



# Side by Side

## A Sociable Arbutus Greenway

HUB Cycling is a charitable not-for-profit that works to make cycling better through education, action and events. We want to get more people of all ages and abilities cycling as this leads to healthier, happier, more connected communities. The provision of safe and convenient routes, such as the Arbutus Greenway, is crucial if we are to make cycling an attractive choice for all.

HUB congratulates the City of Vancouver on the progress made on the Arbutus Greenway project thus far, and provides this document as an overview of our thinking on the plans. It includes

- A vision and values that are meant to represent not only the interests of the 30,000 people that engage with HUB but of all those who will be touched by the Greenway project.
- A list of guiding principles modelled on Council's Guiding Principles for the North East False Creek conceptual plan. HUB has followed the spirit of that document, and borrowed some of Council's language.
- An Appendix (1) addressing the width of the cycling and walking paths that includes estimates of future cycling demand and discussions of conflicts between cyclists and the importance of allowing cyclists to be social.
- An Appendix (2) addressing the temporary path being built once the tracks are removed, before the plans for the new Greenway are developed and built.

### Vision

An Active Transportation Greenway that will delight the citizens of Vancouver and entice the world.

## **Values**

### **Security**

Security means safety and psychological comfort for all the users of the Arbutus Greenway - those who pass along it, those who join it and those who cross it, as well as security for those who linger.

### **Respect**

Respect means mutual respect among all types of users and also non-users who are affected by the development of the Greenway. Respect includes reasonable accommodation to divergent needs and wishes, as well as implying a practice of good faith negotiation and transparent processes.

### **Connectedness**

Connectedness means expanding networks, particularly active transportation networks. The route should include effective links with other transportation modes.

### **Optimism**

The purchase of the Arbutus Greenway is an historic opportunity to create a solid active transportation network, to make communities more liveable, to deepen appreciation of our past and to inspire our future. It will have benefits for the City and the region, including indirect and direct economic benefits. The Arbutus Greenway can become a significant tourist destination and an admired model of urban planning.

## GUIDING PRINCIPLES

### 1. Build to a High Standard

The historic and cultural significance of this land, its public nature, its strategic location, and its economic potential “demands that we build to a high environmental and architectural standard, enriched by public art and high quality landscaping.” (*Rob Grant, professional winner, SPEC All Aboard the Arbutus Greenway design competition in 2004*).

The Greenway should have a consistent look, but also allow community-by-community detailing. Aim high. Do not make plans that would compromise the vision. Our proposed vision is: *An Active Transportation greenway that will delight the citizens of Vancouver citizens and entice the world.*

### 2. Build for Safety

To align with the City’s Vision Zero goal, pay detailed attention to safety in design at each phase. For example:

- Make separate paved bike and pedestrian paths suitable for All Ages and Abilities (AAA), ample in size (5 metres and 4 metres respectively) in the reasonable anticipation of high usage.
- Build well-lit underpasses for the busiest road crossings and control or block car traffic at others.
- Establish long sight-lines for safety and install night lighting throughout.
- Establish spur paths for access to schools, parks and other recreation, and to commercial areas.

### 3. Allow Users to be Social

The Arbutus Greenway will be much more than just a transportation facility. It should invite people to gather, talk, relax, and socialize. It should explicitly provide for side by side cycling in both directions. It should encourage family use, including space for kids in trailers and cargo bikes, tricycles, and mobility scooters. It should encourage use by seniors.

#### 4. Improve Connectivity Throughout the Region

Forge the core of an effective and accessible regional biking and walking network. From the Greenway:

- Go north to the Downtown Peninsula via the Burrard Bridge and a re-invented Granville bridge.
- Go south to Richmond via the Canada Line Bridge.
- Unite East and West with connections to a dozen existing bikeways.
- Fill the gap and set the standard for a Fraser River Passage from UBC to New Westminister (SW Marine, Kent Ave).

Design so that vehicle traffic can flow smoothly across the Greenway.

The Arbutus Greenway is positioned to become *the* most important north-south bicycle route across Vancouver, due to its gentle grades, lack of vehicle traffic, and enormous connectivity to lateral routes and onward destinations.

Make this core potential the first priority for planning, design and implementation.

