

An aerial photograph of the Nanaimo Waterfront Walkway. The walkway is a paved path with a red brick border, lined with green hedges and trees with autumn foliage. It runs along the waterfront, with a large white building and a tall apartment building in the background. The water is blue, and several boats are docked at the piers. The sky is clear and blue.

Nanaimo Waterfront Walkway Implementation Plan

December 2017



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1. SETTING THE STAGE

The City of Nanaimo is a waterfront community on the east coast of Vancouver Island with a population of over 90,000. The natural beauty of Nanaimo's waterfront forms the backbone of the community, bringing residents and tourists together to experience one of the City's greatest assets. The waterfront is a commercial and industrial hub with shipyards, fishing docks, marinas, yacht clubs, and ferry and plane terminals. The area provides employment and integrates residential and recreational uses to create an active and vibrant waterfront.

Nanaimo and its surroundings are part of the ancestral home of a migratory Coast Salish people, the Snuneymuxw. The Snuneymuxw – meaning “The Great People” in the Hul’qumi’num language – lived in several waterfront villages along Nanaimo’s shores from Departure Bay to Newcastle Island, where they found abundant food, fresh

water and winter shelter. Great cedar-planked longhouses were constructed in various locations along this stretch of Nanaimo's waterfront, from the Nanaimo River Estuary to Departure Bay. The proposed Waterfront Walkway will travel through these important Snuneymuxw village sites and it will link present-day parks, shipyards, marinas, transportation terminals and residential developments.

The importance of the Waterfront Walkway has been recognized by Council and the community, with the expansion of the existing walkway highlighted as a key priority in the Transportation Master Plan, OCP, and the 2016–2019 Strategic Plan Update.

This Waterfront Walkway Implementation Plan will be used to expand and improve upon the existing sections of walkway that were built incrementally over the last 30 years.

The plan provides for a continuous multi-use pathway from Departure Bay south 13km to the Nanaimo Estuary that will be enjoyed by pedestrians and cyclists, fitting in with adjacent neighbourhoods and respecting coastline constraints.

This Implementation Plan was prepared through collaboration with community members, key stakeholders, experienced professionals, and City staff to ensure the goals and desires of all are considered.

Technical aspects of the project involved a review of the guiding policies and existing conditions for each pathway section, preparation and evaluation of options, and refinement of the options with community and City input. The result will lead the way to a Waterfront Walkway that is the centrepiece of a thriving and sustainable community.

1.1. Project History

The existing waterfront walkway has been built over the past 30 years with a variety of stakeholders developing the walkway; including contributions by the Nanaimo Port Authority, the City of Nanaimo, private land owners and local service clubs.

To date, 4.5 km of trail have been built to varying standards and widths with several sections only built to interim widths of 2.5m to 3m. The construction of the walkway has been focused around the downtown core and along Newcastle Channel.

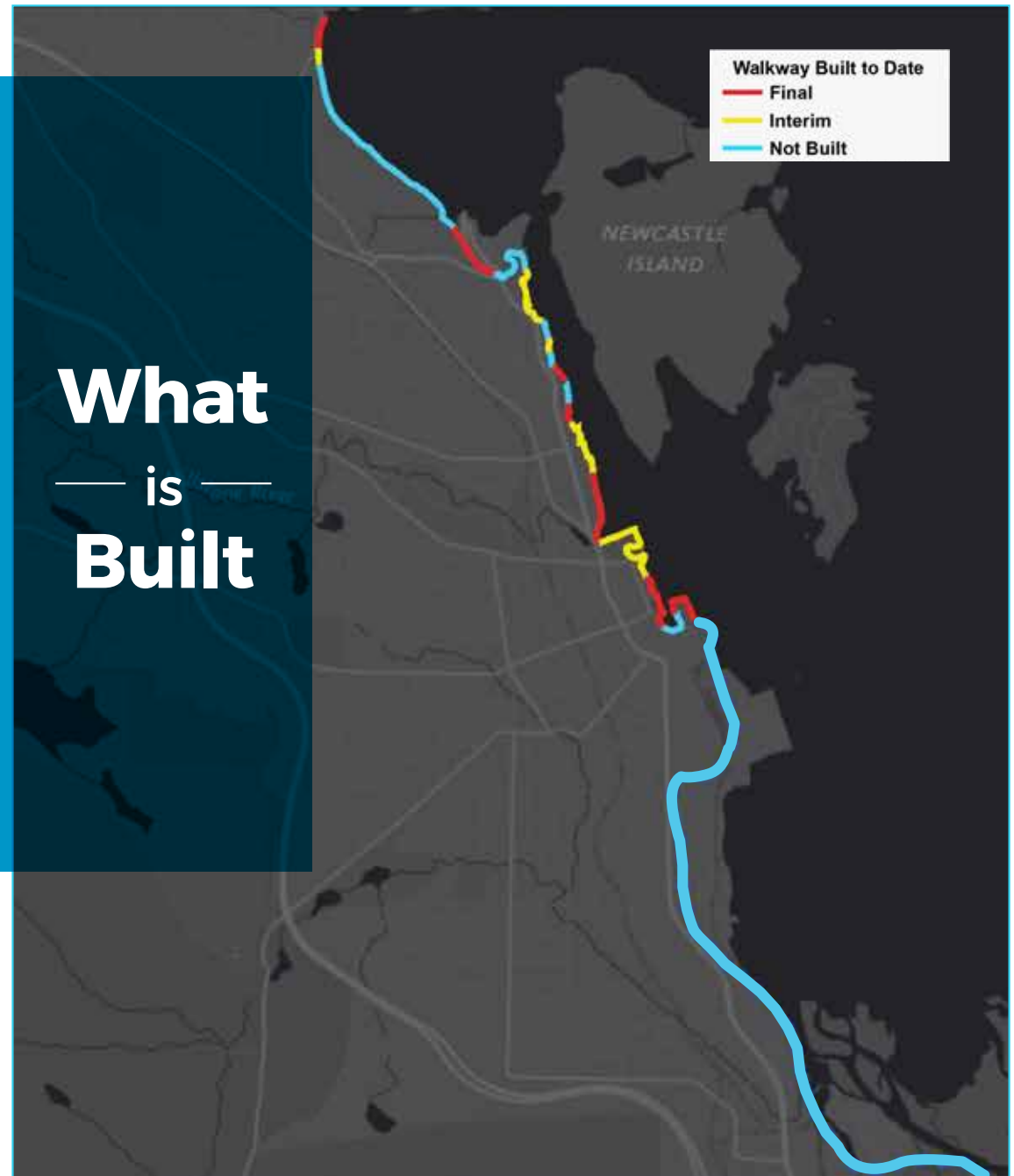
City Council identified a vision for a 'continuous, uninterrupted and accessible trail from Departure Bay to the Nanaimo River Estuary in the 2012–2015 Strategic Plan.

The vision was again identified as a priority in the 2016–2019 Strategic Plan Update with the walkway identified as one of five key capital projects in the plan.

In the fall of 2016, Council provided direction for staff to develop an Implementation Plan that would provide advice on the overall 13km walkway alignment, consider phasing and provide a cost estimate for each section.

In addition, Council identified five priority areas for investment in 2018/2019 that will act as a catalyst for the plan and build momentum for the project.

What — is — Built



The Vision is to create

“a continuous walkway from Departure Bay Beach to the Nanaimo Estuary.”

1.2. Goals & Objectives

By following the guidance of these goals and objectives, this Plan ensures it is aligned with the vision of the City of Nanaimo and will allow the City to connect all 13kms of the pathway by 2027.

Iconic Distinctiveness

Design the Waterfront Walkway with recognition of its important role in the City.

Brand the Waterfront Walkway with a unique name and graphic identity.

Protect view corridors to the waterfront to increase awareness of the walkway.

Incorporate local public art that recognizes and celebrates Nanaimo's uniqueness.

Integrate First Nations and local history into the design of features and interpretive elements.

Public Access & Use

Maximize opportunities for public access to and use of the Waterfront Walkway

Design wayfinding signs and elements that draw attention and use to the Waterfront Walkway.

Make the Waterfront Walkway continuous, uninterrupted and as accessible as possible.

Provide infrastructure to make use of the Waterfront Walkway comfortable and enjoyable.

Design the Waterfront Walkway for use by all ages, abilities and human-powered modes.

The Walkway is intended for use by recreational cyclists only. Consideration is being given to providing commuter cyclist facilities on parallel roads closely following the walkway.

Provide connectivity to existing and proposed pedestrian and cycling facilities as well as to existing and future transit services.

Marine Employment

Support businesses that rely on the waterfront for marine industries, transportation connections, entertainment, and tourism.

Recognize the needs of industry, including access between the water and the shoreline for heavy equipment.

Improve public access to and awareness of commercial operations targeted towards the public.

Recognize the Waterfront Walkway's important role in promoting tourism as an economic benefit.

Provide interpretive information that helps the public understand maritime industry.

Habitat & Archaeological Protection

Protect and enhance the marine habitat.

Minimize disturbance of sensitive marine and associated terrestrial habitats.

Manage steep slopes to minimize the potential for erosion.

Enhance marine and associated terrestrial habitat values along the Waterfront Walkway.

Protect archeological sites.

Sustainability

Plan and design the Waterfront Walkway to respect Nanaimo's goal of becoming a more sustainable community.

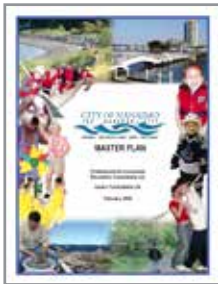
Build the Waterfront Walkway to reduce auto dependency.

Design the Waterfront Walkway to promote outdoor fitness, recreation and social connections.



1.3. Existing Policy Support

Existing City policies have helped guide the implementation of Nanaimo's existing waterfront walkway and have been considered throughout the development of this Plan. These policies include:



TRAILS, RECREATION
AND CULTURE
MASTER PLAN
(2005)



TRAIL
IMPLEMENTATION
PLAN
(2007)



PLANNANAIMO
(OFFICIAL
COMMUNITY PLAN,
2008)



SOUTH DOWNTOWN
WATERFRONT
INITIATIVE
(2013)



NANAIMO
TRANSPORTATION
MASTER PLAN
(2014)



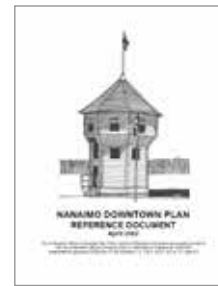
STRATEGIC PLAN
(2016-2019 UPDATE)

1.4. Neighborhood Plan Support

The following existing Neighbourhood Plans of adjacent neighbourhoods have also been considered in the development of the Waterfront Walkway Implementation Plan.



CHASE RIVER
NEIGHBORHOOD
PLAN
(1999)



DOWNTOWN PLAN
(2002)



DEPARTURE BAY
NEIGHBORHOOD
PLAN
(2008)



SOUTH END
NEIGHBORHOOD
PLAN
(2010)



NEWCASTLE
AND BRECHIN
NEIGHBORHOOD
PLAN
(2011)

Key Common Themes

The following key themes associated with the Waterfront Walkway are found in each of the guiding documents reviewed.

Waterfront is a
Priority

Healthy and
Sustainable
Community

Pedestrian and
Cycling Friendly

Connected Trail
Network

Comfortable,
Convenient and
Accessible

2. STRATEGIC FRAMEWORK

2.1. Existing Conditions and Opportunities

The existing waterfront walkway has been developed by a number of parties over the past 30 years. Without a plan in place, the walkway has developed organically resulting in a discontinuous patchwork of trail sections with varying widths that do not meet current needs.

This section of the report lays out the existing conditions, issues and opportunities.

Figure 1 highlights existing path widths, surface type, existing trail users and types of amenities. Building new sections of waterfront walkway to eliminate gaps and improve/expand continuity will increase the use of the walkway significantly.

In addition, the variety of walkway materials, widths and conditions poses a challenge for accessibility and maximum enjoyment of the walkway by the entire community.

Crime Prevention Through Environmental Design (CPTED) principles consider treatments and amenities that help establish safer facilities which can increase use and enhance the user experience.

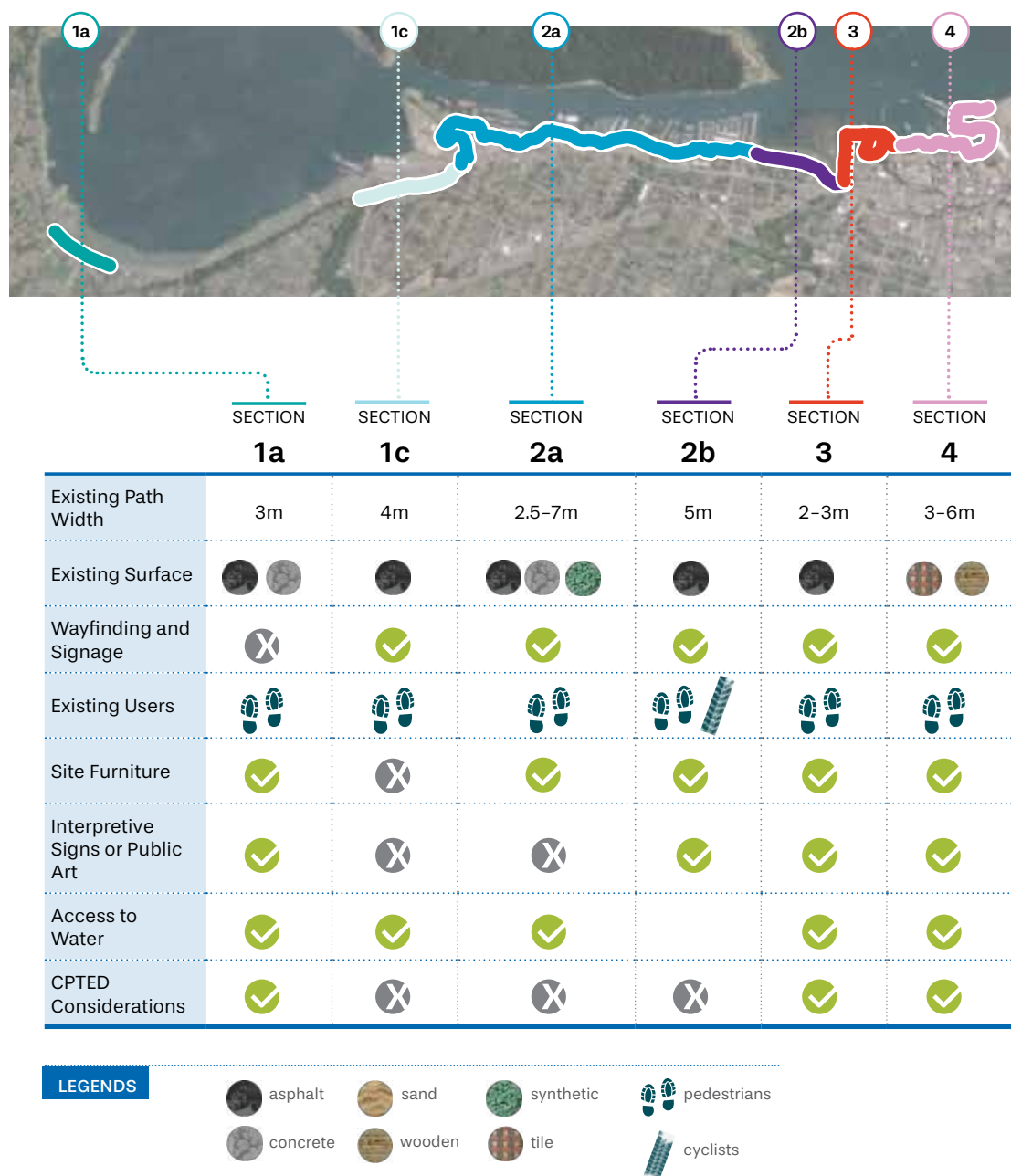


Figure 1. Existing Walkway Conditions and Treatments

2.2. Summary of Geotechnical and Environmental Conditions

A technical review of the existing conditions with respect to the Geotechnical and Environmental conditions was undertaken to provide guidance to the planning and design of the waterfront walkway.

