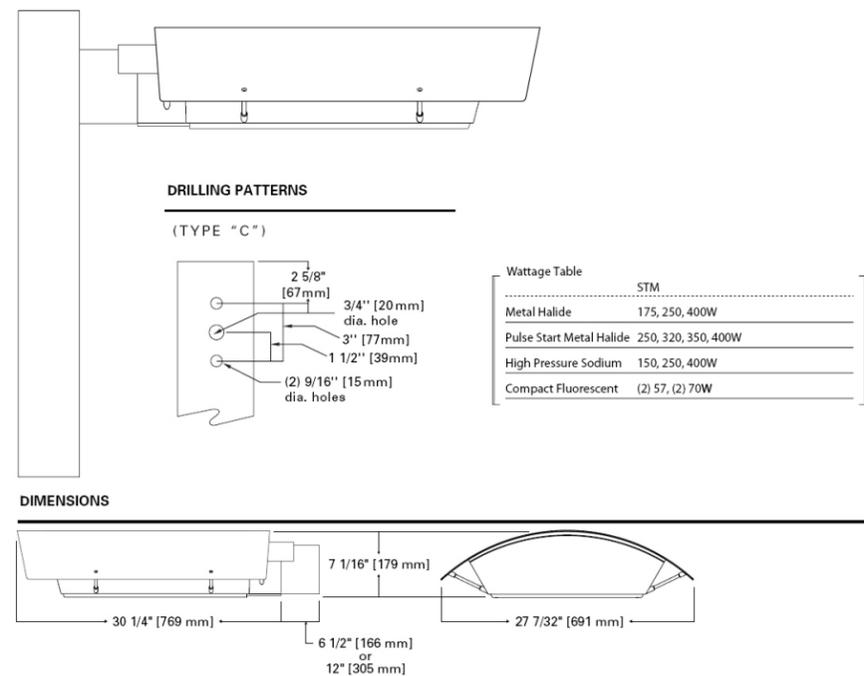
The Street portions of the trail should be lit using existing street lighting. If no lighting fixtures are currently in place, at minimum intersections should be lit.

PARK

With respect to lighting, parks are divided into two types: lit and unlit. The developed park areas along the waterfront section of the trail should be lit to allow for a continuous safe walkway experience. This is consistent with the urban character of these areas. It is important to avoid the situation where two lit areas are separated by a short section of unlit trail.

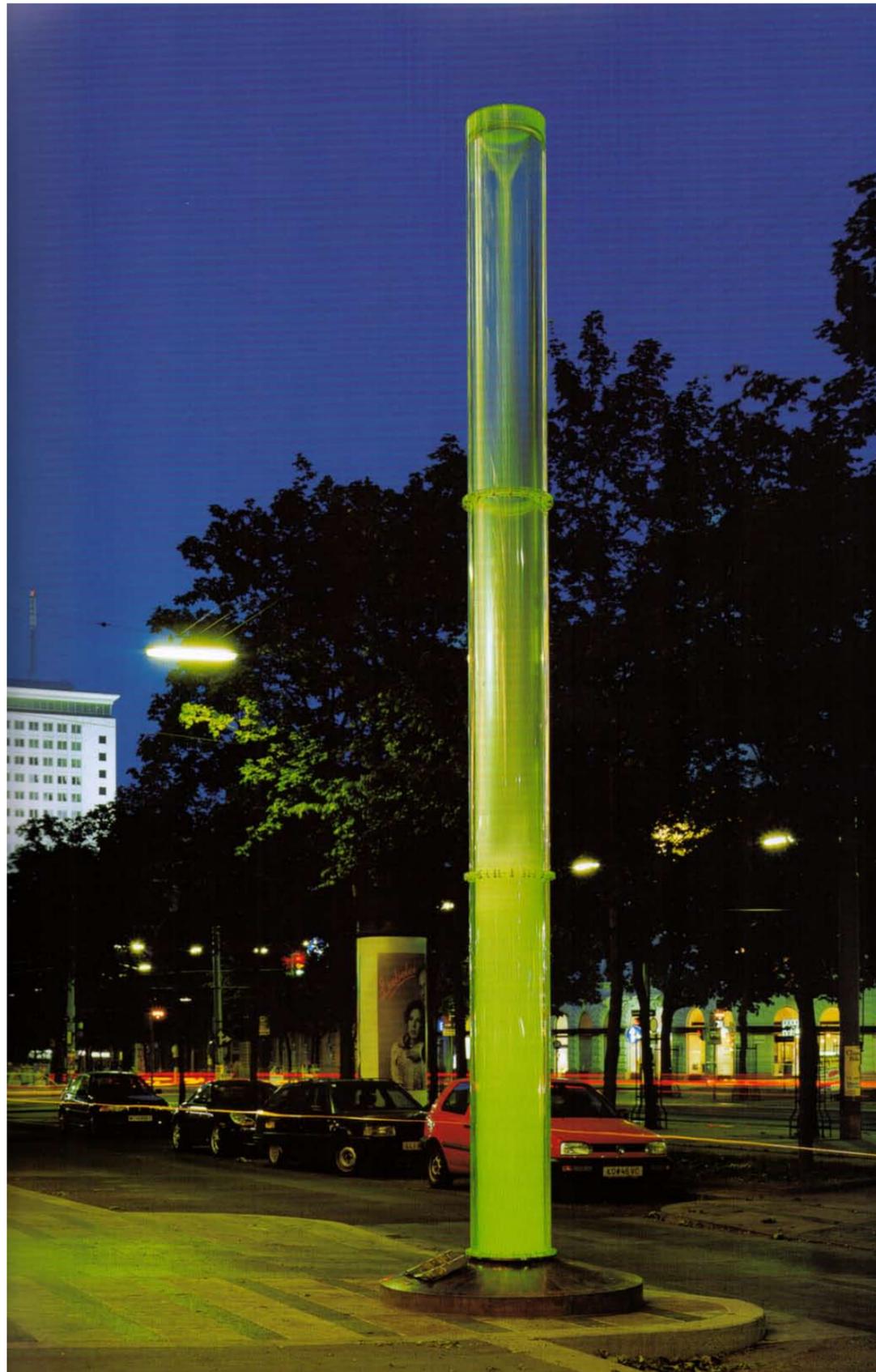
In the natural areas (e.g. Moodyville Trail) the trail should remain unlit to protect wildlife habitat values in these areas.

Specified Light Fixture for the Squamish Nation Mosquito Creek Marina Trail
Cooper Lighting
InVUE - Strut



Minimum Criteria for New Fixtures:

- dark sky compliant
- full cut-off
- energy efficient (compact fluorescent)
- latest technology
- white light sources e.g. metal halide, compact fluorescent, colour corrected LED



This unique lighting element helps to animate the space after dark.

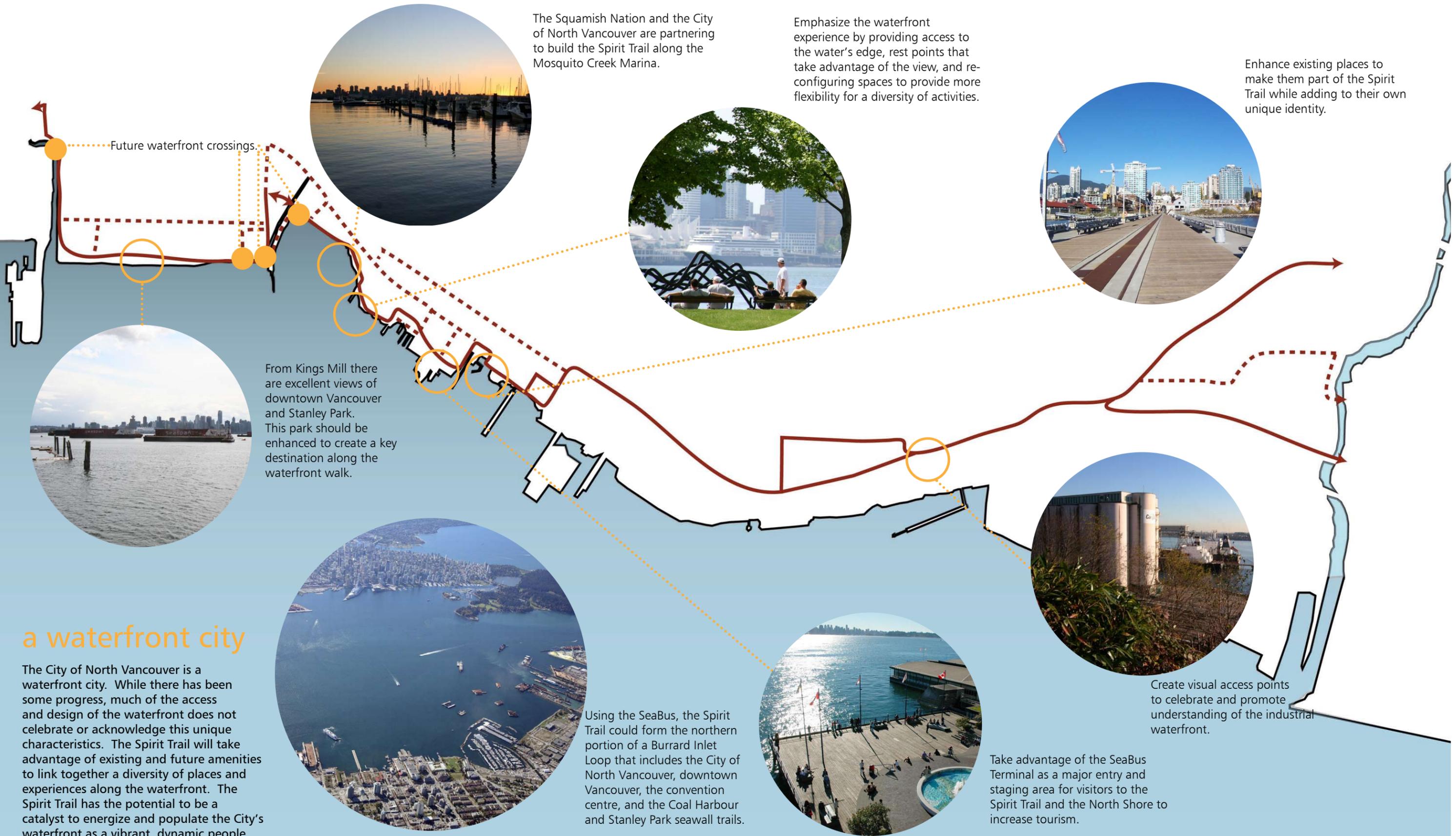
Identity

Creating a strong identity will allow the Spirit Trail to become a highly recognizable part of the City of North Vancouver. The identity will, at the most basic level, allow users to easily navigate the trail. However, the trail could also become an integral part of the fabric of the City. Three themes within the identity umbrella have been identified: *the waterfront city, a green link, and the overlay*. *The waterfront city* and *a green link* emphasize the unique and interesting places that already exist in the City. *The overlay* is a series of new or reconfigured elements that help to identify the trail as one entity.

The Spirit Trail should embody the characteristics of *the waterfront city* and emphasize its strengths. There are many interesting places along the waterfront that will be connected by the Spirit Trail turning this area into a diverse and dynamic harbour walk.

The Spirit Trail will provide connections to the green corridors that already exist with the City of North Vancouver. It will enhance existing natural spaces and add vegetation to the more urban parts of the City which can be used as stepping stones for birds and insects moving from one forest patch to another. The Spirit Trail will connect to existing cycling and pedestrian trails adding more options for people to reduce their carbon footprint and make healthy lifestyle choices by reducing reliance on the automobile.

The overlay is a collection of elements that will be used along the trail to make it identifiable as the Spirit Trail. The overlay includes such items as site furnishings, planting schemes, wayfinding, gateways, trail heads, and lighting.



The Squamish Nation and the City of North Vancouver are partnering to build the Spirit Trail along the Mosquito Creek Marina.

Emphasize the waterfront experience by providing access to the water's edge, rest points that take advantage of the view, and re-configuring spaces to provide more flexibility for a diversity of activities.

Enhance existing places to make them part of the Spirit Trail while adding to their own unique identity.

Future waterfront crossings.

From Kings Mill there are excellent views of downtown Vancouver and Stanley Park. This park should be enhanced to create a key destination along the waterfront walk.

a waterfront city

The City of North Vancouver is a waterfront city. While there has been some progress, much of the access and design of the waterfront does not celebrate or acknowledge this unique characteristics. The Spirit Trail will take advantage of existing and future amenities to link together a diversity of places and experiences along the waterfront. The Spirit Trail has the potential to be a catalyst to energize and populate the City's waterfront as a vibrant, dynamic people place.

Using the SeaBus, the Spirit Trail could form the northern portion of a Burrard Inlet Loop that includes the City of North Vancouver, downtown Vancouver, the convention centre, and the Coal Harbour and Stanley Park seawall trails.

Create visual access points to celebrate and promote understanding of the industrial waterfront.

Take advantage of the SeaBus Terminal as a major entry and staging area for visitors to the Spirit Trail and the North Shore to increase tourism.

Examples of Waterfront City Objectives

Large Scale

Increase access and views to the waterfront.

Medium Scale

Close gaps in the trail between the Squamish Nation Mosquito Creek Marina and Kings Mill Park.

Small Scale

Celebrate the water with special design details or public art.

Enhance the environmental performance of the waterfront by incorporating vegetation into the trail design and choosing more sustainable materials.



Promote waterfront and water based activities.



A ferry could connect Kings Mill Park to downtown Vancouver.



The Spirit Trail could be come part of the procession route for local festivals.



Create opportunities to access the water.

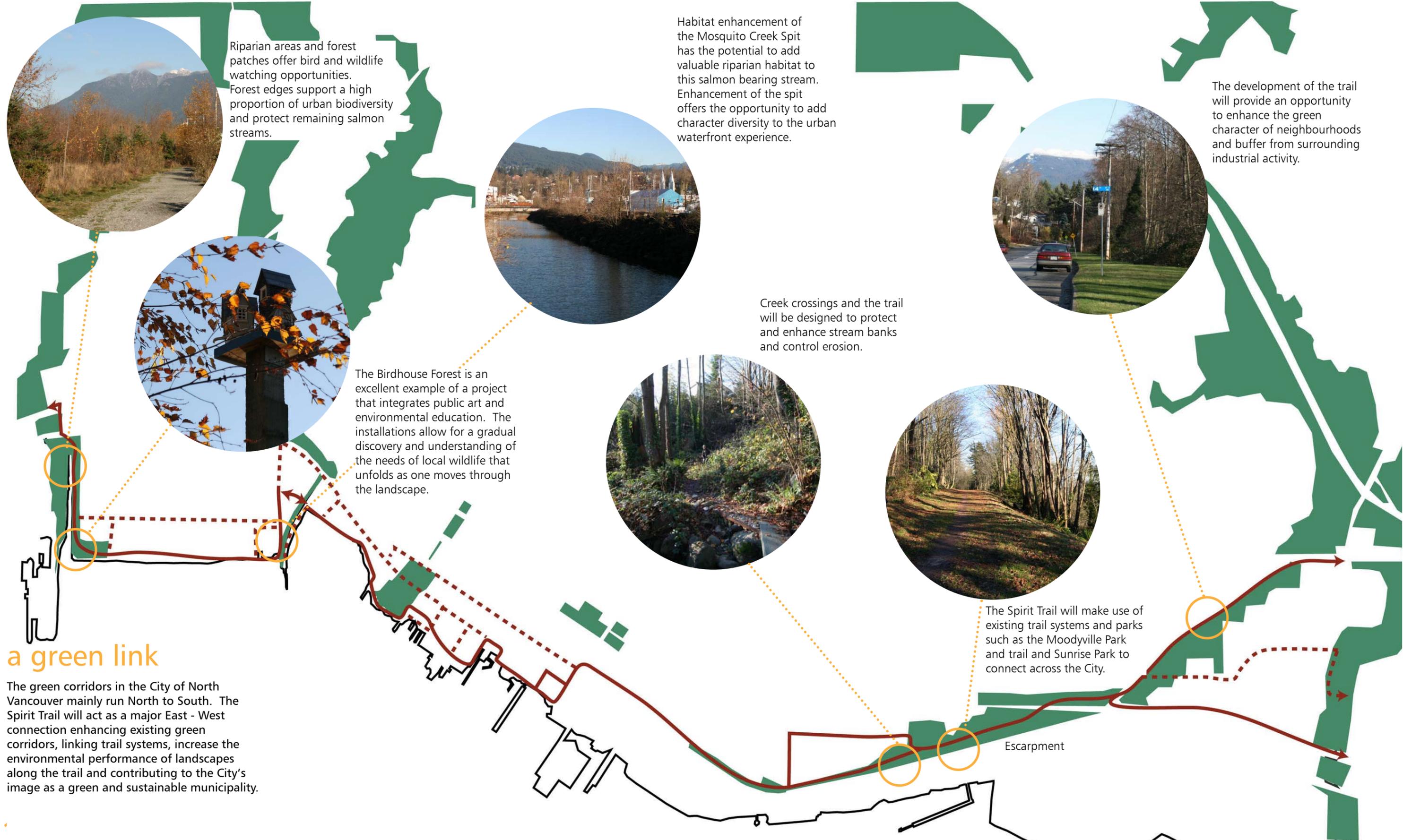


Promote active recreation on and along the waterfront



A high quality, connected waterfront will draw visitors from outside the city.





Riparian areas and forest patches offer bird and wildlife watching opportunities. Forest edges support a high proportion of urban biodiversity and protect remaining salmon streams.

Habitat enhancement of the Mosquito Creek Spit has the potential to add valuable riparian habitat to this salmon bearing stream. Enhancement of the spit offers the opportunity to add character diversity to the urban waterfront experience.

The development of the trail will provide an opportunity to enhance the green character of neighbourhoods and buffer from surrounding industrial activity.

Creek crossings and the trail will be designed to protect and enhance stream banks and control erosion.

The Birdhouse Forest is an excellent example of a project that integrates public art and environmental education. The installations allow for a gradual discovery and understanding of the needs of local wildlife that unfolds as one moves through the landscape.

The Spirit Trail will make use of existing trail systems and parks such as the Moodyville Park and trail and Sunrise Park to connect across the City.

a green link

The green corridors in the City of North Vancouver mainly run North to South. The Spirit Trail will act as a major East - West connection enhancing existing green corridors, linking trail systems, increase the environmental performance of landscapes along the trail and contributing to the City's image as a green and sustainable municipality.

Escarpment

Examples of Green Link Objectives

Large Scale

Enhance existing green corridors along the length of the Spirit Trail to strengthen green space connectivity and identify the trail.

Increase environmental performance of landscapes along the trail by including native trees and shrubs as well as adding innovative stormwater gardens that infiltrate, clean, and slow urban run-off.

Use low impact materials and construction methods.

Develop plans for management of invasive species specific to Spirit Trail.

Medium Scale

Plan to remove invasive species from the natural areas and replace with native varieties.

Plant trees to store carbon and moderate climate.

Small Scale

Create small scale social spaces for people to stop and appreciate nature and wildlife.

Where options for plants are limited use design details or public art to connect people to nature.

Invasive Species



Trail development offers opportunities to remove invasive plant species and replace them with native plants that support local wildlife.

Example:

- Cut the stems of English Ivy growing on trees. Remove Ivy on the ground within the trail development zone and replace with appropriate plant species.
- Remove Himalayan Blackberry within the trail development zone and replace with appropriate species. Cut back Himalayan Blackberry annually outside of the bird nesting season.