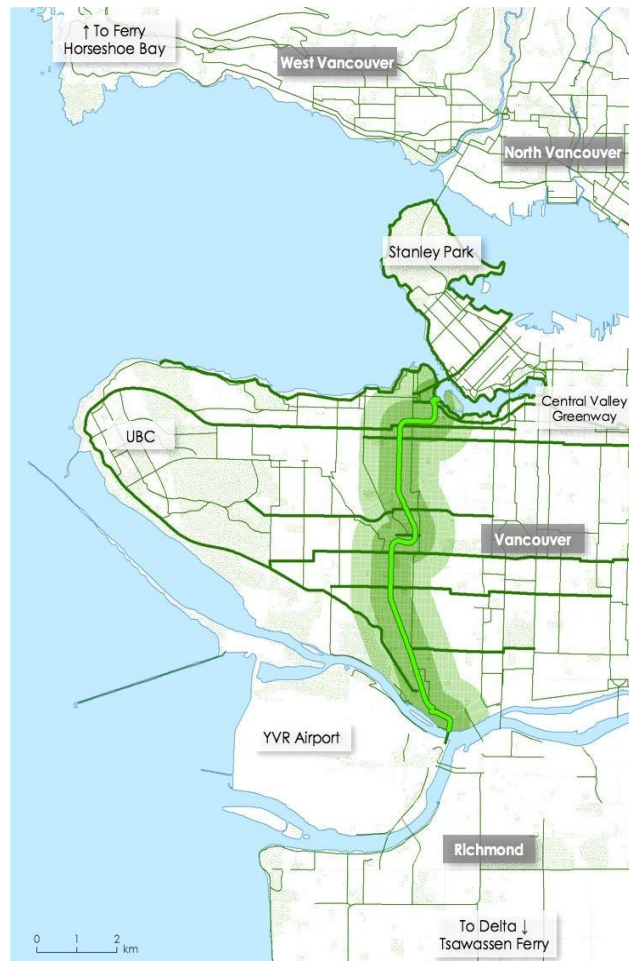


Figure 1 - Arbutus Greenway Network

## 5. Pursue Place-Making Opportunities along the Route

Create a vibrant feature of the Vancouver landscape. The Greenway tracks through eight or more distinct neighborhoods, each with its own character, history and geography. Provide connections to schools, theatres, shopping zones, and community services. Make places that tell stories and engage the passer by. Enable stopping and picnicking places. Develop place themes and colours. Design with *destination tourism* in mind, especially as to connections to the downtown core.