High level geotechnical and environmental assessments of the interim and unbuilt segments of the walkway have been completed to provide input on the alignment and design options for the planned segments.

The geotechnical review identified soil and site conditions are highly variable along the walkway alignment.

Additionally, a geotechnical memo outlining the recommended seismic design philosophy for the type and design of structural sections of the walkway was also completed.

Considerations will need to be made for slope stability of the foreshore along Departure Bay, abandoned mine shafts and entrances located in near proximity to several locations along the proposed alignment, condition and thickness of fill material used in reclaiming coastal land, and condition of existing rip-rap foreshore slopes.

The environmental review identified environmentally sensitive areas along the existing and proposed sections of the walkway that will need to be considered during the design, permitting and implementation of the walkway. Concerns vary from second growth forest and the riparian zone found along the Departure Bay section to sensitive tidal wetlands that support fish and wildlife habitats south of the Nanaimo Port assembly wharf, continuing to the Nanaimo River Estuary.

A summary of geotechnical and environmental conditions identified is shown in Figure 2.

These high level reviews are intended to identify possible considerations that will influence the design and implementation of each section of the walkway. Further detailed studies will be required for each section during engineering design.

These desktop assessments and seismic memo are included for reference in **Attachment D** and **Attachment E**.

2.3. Design Guidelines and Best Practices

A review of relevant guidelines and best practices applicable to multi-use paths, bike lanes, and walkways highlighted the different requirements for different facility types as seen in the following table. Other relevant design guidelines were reviewed and compared against Nanaimo's guidelines. This review verified that Nanaimo's standards meet or exceed other standards and their application will result in a comfortable recreational facility.

A typical multi-use path is between 3.0–8.0m with a preferred width of 6.0–7.0m. Considerations for the surface type and structure of the facility should be considered when determining the best width for each location.

The report included as **Attachment C** provides a summary of the Best Practices review undertaken to support the development of this Implementation Plan.

The Nanaimo Waterfront Walkway is intended for safe and enjoyable use by pedestrians and recreational cyclists. To accommodate this multi-modal use, a nominal width of 7.0–9.0m is proposed, which provides adequate space for both pedestrians and recreational cyclists and includes a buffer to separate these uses and provides the space needed to incorporate the various amenities that were requested by the public during the community engagement process. The width in some limited segments of the walkway are constrained by property or environmental features.

The varied design standards applied to the built sections to date are generally consistent with best practices. However, it is evident that the use, and surrounding environment play a significant role in selecting facility type and width to best meet the needs of the users and to create an inviting space for users to interact with.

City of Nanaimo Design Reference Documents

Reference Document	Multi-Use Width Guidelines	
City of Nanaimo Trail Implementation Plan	Harbourfront Walkway	6.0 m – 8.0 m
	Urban Hard Surface Trail	3.0 m – 4.0 m
	Urban Soft Surface Trail	3.0 m
Plan Nanaimo (OCP)	Pedestrian Corridor	3.0 m
Muffeo–Sutton Park Improvement Plan (2016)	Pathway Width	6.0 m – 9.0 m
Newcastle + Brechin Neighbourhood Plan	Separated Pathway	7.0 m

Summary of Geotechnical and Environmental Considerations

GEOTECHNICAL

ENVIRONMENTAL

SECTION 1 Departure Bay	<ul style="list-style-type: none"> » Slope instability and erosion of steep Cilaire Bluffs » Loose marine sediments » On-going erosion action at shoreline » Sections of reclaimed land with variable thickness & quality of fill materials (Battersea Road) 	<ul style="list-style-type: none"> » Northfield Creek riparian zone contains identified plant community » Departure Bay supports eelgrass beds which lie offshore of the proposed route » Modified rocky shorelines support shore type fish habitats and marine biobands » Second Growth Forest along Cilaire Bluff is a designated ESA (Environmentally Sensitive Area)
SECTION 2 Newcastle Channel	<ul style="list-style-type: none"> » Sections of reclaimed land with variable thickness & quality of fill materials » Abandoned coal mine workings below north section 	<ul style="list-style-type: none"> » Modified rocky shorelines support shore type fish habitats and marine biobands » Riparian zone and floodplain of Millstone Creek provide sensitive habitat
SECTION 3 Maffeo Sutton Park	<ul style="list-style-type: none"> » Sections of reclaimed land with variable thickness & quality of fill materials » Abandoned coal mine workings below sections 	<ul style="list-style-type: none"> » Modified rocky shorelines support shore type fish habitats and marine biobands
SECTION 4 NPA Boat Basin and Cameron Island	<ul style="list-style-type: none"> » Sections of reclaimed land with variable thickness & quality of fill materials » Highly weathered bedrock bluff at Cameron island » Existing rip rap facing on foreshore in NPA Boat Basin » On-going erosion action at shoreline 	<ul style="list-style-type: none"> » Modified rocky shorelines support shore type fish habitats and marine biobands
SECTION 5 Gabriola Ferry Terminal and South Downtown Waterfront	<ul style="list-style-type: none"> » Sections of reclaimed land with variable thickness & quality of fill materials » Abandoned coal mine workings below sections » Existing rip rap facing on foreshore » On-going erosion action at shoreline 	<ul style="list-style-type: none"> » Modified rocky shorelines support shore type fish habitats and marine biobands
SECTION 6 South Downtown Waterfront to Nanaimo Estuary	<ul style="list-style-type: none"> » Loose and/or organic deposits in the estuary » Hard soils with shallow and/or exposed bedrock » Abandoned coal mine workings below sections » Abandoned coal mine shafts recorded in area 	<ul style="list-style-type: none"> » Tidal wetlands provide sensitive fish & wildlife habitats » Chase River riparian zone & floodplain provide sensitive habitats

Figure 2. Geotechnical and Environmental Considerations for Each Section

Successful Walkways in Other Cities

The images on this page provide examples of waterfront walkways in other locations in BC. These examples showcase the features and amenities of well planned and well used walkways and represent some best practices that can be applied to Nanaimo's Waterfront Walkway.

The Seawall Vancouver, BC



Waterfront Promenade Kelowna, BC



Middle Arm Trail and Waterfront Greenway Richmond, BC



Peachland Waterfront Walkway Peachland, BC



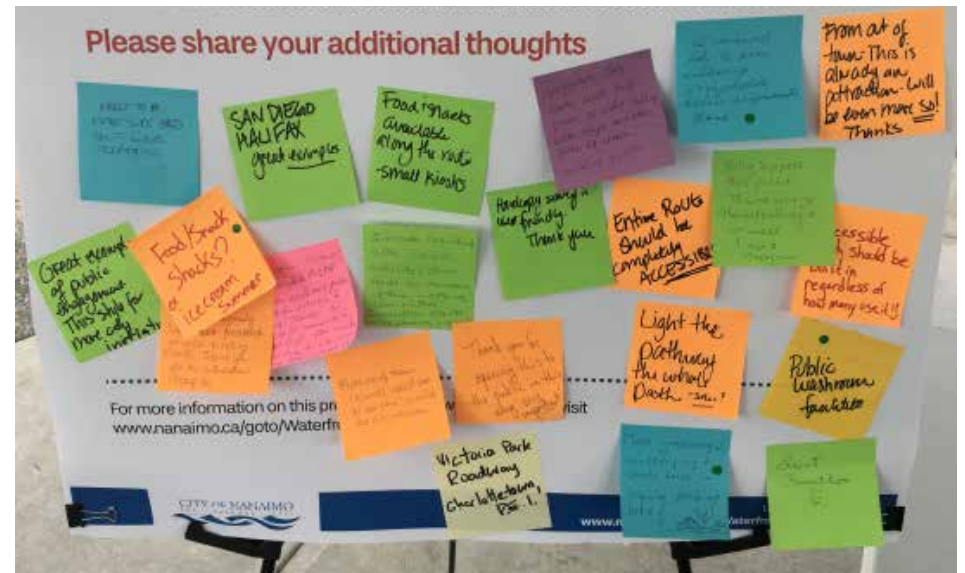
Steveston Greenways Richmond, BC



3. COMMUNITY ENGAGEMENT

At the start of the project, City Council provided the vision of a continuous waterfront walkway from Departure Bay to the Nanaimo River Estuary. The details, such as what the walkway may look like, how it would be used and what sections are priority for investment, were left to the community. Through a series of stakeholder meetings, public open houses, surveys and a design workshop, the City has seen one of its largest public consultation processes.

This section presents the community engagement process undertaken in the development of the implementation plan and summarizes the feedback provided by the public and stakeholders as the project advanced.



3.1. Stakeholder Meetings

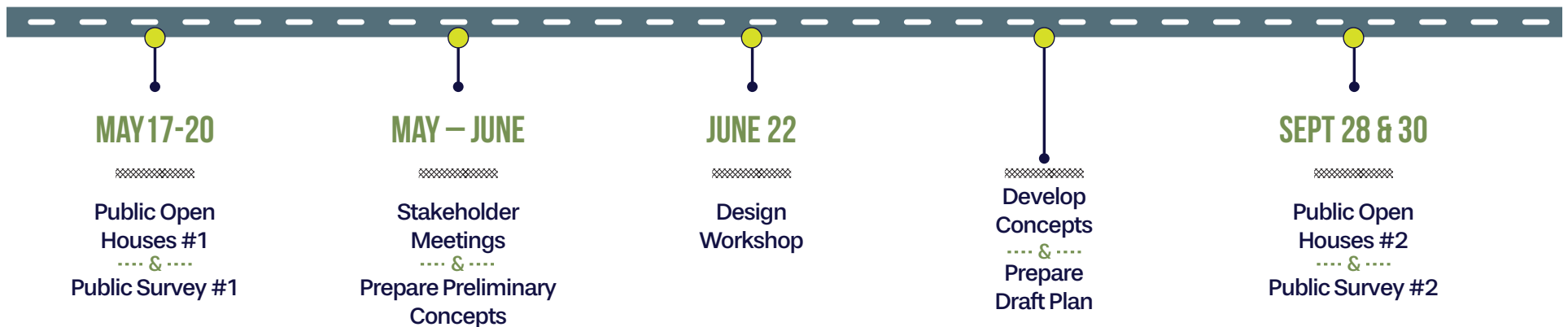
Between May and June, City Staff met with the following stakeholders to discuss the project, the issues and opportunities:

- » Province of BC – Forest Land and Natural Resource Operations
- » Province of BC – Ministry of Transportation and Infrastructure
- » Nanaimo Port Authority
- » Regional District of Nanaimo
- » BC Ferries
- » Island Corridor Foundation
- » Southern Rail
- » Private land owners
- » Departure Bay Neighbourhood Association
- » Newcastle/Brechin Neighbourhood Association
- » South End Neighbourhood Association
- » Chase River Neighbourhood Association

Some of the key messages from these stakeholder meetings included the following:

- » BC Ferries is supportive of working with the City on both the Departure Bay and Gabriola Ferry Terminal.
- » In Departure Bay, the walkway could be built adjacent to the RDN sanitary main as long as the design and construction does not impact the sewer and provided that future access for maintenance and construction is maintained.
- » Stewart Avenue provides an opportunity to divert commuter cyclists away from the recreational use of the walkway.
- » The properties on the Newcastle Channel are subject to lease agreements with the Province and Nanaimo Port Authority. Development of the walkway in these areas requires cooperation between the parties.
- » There is an opportunity to tie the existing walkway into other key pedestrian routes such as the Millstone Greenway, E&N Trail and the Parkway Trail.
- » The City can work with Southern Rail to advance rail/trail discussions in the southern area of the City of Nanaimo.
- » Community groups are supportive of the project as it provides an amenity to their neighbourhood and connects them to the rest of the City along the waterfront.

Timeline of the Public Engagement Process



3.2. Project Open Houses



An initial set of open houses was held in May 2017 to present the overall concept to the public. At this stage in the process, no set ideas or concepts were presented. The goal was for the public to provide feedback on their priorities, concerns and views of the project.

A second set of open houses was held in September 2017 to present the draft plans and details to ensure the material was consistent with the previous feedback received.

Over 1000 community members attended the five events and provided valuable feedback to help shape the project. The open house display boards can be found in **Attachment A**.

— Open Houses #1 —
MAY 17 & 20 Kin Hut
MAY 18 Maffeo Sutton Park

— Open Houses #2 —
SEP 28 Kin Hut
SEP 30 Maffeo Sutton Park



3.3. Public Surveys



As part of the open houses held in May, a survey was available for residents to provide further input on a variety of key items such as existing use of the walkway, priority for implementation of future sections and the key features people hope to see incorporated into the walkway. The information was used to help inform the options that were developed over the summer.

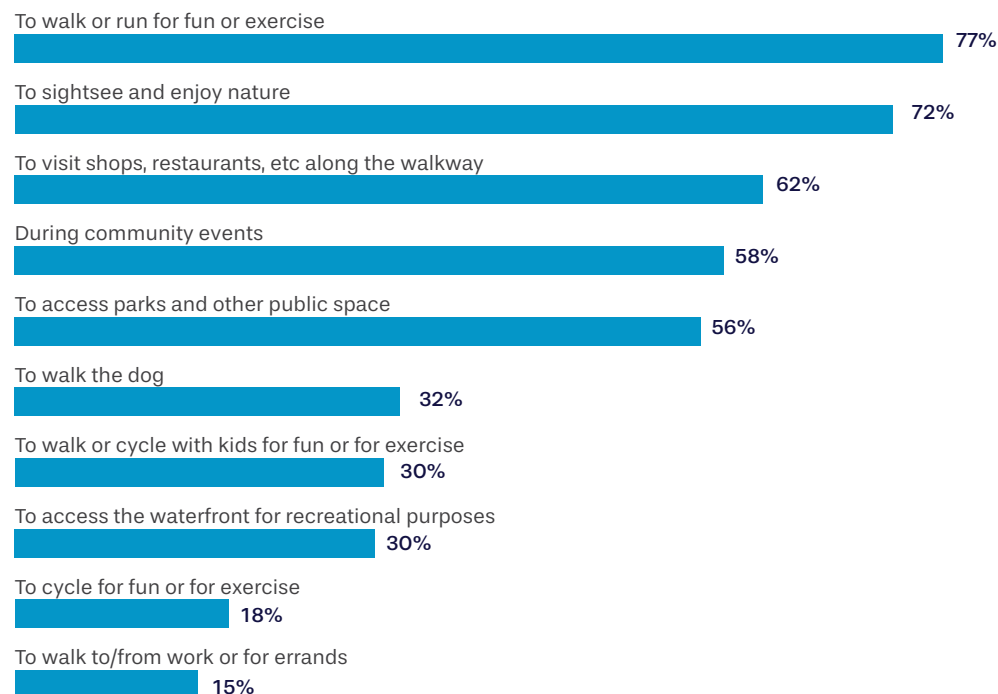
Nearly 2,000 residents participated in the survey, providing valuable information as displayed in the following graphics. The full results are available in **Attachment B**.

A public survey was also made available to residents as part of the second set of open houses in September to provide feedback on the draft plan including options, cross sections and alignment. The public was also asked to reaffirm their support of the project and interest on phasing.

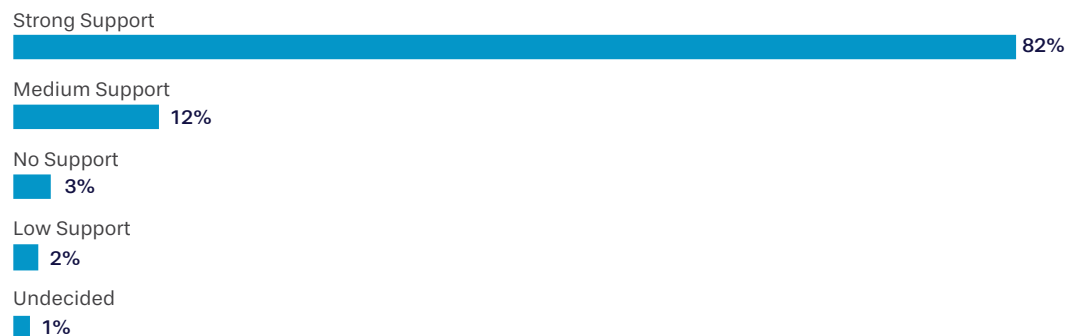
The survey had over 700 responses with 82% of respondents strongly supporting the project. The full results are available in **Attachment B**.