Street Trees



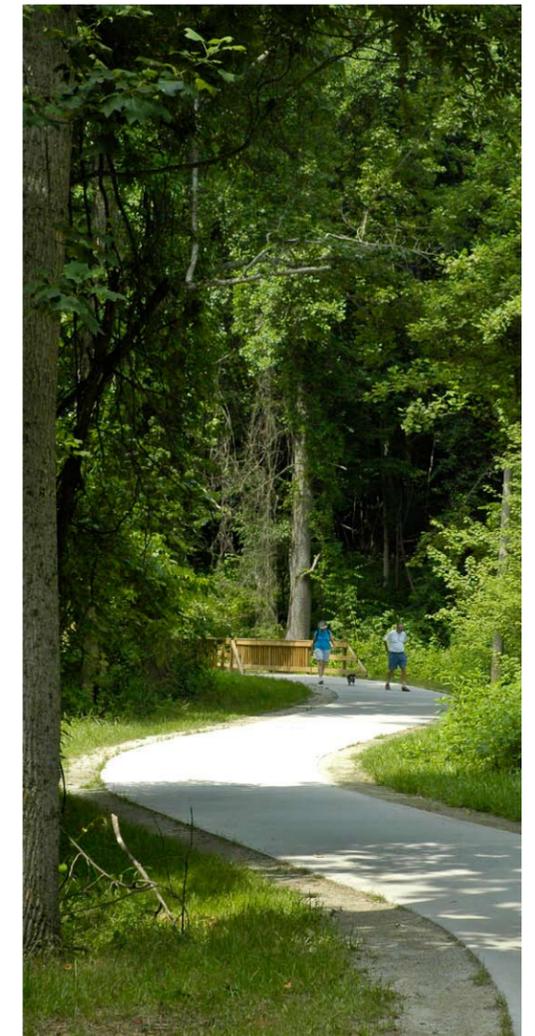
Street Planting Character



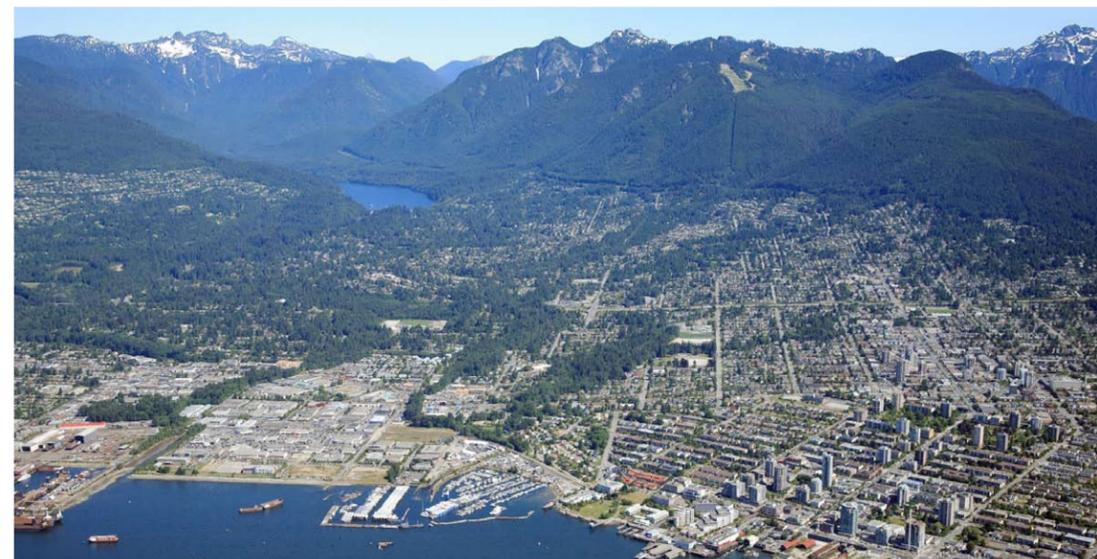
Urban Planting Character



Park Planting Character



North - South Green Corridors





Create connections and smooth transition points along the trail such as a pedestrian/cyclist bridge over the CN Rail at MacKay Creek.



Celebrate important locations with a gateway or entry feature. A unique gateway will mark the entrance to the Squamish Nation Lands along the Spirit Trail.

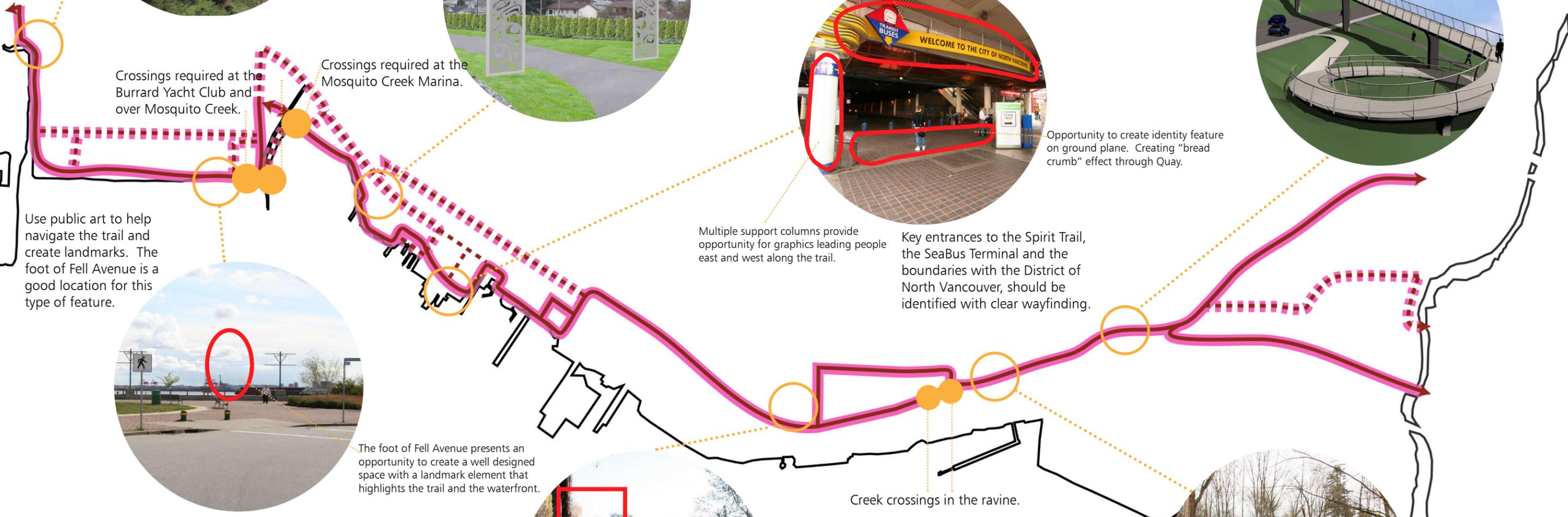
High level graphics have little impact and are ineffective to establish identity.



Create safe crossings. A pedestrian/cyclist bridge over E. 3rd St will extend the park experience from Moodyville to Sunrise Park along Heywood Street.



Opportunity to create identity feature on ground plane. Creating "bread crumb" effect through Quay.



Crossings required at the Burrard Yacht Club and over Mosquito Creek.

Crossings required at the Mosquito Creek Marina.

Use public art to help navigate the trail and create landmarks. The foot of Fell Avenue is a good location for this type of feature.



The foot of Fell Avenue presents an opportunity to create a well designed space with a landmark element that highlights the trail and the waterfront.

Multiple support columns provide opportunity for graphics leading people east and west along the trail.

Key entrances to the Spirit Trail, the SeaBus Terminal and the boundaries with the District of North Vancouver, should be identified with clear wayfinding.

Creek crossings in the ravine.



Build trail heads at key locations. The foot of St. Patricks Street is the start of the naturalized part of the trail and requires a trail head.



Build upon existing amenities and important locations within the City to develop distinct destinations along the trail. One example is the historic Moodyville Townsite.

the overlay

The existing and new parts of the trail will have an overlay that helps to characterize the trail and make it identifiable as the Spirit Trail. This overlay will be comprised of wayfinding strategies, site furnishings, lighting, and public art.

Examples of Overlay Objectives

Large Scale

Develop and implement a wayfinding strategy for the Spirit Trail.

Medium Scale

Select site furnishings for trail 'neighbourhoods' that will help identify and re-inforce the character of these areas.

Small Scale

Incorporate public art into wayfinding and site furnishings strategy to mark special places along the trail.



Infrastructure can be incorporated into wayfinding strategies or public art.



Seating can be used to give character to an area as well as provide a place to rest.



Wayfinding can be integrated into the trail.



Bicycle parking allows trails users to stop and take advantage of local commercial areas.



Signs come in a variety of shapes and sizes.



Pavement marking can help navigate the trail.



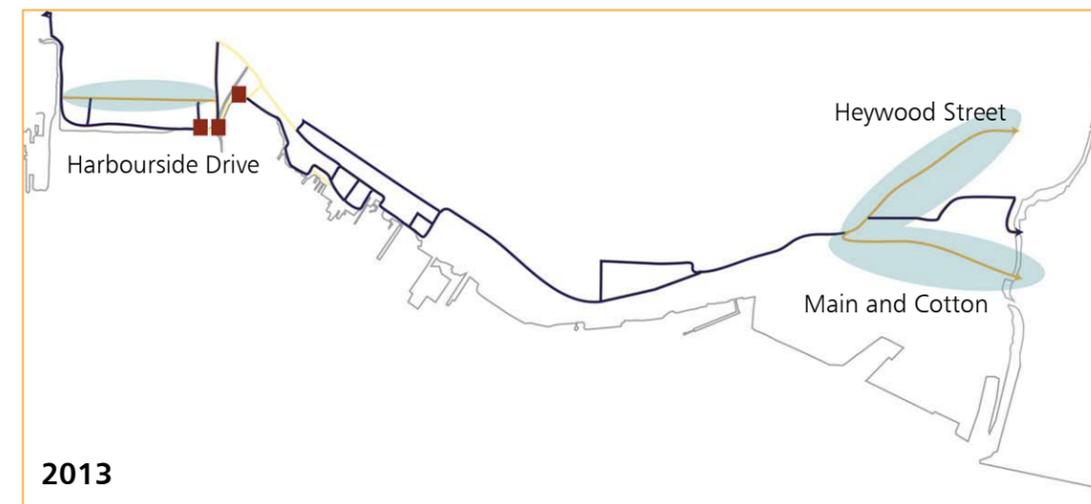
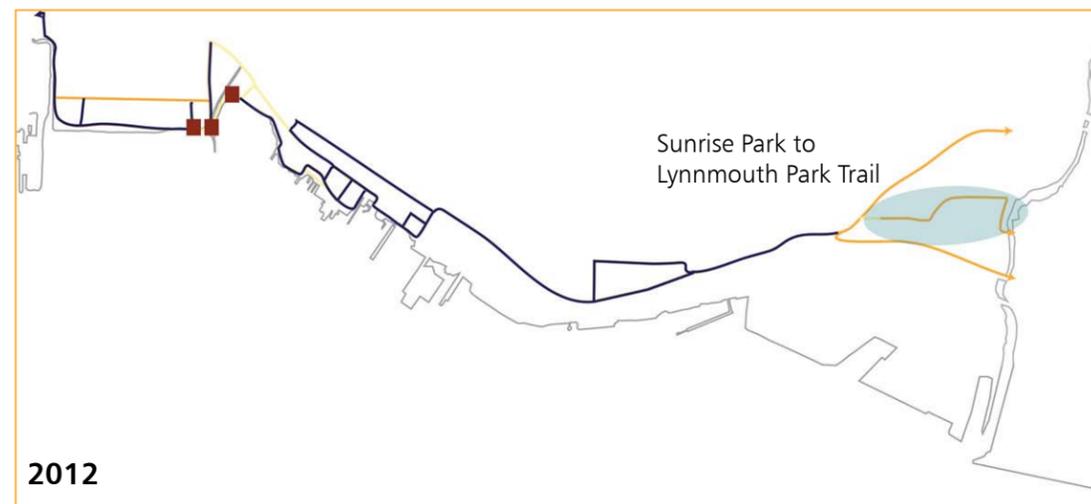
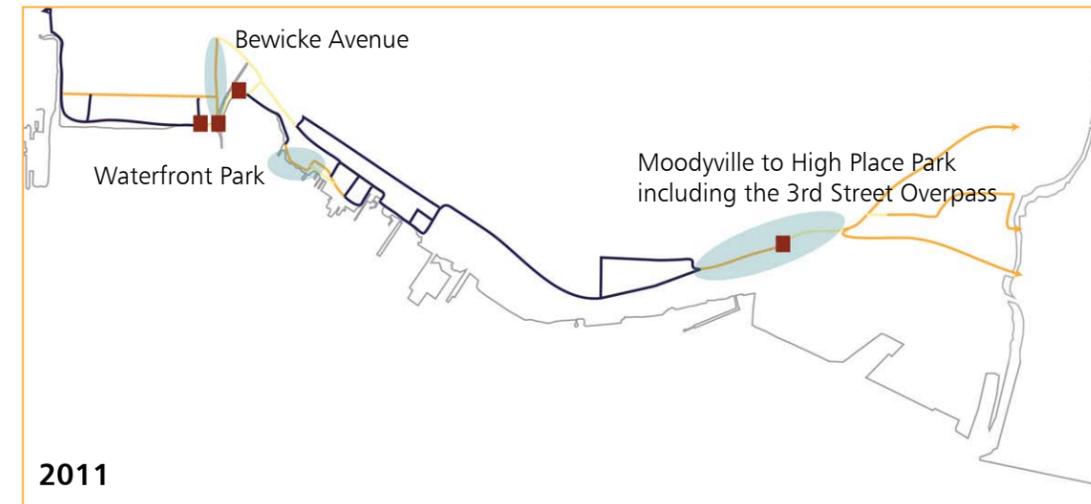
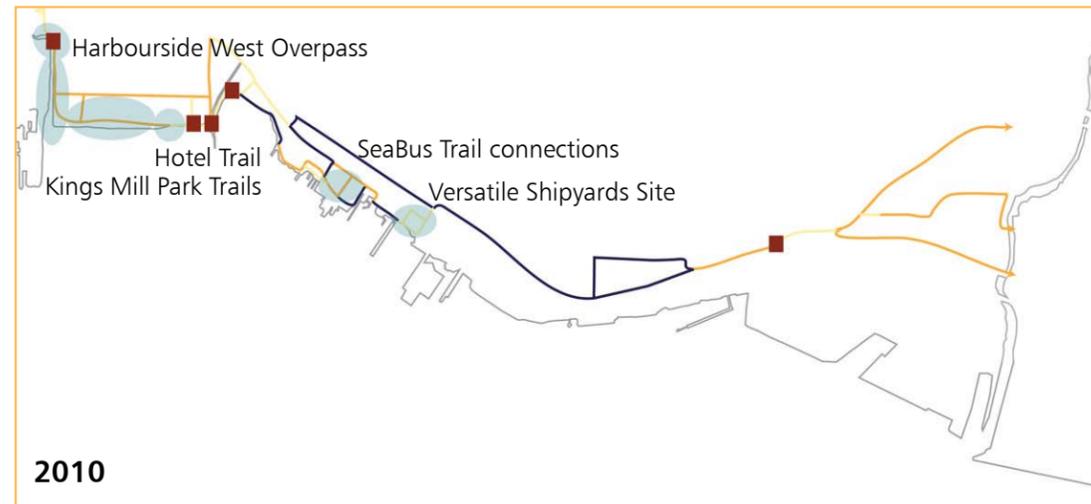
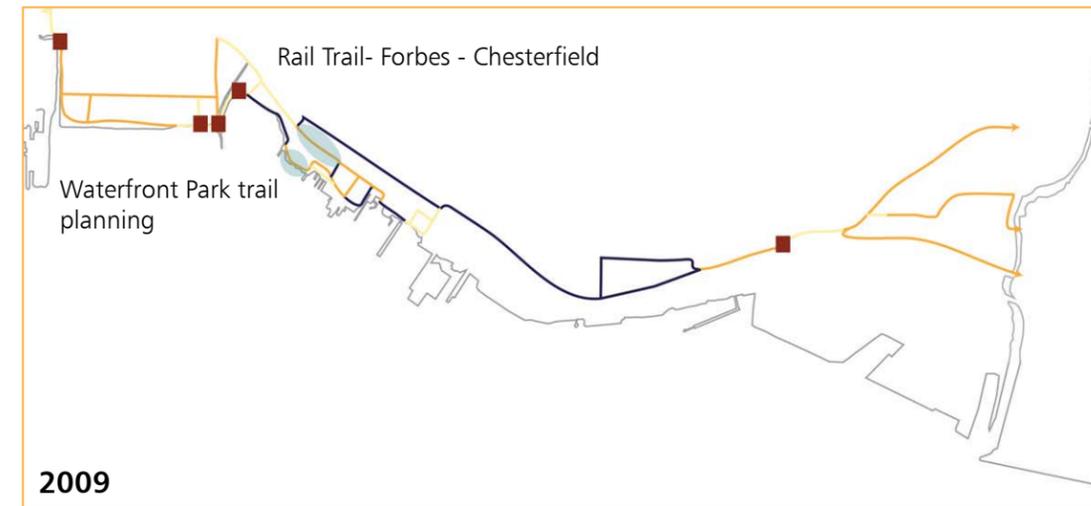
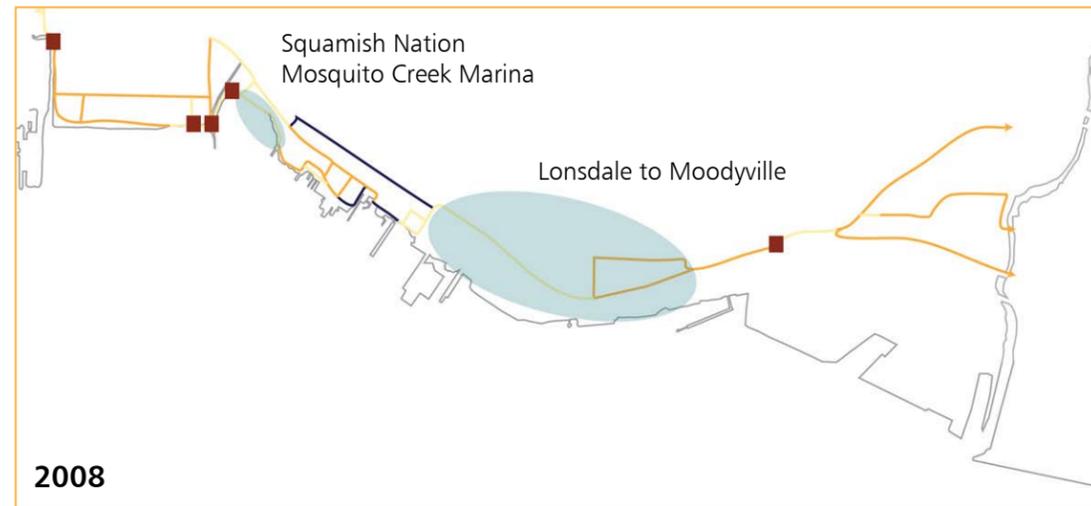
Chain fences and blank walls can be made beautiful with inexpensive special treatments.



Wayfinding is a critical component to the Spirit Trail.



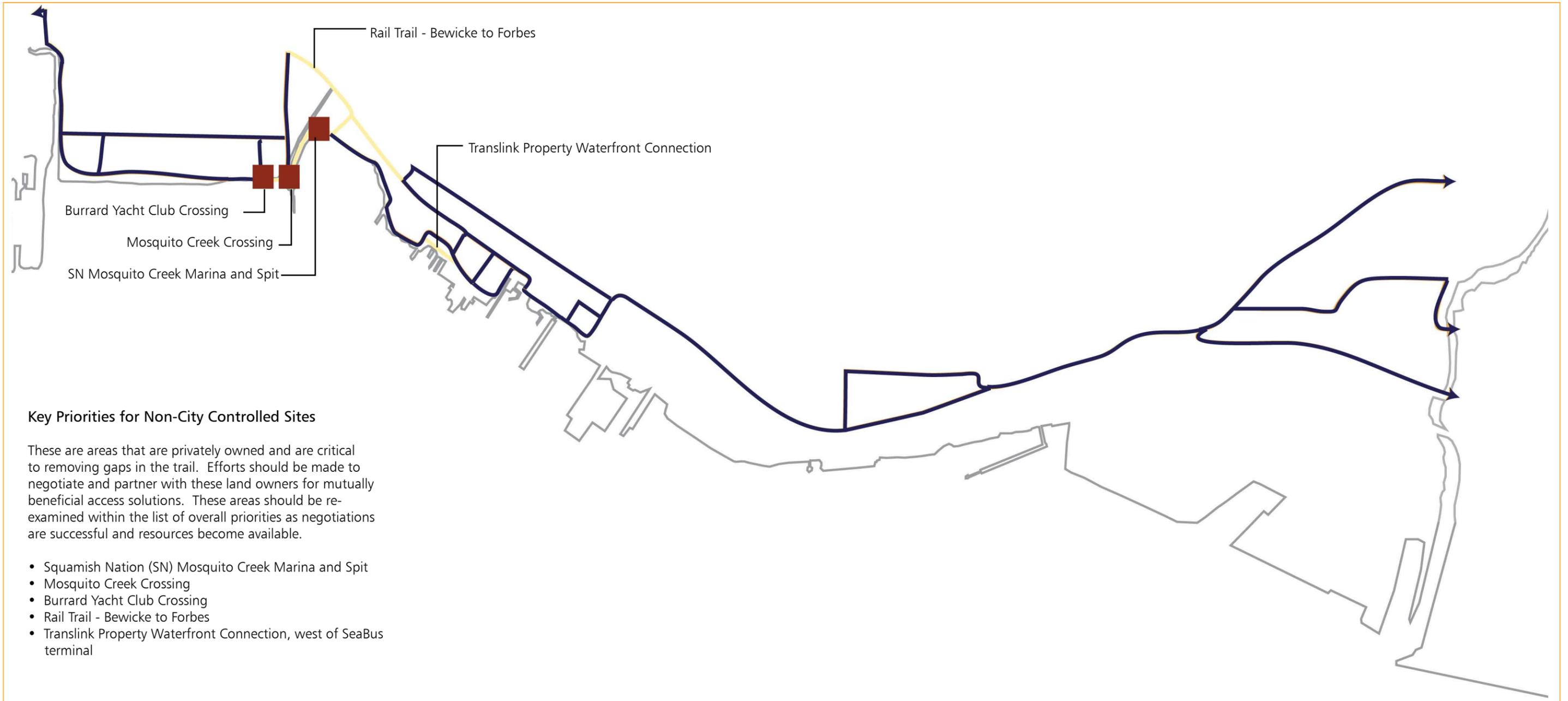
Implementation and Cost Estimates



Implementation Sequence

- 2008
 - Squamish Nation Mosquito Creek Marina
 - Lower Lonsdale to Moodyville
- 2009
 - Rail Trail Chesterfield to Forbes
 - Waterfront Park Trail Planning
- 2010
 - Harbourside West Overpass
 - Kings Mill Park Trails
 - SeaBus Trail Connections
 - Versatile Shipyards Trail
 - Hilton Hotel
- 2011
 - Waterfront Park Trail
 - Moodyville and High Place Park
 - 3rd Street Overpass
- 2012
 - Sunrise Park to Lynnmouth Park Trail
- 2013
 - Harbourside Drive
 - Heywood Street
 - Main and Cotton

-  Area to be Built
-  Structural Crossing Required
-  No Trail Existing
-  Trail, Not to Standard
-  Trail to Standard



Cost Estimate

This cost estimate is based upon 2008 dollars. Considering the current climate of cost escalations, this estimate will need to be revised in the future. Detailed design will also provide further accuracy.