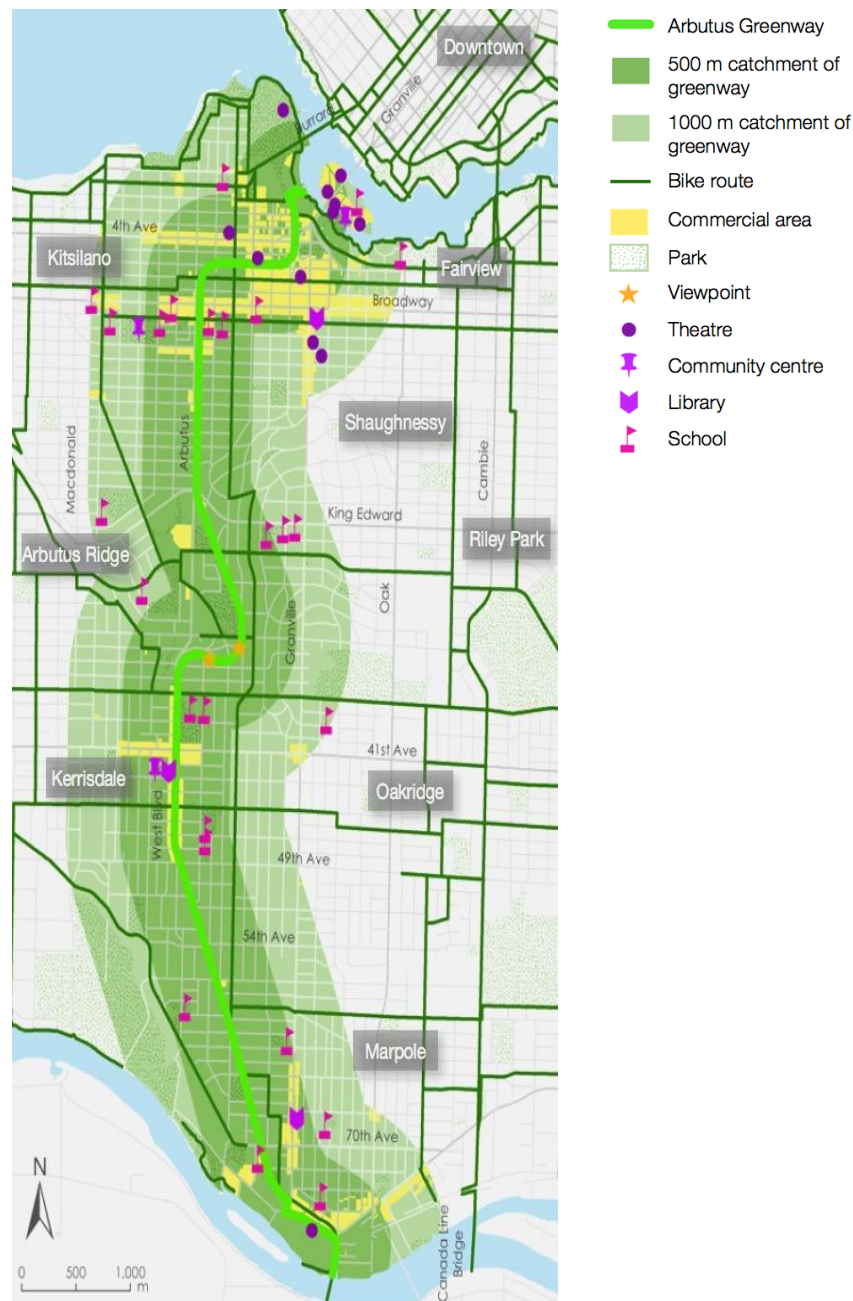


Figure 2 - Arbutus Greenway Places

## 6. Engage Residents and Stakeholders in a meaningful way

Do all of the above while consulting the public and other stakeholders in a meaningful way, at all stages of the planning process, starting with the design of the engagement process and including confirmation of working Principles. Consult community by community along the Greenway on history and community projects and canvass proposals for specific amenities. Consider the model used recently by City staff for the South False Creek Seawall improvements, with a focus group followed by broader public consultation.

Thank you for the opportunity to provide some initial thoughts on this important project, which will have a long lasting impact on the residents of Vancouver and visitors alike. We look forward to opportunities to provide further input as the consultation progresses.

Sincerely

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## Appendix 1

### Wide Enough

Within HUB Cycling there are 10 local committees which possess in-depth knowledge of the cycling infrastructure and needs in their area. Members of these committees stage test rides and route assessments to gain greater understanding of routes and their usage. While they are not traffic engineers, some members of the HUB Vancouver/UBC Committee have compiled the quantitative analysis which proposes suggested path widths and surface materials.

#### **City of Vancouver practice**

With a tape measure in our pocket, members of HUB's Vancouver committee visited many of the bike routes for which the City regularly publishes usage data and then elected three as being relevant to the potential scope of the Arbutus Corridor Greenway development.

**Adanac bikeway** is counted at Union and Hawks, where the width is three metres for a short section through an intersection park. The rest of Adanac is mostly roadway, with a width of approximately five metres. The peak measured midweek volume (averaged over one month) is 4,400 bicycles per midweek day in July, 2015. Adanac is a popular commuter route.

**Burrard Bridge** is a vital commuter and tourism link. The southbound bicycle lane was under construction when we visited, but appeared to be 3.3 metres wide and the northbound cycle lane was approximately 2.0 meters wide. We have observed bicycles on the southbound sidewalk also. The comparable peak volume is 7,100 bicycles per midweek day.

**Science World** is an artery with converging bike routes feeding in from both ends. The width in front of Science World is 4.7 metres, and the peak volume is the same as Burrard Bridge: 7,100 per midweek day.