The graphics to the right reflect some of the key findings from the two surveys.

I currently use the waterfront walkway to...



Overall, do you support the development of the Nanaimo Waterfront Walkway?



Which sections of the walkway would you like to see developed or upgraded first?

Section 1 – Departure Bay to BC Ferries Terminal



Section 2 – BC Ferries Terminal to Millstone River



Section 3 – Maffeo Sutton Park to Pacifica



Section 4 – Boat Basin to Cameron Island



Section 5 – Cameron Island to South Downtown Waterfront



Section 6 – South Downtown Waterfront to Nanaimo Estuary



We asked the public how they supported each of the Quick Wins:

Northfield Creek



Asia Pacific Yacht Club



Alternate Alignment around Nanaimo Shipyard



Port Drive



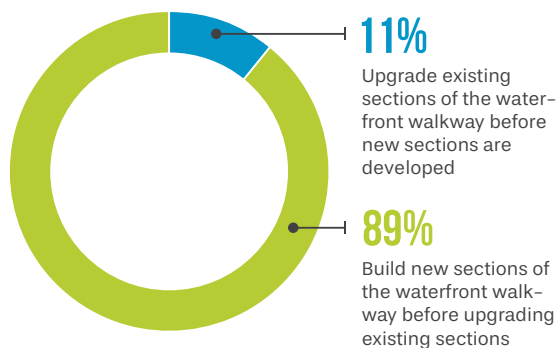
Boat Basin



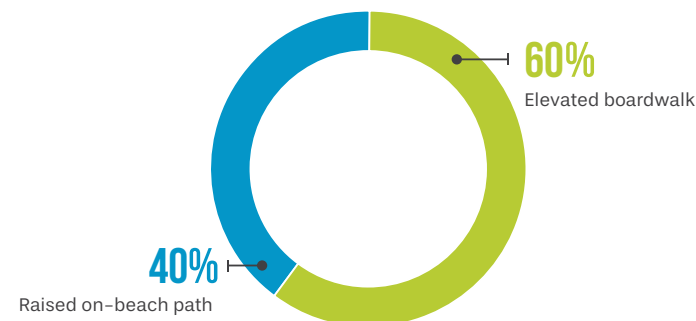
Percentage of Respondents

■ High Support ■ Low Support ■ No Support

Would you rather that the City of Nanaimo...



The City is considering two design options for Section 1 – Departure Bay to BC Ferries Terminal. Based on the information presented, would you prefer an elevated boardwalk or raised on-beach path for Section 1?



3.4. Design Workshop



JUNE 25 Vancouver
Island
Conference
Centre

A design workshop was held in June 2017 to further develop options based on the feedback provided by the public. A group of stakeholders, including representatives from Council, Snuneymuxw First Nation, landowners and tenants adjacent to the walkway, neighbourhood associations, and government agencies were invited.

Over 25 community participants attended and provided input on:

- » vision
- » priorities
- » route alignment
- » walkway treatment and design
- » and other items important to attendees

The results of the design workshop are contained in **Attachment B**.



3.5. Community Engagement Summary

Community Engagement Summary

5



Open Houses
over 1,400 attendees



KEY TAKEAWAYS

There is enthusiastic support for the project to proceed as soon as possible

Create continuous walkway (build new sections before upgrading existing)

Walking and cycling for all ages and abilities

Prioritize connection between Departure Bay and Downtown

Physical separation between bikes and pedestrians

Improve access to the water/beaches

Ample amenities

Protect/preserve the natural environment

Improve signing and wayfinding

Create family-friendly facility

Needs to be fully accessible for all abilities

Walkway should stay along waterfront

Connect communities and destinations

Highlight history and marine activities

Port lands to be more inviting to arriving tourists

Establish gathering spaces/place making

2



Public Surveys
over 2,600 respondents

1

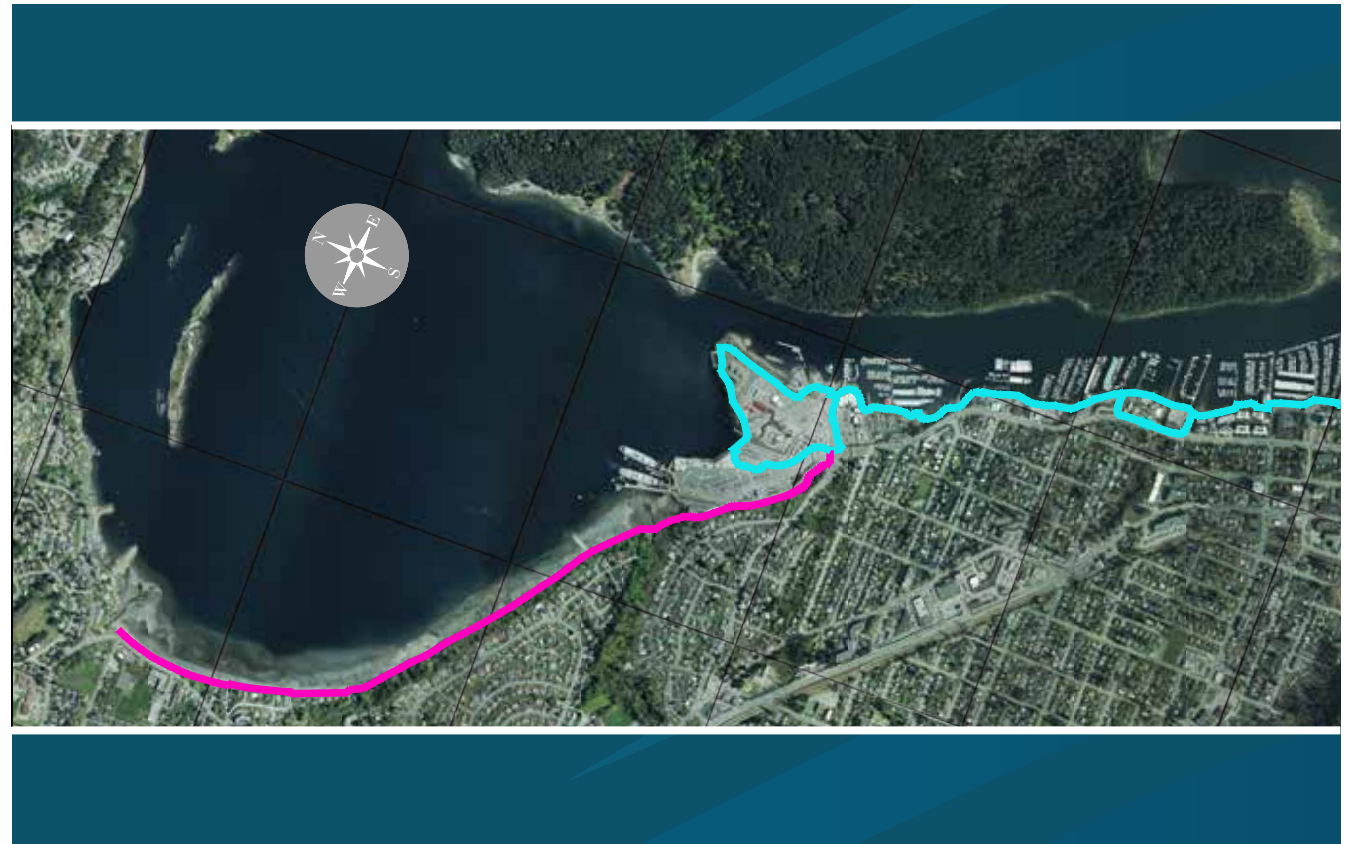


Design Workshop
over 25 community participants



4. SECTION- BY-SECTION ALIGNMENT AND CROSS SECTIONS

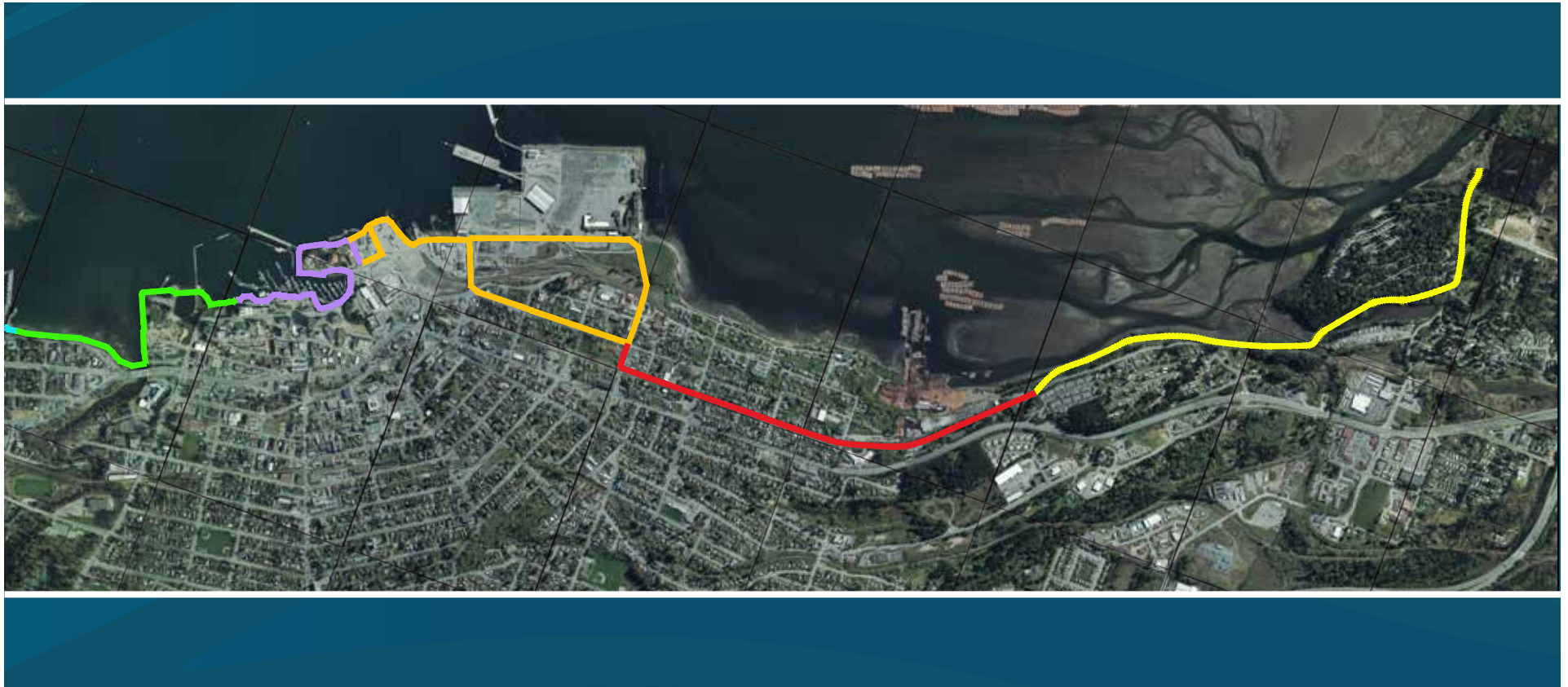
The following chapter describes the existing conditions and features of each specific segment, presents the recommended alignment and cross section for the walkway segments, describes some of the specific attributes of each segment, lists some of the amenities that should be considered, and highlights the issues and considerations that factored into the decision-making process.



LEGEND

█	Section 1	█	Section 5
█	Section 2	█	Section 6A
█	Section 3	█	Section 6B
█	Section 4		

The waterfront from Departure Bay to the Nanaimo Estuary forms the heart of Nanaimo's working waterfront and is a major amenity supporting recreational use, significant marine industries and commercial enterprises. The Waterfront Walkway will enhance the iconic distinctness of Nanaimo's waterfront.



LEGEND

- | | |
|---|--|
| Section 1 | Section 5 |
| Section 2 | Section 6A |
| Section 3 | Section 6B |
| Section 4 | |

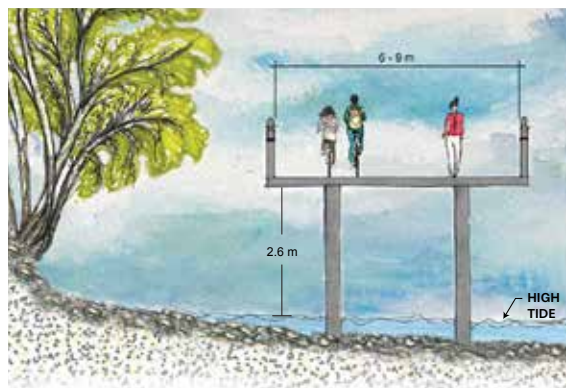
SECTION 1

DEPARTURE BAY



Figure 3. Section 1 map

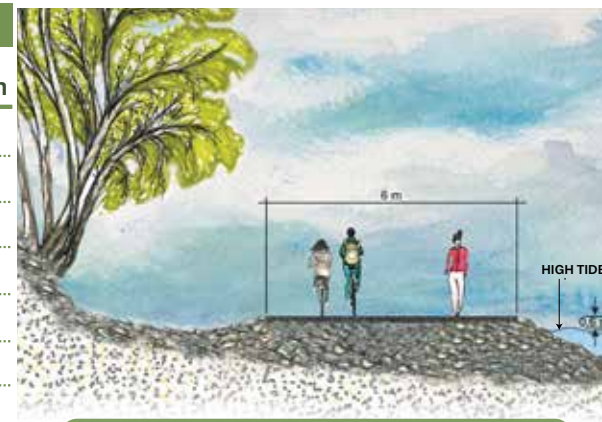
Cross Section Options



Elevated Boardwalk

COMPARING THE OPTIONS FOR CILAIRE SECTION

Elevated Boardwalk		Raised On-Beach Path
Limited	Beach Access	Unrestricted
Best	Protection from Cilaire Bluff	Good
Low	Environmental Impact	Higher
Yes	Built for Sea Level Rise	No
Yes	Walkway Lighting	No
Yes	Accessible During Storms	No
\$12M	Capital Cost	\$3.5M
\$	Maintenance Costs	\$\$



Raised On-Beach Path

This section of the walkway stretches from the northern terminus of the Waterfront Walkway at the Departure Bay Seawall south to the Departure Bay ferry terminal, passing in front of the Departure Bay, Cilaire and Brechin Hill neighbourhoods. The walkway has been constructed to the final standard in both Departure Bay and behind the BC Ferries Terminal.

The public identified this section of the walkway as the top priority for investment. This is also the most complex section of the walkway with geotechnical, archaeological and environmental issues associated with the area. In addition, the Cilaire section is subject to riparian rights issues with upland property owners.

Many amenities, connections, and locations of interest exist or have been identified along this section.

Historically significant locations such as the Snuneymuxw First Nation Winter village, found near Kin Hut at the north end of the section, and the location of the former Hamilton Powder Company found at the foot of the Cilaire bluffs provide opportunities to highlight the rich history along this section of the Waterfront.

Two cross-section options for the Cilaire section exist, a raised on-beach path and an elevated boardwalk. These options are compared in the table above.

A focus on parking impacts and considerations, pedestrian connections and beach access needs to be made at the northern end of this section to remain consistent with the objectives of the Departure Bay Neighbourhood Plan.