This cost estimate does not include an estimation for the on-street portions of the Spirit Trail. There are approximately 3560 linear meters of on street trail. Most of this would require little to no change to the existing streetscape. It is assumed that the on street portions of the trail would be covered by road transportation budgets and development cost charges.

The following items are also excluded from this estimate: land costs, professional fees and disbursements, unforeseen ground conditions and associated extras, removal of hazardous materials, and a cost escalation allowance.

			Kings Mill			Harbourside			Marina			Lonsdale			Esplanade			Moody Ville and Sunrise (Including Heywood Street)			Park and Tilford			Main and Colton		
	Amount	Units	Quantity	Total	Sub Total	Quantity	Total	Sub Total	Quantity	Total	Sub Total	Quantity	Total	Sub Total	Quantity	Total	Sub Total	Quantity	Total	Sub Total	Quantity	Total	Sub Total	Quantity	Total	Sub Total
Trail Construction	\$ 50.00	sq. m.	7325	\$366,250.00		690	\$ 34,500.00		6550	\$ 327,500.00		1400	\$ 70,000.00		1880	\$ 94,000.00		7770	\$ 388,500.00		3740	\$ 187,000.00		2800	\$ 140,000.00	
Rough Grading	\$ 5.00	sq. m.	23375	\$ 116,875.00		1210	\$ 6,050.00		13980	\$ 69,900.00		2350	\$ 11,750.00		3410	\$ 17,050.00		14040	\$ 70,200.00		5938	\$ 29,690.00		3850	\$ 19,250.00	
Planting**	\$ 100.00	sq. m.	16050	\$ 1,605,000.00		520	\$ 52,000.00		7430	\$ 743,000.00		950	\$ 95,000.00		1530	\$ 153,000.00		6270	\$ 627,000.00		2198	\$ 219,800.00		1050	\$ 105,000.00	
Crossings (notes below)		allowance	2(a)	\$ 4,460,000.00			\$ -		2(b)	\$ 1,200,000.00			\$ -		1	\$ 3,000,000.00		1(d)	\$ 3,100,000.00		0	\$ -		0	\$ -	
Lighting 30m o.c.	\$ 7,000.00	each	40	\$ 280,000.00		6	\$ 42,000.00		41	\$ 287,000.00		38			16	\$ 112,000.00		0	\$ -		8	\$ 56,000.00		23	\$ 161,000.00	
Additional Items (notes below)		allowance	A	\$ 175,000.00						\$ -					B	\$ 2,500.00		B,C	\$ 42,500.00			\$ -				
					\$7,003,125.00			\$ 134,550.00			\$ 2,627,400.00			\$ 176,750.00			\$ 3,378,550.00			\$ 4,228,200.00			\$ 492,490.00			\$ 425,250.00
Rest Points																										
Seating	\$ 1,750.00	each	17	\$ 29,750.00			\$ -		11	\$ 19,250.00		21	\$ 36,750.00			\$ -		14	\$ 24,500.00		2	\$ 3,500.00			\$ -	
Garbage Receptacles	\$ 500.00	each	6	\$ 3,000.00			\$ -		2	\$ 1,000.00		8	\$ 4,000.00			\$ -		3	\$ 1,500.00		1	\$ 500.00			\$ -	
Bicycle Parking	\$ 500.00	each	6	\$ 3,000.00			\$ -		2	\$ 1,000.00		8	\$ 4,000.00			\$ -		3	\$ 1,500.00		1	\$ 500.00			\$ -	
Intrepretive Signage	\$ 5,000.00	each	9	\$ 45,000.00			\$ -		2	\$ 10,000.00		11	\$ 55,000.00			\$ -		4	\$ 20,000.00		1	\$ 5,000.00			\$ -	
Wayfinding	\$ 7,500.00	each	14	\$ 105,000.00			\$ -		9	\$ 67,500.00		16	\$ 120,000.00			\$ -		12	\$ 90,000.00		1	\$ 7,500.00			\$ -	
Public Art	\$ 50,000.00	each	3	\$ 150,000.00			\$ -		0	\$ -		3	\$ 150,000.00			\$ -		1	\$ 50,000.00		0	\$ -			\$ -	
Special Paving**	\$ 200.00	sq. m.	150	\$ 30,000.00			\$ -		0	\$ -		150	\$ 30,000.00			\$ -		50	\$ 10,000.00		0	\$ -			\$ -	
					\$ 365,750.00			\$ -			\$ 98,750.00			\$ 399,750.00			\$ -			\$ 197,500.00			\$ 17,000.00			\$ -
Trail Head																										
Seating	\$ 1,750.00	each	5	\$ 8,750.00		2	\$ 3,500.00			\$ -		5	\$ 8,750.00			\$ -		5	\$ 8,750.00		1	\$ 1,750.00			\$ -	
Garbage Receptacles	\$ 500.00	each	3	\$ 1,500.00		1	\$ 500.00			\$ -		3	\$ 1,500.00			\$ -		4	\$ 2,000.00		1	\$ 500.00			\$ -	
Public Art*	\$ 50,000.00	allowance	2	\$ 100,000.00		1	\$ 50,000.00			\$ -		2	\$ 100,000.00			\$ -		1	\$ 50,000.00		0	\$ -			\$ -	
Wayfinding	\$ 7,500.00	allowance	5	\$ 37,500.00		2	\$ 15,000.00			\$ -		5	\$ 37,500.00			\$ -		6	\$ 45,000.00		1	\$ 7,500.00			\$ -	
					\$ 147,750.00			\$ 69,000.00			\$ -			\$ 147,750.00			\$ -			\$ 105,750.00			\$ 9,750.00			\$ -
Intersections																										
Wayfinding	\$ 7,500.00	allowance	10	\$ 75,000.00		2	\$ 15,000.00		12	\$ 90,000.00		16	\$ 120,000.00		6	\$ 45,000.00		11	\$ 82,500.00		4	\$ 30,000.00		6	\$ 45,000.00	
Public Art	\$ 50,000.00	allowance	1	\$ 50,000.00		0	\$ -		0	\$ -		2	\$ 100,000.00		2	\$ 100,000.00		0	\$ -		0	\$ -		1	\$ 50,000.00	
					\$ 125,000.00			\$ 15,000.00			\$ 90,000.00			\$ 220,000.00			\$ 145,000.00			\$ 82,500.00			\$ 30,000.00			\$ 95,000.00
TOTALS					\$ 7,641,625.00			\$ 218,550.00			\$ 2,816,150.00			\$ 944,250.00			\$ 3,523,550.00			\$ 4,613,950.00			\$ 549,240.00			\$ 520,250.00
CONTINGENCY (20%)																										\$ 20,827,565.00
																									\$ 24,993,078.00	

NOTES:

- (a) There are two crossings in the Kings Mill area: the Harbourside West Overpass and a swing bridge with associated items
- (b) There are two crossings in the Marina area: a pedestrian crossing near the mouth of Mosquito Creek and a crossing for the Mosquito Creek Marina dry dock area
- (c) A pedestrian/cyclist overpass or underpass is needed at the intersection of Low Level Road and Esplanade.
- (d) A pedestrian/cyclist overpass is required at the E. 3rd Street Hill. This cost includes the regrading and switch back needed for High Place Park

* Public art and landmarks are grouped together for budgeting purposes

** Special Paving areas are assumed to be 50 sq m each.

***Planting widths along the trail vary depending on the cross section of the trail.

Additional items:

A - traffic signal upgrade (\$175,000)

B - pedestrian crosswalk (\$2500)

C- curb and gutter replacements along Heywood (approx. 400m @ \$100 per linear metre)

Assumptions

The Kings Mill Planting area assumes redesign and replanting of entire space not just along the trail.

Conclusions & Recommendations

Conclusions and Recommendations

Recommended short list of near term actions:

Lower Lonsdale to Moodyville
 eliminates gaps
 closest possible route to waterfront
 unique natural experience
 off street
 enhance habitats

Harbourside West Overpass
 connection to the waterfront
 eliminate gaps
 connects to an off street route

Waterfront Greenway Trail - CN Railway
 eliminate gaps
 off street - key connection for cyclists

Rail to Bewicke Park
 eliminate gaps
 off street

Waterfront Park Master Plan
 waterfront
 create destinations and experiences
 off street

Kings Mill Park Trails
 waterfront
 create destinations and experiences
 off street
 enhance habitats

Where do we go from here?

The Spirit Trail is an ambitious project that will take several years to realize. The following is a discussion of six essential strategies that can be used to help determine how the trail development could be prioritized over time.

Eliminate Gaps

Establishing connections and creating a continuous trail is the first and most critical step in development of the trail. A few of the gaps may have an interim by-pass solution but for the majority until the gap is closed there is no trail. Closing the gaps is also one of the most challenging problems since the reason gaps exist are due to private land ownership and expensive infrastructure requirements.

Connect Waterfront

The City is currently made up of a series of isolated connections to the waterfront. This is the first opportunity to create a unified waterfront experience providing a destination for residents and visitors. As opportunities arise to complete portions of the trail, sections with strong waterfront connections, especially the western portion should be given priority. Where there are options to build redundancy into the trail, the more waterfront oriented route should be considered first.

Create great destinations and experiences

In order for the Spirit Trail to reach its full potential and be more than just a path on the

ground between two places, it must become a journey that allows for enjoyment of the experiences along the way. Commercial nodes such as public docks, water taxi service, and trail related facilities like bike rental shops as well as recreational nodes that include attractive, useful public spaces where public art is integrated and programming acts to create vibrant and diverse areas should all be incorporated in conjunction with trail construction. These nodes should take advantage of and reflect the variety of landscapes, views, and experiences available within the City of North Vancouver. There should also be a hierarchy of nodes that allows for solitary or group experiences. It is a collection of diverse spaces and programming along a continuous waterfront trail that will create a memorable Burrard Inlet experience.

Off Street Trails First

One of the primary goals of the Spirit Trail is to provide another level of trail infrastructure for the City of North Vancouver and safe places for all residents and visitors to walk or cycle. Since the streets already exist within the City and are navigable, priority should be placed on developing the off street portions of the trail first. This will allow connections to be made and gaps to be closed firstly and the street connections to improved secondly.

Enhance Habitats

The development of the trail is an opportunity to enhance habitats of the natural areas, promote coastal stewardship, increase the green character of residential neighbourhoods and improve the

environmental performance of the urban zones adjacent to the trail. The Spirit Trail is an excellent venue to showcase sustainable design practices such as rain gardens, permeable paving, and solar lighting. These goals should be considered throughout the detailed design of the trail to ensure adequate space and resources are allotted for these enhancements.

Show People the Way

In addition to intuitive cues such as materials and strong spatial connections, a layer of wayfinding should be overlaid over the entire trail. This will allow people to navigate the trail, to understand where connections can be made to other pedestrian and cycling networks, and where the major destinations are located. Wayfinding should be considered throughout the design of the trail but could be implemented when the trail is completed.

Appendix

Public Process for Trail Alignment

Phase 1 of the planning process included a public consultation process to receive feedback from the community on the proposed trail alignment. The feedback from two public workshops, the Parks and Environment Advisory Committee and the Joint Bicycle Advisory Committee meetings are synthesized in this section.

Public Information Meeting and Workshop

Spirit Trail East

February 5, 2008

Ridgeway Annex School Gym

The following people were present at Ridgeway Annex gym, 420 E. 5th Street for the public workshop and information session held for the east side residents of the City of North Vancouver from approximately 6:30 - 8:30 pm:

Workshop Attendees

Barb Taylor	M. Binkley
Tom Nykytovuk	Dave Perfitt
Robert Field	Linsey Keats
Carr Vian	Roy Robertson
Antie Wilson	Heather Robertson
Leon Lebrun	Erica Geddes
Bob Bunting	Pam Roskell
Martin Davies	James Wilson
John Fair	David Stone
Claudia Fair	George Ellis
Victor Balon	Larry Hipson
B.T. Cousins	P.K. Kulak
O. Kristsch	

City of North Vancouver	Dave Hutch
	Tony Barber
	Clare Husk

Consultants	Jeff Cutler
space2place	Alexa Uhrich
	Jamie Vala

The meeting was initiated by Dave Hutch, City of North Vancouver, Landscape Architect, who introduced the project and the consultant team. He presented the agenda for the evening and highlighted a couple of initiatives along the Spirit Trail (the MacKay pedestrian overpass and Mosquito Creek Marina) that are in a more advanced phase of planning. Dave stated the goals of the trail are to provide a multi-use, waterfront-oriented greenway that is primarily on City owned land. However, in areas where the land is not city owned city staff are working with willing private landowners to find solutions for the trail alignment.

Jeff Cutler gave an overview of the planning that has been done thus far. This included the proposed alignment of the Spirit Trail, opportunities and challenges found along the proposed alignment as well how the Spirit Trail connects to other CNV trails and to regional trail systems.

Jamie Vala provided a more in depth look at the parts of the trail through the eastern side of the City.

Two issues were brought up during the presentation. The first was a concern over whether the proposed alignment was on private property in some places. The second issue was concern over the stability of the hill on the north side of E. 3rd Street. It was noted that part of the hill had a land slide several years ago.

The participants then broke into small groups to discuss the alignment of the trail. Four questions were posed to start the discussion:

1. How do you think Spirit Trail will benefit the community?
2. A conceptual alignment for the trail was presented this evening, what changes if any, would you consider to improve on this?
3. What connections or other destinations should the Spirit Trail link with?
4. The Spirit Trail is being thought of as a green link or linear park, what components or elements might be included with the trail to help reinforce this concept of a linear park?

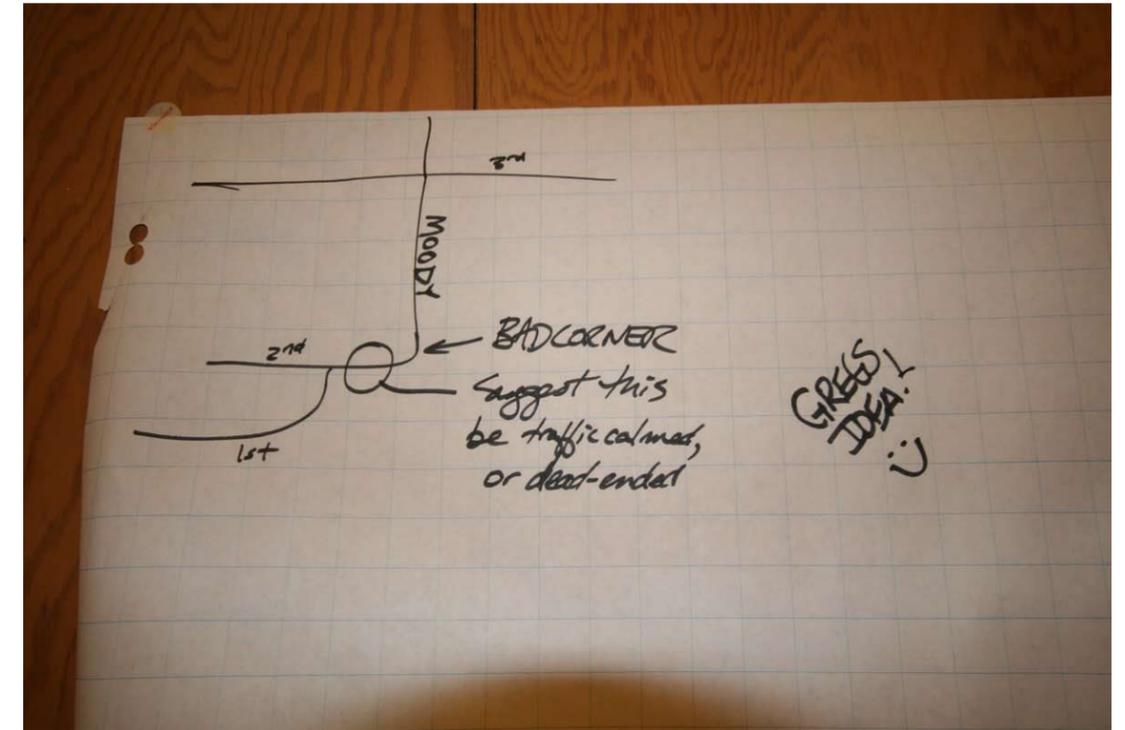
The consultants and City staff circulated to different groups to answer questions and help stimulate discussion.

Each smaller group then reported back to the



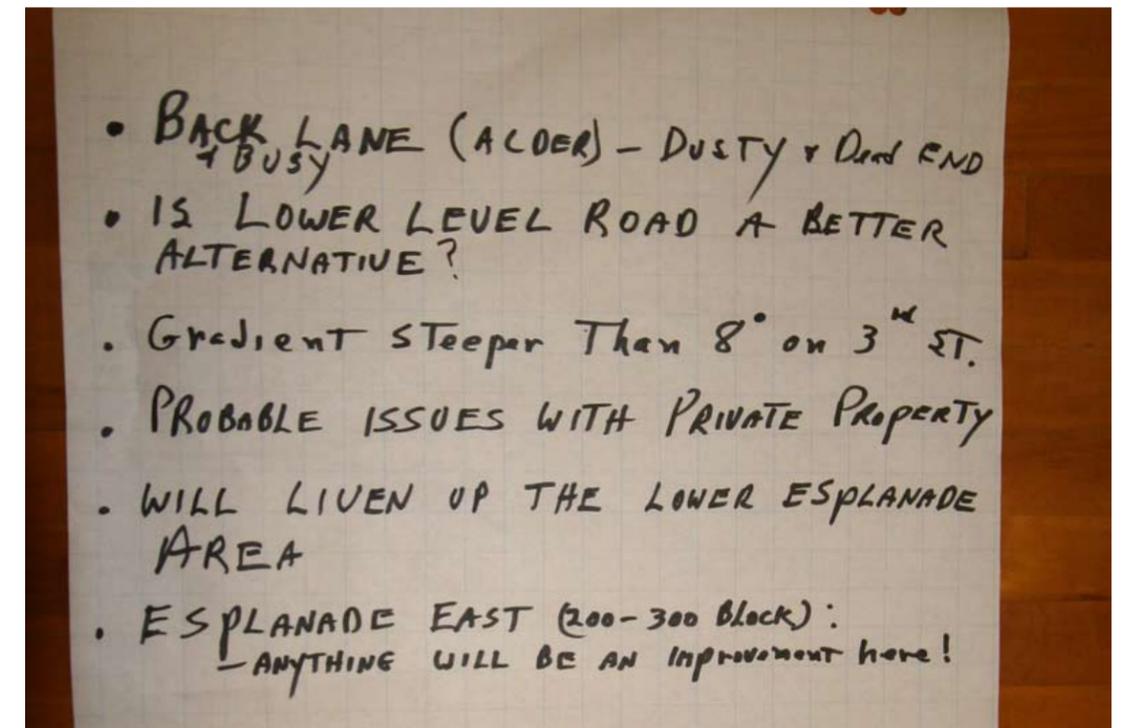
Group 1

Group 1 felt the major obstacle to east side alignment was a safety issue regarding the on street portion of the trail at the corner of E. 2nd St. and Moody Ave. This group proposed traffic calming measures at this corner including blocking it off to vehicular traffic by creating a dead-end at E. 2nd St.



Group 2

Group 2 was concerned about the trail going through private property at the end of lane south of E. 1st St. They discussed how dirty and dusty the lane currently is and wondered if going along Lower Level Road was a better alternative for the route alignment. They noted that there were several points along the trail (E. 3rd St. in particular) that violated the criteria of having less than an 8% slope. This group felt that the trail running along the 200-300 blocks of Esplanade was a positive step towards livening up that part of town.



Group 3

Group 3 was most concerned about cycling access, in particular, with safe biking to bridges and flat spaces for kids to ride. They suggested that E. 2nd St. be considered over E. 1st St. as it is safer and wider. A trail alignment along E. 2nd Street would also connect to the community gardens at the corner of St. Georges. E. 2nd Street, east of Lonsdale, also represents a faster route for cyclists. A safe crossing is required at E. 1st St. and Lonsdale Avenue.