Also notable, the new **Point Grey Road** bikeway is 4.3 metres wide at the counters. It had a peak volume of 3,500 per midweek day in its first summer. That is less than Adanac but clearly the designers anticipated significant future growth. The new Lions Gate Causeway bike lanes have a combined width (North and South) of 3.75 metres. Lions Gate volume, measured before the lanes were finished, was 2,500 per day.

It would seem from our observations that the Arbutus Corridor Greenway, with its centrality and host of connections, could claim a width of four to five metres based on existing bike infrastructure and demand.

### **Future cycling demand**

We can assume that present-day demand will grow over the years and it may be five years before the main Arbutus Corridor project is up and running. Therefore HUB has made a 10-year planning projection, based on the two-year growth in usage for the three example routes (Adanac, Burrard and Science World). The growth factors (compounding annually) are as follows:

#### Ten Years of Growth in Cycling Demand, by route

	<i>Two years (2013 to 2015)</i>	<i>Ten years (2015 to 2025)</i>
Adanac	1.14	<b>1.91</b>
Burrard Bridge	1.18	<b>2.29</b>
Science World	1.17	<b>2.17</b>

Demand will approximately double in each case. (The actual flows may not increase as much because these routes may become too congested and some volume will shift to adjacent routes.)

Applying the projected growth to the midweek peak flows (which are always larger than the weekend flows) we get a range of projections for peak design flows:

#### Ten-Year Design Flows for the Arbutus Corridor Greenway

	Bikes per day	Bikes per hour at rush hour <sup>1</sup>
Adanac	8,400	1,120
Burrard Bridge	16,200	2,160
Science World	15,400	2,050

If the Arbutus Corridor Greenway was meant only for commuters, Adanac might be an adequate base case. If, as is hoped, the City designs the Arbutus Corridor Greenway to encourage *tourism* and *local leisure* in addition to *commuters*, then Science World, with its 4.7 metre bikeway, is a better base case.

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<sup>1</sup> We use a ratio from Burrard Bridge in 2010, when peak bikes per day were 7.5 times peak bikes per hour. It would be good to have more hourly data, but the ratio is reasonable as it is consistent with two rush hour periods of a few hours each with very low volumes the rest of the day.



But can even the Science World current dimensions accommodate the projected flows?

### Further evidence from the UK

According to the London Cycling Design Standards, the current peak volumes at Science World and Burrard Bridge require **four** metres for a two-way path. Our design demand of 2,000 bikes per peak hour would require slightly more than **five** metres, using the LCDS standard.<sup>2</sup>

### Conflicts between cyclists

What does 2,000 bicycles per hour feel like? At that rate, cyclists riding single-file at 15 km/hr would be separated by an average of 7.5 meters. This is far too close and far too fast! So you would need at least double-file in each direction. A two-abreast bikeway should be 4-4.5 metres wide<sup>3</sup> so, with all the bikes going the same way two abreast at rush hour (worst case), the average separation between cyclists would be about 15 metres. Would that work? Maybe not.

The problem is that not all cyclists go at the same speed, faster cyclists overtake slower ones and slow cyclists are frequently overtaken. Every rider experiences conflicts that can be resolved only by passing or slowing or stopping which can create traffic jams.

It all depends on the distribution of preferred speeds and on what is a safe stopping distance. HUB has done some simplified spreadsheet calculations.<sup>4</sup> For uncoordinated cycling speeds and ordinary abilities, the spreadsheet estimates the average time between encounters for most riders is about 17 seconds<sup>5</sup> for the double lane. That might be manageable – if there is always room to pass. With room for two bikes abreast, people will still have to slow, or walk their bikes or even stop from time-to-time. A bikeway that would allow riders to go three abreast would be a material improvement but would mean a

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<sup>2</sup> Ref: <https://tfl.gov.uk/corporate/publications-and-reports/streets-toolkit#on-this-page-1>

<sup>3</sup> For an example based on observations of actual cyclist behavior see <http://abstracts.aetransport.org/paper/index/id/4448/confid/20>

<sup>4</sup> Two examples. We ignore the effect of perceived stopping distances. In reality, riders will not tolerate a gap smaller than looks safe. Therefore they will pass, slow or stop. This decreases calculated capacity. On the other hand, we assume that rush hour flows are unidirectional in the direction of the commute. In fact, some of the flow will be counter flow, which will increase calculated capacity. These two largish errors are offsetting, but not completely so.