ISSUES

City to work with property owners to secure riparian rights

On-beach path to be offset from toe of Cilaire Bluff to protect path and users from instability and erosion of bluff

CONSIDERATIONS

Walkway to be consistent with goals and objectives of Departure Bay Neighbourhood Plan

Elevated boardwalk option to be offset from RDN sanitary sewer to avoid disturbance to sewer when installing piles

Existing path at north end and beside BC Ferries can be improved to full width standard when future use warrants

Historic Nanaimo



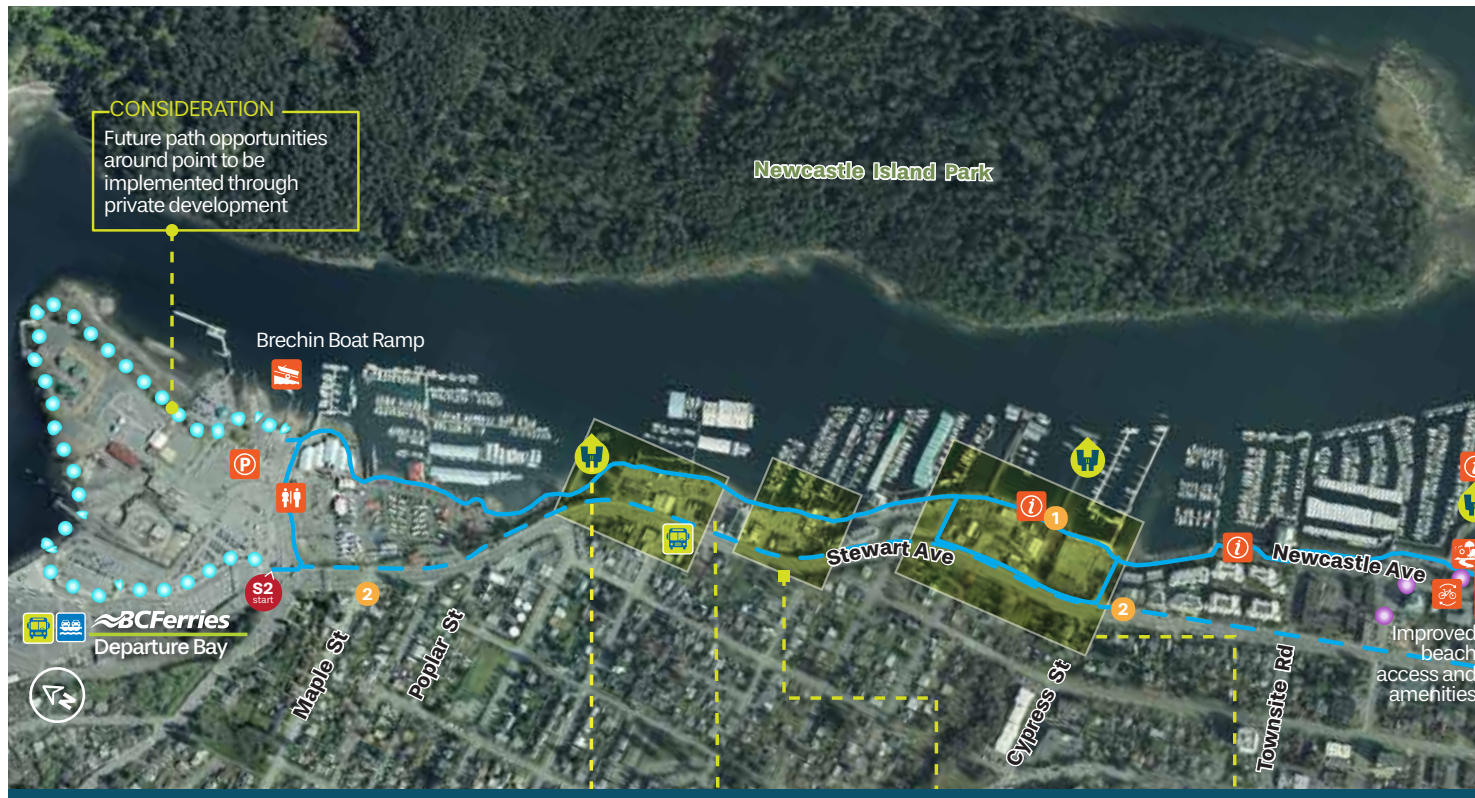
Departure Bay, 1890



Departure Bay, 1939

Images courtesy of Nanaimo Community Archives

SECTION 2 NEWCASTLE CHANNEL



LEGEND

- proposed waterfront path
- - commuter cyclist route
- ... future path extension
- ... trail connection
- transit
- viewpoint
- existing parking
- existing washrooms
- bike connection
- interpretive signage
- beach access
- trail connection
- boat ramp



QUICK WIN Asia Pacific Yacht Club



COST | \$150,000

QUICK WIN Newcastle Marina Section



COST | \$350,000

QUICK WIN Nanaimo Shipyard Detour



COST | \$100,000

1 Nanaimo Shipyard



Viewpoints and interpretive signage to connect with and celebrate the shipyard's historical significance

2 Commuter Cyclists on Stewart Ave



Waterfront Walkway is intended for recreational slow-speed cycling only. Provisions on Stewart Ave for commuter cyclists to be coordinated with Province and Nanaimo Transportation Master Plan

Figure 4. Section 2 map

Cross Section Options



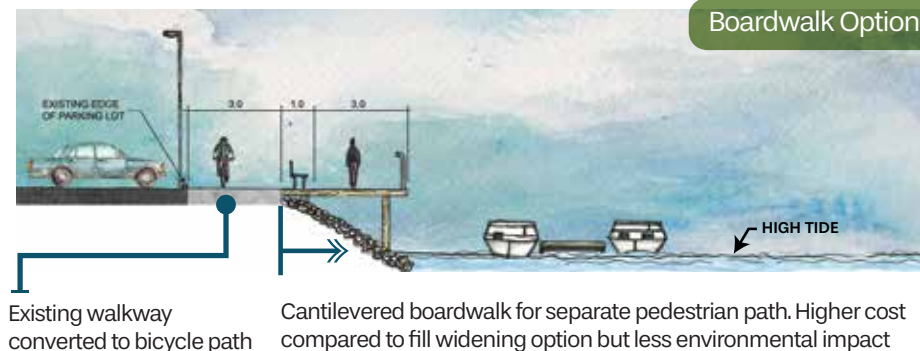
This section of the walkway stretches approximately 3km from BC Ferries Departure Bay terminal south to the Nanaimo Yacht Club, travelling through the Brechin Hill and Newcastle neighbourhoods. Portions of the walkway have been built to both interim and final standards. The walkway along the Newcastle Channel is almost complete with the exception of three properties which are under the jurisdiction of the Nanaimo Port Authority. Completing the walkway to an interim standard in these locations would create the continuity to have the walkway stretch from downtown to BC Ferries Departure Bay Terminal.

A key consideration in this area is a need to design the walkway so that existing industry and the walkway can coexist. The City needs to work with the Nanaimo Port Authority and its tenants to help deliver the project in this area of the City.

This section of the walkway was viewed as a top priority for investment by the public, just below the Departure Bay section.

Cross section options have been developed for the expansion of the interim pathways that are only 3m wide. Both options will expand the pathway to a total width of 7m creating a multi-use path with a buffer between recreational cyclists and pedestrians. The two options differ in how the extra required width is gained, either by building a cantilevered boardwalk or adding rip-rap fill to build the path on, as seen in the Cross Section Options figure above.

Other areas that will require further considerations include, ensuring commuter cyclists are accommodated for along Stewart Avenue, providing pedestrian connections to intersecting cross streets as mentioned in the Newcastle / Brechin Hill Neighbourhood Plan, and monitoring path use of interim sections to ensure the expansion to the final standard is completed when required.



ISSUES

Near-term goal is to construct missing sections of pathway to provide continuity between BC Ferries and Downtown Waterfront. Long-term goal is to improve existing sections to full width standard

City of Nanaimo and Nanaimo Yacht Club to widen existing walkway by 2019

Path design and construction to ensure continued operation of existing boatyards and other active businesses

CONSIDERATIONS

City to work with NPA and property owners to identify location and create public washroom facility

City and Nanaimo Port Authority will coordinate maintenance and liability to ensure consistent approach

Include signage to provide good wayfinding throughout, particularly during phasing of build-out

Walkway to be consistent with goals and objectives of Newcastle Brechin Neighbourhood Plan

Historic Nanaimo



Images courtesy of Nanaimo Community Archives

SECTION 3

MAFFEO SUTTON PARK



LEGEND

- proposed waterfront path
- - - commuter cyclist route
- transit
- viewpoint
- playground
- fishing and crabbing
- existing parking
- existing washrooms
- bike connection
- interpretive signage
- beach access
- trail connection

1 Queen Elizabeth Promenade



Promenade to be widened in the future to provide full width standard and additional amenities when future use warrants

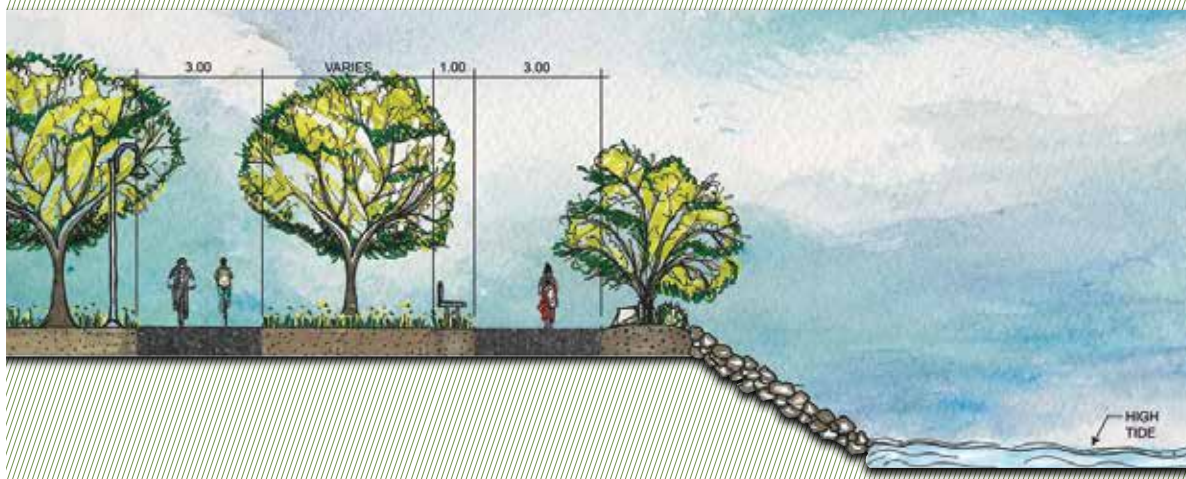
2 Narrow Bridge over Millstone River



Replace existing bridge with wider structure to accommodate multi-use path

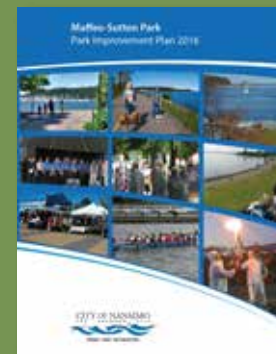
Figure 5. Section 3 map

Cross Section Options



Maffeo Sutton Park Improvement Plan

Waterfront Walkway Improvements will be coordinated with Maffeo Sutton Park Improvement Plan



This section of the path travels approximately 1.5km of the waterfront from Queen Elizabeth Promenade and around Maffeo Sutton Park on a path built to an interim standard. This park is Nanaimo's signature park with stunning views of the harbour as well as Newcastle Island and plays host to community events throughout the year. Key features include the Spirit Square, children's play areas, swimming beach and lagoon and a ferry to access Newcastle Island Park. These amenities make Maffeo Sutton Park a popular destination for both residents and tourists.

The popularity of the park combined with the interim condition of the built path requires cyclists to dismount and walk their bikes through this section or to find an alternative connection along Comox Road. The proposed improvements to the interim pathway

include adding a second pathway dedicated to cyclists inland from the existing pathway, these improvements are to be coordinated with the Maffeo Sutton Park Improvement Plan. The connection for cyclists to Comox Road is consistent with the proposed bike facilities on Comox Road from the Nanaimo Transportation Master Plan.

Further opportunities exist to improve the connection to transit at Maffeo Sutton Park and the walkway and public space found at Georgia Park at the north end of the section.



Concept sketch showing possible Georgia Park Improvements

ISSUES

Lions Great bridge needs to be replaced in the future and should be widened

Connect cyclists through the park in a safe manner to Front Street

CONSIDERATIONS

Coordinate walkway with Maffeo Sutton Park Improvement Plan improvements

Consider walkway use and events

Maffeo Sutton Park is a trail head for the walkway

Georgia Park Walkway to be upgraded as part of Maffeo Sutton Park Plan or during redevelopment of 10 Front Street

Historic Nanaimo



Swyalana Lagoon Bridge, Construction, 1933



Maffeo Sutton Park, 1966

Images courtesy of Nanaimo Community Archives

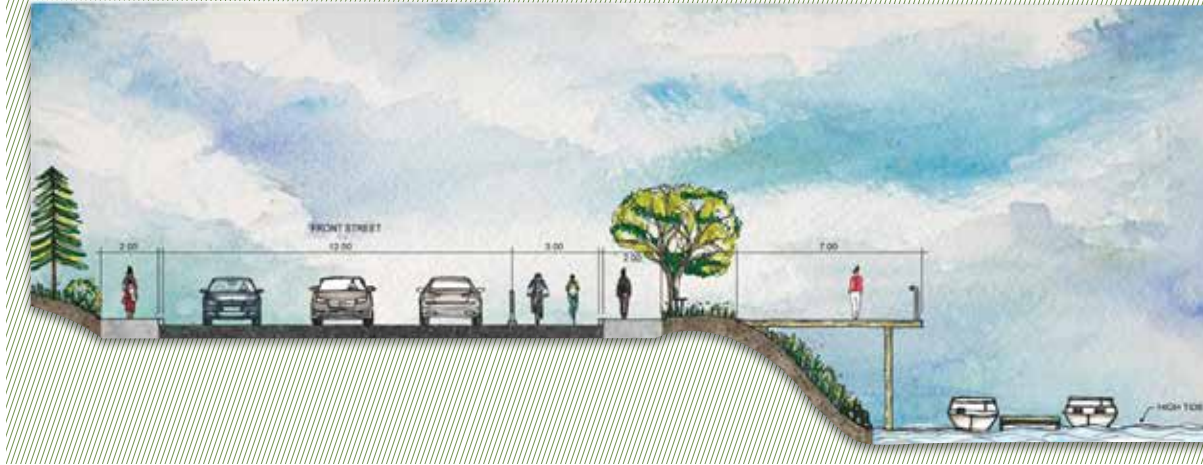
SECTION 4

NPA BOAT BASIN AND CAMERON ISLAND



Figure 6. Section 4 map

Cross Section Options



7m boardwalk in Boat Basin is an extension of the existing cantilevered boardwalk

3m bi-directional on-road cycle track on Front St. to be accommodated by reducing traffic lanes

Section 4 travels south from Georgia Park through the Boat Basin lands to the Gabriola Ferry Terminal. Most of this section is built to the final standard with only 150m not built along Front Street, requiring pedestrians to use the sidewalk along Front Street to connect back to the path around Cameron Island. This section of pathway travels adjacent to the downtown core and provides access to the float plane terminal as well as the popular waterfront shops. With the heavy pedestrian volumes and storefronts along the pathway cyclists are required to dismount and walk their bikes in this section.

The Boat Basin was identified by the City as a quick win project. Geotechnical challenges will need to be considered when extending the cantilevered boardwalk through the Boat Basin to the existing pathway on

Cameron Island. The proposed design will accommodate the large pedestrian volumes with a 7m boardwalk and work with the City towards a bi-directional on-road cycle track for commuter cyclists. This section of Front Street is an existing signed bike route and was identified as a cycling gateway and cycle track route in the Transportation Master Plan.

This section would benefit from enhanced amenities and highlighting the rich history of the port and shoreline. The existing detour around the BC Ferries Gabriola terminal provides an opportunity for an improved route when future terminal improvements are considered.

ISSUES

Congested area with businesses and narrow walkway results in potential conflicts. Cyclists required to dismount and walk between Pacifica and Boat Basin.

Shoreline infill area requires geotechnical measures to strengthen ground and reduce potential earthquake damage where boardwalk is constructed.

CONSIDERATIONS

Potential to provide additional and enhanced amenities in downtown area to reflect the high value of the public space.