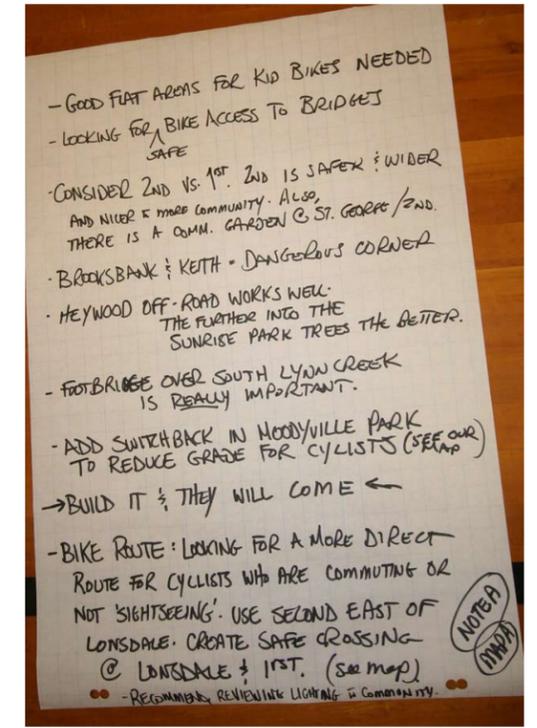
This group felt that the route along Heywood St. worked very well but would like to see it as far into the park as possible. However, when the route turns on to Keith road, major improvements would be required to make this area safe.

A pedestrian bridge over southern Lynn Creek was seen as a vital link for access to the District of North Vancouver. This bridge would also create a loop in the Lynn Creek trail system for pedestrians.

A switch back was suggested along the trail where the trail leaves E. 2nd Street and enters Moodyville Park.

Group 3 indicated that Esplanade is a truck route and not good for cycling. They would prefer an alternative to get off this busy route.

Group 3 also wanted to know if any decision had been made around lighting the trail. Jeff and Dave explained that those decision had not been made and a set of criteria would be developed in order to help make those decisions. Group 3 recommended that the lighting plan be reviewed with the community.



Summary of Verbal Feedback from Group Discussion

General Comments

- Concerned about the trail going through private property at the end of lane south of E. 1st St.
- It was noted that there are several areas that exceed the desired 8% max slope.

Safety

- A safety concern was brought up for the corner of E. 2nd St. and Moody Ave. Traffic calming measures were proposed including blocking off this intersection to vehicular traffic by creating a dead-end at E. 2nd St.
- Cycling safety was a major concern.
- A safe crossing for cyclists is required at E. 1st St. and Lonsdale Avenue.
- Safety improvements are needed along Keith Road.
- Lighting of the trail is a concern and it was suggested that lighting criteria be reviewed with the community.

Connectivity

- The trail running through the 200-300 blocks of Esplanade would contribute positively to livening up that area.
- A pedestrian bridge over south Lynn Creek is seen as a vital link to the District of North Vancouver. A bridge here would also create a loop in the Lynn Creek Trail system.

Alignment

- Lower road was considered a better alternative than the lane south of E. 1st St. as this lane is dusty and dirty.
- E. 2nd St. should be considered over E. 1st St. as a way to connect from Moodyville Park to Lonsdale. This alignment would also connect to the community gardens at the corner of St. Georges and E. 2nd. This would be a faster route for cyclists.
- The route along Heywood was seen as a good option. Trail placement inside the park was preferred.
- Esplanade is not a preferred bike route as it is also a large truck route and therefore is unsafe for cyclists.

Written Feedback

February 5, 2008

The first information session was directed at residents of the eastern portion of the City of North Vancouver was held on February 5, 2008. Twenty-six (26) participants signed into the meeting. Seventeen (17) feedback forms were filled out. Several questions were asked on this form. The major responses are summarized below.

How do you use the trails? (more than one answer was often checked)

- 14 Walking
- 7 Dog Walking
- 11 Cycling
- 1 Commuting
- 2 Other
 - Access to Lonsdale Quay from home (E.4th), access to Park and Tilford from home.
 - Running

How often do you use trails? (more than one answer was checked)

- 8 Daily
- 7 Weekly
- 3 Monthly
- 1 25 times per year
- 0 Never

A 6.5 km waterfront oriented trail is being proposed for the City of North Vancouver. Please indicate your thoughts on this proposal:

- 13 Strongly support
- 1 Somewhat support
- 2 Neutral
- 0 Opposed
- 0 Strongly Opposed
- 1 No response

The Spirit Trail is being proposed as a multi-use trail; designed for use for walkers, joggers, people with wheeled mobility devices, bicycles, and in-line skaters. In some places it will be necessary to separate "wheeled" from "heeled" uses:

- 7 Strongly support
- 5 Somewhat support
- 0 Neutral
- 1 Opposed
- 0 Strongly Opposed
- 4 No response

What types of amenities should be found along the Spirit Trail? (more than one answer was often checked)

- 11 Seating
- 4 Public Art
- 10 Maps and Signage
- 8 Interpretive Info
- 3 Drinking Fountains
- Other
 - Public Toilets (3)
 - Maps indicating where you are w.r.t.. commercial district
 - Doggie bags and garbage cans
 - Garbage Cans
- 4 No Response

Comments from Questionnaires

Responses are recorded here verbatim.

General

- This type of project which is needed to enhance the livability of North Van City and environs.
- Would like more info on the trail in the area in 600-500 block of E. 1st St.
- Sounds like a great project. Lets get on with it. - the sooner the better.
- What benefit will this bring to our neighbourhood?
- Alder Lane 600 block - if you are paving a trail, please pave the lane so we don't have to leave pedestrians in the dust. Speed bumps will control the speed of traffic.
- Somewhat concerned about additional

foot traffic on Alder St (500-600 block) - its now a dead end lane and runs by our house - nice and peaceful.

- Go for it - Looks Great.

Character

- The project should exploit and enhance 'natural' areas and should not aim for an excessively sculpted appearance.
- Concerned about lighting, especially in alleys behind residences. I'm against light pollution and the opportunity for less 'community'-oriented persons to gain access to people's backyards & car ports because they are now well-lit. Indirect lights, please.

Safety

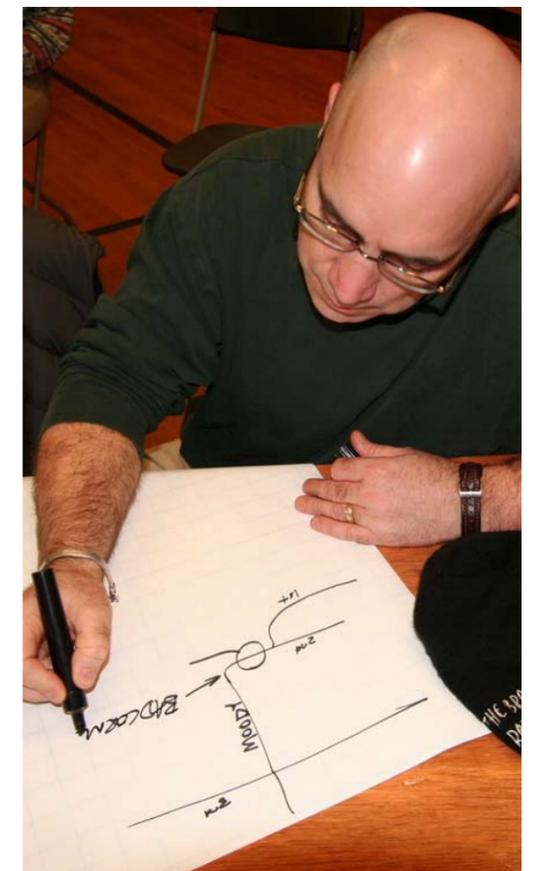
- Want to be able to ride bikes with kids.
- I'm a primary walker but only because cycling is often such a pain.
- Must be safe.
- Several people living in 500 and 600 block of E. 1st St. access their carports and garages via 500-600 Block of Alder. We drive up and down this lane daily and to have children, dogs, baby strollers using it would not be safe.

Connectivity

- Excellent idea to get some linkages along the waterfront.
- Possibly connect to proposed expansions of Green necklace (if not already in place).
- Structural crossings are not required, pedestrian (cyclists) controlled signals will meet the needs @ a fraction of the cost.
- Community gardens on 2nd
- Maximize connections/access to cycle commuting routes to Lions Gate Bridge.
- Keep the commuter part of the trail on the lower road.

Destinations

- Definitely Moodyville



Public Information Meeting and Workshop Spirit Trail West

February 20, 2008

Capilano Mall Community Meeting Room

The following people were present at the Community Meeting Room at the Capilano Mall for the public workshop and information session held for the west side residents of the City of North Vancouver from approximately 6:30 - 8:30 pm:

Workshop Attendees

Karen Ireland	Monica Huppert
Connie Sedgewick	Kevin Kubish
Pat Scarlett	Juan Manuel Felix
Karen Kraushaar	Trent Appeler
B. Hodgins	Macher Wodzynski
Raymond Chan	Car Duman
Paul McCann	Doug Smith
Lyle Davis	Cathy Lee
Linsey Keats	Leon Lebrun
Allan Burgesse	Manckhehc Galgini

City of North Vancouver	Dave Hutch
	Clare Husk

Consultants	Jeff Cutler
space2place	Jamie Vala

The meeting was started by Dave Hutch, City of North Vancouver Landscape Architect, who introduced the project and the consultant team. He presented the agenda for the evening. Dave stated the goals of the trail are to provide a multi-use, waterfront-oriented greenway that is primarily on City owned land. However, in areas where the land is not city owned city staff are working with private landowners to find solutions for the trail alignment.

Jeff Cutler gave an overview of the planning that has been done thus far. This included the proposed alignment of the Spirit Trail, opportunities and challenges found along the proposed alignment as well how the Spirit Trail connects to other CNV trails and to regional trail systems.

Jamie Vala provided a more in depth look at the parts of the trail through the western side of the City.

The participants then broke into small groups to discuss the alignment of the trail.

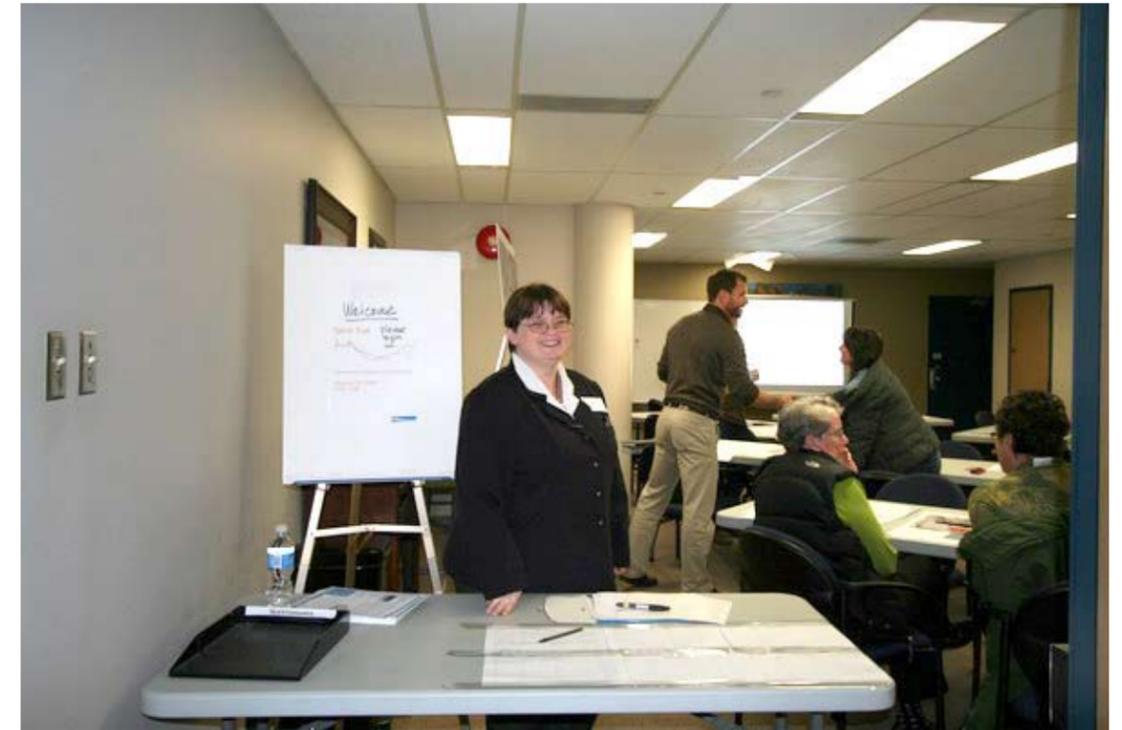
Four questions were provided to start the discussion:

1. How do you think Spirit Trail will benefit the community?
2. A conceptual alignment for the trail was presented this evening, what changes if any; would you consider to improve on this?
3. What connections or other destinations should the Spirit Trail link with?
4. The Spirit Trail is being thought of as a green link or linear park, what components or

elements might be included with the trail to help reinforce this concept of a linear park?

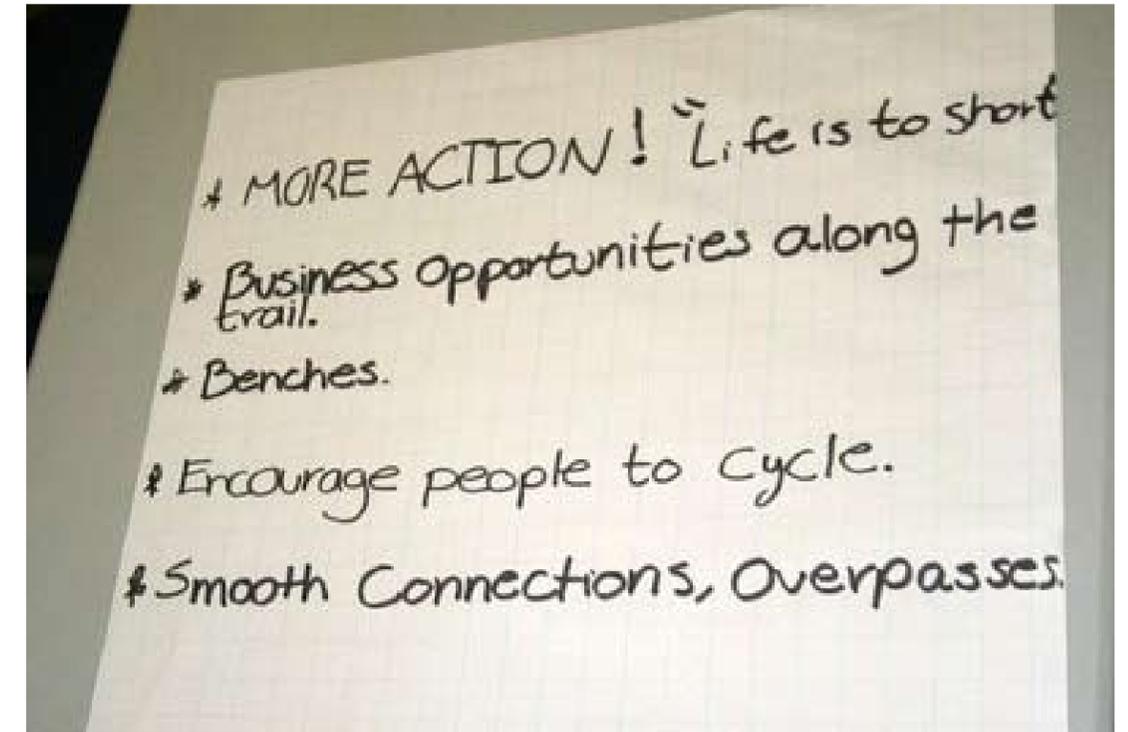
The consultants and City staff circulated to different groups to answer questions and help stimulate discussion.

Each smaller group then reported back to the entire group.



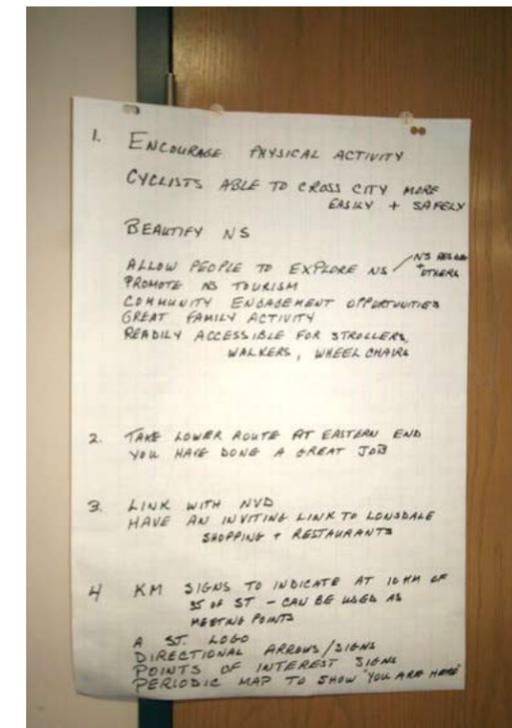
Group 1

Group 1 thought the trail created a health benefit to the community as an opportunity to get out and walk. It was seen as important for students, especially from Bodwell School. The opportunity to have businesses along the trail such as concession stands was also seen as a community benefit. This group emphasized the importance of smooth connections provided by overpasses and good alignment. There was an overall desire to "Do It Now." These members of the community wanted to be using the trail as soon as possible.



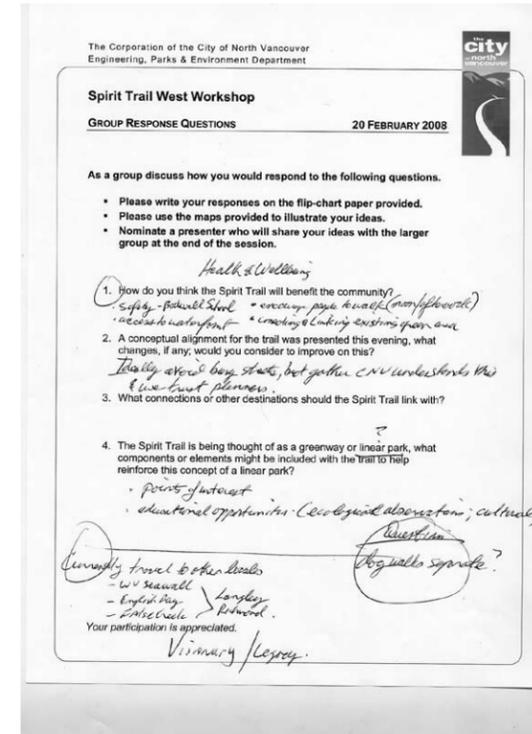
Group 2

Group 2 felt that the Spirit trail would encourage physical activity, beautify the North Shore, provide tourism opportunities and was readily accessible. At the eastern edge, the lower arm of Spirit Trail along Main/Cotton Street was seen as the preferable route and in general connections to the District of North Vancouver were deemed important. Important amenities to consider were distance markers that could be used as meeting points, a standardized logo, lots of wayfinding including You Are Here maps. Group 2 supported the idea of the viewing the trail as a linear park. They felt it was very important that the trail have an identity.



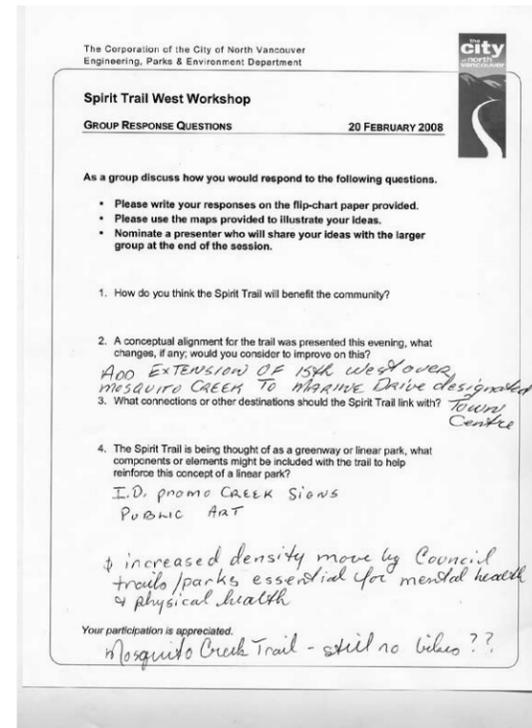
Group 3

Group 3 spent most of their time discussing the first question. They were very supportive of the trail and thought it would bring many health and wellness benefits. It would provide safe places to walk, places for employees to walk during lunch time. Spirit Trail was seen as a good way to connect existing greenspaces into a larger network. Overall, this group felt the trail was quite visionary. They questioned how to separate uses (bikes, people, dogs) so that the trail would be safe for all.



Group 4

Group 4 was made up of two people who were previously part of the Marine Drive Task Force. They wanted an overpass over Mosquito Creek into the Marine Drive town centre {this area is not within the Spirit Trail}.



The meeting ended with a small question and answer period.

1. Next Steps?

There is current funding for part of the trail on Squamish Nation lands in the Mosquito Creek Marina. This part is undergoing detailed design currently. There is also funding available this year for a portion of the trail from the Versatile Shipyards site to Moodyville Park (1.5-2 km in length). An agreement in principle has been reached to proceed with part of the trail along the CN row between Chesterfield and Forbes.

2. How long before the trail is built?

This depends on City council's priorities. The council is currently very supportive of the trail and it will likely take 5-10 years to complete. There are some cost intensive areas. The City is exploring all options for grants including provincial and federal.