<sup>5</sup> That is the average time for riders who ride at the most popular speed. “Fast” riders and “slow” riders will have more encounters. We optimistically set the ‘popular’ speed at 4 metres per second, or 14 km/hour. If the popular speed is lower, riders will have to ride closer together to achieve 2000 per hour. That may not be possible.

cycleway more than 6 metres wide.<sup>6</sup> However, there are stretches of the corridor where the space available is no more than eight metres for both bikeway and footpath -- in particular, the northern slope up to Arbutus Ridge, which is narrowed by expensive-to-bury hydro lines.

We see several approaches. Firstly, the path could encroach on the pedestrian way, which is proposed to be three metres wide. Or, bike lanes could be developed on parallel roads (West Boulevard and East Boulevard for example) which fast riders might anyway prefer. A third option is to make the bikeway extra wide where there is room, to allow congestion to clear. Or, riders may use the oncoming lane to overtake which could often work since counter flow will be much smaller than rush hour flow -- but there is an extra crash risk. An additional problem is road crossings. Underpasses are proposed for major roads, but stops will be needed from time-to-time at minor roads, creating backups of either cyclists or motorists.

HUB has observed that Science World is already very busy at peak hours, with frequent slowing and overtaking by faster riders. If demand were to double, fast riders would migrate to Quebec Street, which runs parallel, and there would doubtless be other adjustments.

However, it seems clear that achieving the vision of creating a transportation corridor that will meet the aspirations of Vancouver citizens will be a significant (but worthwhile) challenge.

### **The importance of being social**

Cycling two abreast is a comfortable and sociable experience and, as the City wants this to be a showpiece of how well a Greenway can be done for cycling we recommend a path that encourages this to happen in both directions. Setting aside all of the possible calculations, the ability to ride side-by-side is an inherent characteristic of a successful cycle path.<sup>7</sup>

Note that two riders riding as a couple block a double lane -- unless one of them drops back or spurts ahead to convert momentarily to single file when requested by an overtaking rider. In real life, this is a normal adjustment.

### **The bottom line**

The bottom line from the evidence is that the path should be six metres or more where space permits and five metres minimum where space is constrained.

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<sup>6</sup> For example see <http://abstracts.aetransport.org/paper/index/id/4448/confid/20>

<sup>7</sup> The Netherlands designs this characteristic into many of its cycling paths. See <http://tinyurl.com/jp2hg82>

## Appendix 2

### The Temporary Path

Consultations, planning, design and construction of the main project will take some time, probably several years, and HUB supports the City's plans to build a temporary path as soon as possible. A temporary path will provide valuable interim transportation services, as well as stoking public enthusiasm and informing and inspiring the design process. Our recommendations, which are outlined below, rest on Guiding Principles 1 through 3 (Building well, Safety, Sociable).

#### Collecting data

The Temporary Path will provide concrete data on actual and projected use all along the Greenway. Counters, similar to those used at the Burrard Bridge, should be installed at each major intersection to determine hourly and daily cyclist volume. Usage data will also illuminate the impact on the bicycle network with which the Greenway will connect.

#### Safety

A wide-enough cycleway that attracts many users at the outset will make all riders and walkers more secure - a particular benefit and attraction for more vulnerable users. Both the cycling and pedestrian paths should be paved as this will make the Greenway safer and more comfortable, as will early attention to the design of street crossings. Making the Greenway safe from the start is a concrete action that supports Vision Zero for the City of Vancouver and it will be the first step in building the reputation of the Arbutus Greenway.

Furthermore, proper sizing and paving will make usage data from the temporary path more helpful in designing the main project. If the temporary path is undersized or unpaved, it will attract fewer people and this, in turn, could lead to under-estimation of future demand.

For these reasons, it would be a great advantage to build a full-size temporary path, paved, with a width of at least five metres, as discussed in Appendix 1. Even along its narrowest portion (the slope up to Arbutus Ridge) there is room for a five metre cycle path and a three metre pedestrian path without disturbing the existing hydro right of way.