Historic Nanaimo



Images courtesy of Nanaimo Community Archives

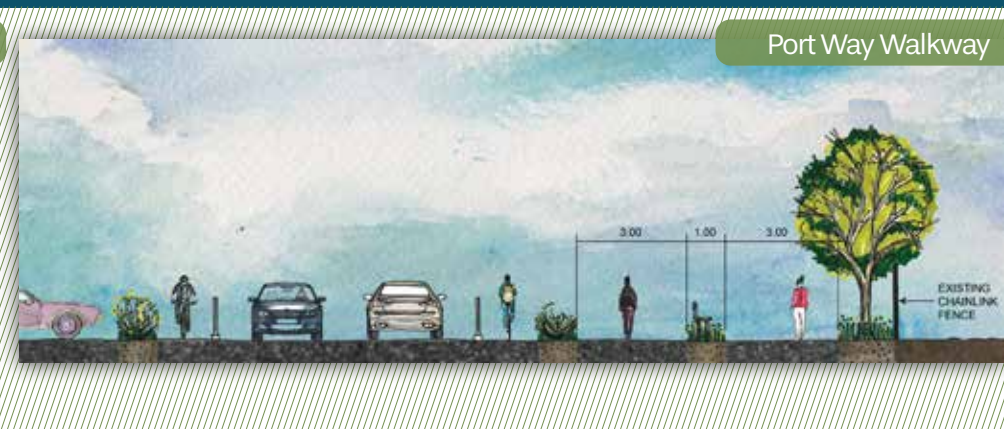
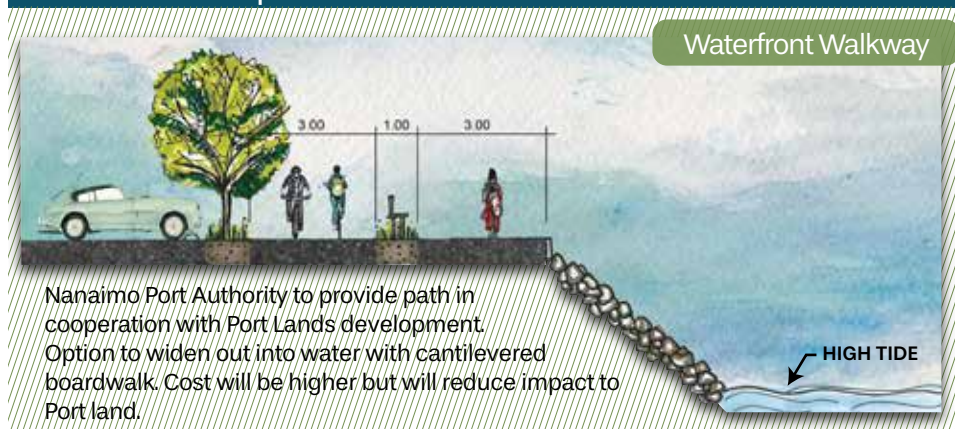
SECTION 5

GABRIOLA FERRY TERMINAL AND SOUTH DOWNTOWN WATERFRONT



Figure 7. Section 5 map

Cross Section Options



This section of the pathway is located on land the City has recently (2013) purchased from CP Rail and is in the process of developing a Master Plan to shape the area. One of the key features of future developments on this land is access to the waterfront, which will initially be along an interim path that will be built out to the final standard as development takes place. The waterfront walkway will play an integral role in transforming the space from industrial use to an area used and enjoyed by a variety of users.

The City identified development of the pathway connecting to Port Drive from Cameron Island as a Quick Win project creating a connection onto the interim path alignment on Irwin Street. The existing trestle connecting Irwin Street across the rail tracks is to be modified to allow safe passage of cyclists and pedestrians. Possible walkway cross sections are seen in the Cross Section Options on this page.

Further coordination is needed to determine a connection to the cruise ship and Helijet terminals as well as access across the rail tracks further south in the section currently being planned through the Secondary Access Study. Coordination between the stakeholders and consulting studies will be critical in creating an ultimate alignment that will be used and enjoyed by all.

Until there is a new/rebuilt secondary access to the South Downtown Waterfront, the existing trestle will serve as the interim route connecting Port Drive to the southern sections of the waterfront walkway.

ISSUES

Nanaimo Port Authority to connect walkway to NPA Assembly Wharf land and cruise ship terminal / Helijet

Coordinate walkway with Front Street extension

Coordinate with BC Ferries to develop safe walkway crossing through Gabriola Ferry Terminal as part of future terminal upgrades

Design of a safe walkway across tracks at rail loading ramp required and to be coordinated with Front Street extension and Southern Railway

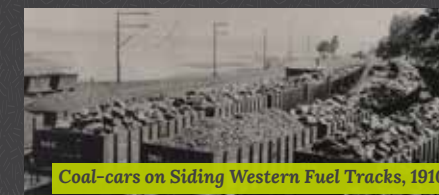
CONSIDERATIONS

Nanaimo Waterfront Walkway alignment to be coordinated with Secondary Access Study and Front Street Extension

Improve walkway through Gabriola Island Ferry Terminal when future terminal improvements are considered by BC Ferries

Work with NPA to develop connection that would link Waterfront Walkway to cruise Ship Terminal and Helijet

Historic Nanaimo



Images courtesy of Nanaimo Community Archives

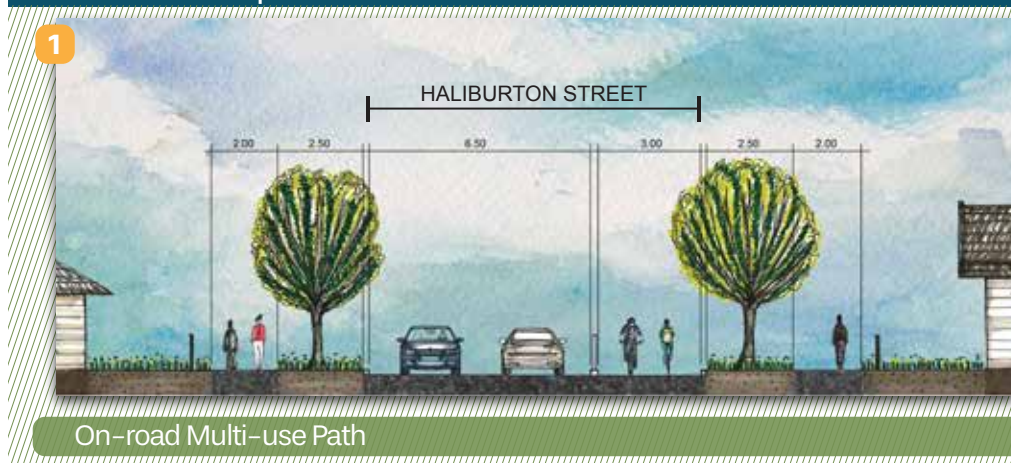
SECTION 6a

SOUTH DOWNTOWN WATERFRONT TO COASTLAND



Figure 8. Section 6a map

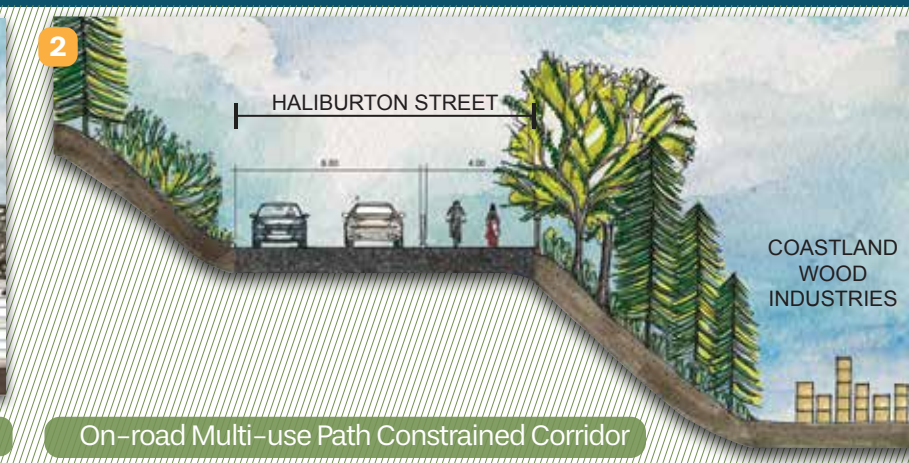
Cross Section Options



The on-road path deviates from the waterfront and travels along Haliburton Street to get around the Snuneymuxw First Nations land and the Coastland Wood Industries properties.

The on-road section follows the existing signed bike route and is consistent with the Transportation Master Plan and the objectives of

the South End Neighbourhood Plan. Challenges exist along the on-road section with narrow right of ways, crossing heavy traffic in and out of the Coastland Wood Industries facilities, and parking considerations. Two different cross-sections have been proposed to meet the constraints along Haliburton Street in the residential blocks and adjacent to Coastland



Wood Industries. Opportunities exist along this section to create connections to the Snuneymuxw First Nation and to celebrate the areas coal mining history through interpretive signage.

ISSUES

Narrow right of way and steep slopes on east side of Haliburton St. constrains the design of the multi-use path. Reallocation of road space needed to accommodate path. 4m path may be reduced to 3m locally where space is highly constrained

Walkway Crossing of Coastland Wood Industries entrance to consider conflicts with industrial truck traffic

CONSIDERATIONS

Haliburton St. in residential neighbourhood allows opportunity to reallocate space from road to construct multi-use path. Parking lane can be replaced with local parking pull-out bays spaced throughout corridor

Safe separation between road and multi-use path achieved by physical barrier (i.e., road curb, bollards, raised plantings, etc.)

Narrow ROW, driveways, utilities, and truck/ transit route provide constraints to pathway width

Path to link with major goals and objectives of South End Neighbourhood Plan

Historic Nanaimo



Deverill Square

Images courtesy of Nanaimo Community Archives

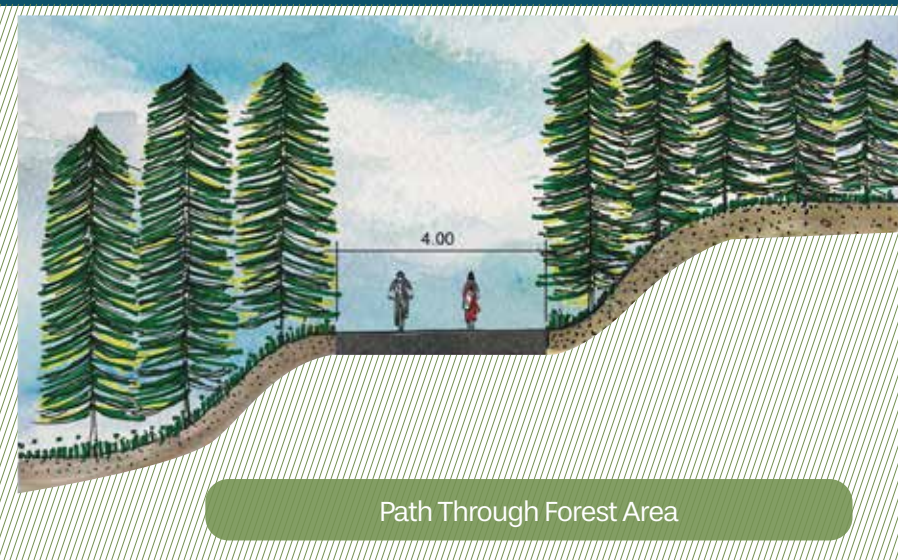
SECTION 6b

COASTLAND TO NANAIMO ESTUARY



Figure 9. Section 6b map

Cross Section Options



South of Coastland Wood Industries the path alignment will return to the waterfront, running adjacent to the existing rail tracks passing through the Chase River Neighbourhood. Further south the path will cross the Chase Estuary where sensitive fish and wildlife habitat will need to be considered in the design of the crossing and path. Opportunities exist to work with the Southern Railway of Vancouver Island, Island Corridor Foundation, Living Forest Campground and private land owners to develop a path built to an interim standard to allow faster implementation and connection to the estuary, park and the campground. Proposed cross sections of 3–4m will comfortably accommodate the expected level of use in the area.

ISSUES

Nanaimo Estuary and Chase River Riparian Zone and Floodplain are home to sensitive fish and wildlife habitat

CONSIDERATIONS

Additional viewpoints can be considered to establish view corridors from the path to the estuary.

Separation between rail and trail can be achieved by fence, vertical difference, or vegetated barrier.

Crime Prevention Through Environmental Design (CPTED) principles to be applied to establish a safe and enjoyable environment in the more isolated sections of the path.

Consideration to construct interim path (i.e., narrower gravel path) to facilitate faster implementation of connection to Nanaimo Estuary. Improvements to full width standard to be made when future use warrants.

Path to link with major goals and objectives of Chase River Neighbourhood Plan.

Historic Nanaimo



Images courtesy of Nanaimo Community Archives

5. TREATMENTS, FEATURES AND AMENITIES

Throughout the public and stakeholder engagement process, many people expressed the need for a variety of amenities along the waterfront walkway. A key objective of the waterfront walkway is to provide a vibrant and engaging space where people can sit, gather, and enjoy the remarkable setting. Appropriately designed amenities distributed along the walkway will allow users to spend more time and to be more comfortable navigating and appreciating the walkway and the public spaces along the route.

The amenities most frequently requested by the community include wayfinding signage, lighting, benches and seating areas, viewpoints, waste receptacles, beach access, and washrooms. Some of these will require access to electrical, water, and sewer services. The community also mentioned interests in the walkway supporting uses such as events, food trucks, artist booths, and performers.

To meet the City's objectives, a consistent approach to branding the walkway, designing furnishings and elements, providing interpretive signage, and incorporating public art will help to raise its profile and make it an important destination in Nanaimo. This section provides considerations and examples of amenity features that will guide the detailed design phase of the walkway Implementation.



5.1. Branding

Branding a walkway involves establishing a consistent graphic approach that supports wayfinding and walkway identification. Branding typically includes a logo, name, and a consistent graphic design that is incorporated onto signs, brochures, maps and any other materials associated with the walkway.

Most cities have branding packages that integrate municipal places, programs and services in a consistent way. In accordance with this approach, branding for the waterfront walkway would be coordinated in relation to the City's overall branding, and the specific branding for parks, civic facilities, etc. Ideally, the City's entire trail system would be branded consistently, with the waterfront walkway as a subset of that system. Because the waterfront walkway is part of the TransCanada Trail (recently rebranded The Great Trail), the branding should integrate that logo as well.



5.2. Wayfinding and Signage

Wayfinding elements play a critical role in providing a trail network that is easy to navigate, allowing people to comfortably and efficiently discover and use the walkway and destinations accessible from the walkway. Wayfinding elements can include signs, maps, pavement markings, and information kiosks.

Typically, a hierarchy of elements is included in a wayfinding system, including kiosks, identification signs, and directional signs. Wayfinding systems are a part of branding, and it is best when they are attractive, legible, and consistent throughout the municipality.

Nanaimo's Trail Implementation Plan (2007) includes recommendations for Trail Signage, which include wayfinding signs. Various types of signs are needed for trail systems, as follows, and these are ideally integrated with the planning of wayfinding signs:

- » Wayfinding signs, including maps, entry and directional signs, and distance markers to aid in navigation
- » Informational signs – trail types/ratings (as applicable), types of use permitted on each trail
- » Regulatory information signs, including bylaws, seasonal closures, warnings about risks, etc.
- » Interpretive signs, including information on natural and cultural/heritage resources
- » Information on trail etiquette for the various types of uses

The locations of wayfinding and other signs are guided by the layout of the trail system. Kiosks are typically located at major staging areas, identification signs at minor trail entry points, and directional signs at trail junctions. Kiosk signs often include a map, and informational, regulatory, interpretive and trail etiquette information. Interpretive signs are located at viewpoints and locations of natural or cultural interest.



5.3. Materials and Treatments

The existing sections of the waterfront walkway have a variety of materials and treatments, based on the previously uncoordinated approach to implementation.

New / rebuilt sections of the walkway will offer a better experience and will be more identifiable if there is consistency in the materials and treatments, with provisions for all ages and abilities. The usual approach is to establish a palette of materials and designs that can be applied in different locations. This would ideally be undertaken at the beginning of the detailed design stage. The following are examples of how this could be incorporated into the design of the waterfront walkway.