3. What proportion of the trail is soon to be built?

About 40%. There was some discussion around whether to build the expensive connectors or to build longer portions of the trail within a reasonable budget and time frame first. It was noted that priorities will be determined within this planning phase of the trail.

4. What is happening with the trail and the Burrard Yacht Club?

The City is negotiating with those private landowners who are willing to facilitate the trail. The preliminary talks with the Yacht club have been positive.

5. Is there a hotel going into the empty site adjacent to the Yacht club?

There is an application in the preliminary phase for a hotel on this site that includes trail access along the waterfront.

6. Is there funding for the overpass at MacKay?

There is \$100,000 in the 2008 budget for detailed design and a provincial government grant application has been made.

Summary of Verbal Feedback from Group Discussion

General Comments

- Faster action!
- Concept sounds great.
- This is a visionary project that will create a legacy for the City.
- Consider business opportunities along the trail (concessions, etc).
- Trail is a good way to encourage people to cycle.
- Focus on the concept of a linear park.
- Priorities - is it better to spend money on expensive infrastructure items such as overpasses or to build longer sections of the trail that are unconnected?

Character

- Promote public art
- Wayfinding and Signage are important.
- Trail is a way to beautify the North Shore.
- Have kilometer markers along the trail that could be used as meeting points.
- Have a standard logo.
- Mapping and wayfinding is important.
- Seating areas are important.
- Needs identity.

Safety

- The trail enable cyclists to cross the city more safely and easily.

Connectivity

- Smooth connections between parts of trail (use of overpasses, good flow, not waiting for cars).
- Important to link with the District of North Vancouver.
- Important to have good connections with Lonsdale shopping and restaurants.
- Good way to provide connectivity to existing green spaces.

Destinations

- Important to have points of interest and educational opportunities.

Alignment

- Avoid the trail along big streets.
- Add an extension of 15th over Mosquito

Creek to the designated Marine Drive Town Centre.

- Of the three arms in the eastern side, the lower route is preferred by some.

Benefits to Community

- Exercise, fresh air, and health components.
- Increase in safety.
- Access to the waterfront
- Links to existing green space.
- Promotes tourism and exploration of North Shore.
- Creates community engagement opportunities.
- Provides great family activities.
- Readily accessible for strollers, walkers, and wheel chairs.

Written Feedback

February 20, 2008

The second information session was directed at residents of the eastern portion of the City of North Vancouver was held on February 20, 2008. Twenty (20) participants signed into the meeting. Fifteen (15) feedback forms were filled out. Several questions were asked on this form. The major responses are summarized below.

How do you use the trails? (more than one answer was often checked)

- 14 Walking
- 2 Dog Walking
- 8 Cycling
- 1 Commuting
- 0 Other

How often do you use trails? (more than one answer was checked)

- 5 Daily
- 9 Weekly
- 2 Monthly
- 1 20 times per year
- 0 Never
- 1 No response

A 6.5 km waterfront oriented trail is being proposed for the City of North Vancouver. Please indicate your thoughts on this proposal:

- 15 Strongly support
- 0 Somewhat support
- 0 Neutral
- 0 Opposed
- 0 Strongly Opposed

The Spirit Trail is being proposed as a multi-use trail; designed for use for walkers, joggers, people with wheeled mobility devices, bicycles, and in-line skaters. In some places it will be necessary to separate "wheeled" from "heeled" uses:

- 14 Strongly support
- 0 Somewhat support
- 0 Neutral
- 0 Opposed
- 0 Strongly Opposed
- 1 No response

What types of amenities should be found along the Spirit Trail? (more than one answer was often checked)

- 12 Seating
- 10 Public Art
- 11 Maps and Signage
- 8 Interpretive Info
- 7 Drinking Fountains
- 9 Other
 - Points of interest (2)
 - Lighting (2)
 - Dog Area
 - Public washrooms (3)
 - Concession cafe (2)
 - Garbage cans and recycling containers (3)
 - Emergency phones
 - Distance markers
- 1 No response

Comments from Questionnaires

General

- I think the plan is very strong.
- Would be a huge benefit to the community.
- I think it is a great idea. We @ Bodwell could like to be able to walk more from our location on Harbourside drive. We feel a bit disconnected and this trail would help at lot.
- I like the trail west of Lonsdale Quay. I dislike the trail east of Pier at Lonsdale (I don't like separation from water in east part of the trail).
- It is an awesome idea.
- Would love to use trail for bicycling and walking in order to stay fit and healthy into "old age" (67 years young)

- In the Spirit of the "Spirit Trail" I do hope that the negotiations between the Squamish Nation and CN Rail will go smoothly and "un-delayed;" life is short; less talk, do "the WALK". Can't wait.
- Commend the City for Vision to invest in the health and well being for residents and workers by providing and linking greenspace.
- Have you thought of seek corporate sponsorship for segments of the trail to make it more economical? i.e. Vancity, Telus, Starbucks, Park Royal.
- A great legacy.

Character

- Re: Question 7 (*separate wheel from heel parts of the trail*) Separation should be limited to absolute minimum. There are many areas in Vancouver where even 3-4 meters width of trail (Stanley Park) is enough for both pedestrians and bikers.

Safety

- Cyclists - commuting safety

Connectivity

- 15th Street (west) bridge across Mosquito Creek for pedestrian use (away from traffic on Marine Drive and Larson).
- Bridge over CNR track @ Harbourside Park
- To be extended for cyclists inside city limits.
- Connections should be the priority
- Easy access to the shopping malls off the trail, i.e. Park and Tilford/Capilano/Park Royal
- Bewicke Ave south of E. 1st
- Great idea (long overdue) more overpasses, bridges across CN tracks, roadways, creeks.



Advisory Committees

Parks and Environment Advisory Committee

A presentation was given to the CNV Parks and Environment Advisory Committee on February 7th, 2008 by the consultant team and Dave Hutch. This presentation provided the committee with an overview of the planning process so far. The committee was then asked to work through the same four questions that were given to the general public:

1. How do you think Spirit Trail will benefit the community?
2. A conceptual alignment for the trail was presented this evening, what changes if any; would you consider to improve on this?
3. What connections or other destinations should the Spirit Trail link with?
4. The Spirit Trail is being thought of as a green link or linear park, what components or elements might be included with the trail to help reinforce this concept of a linear park?

Their feedback is summarized below:

Benefits to Community

- Unique waterfront feature
- Opportunity to reclaim access to water
- More powerful social experience (compared to Stanley Park and West Van seawall).
- Encourage people to get out and enjoy the City.
- Opportunity to highlight City features (e.g.

Sailors memorial and Moodyville Historic Park)

- Connections to Squamish Nation and the District of North Vancouver
- Physical fitness
- Mental well-being
- Safe walk option to local eateries, pubs, etc.

Conceptual Alignment

- Preference for waters edge if possible.
- Ideal edge of Moodyville across the ravine rather than on street.
- 3rd street hill- could you go down to Low level bike route?
- Clearly mark or separate pedestrian/cycle paths
- Have shorter walking trails and longer bike trails
- Incorporate lookouts/belvederes.

Connections/Destinations

- Link to future Green Necklace

Elements that re-inforce the Linear trail

- Art- Industrial artifacts
- Signage
- Lighting
- Safe intersections
- Highlight features along the trail
- Preserve Natural elements
- Industrial Interpretation
- Incorporate elements for non-linearity

General

- Focus on sustainability and new technologies.
- Bike lockers - for tourists that allow people to shop and dine and not worry about their bikes.

Joint Bicycle Advisory Committee

A presentation was given to the joint City of North Vancouver and District of North Vancouver Bicycle Advisory Committee, March 5th, 2008 by the consultant team and Dave Hutch. This presentation provided the committee with an overview of the planning process so far. The committee was then asked to discuss four questions that were given to the general public:

1. How do you think Spirit Trail will benefit the community?
2. A conceptual alignment for the trail was presented this evening, what changes if any; would you consider to improve on this?
3. What connections or other destinations should the Spirit Trail link with?
4. The Spirit Trail is being thought of as a green link or linear park, what components or elements might be included with the trail to help reinforce this concept of a linear park?

Their feedback is summarized below:

Benefits to Community

- The benefit was considered to be obvious and the discussion moved on to question 2.

Alignment

- A connection is needed from the intersection of the CN railway and Bewicke Ave. to the 1st Street bike way.
- The preliminary design of MacKay overpass was generally thought to be of good design and much more bike friendly than the Fell Ave. overpass.
- The idea of having 'wheeled' traffic through the Lonsdale Quay area was generally thought to be a safety hazard. It was thought there was too much conflict with pedestrians. An expansion of the boardwalk was thought to lead to an increase in number of pedestrians.
- Some of the committee felt the trail

could go through the bus terminal while others thought this was a very unsafe proposition.

- It was considered important to solve major crossing issues for both cyclists and pedestrians.
- A connection from greenway/bikeway along Queensbury to Moodyville park and the Spirit Trail would be a good addition.

Amenities

- Cultural and natural interpretative signage.
- Public art.
- Viewpoints to stop and lookout along the trail.
- A north - south connection to Waterfront Park is considered critical.
- Small play areas or multi-use features such as a skate rail/bench along the trail for children would a welcome addition.
- The question of lighting was brought up again. Lighting is one of the things that will be considered in the next phase of this project. The consultants will be coming up with criteria for lighting recommendations along the trail.

There was not time for a discussion of question 4.

On April 3, 2008, PEAC passed a motion that stated "PEAC supports Phase 1 proposed trail alignment and look forward to participating in Phase 2, the Concept Design."

Public Process for Conceptual Design

The project included a second round of public consultation to discuss the conceptual design of the trail. Two public open houses were held in June. The conceptual design was also discussed at the Joint Advisory Bicycle Committee and the Park and Environmental Advisory Committee.

Public Open House East of Lonsdale June 4, 2008

The following people were present at the Ridgeway Annex School Gymnasium for the public open house and presentation held for the residents of the City of North Vancouver who live East of Lonsdale. This event was held from a 6:30 - 8:30 pm:

Workshop Attendees:

Carol McDowall	Bern Smith
Don McDowall	Jane Smith
Ken Neal	Gorden Briggs
Lorna Neal	Edward Haboly
Merle Longman	Jo Hinculiror
Ken Timewell	Martin Davies
John Fair	Barb Braithwaite
Walt Perri	Chris Simon
Sue Perri	Susanne Simon
Joy Beckett	Mike Culbertson

City of North Vancouver	Dave Hutch
	Clare Husk
	Gary Penway

Consultants	Jeff Cutler
space2place	Jamie Vala

A presentation by Dave and Jeff gave an overview of the planning and public consultation process thus far as well as a short description of the proposed conceptual design of the trail. People were then encouraged to examine the presentation boards and ask questions directly to the City staff and consultants.

11 feedback forms were received. The results of which are summarized below.

Questions:

Did you attend Spirit Trail Open Houses in February 2008?

2 Yes
9 No

Do you use existing North Shore Trails?

11 Yes
0 No

Overall Concept - based on input from previous open houses, a concept for the Spirit Trail East of Lonsdale is presented this evening? Please indicate your thoughts on the overall concept presented tonight?

6 Strongly Support
4 Somewhat Support
0 Neutral
0 Opposed
1 Strongly Opposed

Written Comments:

- Fantastic way to connect three parts of the City (Lonsdale, Capilano Mall, Park and Tilford), Should connect with existing greenways and bike network as much as possible.

- I strongly support and encourage this initiative. I hope it will inspire people and politicians to support more greenways throughout the Northshore. Greenways are a very positive way to provide alternatives to the automobile and to get people out engaging and interacting with the community. Thank you.

-Upkeep of the trail between 500-600 Block First. Example: will City cut the grass between the country road and vegetation on south side of Spirit Trail (we have lived at our residence for 40 years and its just about impossible for the City to come and cut the grass just never mind keep this area maintained.

- Understand the trail is meant for recreation not commuting.

- Regarding Parking on Heywood, extra parking should be avoided, people shouldn't be driving to recreational places.

- Please consider horseback riding and keeping the crossing of Lynn Valley Road between Williams and Highway.

-Overpasses on Low Level/Esplanade and 3rd Street Hill are ESSENTIAL. East 1st Street residents concerns about noise and loss of green space are unfounded.

- Detail maps of Moodyville Creek trail is needed for more comment.

- not enough information along the back of houses (after the back lane ends). Location of the trail, width, trees cut down, soil stability, engineering studies, etc

At St. Patrick's Avenue the Spirit Trail is proposed to split into two separate trails: one for cyclists and wheeled users along East 2nd Ave and one for pedestrians along the lane behind 500 + 600 East 1st and on to Moodyville Park. The two trails come together again at Queensbury and East 2nd Ave and continue on through Moodyville Park. Please indicate your thoughts on this concept:

2 Strongly Support
3 Somewhat Support
2 Neutral
1 Opposed
1 Strongly Opposed

Written Comments:

- Separation of bikes and pedestrians is appropriate in this area, but if you are allowing cars along the lane, why not bikes?

- Seems sensible, assuming there is no possibility for trails south of Moodyville Park too close to R/R?

- I think that no way will bikes continue up St. David's until 2nd - they will for sure turn right at first and therefore we will be in the middle of the trail.

-Traffic calming required.

- More detailed plans are needed for comment.

- the bikers could continue down the country land and the embankment.

Lighting is being considered for the Spirit Trail in a variety of places, currently lighting is being considered for urban and on-street sections of the Trail. Currently lighting is not being considered for natural park areas. Please indicate your thoughts on this concept:

2 Strongly Support
1 Somewhat Support
3 Neutral
2 Opposed
1 Strongly Opposed

Written Comments

- I understand the logic but if people use this trail to walk/ride to/from work in the winter they will have to walk through these areas in the dark.

- Granted that they lighting is as low key as possible.

- Some lighting is required for commuter cyclists, although minimal.

-No lighting on the trail between 500 + 600 Block First but strongly support lighting at 2nd and Moody.

- where would the lighting be placed?

In combination with the Spirit Trail, a "country lane" concept is being proposed for the lane south of 500 + 600 blocks of East 1st Street. A country lane consists of paved wheel strips, driveway connections and reinforced grass pavers in sections. Benefits include reduced dust, infiltration of rainwater, reduced heat island effect and a greener alternative to conventional asphalt paved lane. Please indicate your thoughts on this concept:

2 Strongly Support
3 Somewhat Support
2 Neutral
1 Opposed
1 Strongly Opposed

Please share any other thoughts or comments on the proposed Spirit Trail concept presented tonight:

-Connect Moodyville portion to Queensbury "trailhead" @3rd. Connect 3rd St to 4th St bike routes via Kennard Street and Spirit Trail Section. Ensure connections to the Lynn Creek Trail system. Safe crossing of E. Esplanade is critical.

- I like the concept. I'd be concerned about cars backing out and crossing the trail? or is there some kind of barrier or buffer?

- On #9 proposal - this area must be maintained by City - cutting the grass and controlling the blackberry bushes, etc on south side of trail. Must have something for people to throw away garbage and dog waste.

- I would rather see the creation of a multi-use trail with pedestrians and cyclists aimed at commuters.

- The lane behind 500-600 Block E. 1st St is not wide enough to support an addition path as the south side of the lane is not a gradual slope. It is a dangerous cliff that has been eroding to a strong undercut.

- The proposed concept is good - just issues of safety crossing Esplanade, E. 3rd Stret, and the undercut of the bank in 500-600 E. 1st St.

- No parking on the south side of Heywood.

- Keep the route simple, even if it means a greater cost. If residents on Heywood complain of the loss of "their" grass strip, remove ALL the parking on S/E side.

- there does not seem to be any further studies done on the stability of the embankment. We understand that stairs and bridges will be built, but a few years ago a bike trail was cancelled due to the instability of the slope. Will the Spirit Trail follow the existing trail?



Public Open House City wide June 10, 2008

The following people were present at the John Braithwaite Community Centre for the public open house and presentation held for the residents of the City of North Vancouver. This event was held from a 6:30 - 8:30 pm:

Workshop Attendees:

Don McDowall	Carol McDowall
M. Bickley	David Stone
K. Neal	George Ellis
Carolyn Girard	Mike Culbertson
Katie Fenn	Mary Tasi
Osmo Kvist	E. Macdonald
Sarah MacKenzie	Lesley McLaughlin
Ken Harrison	Tom Simpson
Vic Balon	Myra Frampton
Walt Perri	John Fair
J. Graham	P. Hetherington

City of North Vancouver	Dave Hutch
	Clare Husk
	Gary Penway

Consultants space2place	Jeff Cutler Jamie Vala
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A presentation by Dave and Jeff gave an overview of the planning and public consultation process thus far as well as a short description of the proposed conceptual design of the trail. People were then encouraged to examine the presentation boards and ask questions directly to the City staff and consultants.

16 feedback forms were received. The results of which are summarized below. Each question was not necessarily answered in each form.

Questions:

Did you attend Spirit Trail Open Houses in February 2008?

4 Yes
12 No

Do you use existing North Shore Trails?

14 Yes
2 No

Overall Concept - based on input from previous open houses, a concept for the Spirit Trail East of Lonsdale is presented this evening? Please indicate your thoughts on the overall concept presented tonight?

9 Strongly Support
4 Somewhat Support
2 Neutral
1 Opposed
0 Strongly Opposed

Written Comments:

. Thanks for your efforts towards these pathways
.
- Concept to date has been very responsive to community feedback. It will be impossible to satisfy everyone, so CNV Council will need to make some arbitrary, tough decisions.

- Based on the conceptual drawings, back lane "country lane" of 500/600 Block is almost 20 feet - is there enough room? I don't think so with jeopardizing the stability of the slope.

- Very concerned for public safety in regard to trail design in 500-600 block E. 1st St laneway. The embankment is very unstable- can it support the bike path on the south side? Several severe landslides have already occurred from 1995-present from bank to Low Level Rd.

- Keep cyclists, skateboards away from residences and cyclists.

- Must separate pedestrians and cyclists and keep cyclists and skateboarders away from residences.

- A soft running surface would be nice

- Great work! An excellent vision for the waterfront. This initiative will provide safe and enjoyable opportunities for people of all ages and abilities to get out of their cars and find healthy ways to move through our communities.

- Thank You. I think it is fabulous to have

connecting trails (multi-use) and I understand and would use the more direct routes for bikes. Trails will beautify neighbourhoods and get more people and bikes off busy streets. I love to find trails that I can use on my commutes to get me off main roads. I'm always thrilled when I find more off road routes to get me from Main Street up to Lynn Valley for example.

- more cycling lanes for streets

The Spirit Trail, west of St Andrew's Ave, is proposed to follow the water's edge with a more pedestrian focused trail, with a more cyclist-focused trail proposed back from the shoreline. East of St. Andrew's Ave the Spirit Trail is proposed as a combined cyclist and pedestrian trail, except at St. Patricks Avenue the Spirit Trail is proposed to split into two separate trails: one for cyclists and wheeled users along East 2nd Ave and one for pedestrians along the lane behind 500 + 600 East 1st and on to Moodyville Park. The two trails come together again at Queensbury and East 2nd Ave and continue on through Moodyville Park on eastward to the District of North Vancouver. Please indicate your thoughts on this concept.

8 Strongly Support
2 Somewhat Support
2 Neutral
1 Opposed
1 Strongly Opposed

Written Comments:

- Great idea to separate the two b/c cyclist will be commuting and going fast.

- I particularly like the idea of retaining a pedestrian corridor through the ravine in Moodyville Park.

- I prefer 1st to 2nd (as a cyclist) for the ravine bypass, but ok

- Not familiar

Lighting is being considered for the Spirit Trail in a variety of places, currently lighting is being considered for urban and on-street sections of the Trail. Currently lighting is not being considered for natural park areas. Please indicate your thoughts on this concept:

5 Strongly Support
3 Somewhat Support
2 Neutral
3 Opposed
1 Strongly Opposed

Written Comments

- On street lighting is critical for the safety of cyclists in the dark/rain but lets not light up the parks (environmental and energy conserving reasons).

- Cost-wise it is prohibitive to install lighting in all areas. Also, lighting will detract from natural park experience.

- No more lights in residential areas of the trail.

- Opposed to lighting in lane of 500-600 Block of E. 1st St. Grain elevator lights are enough.

- I don't agree with this concept.

- Would not want "urban" areas to be too bright, nor "nature" areas to be dark.

- Lighting in natural areas would disrupt the natural cycle.

- Where trail provides an important off road bicycle connection, I support lighting to encourage bicycle commuting during the winter months.

- Lights should be installed due to safety reasons.

- Should probably avoid parks in the evenings- unsafe and we should consider light pollution.

- No lighting between 500-600 Block 1st. Rubbish container for people and dogs and pick up.

Please share any other thoughts or comments on the proposed Spirit Trail concept presented tonight:

- Great work to date. I strongly support the vision and hope the CNV Council sticks to the vision.

- Washrooms?

- Concerned at the lack of public information prior to this 'fait accompli' route announcement.
- Sounds great.

- I think it's all great and will be a wonderful legacy for the North Shore. I am seeing it all from a cyclist/commuter point of view and would like to see safer pathways for getting around the North Shore.

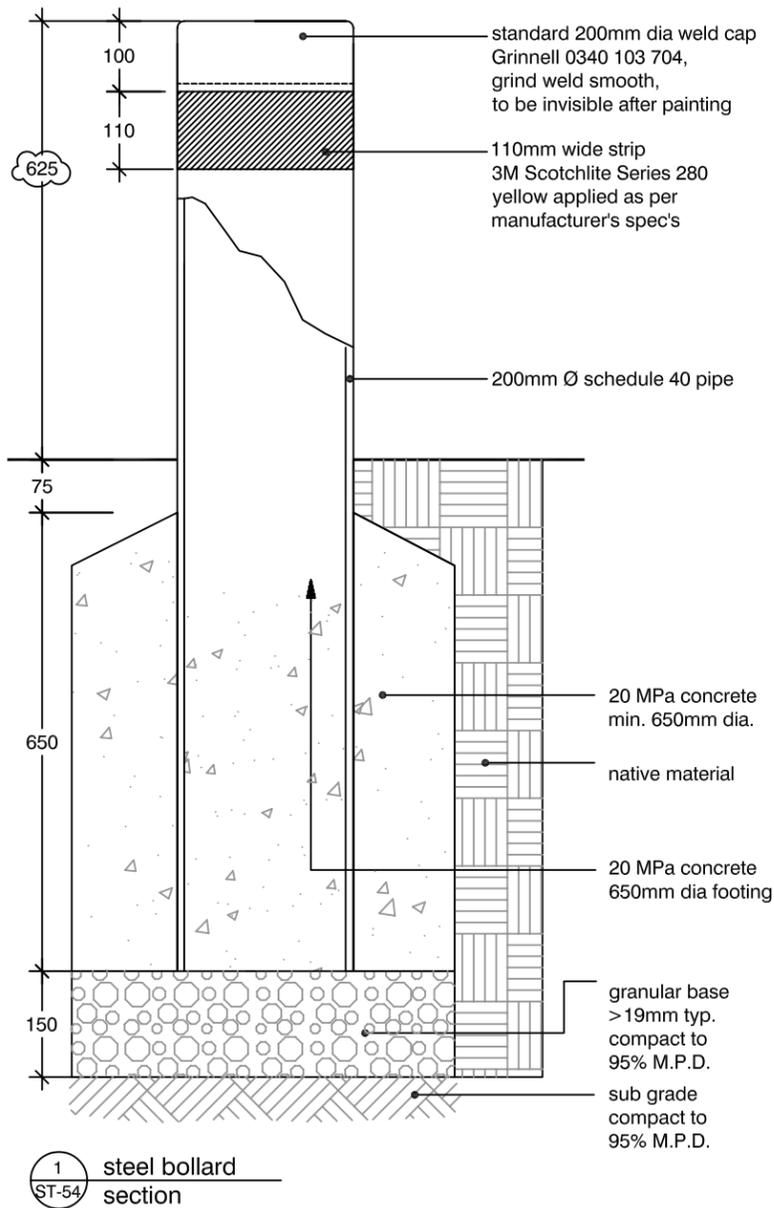
- Sounds good but maintaining 500-600 Block 1st hopefully will be done. But I don't think this will be done.



Appendix

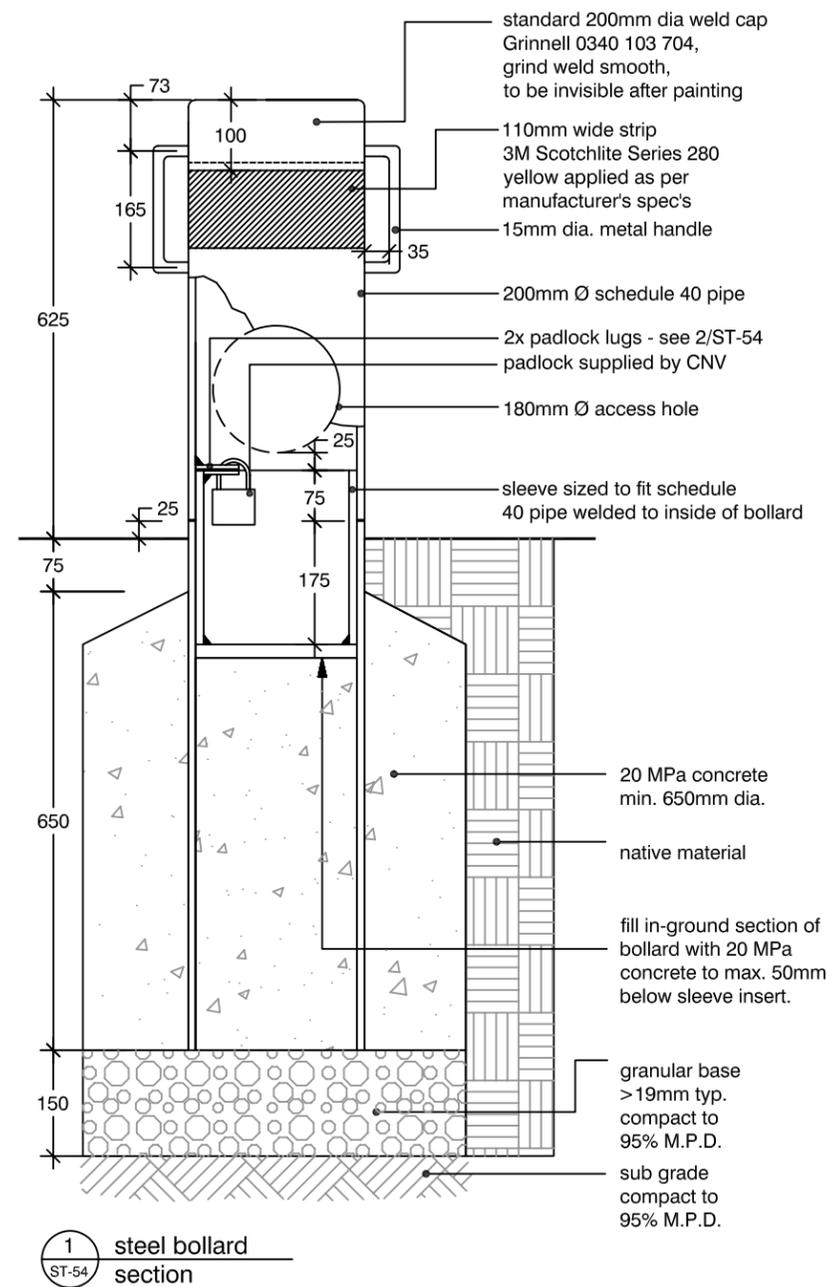
Technical and Design Details

Standard City of North Vancouver details contain in this appendix should be used along the Spirit Trail in Park trail-type sections. In the Urban and Street trail type sections some of these detailed may be adapted and/or special treatments or designs may be required depending on context.



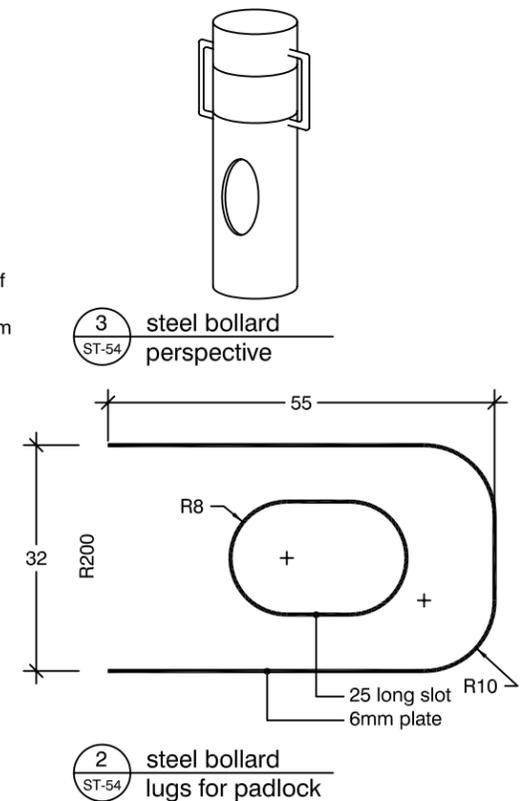
General Notes:

- Specifications: All components and workmanship conform to Specification Section 03300 Cast-In-Place Concrete, 05500 Metal Fabrication and Section 09900 Painting.
- Shop drawings showing all dimensions, finishes, gauges, fasteners, connections, welds and hardware specifics required for approval by CNV representative prior to fabrication.
- All welds to be neat, full continuous fillets without cavities. Grind off surplus material, leaving all edges and surfaces smooth.
- Finishing + Painting: prime and powder coat Colour: colour to match Francis Andrews Hunter Green - RAL 6005 (1-800-565-6579). Samples must be submitted to CNV Contract Administrator for approval prior to fabrication of bollard.
- Location on site: Refer to Contract drawings for location of bollards.
- All bollards to be installed plumb and true, layout to be approved by CNV representative prior to pouring of concrete.
- Restore disturbed areas around footing as directed by CNV representative.



General Notes:

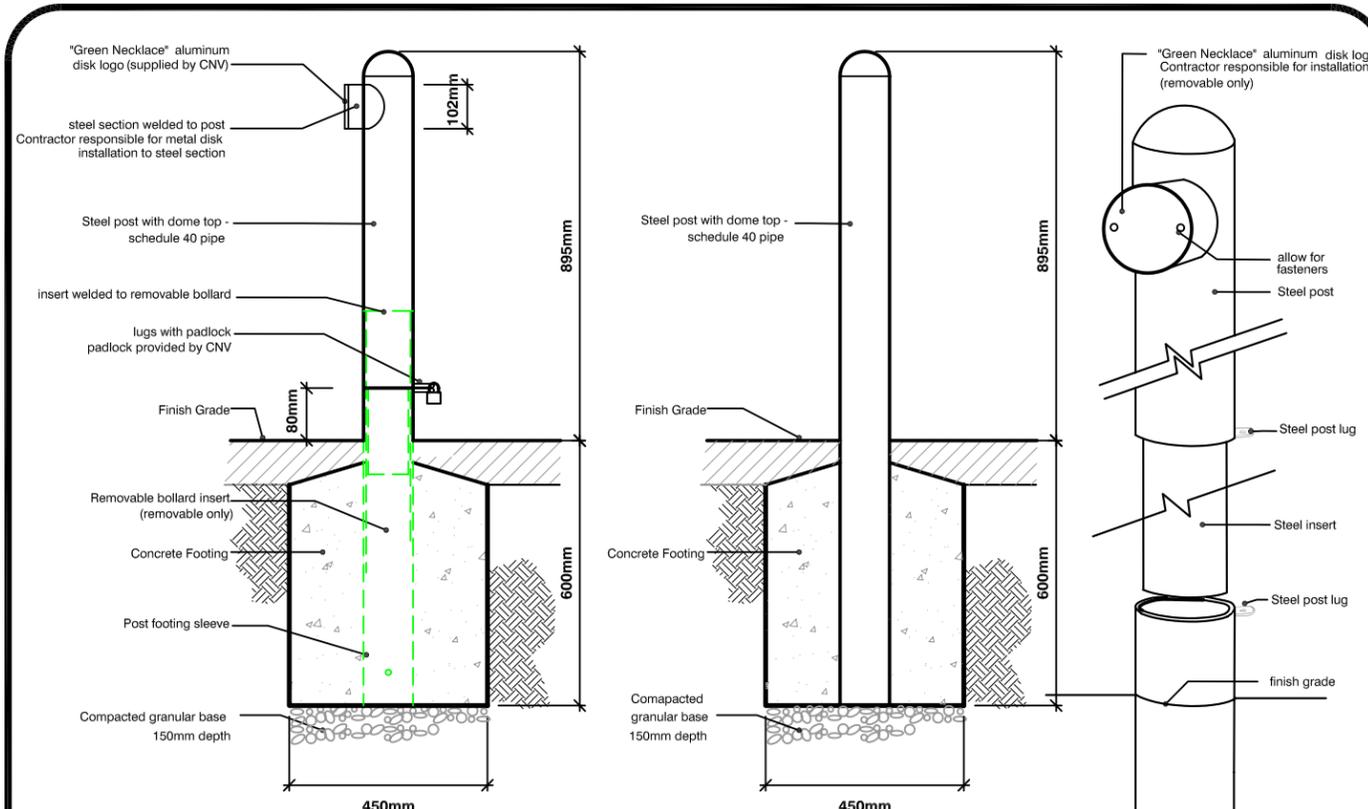
- Specifications: All components and workmanship conform to Specification Section 03300 Cast-In-Place Concrete, 05500 Metal Fabrication and Section 09900 Painting.
- Shop drawings showing all dimensions, finishes, gauges, fasteners, connections, welds and hardware specifics required for approval by CNV representative prior to fabrication.
- Prepare surfaces + apply paint as per manufacturers application data.
- Finishing + Painting: prime and powder coat
- Colour: colour to match Francis Andrews Hunter Green - RAL 6005 (1-800-565-6579). Samples must be submitted to CNV Contract Administrator for approval prior to fabrication of removable bollard.
- Location on site: Refer to Contract drawings for location of removable bollards and confirm on site with Contract Administrator prior to installation.
- All bollards to be installed plumb and true, layout to be approved by CNV representative prior to pouring of concrete.
- Lubricate sleeve prior to insertion of removable bollard.
- Restore disturbed areas around footing as directed by CNV representative.



drawing title steel bollard				drawing no. ST-16	
designed D. Hutch	drawn T. McLellan	H/D location t:\...dwgs\Standard Drawings\structure\st_16.dwg		date 28 March 2000	
scale n.t.s.	plot scale .01	revised 2008.03.25 adjust height			



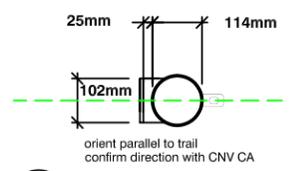
drawing title removable steel bollard - 200mm dia.				drawing no. ST-54	
designed D. Hutch	drawn T. McLellan	H/D location t:\...dwgs\Standard Drawings\structure\st_54.dwg		date 16 March 2001	
scale n.t.s.	plot scale .01	revised -			



1 Green Necklace Bollard - removable section

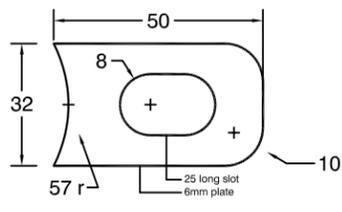
2 Green Necklace Bollard - fixed section

3 Bollard steel section - removable perspective



4 removable Bollard plan view

Green Necklace Phase 1 - Bollard Schedule			
	semi-gloss black	hunter green	total
fixed	14	20	34
removable	7	10	17



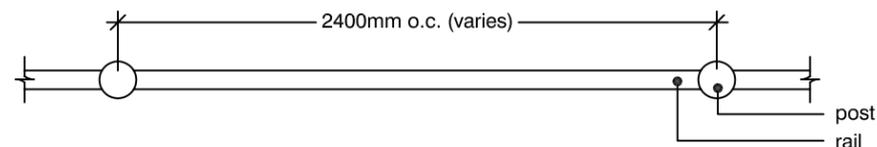
6 removable bollard padlock lug

General Notes:

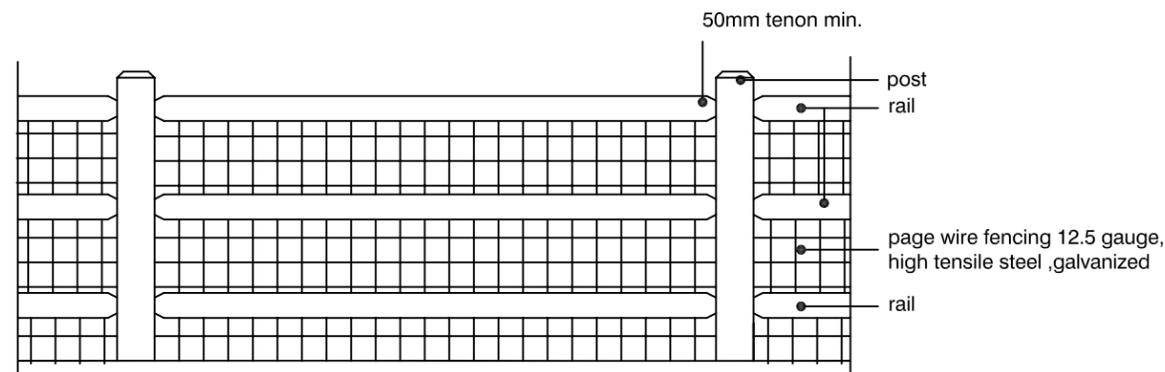
- Specifications: All components and workmanship conform to Specification Section 03300 Cast-In-Place Concrete
- Shop drawings showing all dimensions, finishes, gauges, fasteners, connections, welds and hardware specifics are required and must be approved by CNV Contract Administrator prior to commencing fabrication.
- All joints mitred, welded all around and smoothed. Finishing + Painting: Entire bollard assembly hot dipped galvanized primed and powder coated. Submit colour+finish sample
- All bollards to be installed plumb and true, layout to be approved by CNV Contract Administrator prior to pouring of concrete. Refer to contract drawings for location of bollards.
- Restore disturbed areas around footing as directed by CNV representative.



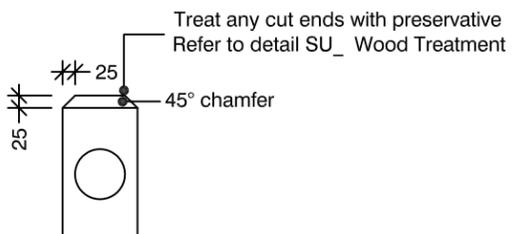
drawing title bollard - removable + fixed			
drawn A.Vasilevich	checked D Hutch	H/D location T:\Drawings\Parks\Standard Drawings\Drainage\ST_98.dwg	drawing no. ST-22
scale n.t.s.		date January 24 2005	revised 1. April 26, 2005 lugs and flange gb



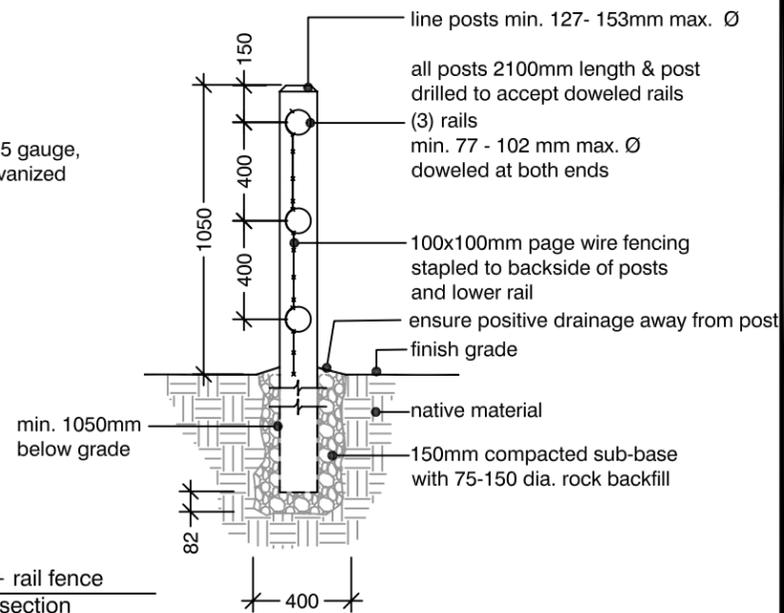
1 post + rail fence
ST-24 plan



2 post + rail fence
ST-24 front elevation



4 post top
ST-24 detail



3 post + rail fence
ST-24 cross section

General Notes:

- All post and rails are machine peeled Lodgepole pine. Nominal variations in diameter and natural tapering of posts and rails is acceptable. Nominal variations in total length of post is acceptable.
- All wood components to be pressure treated as per manufacturer's specifications.
- Shop drawings showing all dimensions, finishes, gauges, fasteners and hardware specifics required for approval by CNV representative prior to fabrication and installation.
- Location on site: Confirm on site with CNV representative prior to installation.
- Restore disturbed areas around fence as directed by CNV representative.
- Sample of post, rail and wire required for approval by CNV. In installation of posts, if bedrock or large stone is hit, and hole is more than 1/4 short of required depth, concrete footing may be required.