Walkway Surface

Existing walkway surfaces include several types of unit pavers, concrete with paver feature strips, exposed aggregate concrete, broom finish concrete, composite rubber boardwalk, asphalt, and gravel. The following could be a future approach, in which the surface relates to the location and level of use:

- » Primary surface – asphalt for bicycles, asphalt or concrete for pedestrians
- » Raised boardwalk – concrete, asphalt
- » High use areas and nodes – pavers, coloured/patterned concrete, stamped asphalt or concrete
- » Lower use areas or locations with geotechnical limitations – asphalt or gravel
- » Connecting trails or adjacent surfaces – asphalt or gravel



Different material or surface treatment delineates the pedestrian area from the recreational cyclist area

Galloping Goose trail, Victoria



User Group Surface Preferences			
Surface Type	People with Mobility Devices and Strollers	People Walking & Running (including people walking with dogs)	Recreational Cyclists
Wood Chips			
Loose Gravel			
Compacted Dirt or Naturalized Pathway			
Hard-packed Gravel/Stone Dust			
Chip Seal			
Rubber Composite			
Pavers/Bricks			
Asphalt			
Concrete			
Wooden Board Walk			



Suitable Surface



Questionable Suitability



Not Suitable

Existing railings include several types: white horizontal bars with curves above, simple white with two horizontal bars, white metal post and chain, grey vertical posts, grey vertical and horizontal rails with wire, a few types of raised concrete walls, chainlink fence, and tall black vertical posts (BC Ferries). On the landward side, there are also many different treatments; in some cases, the walkway is very close to roads and parking lots with minimal or no buffering between.

The following could be a future approach, considering the shoreline and landward edges of the trail:

Shoreline Edge

- » Steep or vertical drop-off – metal railing (use an existing design or identify a new design – could use an approach that is consistent with the new branding and/or a design that "disappears" in the landscape to minimize the impact on views)
- » Gentle drop-off – consider a lower railing (and/or concrete seating wall)
- » No or minimal drop-off next to path – no railing (do this where possible)

Landward Edge

- » Urban plaza or park – blend with space, keeping path definition
- » Road or parking lot – landscaped edge with trees preferred, grass and trees second choice



Waterfront Promenade, Kelowna



Peachland Waterfront Walkway, Peachland



Scottsdale, Arizona

5.4. Pathway Lighting

Existing lights are of differing type and colour, but generally can be described as either:

- » light blue arched pole with covered lamp,
- » light blue arched pole with open lantern, or
- » black vertical pole with LED dome light

Several poles have accompanying hardware including banner holders or hanging basket holders.

The following could be a future approach:

- » Use black posts and LED fixtures as in Departure Bay or a new design
- » Solar lighting – if used, consider a style of solar lighting matched to the standard lighting to the degree possible
- » Optional accessory hardware to accommodate banners and/or hanging basket holders.
- » Optional accessory hardware to accommodate power outlets

It would be ideal for the colour of the light fixtures to be the same as the railing.

Community input indicated a desire for lighting along the entire walkway. Pathway lighting offers advantages to those who want to use trails in the dark, especially during the short days of winter. A potential disadvantage is that when lighted paths are in locations where oversight is challenging (e.g., Cilaire), there can be concerns about safety and security, including potential vandalism of the lights themselves. Other considerations in this location include limiting any light spillover to adjacent residences, and minimizing impacts on wildlife.



5.5. Major Facility Amenities (furnishings, washrooms, shelters, etc.)

Benches

There are multiple types of benches in the urban sections of the waterfront walkway, and few or no benches in most of the outlying areas. It would be ideal to identify a bench that the City would like to use along the waterfront walkway, if there is already a bench being used in parks. If there is not, a bench that is consistent with the railing and lighting should be identified for use.

The placement of benches, seating and picnic tables are dependent on the level of use anticipated, the degree of isolation, and the locations of good viewing spots.



Garbage/Recycling Bins

Garbage/recycling bins are needed in greater numbers where use is higher. The style of the receptacle, if there is not a City standard, should ideally match the benches and other furnishings. The spacing should vary similar to the spacing of benches, ranging from 20 metre spacing in the busiest areas to locations at major trailheads, viewpoints and intersections in the outlying areas. Pet waste bag dispensers may also be included at regular intervals. Waste receptacles need to be selected with consideration for ease and frequency of maintenance, reduction of littering, and resistance to birds and animals.



Washrooms

Washrooms and drinking fountains are a priority for the public. The best strategy is to locate washrooms in parks and other City facilities where they can serve trail and park users. Once these locations are identified, the need for additional washrooms can be evaluated. If washrooms are needed to support trail use, it is ideal if they are designed to withstand potential vandalism, with security measures to prevent loitering. Washrooms should be located where there is good surveillance from a road and reasonable lighting at all times.



Shelters

There are various types of shelters that could be considered along the trail, including a small roof over kiosks to support more comfortable viewing of signs, small roofs over benches to make them usable in a range of weather conditions, or larger shelters that can support gatherings. The larger shelters are most appropriate in parks where they can serve multiple functions. Roofs over kiosks are appreciated and relatively easy to provide.

The shelters over benches are the most challenging to operate. They work best in highly visible locations where there is also a good view and enough character that people will want to linger there. The materials should be compatible with the other trail features.



5.6. Viewpoints and Public Art

Viewpoints and public art can add immense value and character to trail systems, especially in a location like Nanaimo's waterfront walkway, where there are outstanding and diverse views, environmental resources and history. Most of the viewpoints along this trail will likely be small nodes that are widenings along the walkway, with two benches and interpretive sign(s).

Public art can take the form of sculptural pieces that relate to the context, or they can be elements that serve a purpose, e.g., railings, benches. With the trend towards play environments and natural play, the waterfront walkway provides an excellent opportunity to incorporate natural features that can have play value. These could be features found or excavated on site that would otherwise be removed, such as large boulders, interesting rocks, logs, or root wads.



6.

PHASING AND IMPLEMENTATION

6.1. Interim and Ultimate Alignment

This chapter presents an Implementation Strategy to be considered in the planning of the waterfront walkway construction. The City plans to complete the construction of the continuous walkway from Departure Bay to the Nanaimo Estuary by the Year 2027. Upgrades to bring the existing interim sections to full width standard will be scheduled to happen after Year 2027, or where possible coordinated with waterfront development earlier. Segments could also be upgraded sooner if warranted by public demand as demonstrated through high user volumes.

This Implementation Strategy will help guide the City's decisions in obtaining capital financing over the next 10+ years to fund the construction of these segments. The implementation strategy has been developed based on a number of principles including:

- » Building missing links prior to upgrading existing sections to final standard;
- » Focusing on sections where demand is projected to be high and guided by the public's input to priority segments identified through the community engagement process;
- » Taking advantage of opportunities to coordinate the construction of new walkway segments and upgrading of existing pathway segments to full width standard based on the timing of redevelopment opportunities along the corridor

Prior to the construction of the new sections of waterfront walkway, the City should undertake an exercise to develop a branding strategy for the waterfront walkway. The branding strategy should determine a name for the walkway, a logo, and incorporate similar design elements complete with logo into the amenities discussed in **Chapter 5**.

Each segment has been broken down into subsegments and recommended construction phasing/timing has been determined with consideration of the criteria above. The following implementation plan highlights key information for each subsection including:

- » Description of the proposed works;
- » Limits of the proposed work;
- » Recommended timeframe for implementation;
- » Potential Coordination Issues;
- » "Order-of-Magnitude" Estimated Construction Cost (in 2017 dollars, for projects up to 2027 only);
- » Potential Development Contributions
- » Potential Coordination and/or Design Issues

Standard amenities described in **Chapter 5** will be included throughout the walkway as segments are built out. These include but are not limited to

benches/seating areas, viewpoints, washrooms, garbage receptacles, wayfinding and guide signs, lighting, interpretive signage, and public art.

The City will work on developing a capital budget plan with various development and amenity contributions to follow this implementation plan.

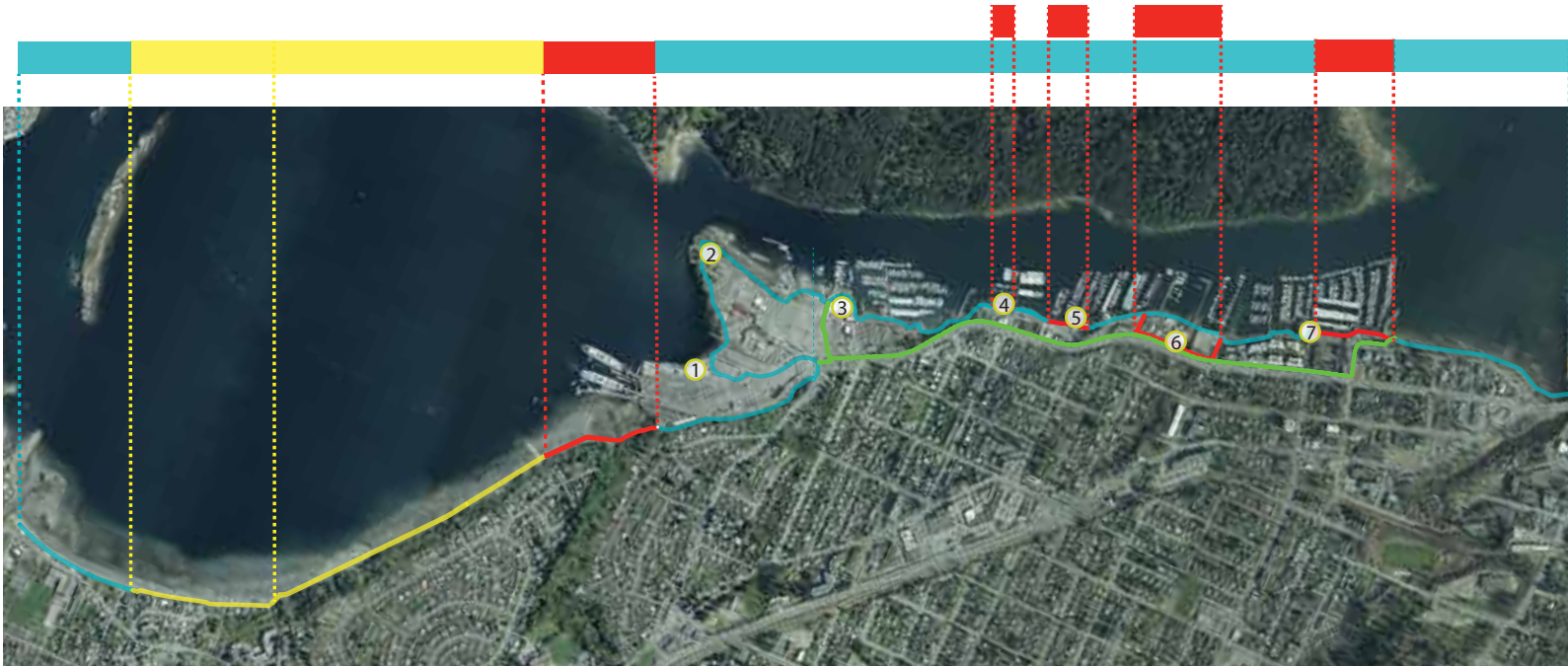
Each segment will be coordinated with all applicable stakeholders, partners, affected property owners, etc during the design process to ensure the design reflects local concerns.

The City will engage with stakeholders, partners and property owners/developers to identify opportunities to improve existing segments to full standard prior to Year 2027 based on redevelopment. The City will also use this Implementation Plan to establish requirements to incorporate the construction of the walkway to full width standards as part of the development approval process.

6.2. Waterfront Walkway Implementation Plan

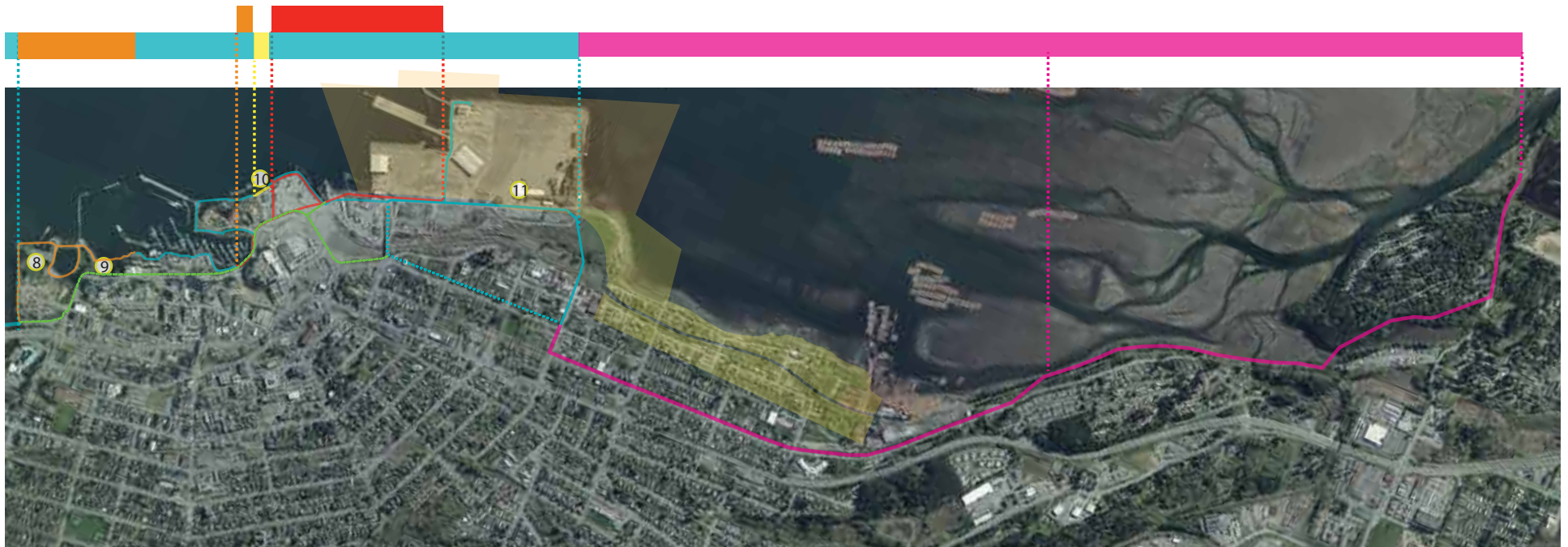
Building the Vision

This Plan is aligned with the vision of the City of Nanaimo and will allow the City to connect all 13Kms of the pathway.