City of
North Vancouver
Parks + Environment



drawing title

post + rail fence with mesh

designed
D. Hutch

drawn
T. McLellan

H/D location
t:\...dwgs\Standard Drawings\structures\st_24.dwg

scale
n.t.s.

date
24 April 2002

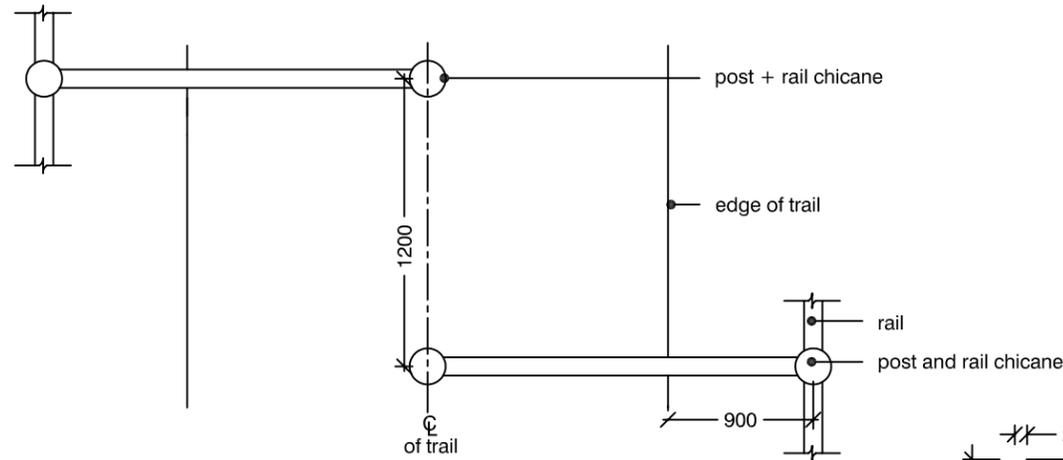
plot scale
.03

revised:

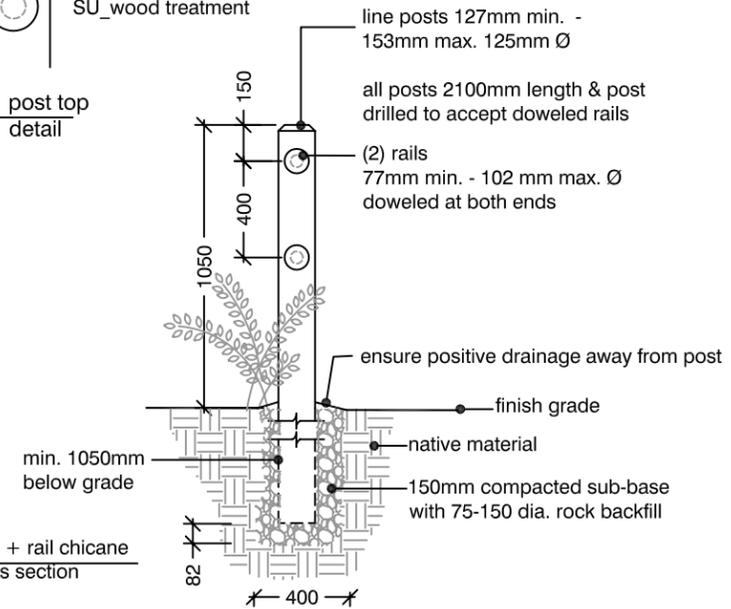
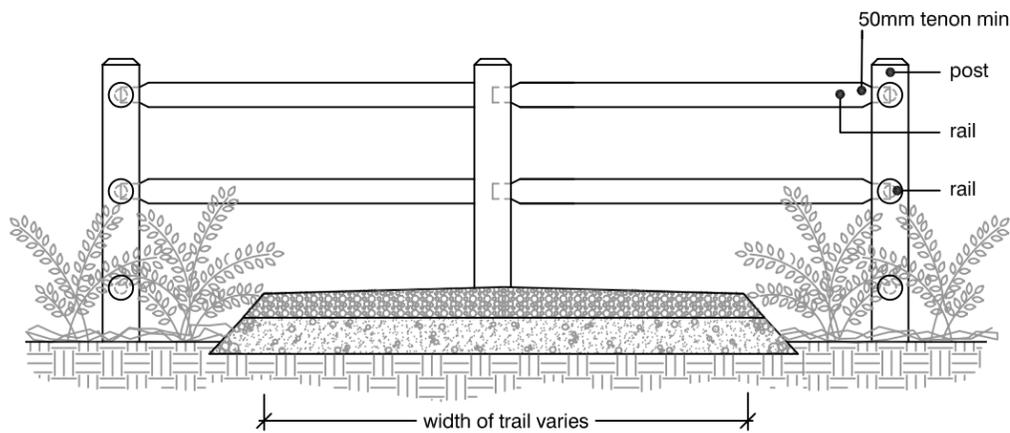
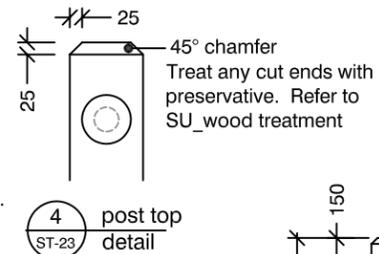
2008.02.05 Increased post + rail diameter
Updated notes
Footing details
Tenon specification

drawing no.

ST-24



1 post + rail chicane plan
ST-23

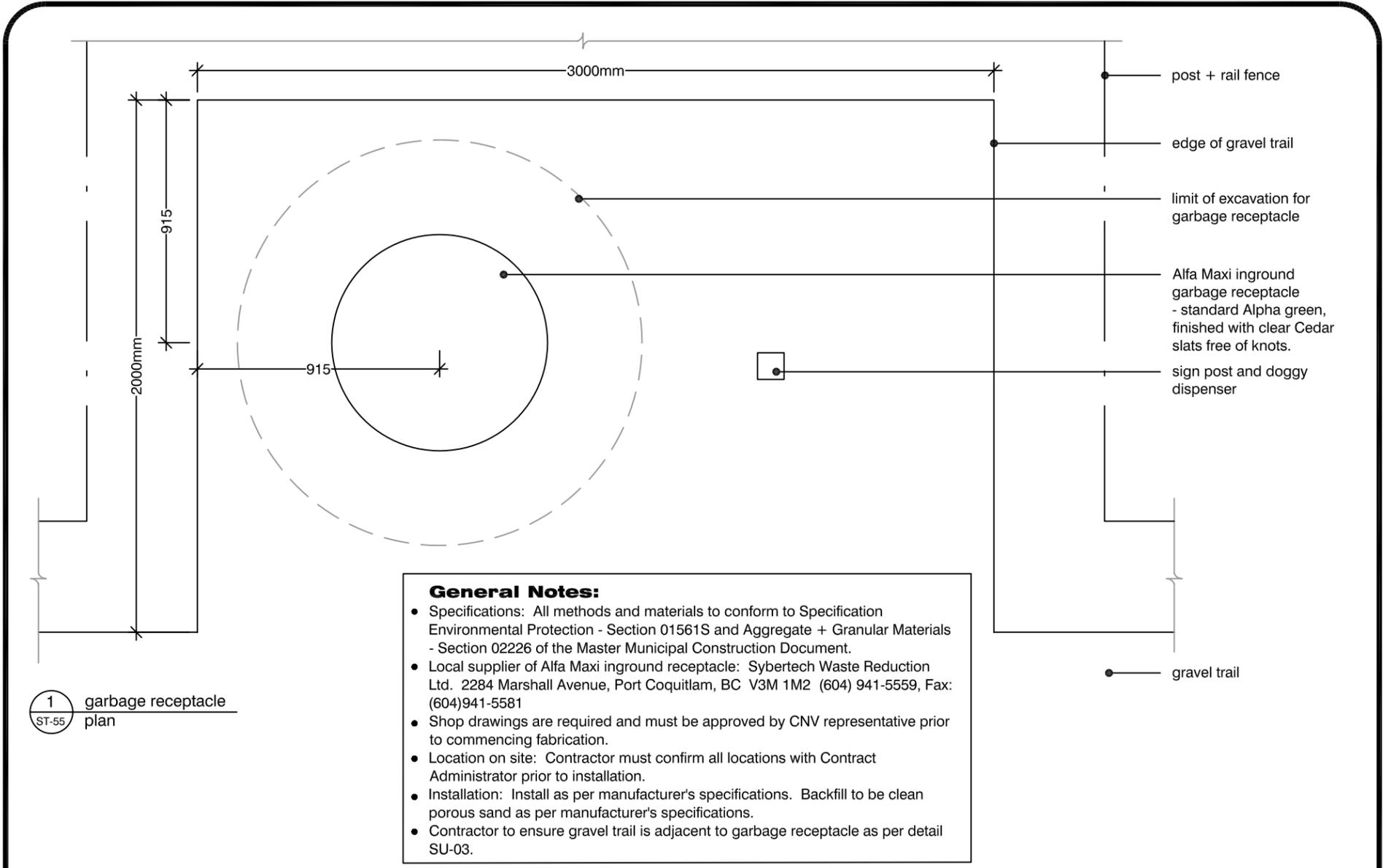


- General Notes:**
- All post and rails are machine peeled Lodgepole pine. Nominal variations in diameter and natural tapering of posts and rails is acceptable. Nominal variations in total length of post is acceptable.
 - All wood elements to be pressure treated as per manufacturer's specifications.
 - Shop drawings showing all dimensions, finishes, gauges, fasteners and hardware specifics required for approval by CNV representative prior to fabrication and installation.
 - Location on site: Refer to Contract drawings for location of chicanes. Confirm on site with CNV representative prior to installation.
 - Restore disturbed areas around chicanes as directed by CNV representative.

City of
North Vancouver
Parks + Environment



drawing title post + rail chicane			revised: 2008.03.25 Post + rail diameter Footing detail Tenon specification	
designed D. Hutch	drawn T. McLellan	H/D location t:\...dwgs\Standard Drawings\structures\st_23.dwg	drawing no. ST-23	
scale n.t.s.	date 11 February 2000	plot scale .03		



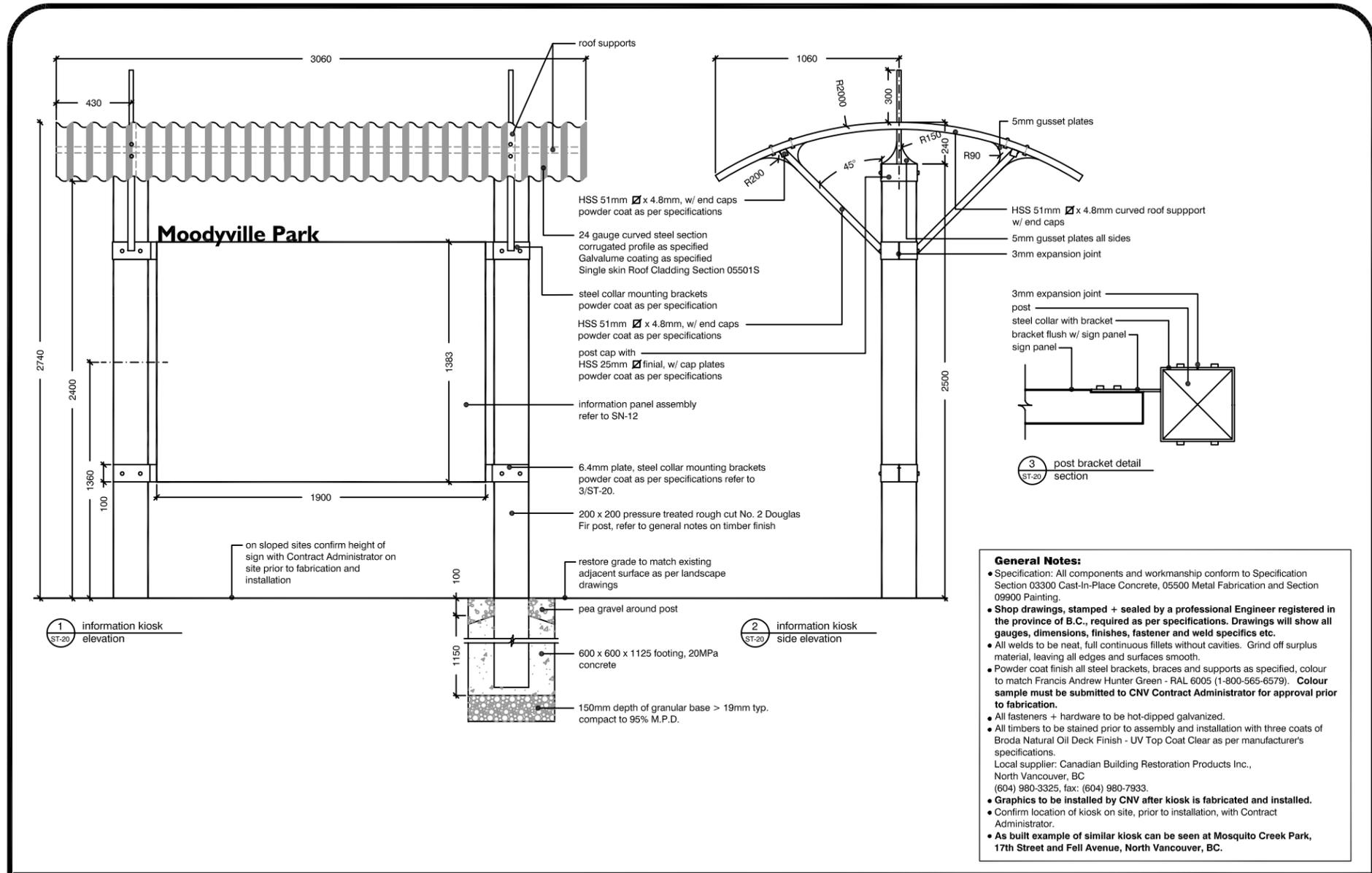
1 garbage receptacle
ST-55 plan

City of
North Vancouver
Parks + Environment



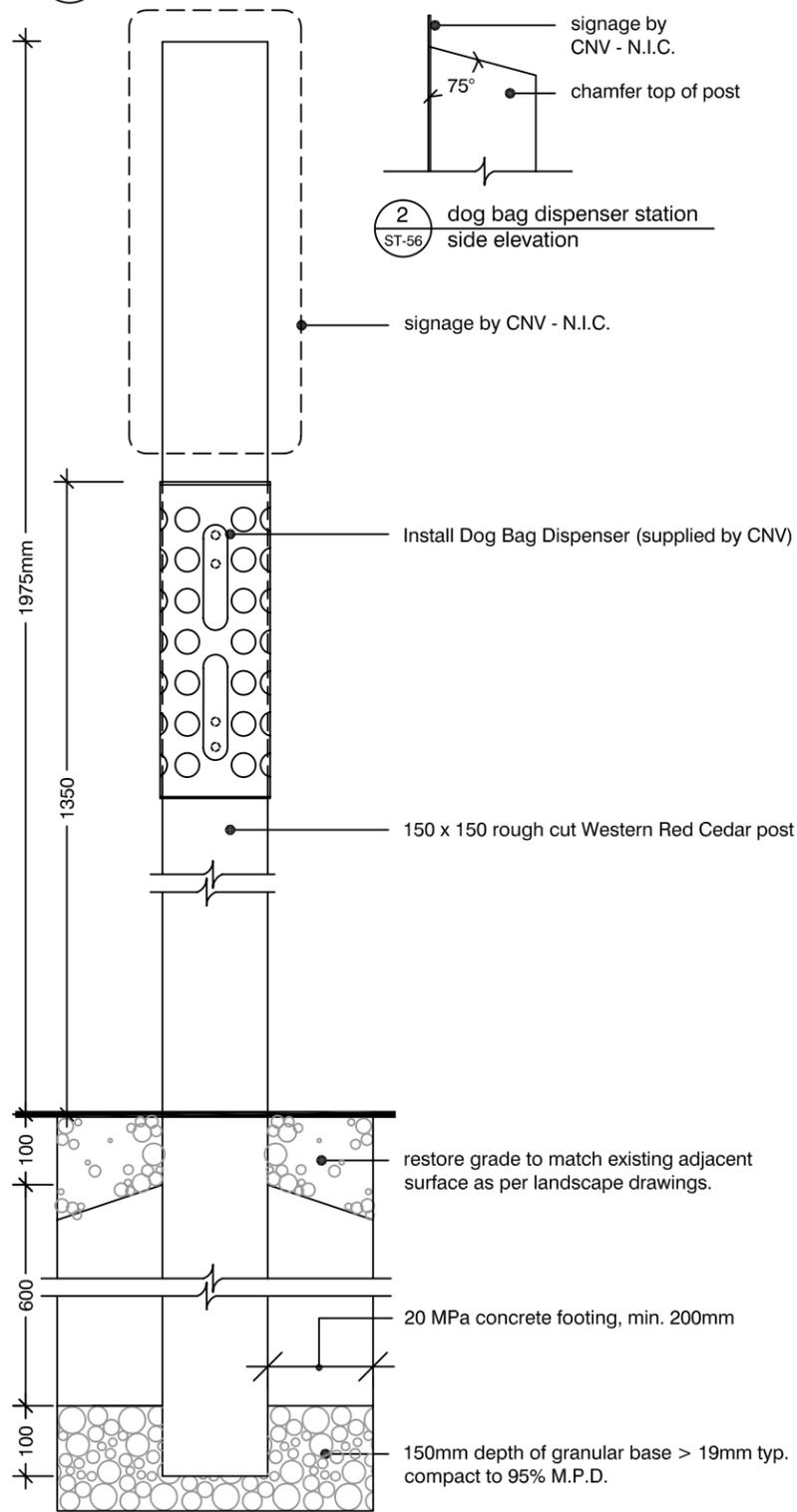
drawing title			revised:	
garbage receptacle node				
designed	drawn	H/D location		
D. Hutch	T. McLellan	t:\...dwgs\Standard Drawings\structures\st_55.dwg		
scale	date	plot scale		
n.t.s.	19 March 2001	.02		

drawing no.
ST-55



City of North Vancouver Parks + Environment 	drawing title			general notes:	
	trailhead information kiosk				
	designed D. Hutch	drawn T. McLellan	H/D location t:\...projects\standdwgs\structures\ST-20.dwg	revisions:	
scale n.t.s.	date 19 July, 2001	plot scale .01	drawing no. ST-20		

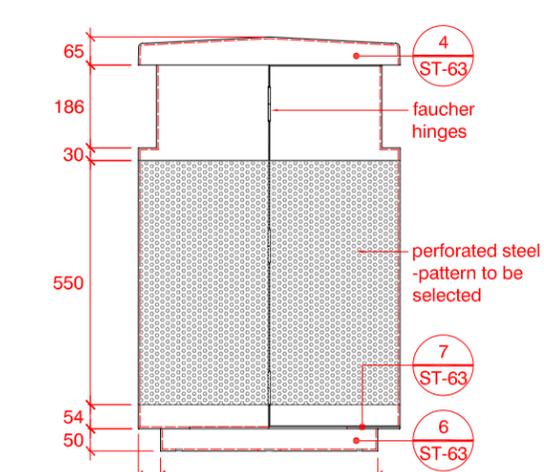
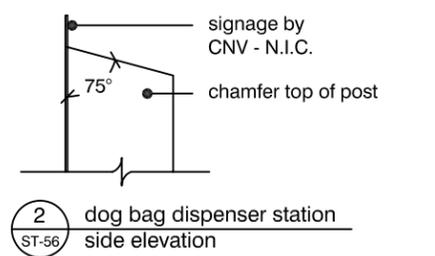
1 dog bag dispenser station front elevation
ST-56



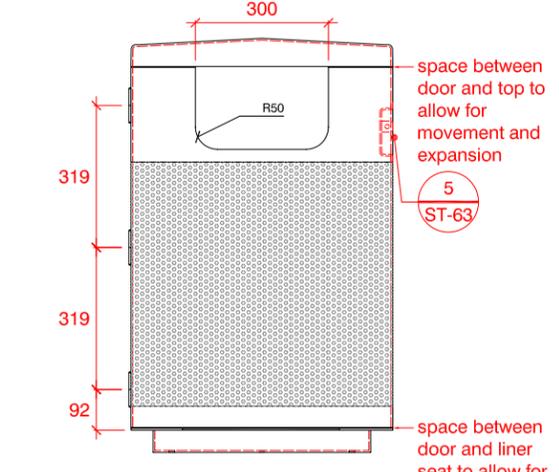
General Notes:

- Specifications: All components and workmanship conform to Specification Section 03300 Cast-In-Place Concrete.
- Before assembly and installation stain all timbers with three coats of Weather Bos Enviro Safe Stain C01 clear, to manufacturer's specifications. Allow stain to dry fully between applications.
- Confirm location on site with CNV Contract Administrator prior to installation.