LEGEND	Phases	Paths	Redevelopment Opportunities
	<div></div> 2018–2019	<div>---</div> commuter cyclist route	<div>①</div> BC Ferries
	<div></div> 2020–2021	<div>...</div> interim path	<div>②</div> Esso Oil Tank Farm and Lafarge
	<div></div> 2022–2024		<div>③</div> Sealand Market
	<div></div> 2024–2027		<div>④</div> Asia Pacific Yacht Club
	<div></div> 2027+		<div>⑤</div> Newcastle Marina
			<div>⑥</div> Nanaimo Shipyards
			<div>⑦</div> Nanaimo Yacht Club (cost share agreement)

6.2. Waterfront Walkway Implementation Plan (cont'd)



LEGEND

Phases

- 2018-2019
- 2020-2021
- 2022-2024
- 2024-2027
- 2027+

Paths

- commuter cyclist route
- ... interim path

Redevelopment Opportunities

- ⑧ Maffeo Sutton Park
- ⑨ Georgia Park
- ⑩ BC Ferries Gabriola Island Ferry Terminal Upgrades
- ⑪ South Downtown Waterfront and Secondary Access

SECTION 1

DEPARTURE BAY



LEGEND

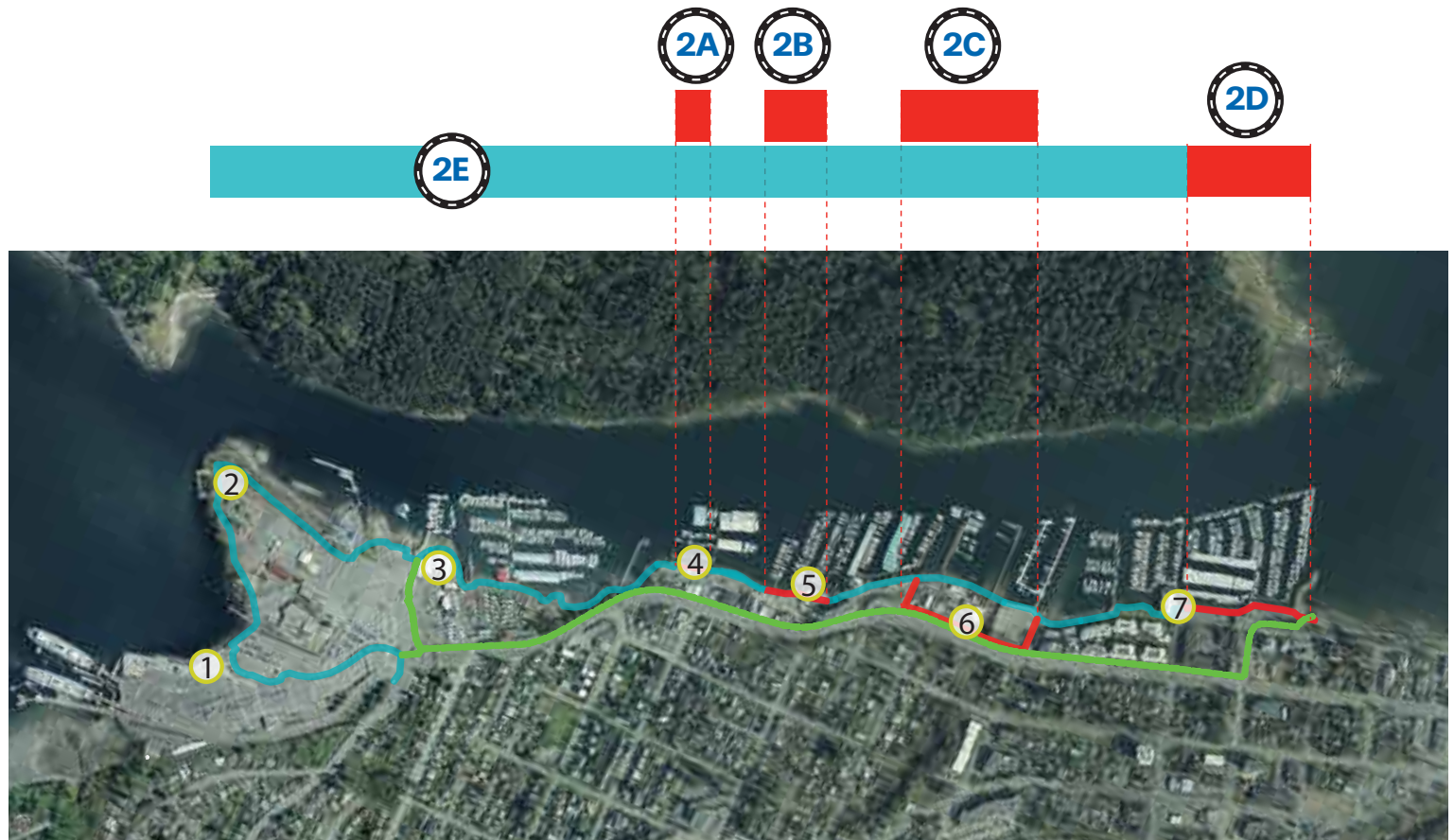
2018 - 2019	2020 - 2021	2027+
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Subsegment	1A	1B	1C	1D	1E
 Description of Works	Upgrade remaining portion of walkway along Departure Bay Seawall	Construct raised on-beach Pathway along Departure Bay Beach and Battersea Road	Construct elevated Boardwalk or raised on-beach pathway along bottom of Cilaire Bluffs	Construct elevated Boardwalk from BC Ferries to Cilaire (Quick Win)	Upgrade and widen existing 4m wide asphalt multi-use path to 7m wide final standard
 Limits of Work	Departure Bay Seawall in front of Kinsmen Park	End of Loat Street to south end of Battersea Road	South end of Battersea Road to White Eagle Terrace trail	White Eagle Terrace Trail to Existing path adjacent to BC Ferries	From end of existing path adjacent to BC Ferries to Stewart Avenue Intersection
 Current Status	Final walkway upgrades along car park area completed in 2016. Interim walkway exists for remainder	Not Yet Built	Not Yet Built	Not Yet Built	Existing interim walkway
 Year to be Built	2027+	2020–2021	2020–2021	2018–2019	2027+
 Estimated Construction Cost (2017 dollars)		\$1M	\$3.5M (on-beach path) \$12M (elevated boardwalk)	\$3.5M	
 Potential Development Contributions	Coordinate with redevelopment of Kinsmen Park & Kin Hut	None	None	None	None
 Potential Coordination/Design Issues	<ul style="list-style-type: none"> » Coordinate with Snuneymuxw First Nation » Known archaeological site » Timing to be coordinated with Kinsmen Park and Kin Hut redevelopment 	<ul style="list-style-type: none"> » Work with property owners to minimize view impacts » Coordinate with Regional District of Nanaimo (trunk sewer) » Coordinate with Province » Potential combination of Raised On-Beach Path and roadway path along Battersea Road 	<ul style="list-style-type: none"> » Work with property owners to secure riparian rights /geotechnical slope considerations / minimizing view impacts » Coordinate with Regional District of Nanaimo (trunk sewer) » Coordinate with Province. » Potential combination of Raised On-Beach Path and Elevated Boardwalk 	<ul style="list-style-type: none"> » Work with property owners to secure riparian rights /geotechnical slope considerations / minimizing view impacts » Coordinate with Regional District of Nanaimo (trunk sewer) » Coordinate with Province » Coordinate connections to existing trails at Beach Estates Park and White Eagle Terrace 	<ul style="list-style-type: none"> » Spacing requirements, impacts to BC Ferries, slope considerations » Work with BC Ferries and adjacent land owners

SECTION 2 NEWCASTLE CHANNEL

Redevelopment Opportunities

- ① BC Ferries
- ② Esso Oil Tank Farm and Lafarge
- ③ Sealand Market
- ④ Asia Pacific Yacht Club
- ⑤ Newcastle Marina
- ⑥ Nanaimo Shipyards
- ⑦ Nanaimo Yacht Club (cost share agreement)



LEGEND

2018 - 2019

2027+

commuter cyclist route

Subsegment	2A	2B	2C	2D	2E
Description of Works	Develop interim pathway across Asia Pacific Yacht Club property	Develop interim pathway across Newcastle Marina Property	Construct interim detour around shipyard property	Upgrade to fully separated pathway along Nanaimo Yacht Club	Construct/upgrade to fully separated pathway along shoreline
Limits of Work	Asia Pacific Yacht Club property	Newcastle Marina property	Around shipyard property	Nanaimo Yacht Club	Brechin Point (Pimbury Point) to Nanaimo Yacht Club
Current Status	Not yet built	Not yet built	Not yet built	Existing interim pathway	Existing interim pathway from Sealand market to south, with missing sections not yet built
Year to be Built	2018–2019	2018–2019	2018–2019	2018–2019	2027+
Estimated Construction Cost (2017 dollars)	\$150K	\$350K	\$100K	\$1.2M	
Potential Development Contributions	Coordinate with Nanaimo Port Authority and tenant	Coordinate with Nanaimo Port Authority and tenant	Coordinate with Nanaimo Port Authority and tenant	Cost Sharing Agreement in place with tenant	Coordinate with Nanaimo Port Authority, Province and tenants
Potential Coordination/Design Issues	Coordinate with Nanaimo Port Authority and tenant	Coordinate with Nanaimo Port Authority and tenant	» Coordinate with Nanaimo Port Authority and tenants » Coordinate with BC Ministry of Transportation and Infrastructure	Coordinate with Nanaimo Port Authority and tenant	» Coordinate with Nanaimo Port Authority and tenants » Coordinate with BC Ferries to develop better connection through Terminal as part of future upgrades

SECTION 3

MAFFEO SUTTON PARK

3A

3B

Redevelopment Opportunities

- 8 Maffeo Sutton Park
- 9 Georgia Park (leverage amenity contributions)



LEGEND

2027+

2024 - 2027








commuter cyclist route

Subsegment	3A	3B	Cycling Connection to Front Street
 Description of Works	Separated pathway along shoreline	Upgrade to fully separated pathway through Maffeo Sutton Park	Cycling connection to Front Street to bypass park
 Limits of Work	Queen Elizabeth Promenade	Maffeo Sutton to Pacifica	Lions Great Bridge to Front Street
 Current Status	Existing separated pathway (~6.0m wide, painted separation)	Interim walkway through park	Not Yet Built
 Year to be Built	2027+ (Final)	2024-2027	2024-2027
 Estimated Construction Cost (2017 dollars)		\$1.5M	\$300K
 Potential Development Contributions	» Coordinate with Maffeo Sutton Park redevelopment	» Coordinate with Maffeo Sutton Park redevelopment » Leverage amenity contribution from redevelopment of 10 Front Street for Georgia Park	» Coordinate with Maffeo Sutton Park redevelopment
 Potential Coordination/Design Issues	» Impact on shoreline requiring Fisheries Act Authorization. » Coordination with Nanaimo Port Authority and private land owners » Replacement or twinning of existing Millstone River Bridge	» Timing to be coordinated with Maffeo Sutton Park Redevelopment » Coordinate with Snuneymuxw First Nation » Known archaeological sites within park	» Timing to be coordinated with Maffeo Sutton Park Redevelopment » Coordinate with Snuneymuxw First Nation

SECTION 4

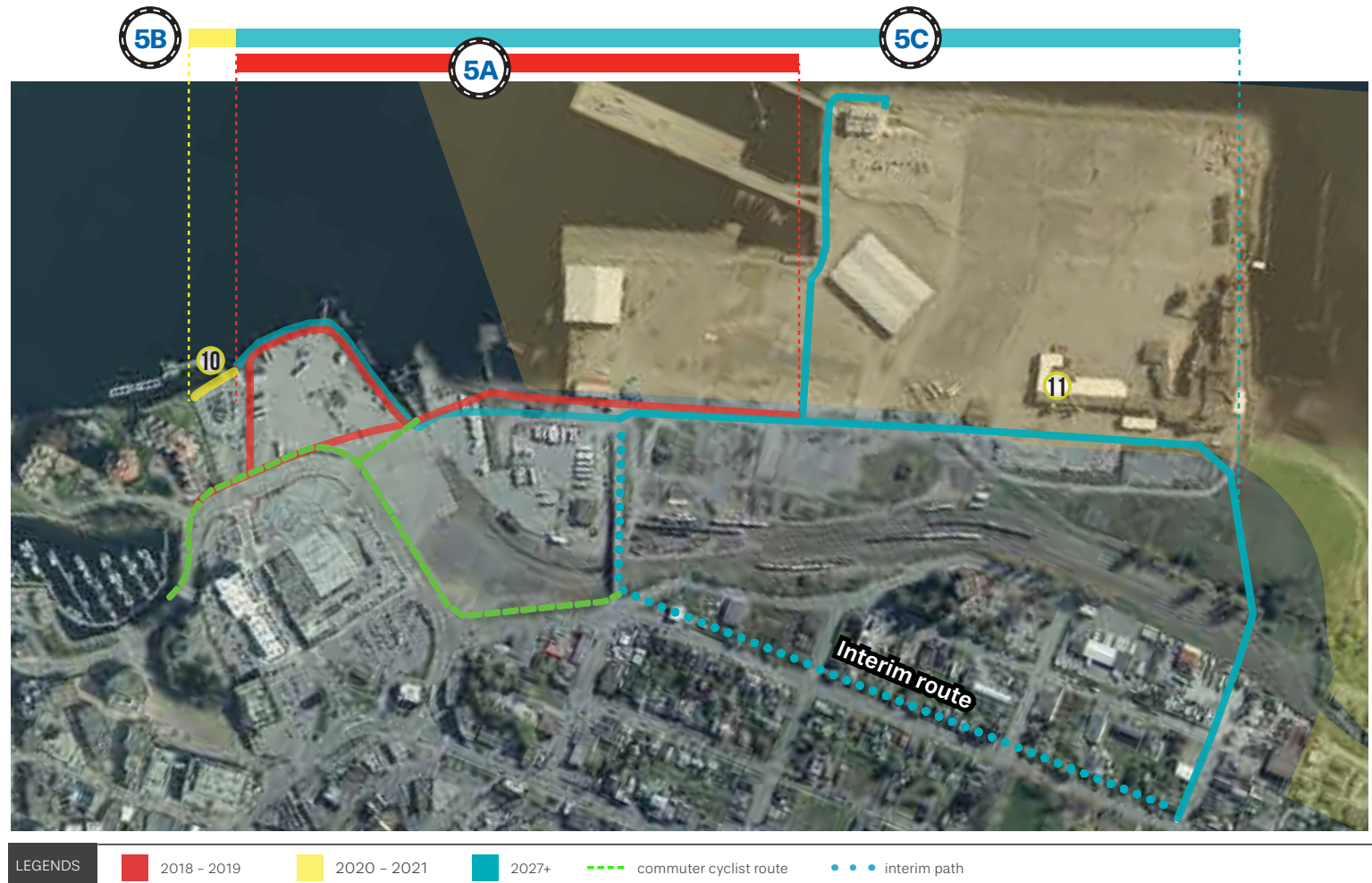
NPA BOAT BASIN & CAMERON ISLAND





Subsegment		4A	4B
	Description of Works	Extend cantilevered walkway to Cameron Island	Upgrade existing sections of walkway around NPA Boat Basin and Cameron Island
	Limits of Work	End of existing cantilevered walkway (across from Port Theatre) to Cameron Island	Front Street to Gabriola Ferry Terminal
	Current Status	Existing sidewalk adjacent to Front Street	Existing pathway of various materials
	Year to be Built	2024–2027 (could be advanced dependant on development contribution)	2027+ (Final)
	Estimated Construction Cost (2017 dollars)	~ \$2M	
	Potential Development Contributions	Leverage amenity contribution from Port Place Mall redevelopment	Coordinate with Nanaimo Port Authority and tenants
	Potential Coordination/ Design Issues	<ul style="list-style-type: none"> » Geotechnical Considerations » Coordinate with Nanaimo Port Authority » Coordinate with Regional District of Nanaimo (trunk sewer) 	<ul style="list-style-type: none"> » Coordinate with Nanaimo Port Authority and tenants » Coordinate with Regional District of Nanaimo (trunk sewer)