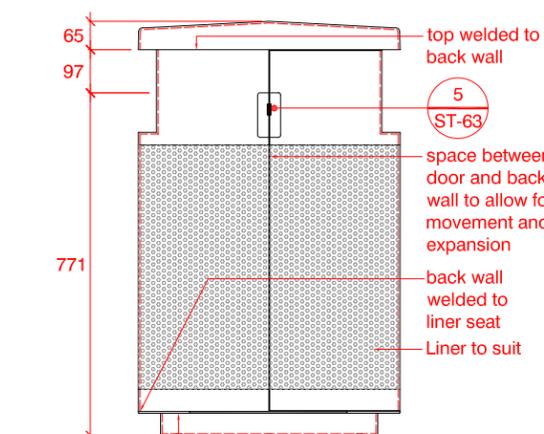
2 dog bag dispenser station side elevation
ST-56



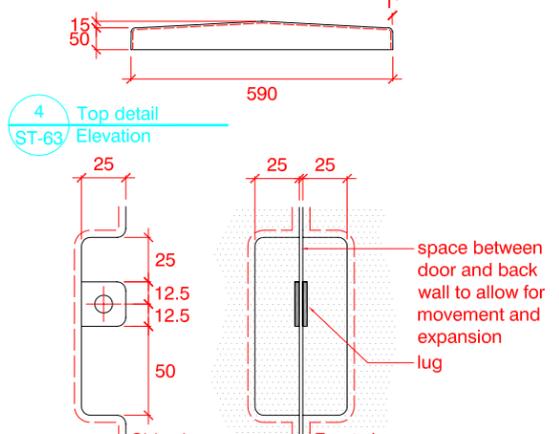
1 Left ST-63 Elevation



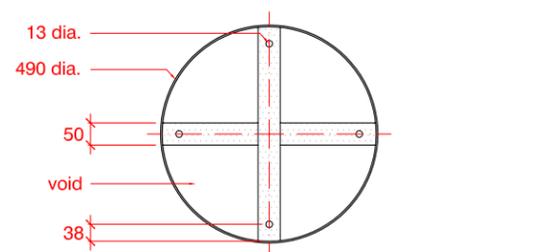
2 Front ST-63 Elevation



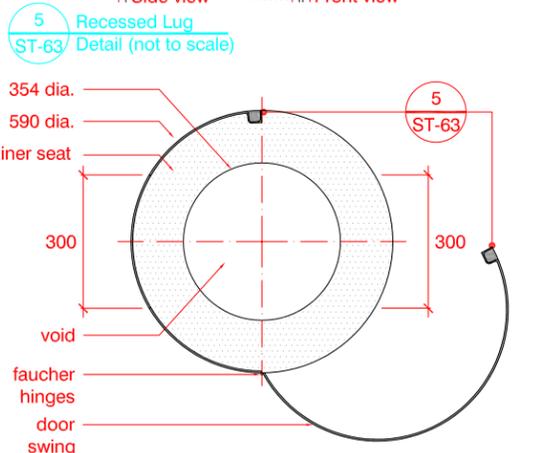
3 Right ST-63 Elevation



4 Top detail ST-63 Elevation



6 Base detail ST-63 Plan



5 Recessed Lug ST-63 Detail (not to scale)

- Notes:
1. Steel grade:
 2. Welding to:
 3. All welds to be ground smooth
 4. Finish: Powdercoat - Hunter Green
 5. Anchors by others
 6. Lock is by others

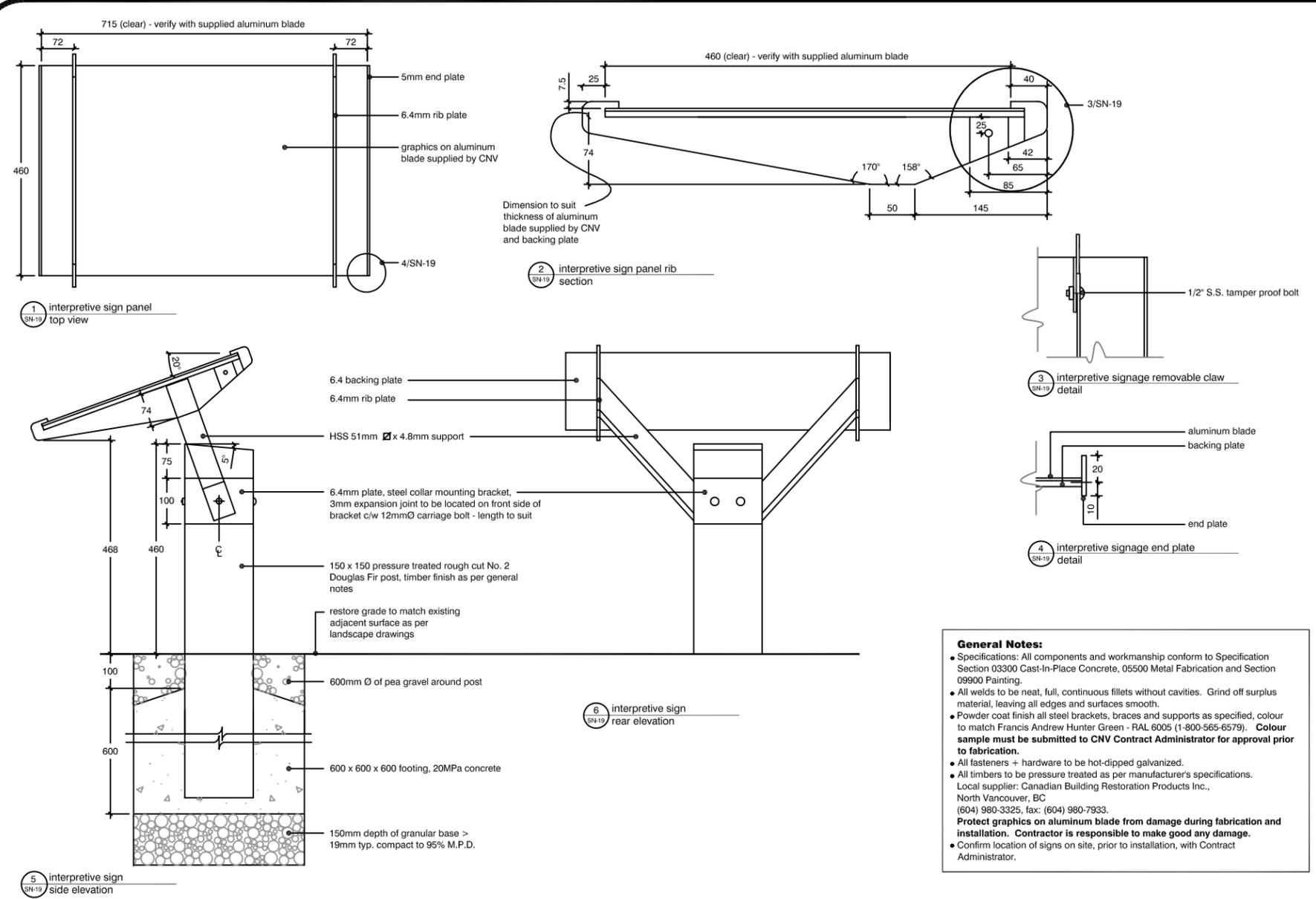
7 Liner seat + body ST-63 Plan



drawing title dog bag dispenser station				drawing no. ST-56
designed D. Hutch	drawn T. McLellan	H/D location t:\...dwgs\Standard Drawings\structure\st_56.dwg		
scale n.t.s.	plot scale .01	date 19 March 2001	revised -	

drawing title CNV Parks Standard Trash Receptacle				drawing no. ST-63
drawn by C. Luff	checked by D. Hutch	H/D location T:\Drawings\Parks\Standard Drawings\Structures\st-63.dwg		
scale N.T.S		date 08 Oct 2004	revised	



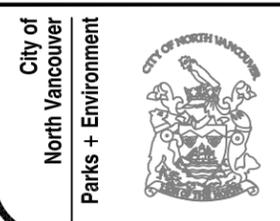


General Notes:

- Specifications: All components and workmanship conform to Specification Section 03300 Cast-In-Place Concrete, 05500 Metal Fabrication and Section 09900 Painting.
- All welds to be neat, full, continuous fillets without cavities. Grind off surplus material, leaving all edges and surfaces smooth.
- Powder coat finish all steel brackets, braces and supports as specified, colour to match Francis Andrew Hunter Green - RAL 6005 (1-800-565-6579). **Colour sample must be submitted to CNV Contract Administrator for approval prior to fabrication.**
- All fasteners + hardware to be hot-dipped galvanized.
- All timbers to be pressure treated as per manufacturer's specifications. Local supplier: Canadian Building Restoration Products Inc., North Vancouver, BC (604) 980-3325, fax: (604) 980-7933.

Protect graphics on aluminum blade from damage during fabrication and installation. Contractor is responsible to make good any damage.

- Confirm location of signs on site, prior to installation, with Contract Administrator.

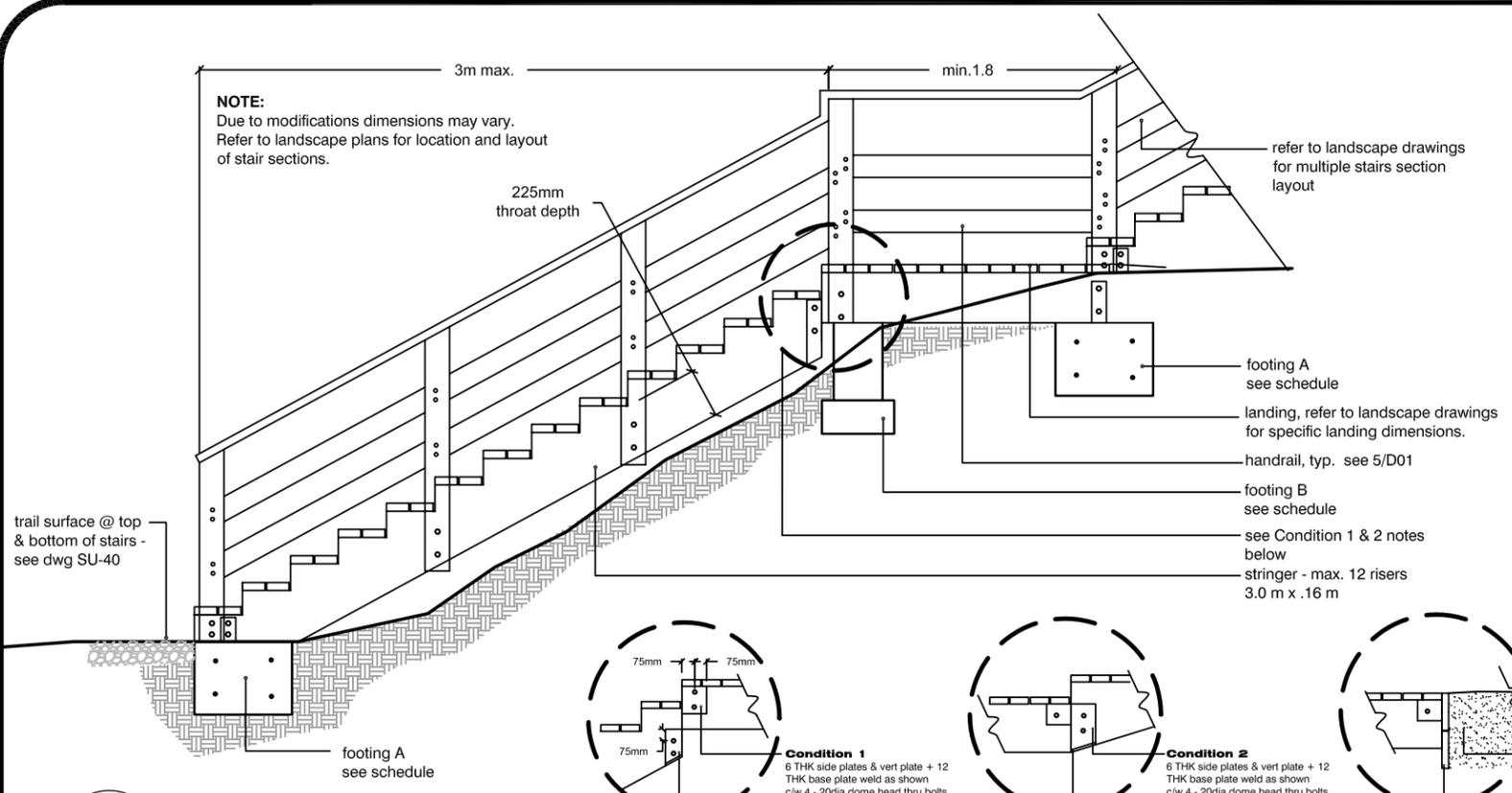


drawing title			
interpretive sign base with post collar mount			
designed	drawn	H/D location	
D. Hutch	T. McLellan	T:\...Standard Drawings\Signage\SN-19.dwg	
scale	plot scale	date	revised
n.t.s.	.02	26 July, 2001	

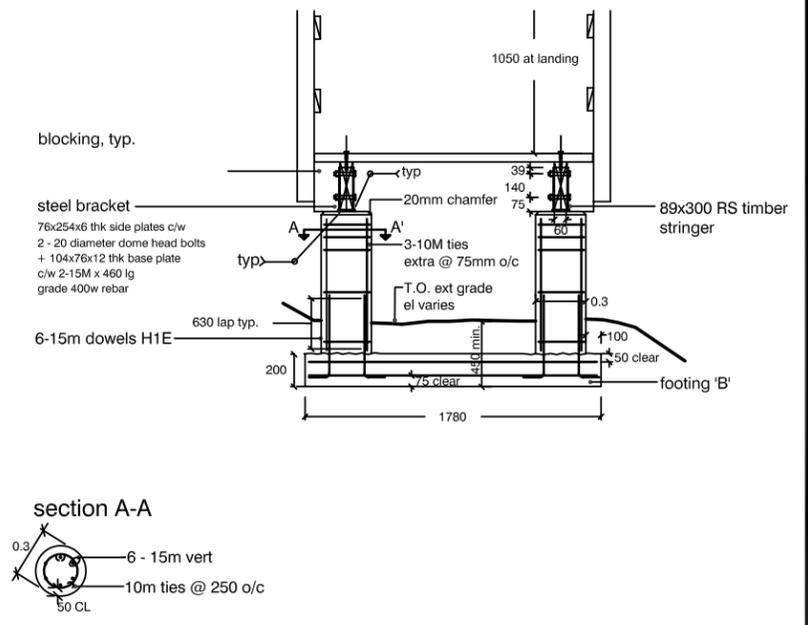
general notes:

drawing no.
SN-19

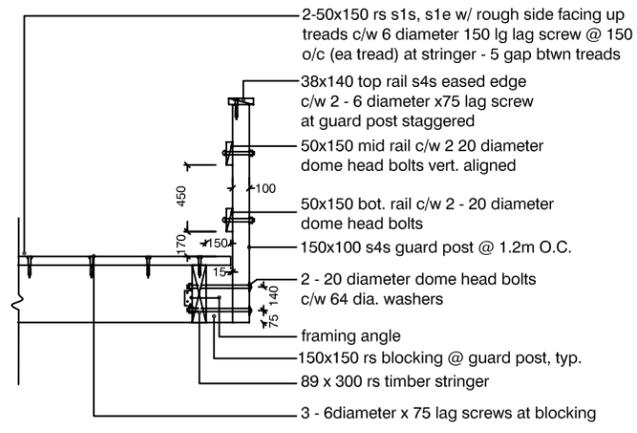




1 Timber stair (typ. section) ST-86 elevation



2 concrete pilaster & footing ST-86 detail scale 1:20



3 typical tread section ST-86 detail scale 1:20

General Notes:

- 1.0 General:**
 - The following notes are **minimum requirements** unless noted otherwise on the drawings.
 - 1.1 Read these drawings in conjunction with the contract specification, if any.
 - 1.2 Read these drawings in conjunction with the project drawings.
 - 1.3 The latest edition of the standards and codes referenced in these notes shall apply.
 - 1.4 Do not scale the drawings. All dimensions shall be confirmed by the General Contractor prior to construction.
 - 1.5 Information on larger scale drawings take precedence over information on smaller scale drawings.
- 2.0 Structural Design:**
 - Design Parameters:
 - a) Ground Snow Load, Ss 2.7kPa(56.2psf)
 - b) Rain Load, Sr 3kPa(6.2 psf)
 - 2.1 Boardwalk Design Live Loads:
 - a) Foot Traffic 4.8kPa(100psf)
 - 3.0 Concrete**
 - mix design to alternative 1:
 - 28 day compressive strength: 25mPa
 - w/c ratio: 0.55
 - air entrainment: 4 to 7%
 - slump: 80 ± 30mm
 - enposure class: F-2
 - cement type: 10
 - 3.1 Ensure all concrete is well consolidated with mechanical vibrator.
 - 3.2 Standard CSA CAN 3-A231
 - 4.0 Construction:**
 - Contractor is responsible for providing temporary support for all building elements against construction loads as work progresses. Temporary support to be designed by a B.C. Registered Professional Engineer as required by Local Building Authorities.
 - 4.1 Protect structural work in adverse weather conditions to approval of CNV Contract Administrator.
 - 4.2 Contractor to compare all design drawings, dimensions and site condition and notify CNV Contract Administrator of any discrepancies prior to proceeding with work.
 - 4.3 Contractor to submit to CNV Contract Administrator in writing all proposed alternated products and structural systems for review and approval.
 - 4.4 Foundations:
 - Foundations are designed for assumed allowable soil bearing pressure of 120 kPa (2500psf) for footing bearing on undisturbed soil.
 - 5.0 Field Review:**
 - Contractor shall notify CNV Contract Administrator **at least 48 hours in advance** for field review of wood framing prior to concealment.

- 6.0 Wood Treatment and Finish:**
 - Beams & decking are to be pressure treated as per 6.1, 6.3
 - 6.1 All structures constructed with pressure treated lumber to be constructed in accordance with CAN/CSA-S406 "Construction of Preserved Wood Foundations".
 - 6.2 All wood members (excluding beams) are to be stained prior to assembly and installation with three coats of Broda Natural Oil deck Finish-UV top coat clear as per manufacturer's specifications. Local supplier: Canadian Building Restoration Products Inc. North Vancouver, BC 604-980-3325
 - 6.3 Preservative Treatment:
 - a) Pressure treat wood members by pressure process in accordance with CSA 080 Series-97 "Wood Preservation" and to "Best Management practices for Use of Treated Wood in Aquatic Environments" (BMPs) developed by the CITW and WWPI. All treating shall occur in a BMP certified treatment facility.
 - b) Preservation to be ACZA to retentions noted below:

Material	Exposure Condition	Retention
Lumber	No contact with ground	4.0 kg/m ³
	Contact with ground/freshwater	6.4 kg/m ³
 - c) PRECUT ALL WOOD MEMBERS PRIOR TO TREATMENT.
 - d) Field treat all wood beam members cut or drilled on site with at least three coats of copper naphthenate.
 - e) Pressure treater shall retain an independent certified inspection company to inspect all timber prior to and after pressure treatment. The inspection company shall verify that all timber was treated in accordance with the BMP's and stamp all acceptable treated lumber with the BMP mark and confirm pressure treatment retention by assay.
 - f) Prior to any construction on site, Pressure treater must submit for approval by CNV Contract Administrator, for all pressure treated lumber verifying that all pressure treated lumber was produced in conformance with the BMP's, the following:
 - a) Grading Certificate
 - b) Certificate of Treatment
 - 6.4 Protect shop finish of heavy timber framing from markings during shipping, storage and installation until building has been closed in. Sand any markings, scuff marks, water stains, etc. to smooth finish.
 - 6.5 Delay applying finish as long as possible to allow maximum drying time for wood members.

- 7.0 Connections**
 - All fasteners, hardware and steel connections to be hot-dipped galvanized in accordance with ASTM A446.
 - 7.1 Steel to be in accordance with CAN/CSA G40.21.
 - Bolts to be to ASTM A307. Bolts and washers to be as follows:

Bolt Size	Type	Nut	Plate Washer
16mm Ø	Economy head bolt with 57mm Ø domehead	Hex	40mm Ø x 5mm thick
16mm Ø	Hex head bolt	Hex	40mm Ø x 5mm thick or as noted on dwgs
 - 7.2 Drift pins: Smooth dowels to conform to ASTM A307 with tapered end. Bore holes 1.5mm less than the diameter of drift pin. Provide drift pin with dome head where indicated.
 - 7.3 Lag screws: To conform to CSA B34. Predrill holes and screw into wood - do not drive lag screw. Install flush with top of wood surface, typical.
 - 7.4 Spikes: Spike to be 6.4mm Ø x 100mm lg common spike spiral shank.
 - 7.5 Shims: Use plastic shims manufactured by Korolath, supplied by Fairwind Construction Products - phone (604) 940-2229.(or approved alternate)
 - 7.6 Double check and retighten all bolted connections prior to enclosing wood framing.
 - 7.7 Supplier shall supply and install (in shop where required) all steel connections between heavy timber to heavy timber.
- 8.0 Timber**
 - All wood to be as follows:

Member	Grade U.N.O.	Finish	Treatment
Decking	DF No. 2	Rough, pressure treated	ACZA
Beams	DF No. 1	Rough, pressure treated	ACZA
Rails/Rail Spacers	S4S Eased Edge	Western Red Cedar, No. 2 or better	Broda
 - 8.1 Install heavy timber in accordance with the Shop Drawings and Supplier's specifications.
 - 8.2 Submittals: Supplier shall provide the following submittals (refer to the Submittals section):
 - a) Layout showing location of heavy timber, bearing conditions and relevant dimensions.
 - b) Detailed fabrication of each member.
 - c) Shop drawings are required for all steel works only(12/L07) and are to be submitted to CNV Contract Administrator and approved prior to fabrication. Shop drawings are to show all dimensions, finishes, gauges, connections, fasteners and weld specifics.
 - d) Quantity of all member types, connections and accessories on a shipping sheet.

Footing Schedule

Type	Size	Reinf. U.N.O.
A	600x1580x450 DP	2 - 15m Top 2 - 15m bot.
B	400x1780x250 DP	2 - 15m top 2 - 15m bot.

- Notes:
1. Centre spread footings under columns U.N.O.
 2. Connectors and reinf dowels to be cast-in-place with footing pour.

drawing title

timber stairs

drawing no. **ST-86**

H/D location T:\Drawings\Parks\Mahon\PhaseII\D-01.dwg

drawn T. McLellan

designed D. Hutch

date July 07 2003

plot scale .02

scale n.t.s.

Parks + Environment
City of North Vancouver

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perience urban journey art
meability culture flexibility
place accessible diversity
reation health cycle run walk
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