SECTION 5

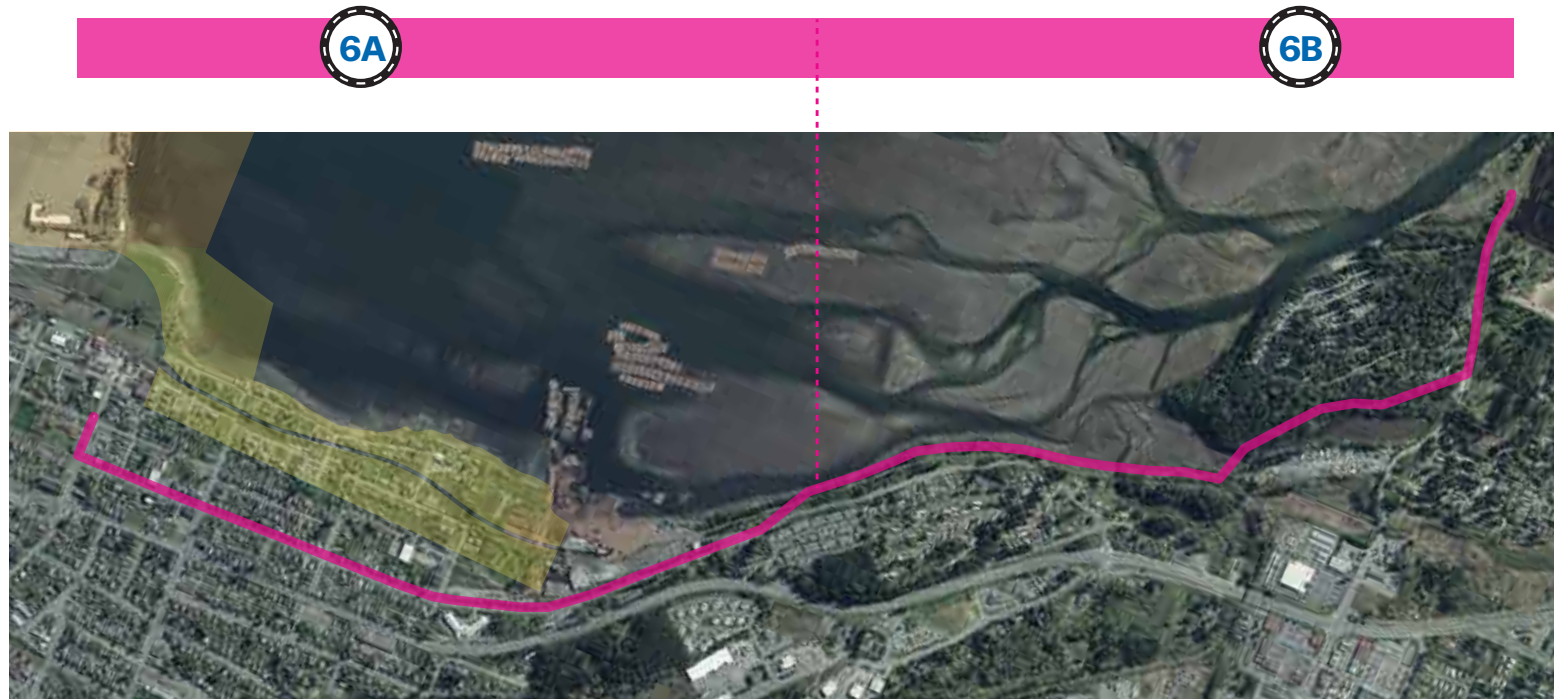
GABRIOLA FERRY TERMINAL AND SOUTH DOWNTOWN WATERFRONT



Subsegment	5A	5B	5C
 Description of Works	Construct interim pathway on City owned 1 Port Drive property (in conjunction with Port Drive road project)	Work with BC Ferries to develop connections to new multi-use pathway through Gabriola Ferry Terminal	Develop fully separated multi-use pathway from Gabriola Ferry Terminal to South End Neighbourhood
 Limits of Work	City-owned 1 Port Drive property, 'Bow Tie' lands to Nanaimo Port Authority Assembly Wharf	BC Ferries Gabriola Ferry Terminal	BC Ferries Gabriola Ferry Terminal to intersection of Irwin and Farquhar
 Current Status	Not Yet Built	Not Yet Built	Not Yet Built
 Year to be Built	2018-2019	2020-2021	2027+
 Estimated Construction Cost (2017 dollars)	\$800K		
 Potential Development Contributions	None	Coordinate with BC Ferries redevelopment of Gabriola Ferry Terminal	Coordinate with South Downtown Waterfront area redevelopment
 Potential Coordination/Design Issues	Coordinate with Nanaimo Port Authority, Southern Rail, Island Corridor Foundation	Coordinate with BC Ferries	<ul style="list-style-type: none"> » Coordinate with South Downtown Waterfront area redevelopments » Coordinate with Nanaimo Port Authority and tenants, Southern Rail, Island Corridor Foundation, Snuneymuxw First Nation » Interim routing via Irwin Street required until secondary access to South Downtown Waterfront is complete

SECTION 6

SOUTH DOWNTOWN WATERFRONT TO NANAIMO ESTUARY



LEGENDS

2022 - 2024

Subsegment

6A

6B



Description of Works Develop multiuse Path along local roadways (Farquhar Street and Haliburton Street)

Develop multiuse pathway in railway corridor. Consider 2-3m wide gravel path in the interim. New bridge structures over Chase River and Wexford Creek



Limits of Work Intersection of Irwin and Farquhar to Coastland

Coastland to the "wheel"



Current Status Not Yet Built

Not Yet Built



Year to be Built 2022-2024

2022-2024



Estimated Construction Cost (2017 dollars) \$3M

\$6.75M



Potential Development Contributions None

None






Potential Coordination/Design Issues

- » Coordinate with Snuneymuxw First Nation
- » Geotechnical Slope Considerations, Road Right-of-way widths, Utility conflicts

- » Geotechnical slope considerations/constrained rail corridor widths / new bridge crossings at Chase River and Chase River Estuary
- » Coordinate with Coastland, Southern Railway, Island Corridor Foundation, Province, Snuneymuxw First Nation, Living Forest Campground, and private land owners

6.3. Implementation Phasing Plan

		
Year	Segment	Estimated Cost
2018–2019	» BC Ferries Depature Bay to White Eagle	\$3,500,000
	» Asia Pacific Yacht Club Gap	\$150,000
	» Newcastle Marina Gap	\$350,000
	» Shipyard Bypass	\$100,000
	» Nanaimo Yacht Club Upgrade	\$1,200,000 ★
	» 1 Port Drive	\$800,000
2020/2021	» Battersea to Kin Hut	\$1,000,000
	» White Eagle to Battersea	\$3,500,000
	★ On-beach path option	
	★ Elevated boardwalk option	\$12,000,000
	» BC Ferries Gabriola Ferry Terminal Redevelopment	\$ with Terminal Redevelopment
2022/2024	» Haliburton to Nanaimo River Estuary	\$9,750,000
2024/2027	» Boat Basin	\$2,000,000 ★ ◆
	» Maffeo Sutton Park Upgrade	\$1,500,000
	» Maffeo Sutton Park Cycle Connection to Front St.	\$300,000
	» Georgia Park Upgrade	\$Developer Cost Share ★
2027+	» Upgrade interim walkway segments as use warrants	◆
	» South Downtown Waterfront and Secondary Access	\$ With road project ◆
	» Brechin Point (Pimbury Point)	◆

◆ denotes timing is dependent on development

★ denotes cost share with partner

Learn more at:

www.nanaimo.ca/goto/WaterfrontWalkway



Attachment A

Engagement Boards





City of Nanaimo Waterfront Walkway Implementation Strategy

Design Workshop

June 22, 2017

AGENDA

- 1:00 – 2:15 Welcome, Project Introduction and Context**
 - Survey Results**
 - Visioning**
- 2:15 – 3:00 Design Workshop BEGINS**
 - Table Rotation #1 (45 Minutes)**
- 3:00 – 3:15 Break (Refreshments)**
- 3:15 – 3:45 Table Rotation #2 (30 Minutes)**
- 3:45 – 4:15 Table Rotation #3 (30 Minutes)**
- 4:15 – Wrap-Up**
 - Summary Input and Perspectives**
 - Open discussion**
- 4:45 – Next Steps and Thank you**
- 5:00 – 7:00 Opportunity for information sharing and additional public input**



Welcome and Introductions

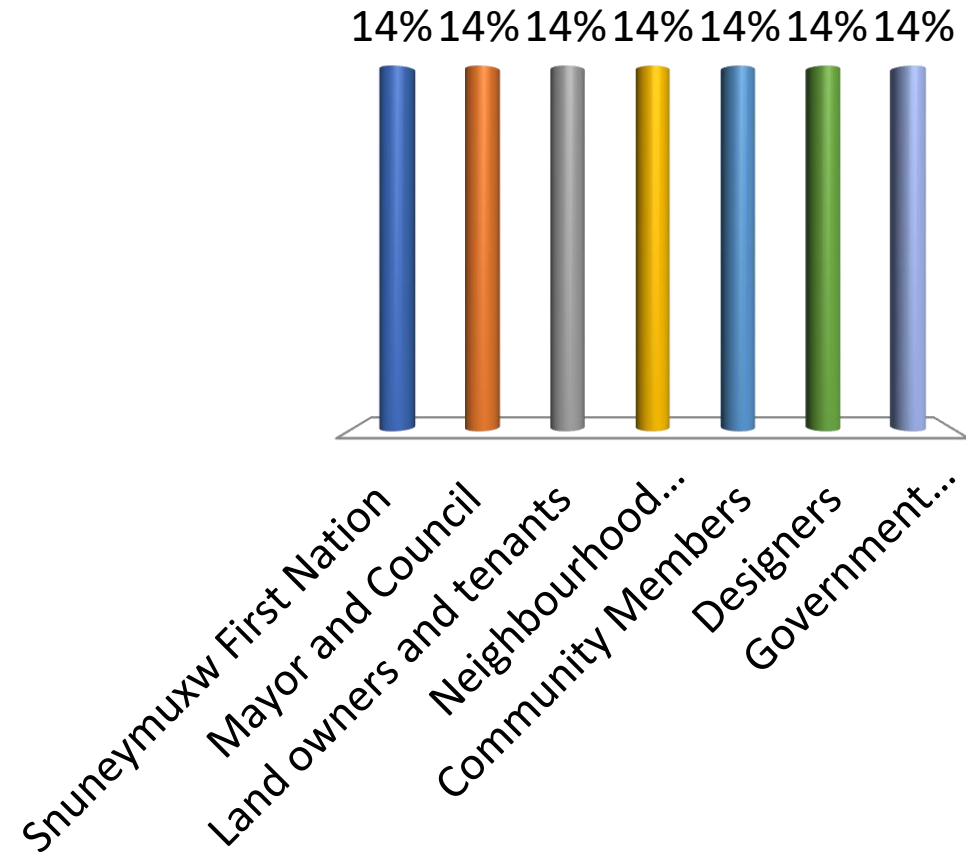


POTENTIAL WATERFRONT WALKWAY ROUTE



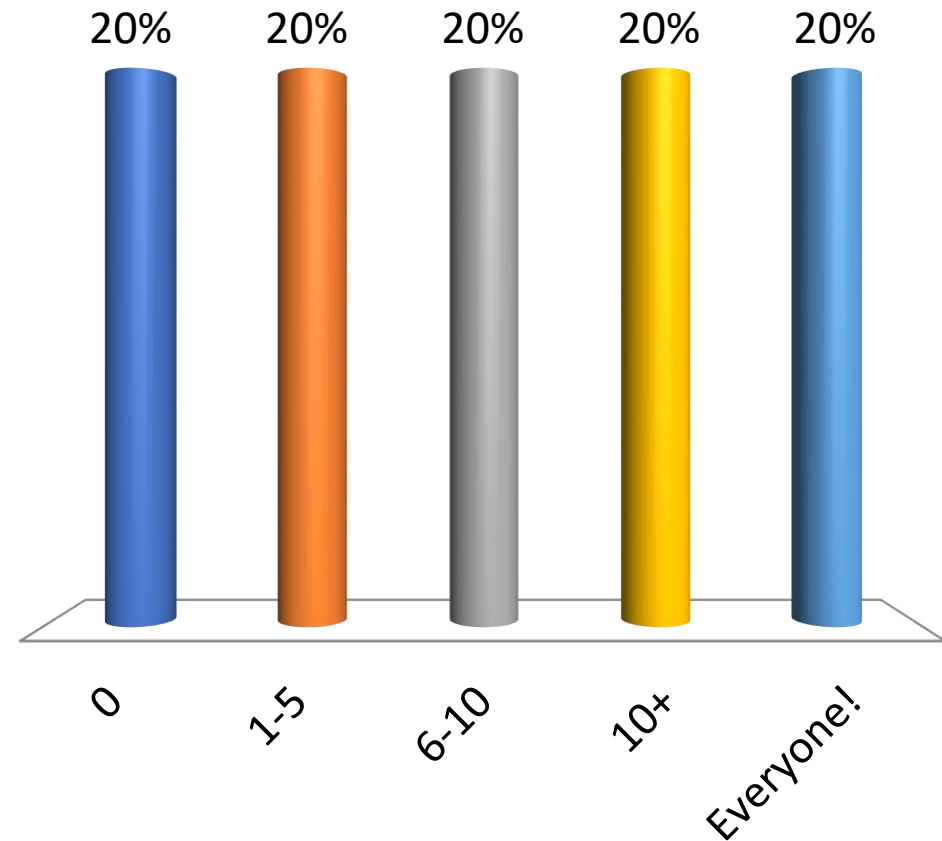
WHO ARE YOU?

1. Snuneymuxw First Nation
2. Mayor and Council
3. Land owners and tenants
4. Neighbourhood Association Members
5. Community Members
6. Designers
7. Government representatives



HOW MANY PEOPLE DO YOU KNOW HERE?

1. 0
2. 1-5
3. 6-10
4. 10+
5. Everyone!

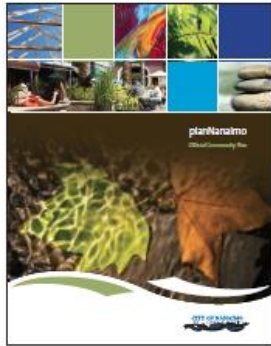


WHY WE ARE HERE

- Council has made a commitment to develop a plan that will outline how an extended waterfront walkway can be completed in a timely manner as well as complete five small, but important sections of the walkway in 2018.
- This project is one of five key projects identified in the 2016-2019 Strategic Plan.
- The Vision is to create... *“a continuous walkway from Departure Bay to the Estuary.”*



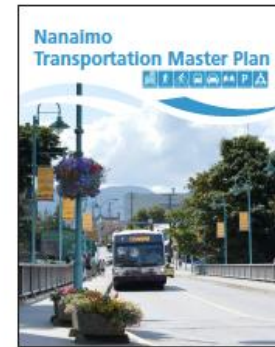
POLICIES



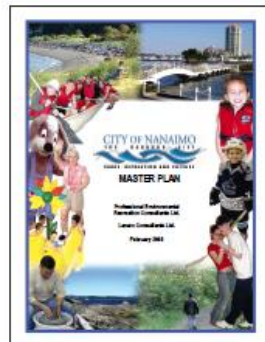
**PLANNANAIMO (OFFICIAL
COMMUNITY PLAN, 2008)**



**STRATEGIC PLAN
(2016-2019 UPDATE)**



**NANAIMO TRANSPORTATION
MASTER PLAN (2014)**



**TRAILS, RECREATION AND
CULTURE MASTER PLAN (2005)**

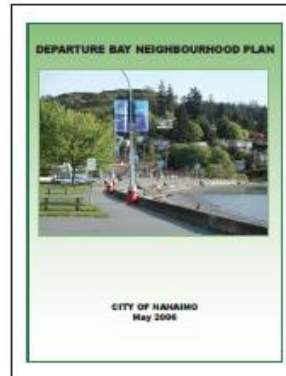


**SOUTH DOWNTOWN
WATERFRONT INITIATIVE (2013)**

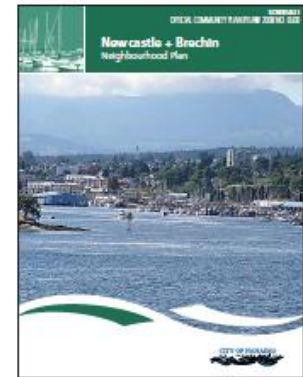


**TRAIL IMPLEMENTATION PLAN
(2007)**

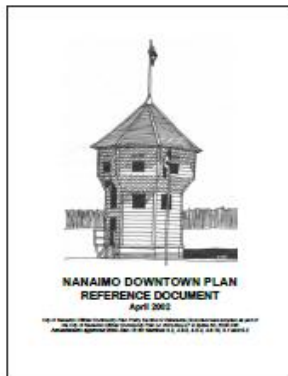
NEIGHBORHOOD PLANS



**DEPARTURE BAY
NEIGHBORHOOD PLAN (2008)**



**NEWCASTLE AND BRECHIN
NEIGHBORHOOD PLAN (2011)**



DOWNTOWN PLAN (2002)



**SOUTH END NEIGHBORHOOD
PLAN (2010)**

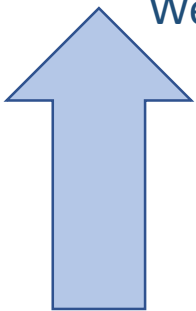


**CHASE RIVER NEIGHBORHOOD
PLAN (1999)**

PROJECT PROCESS



We are here



COMMUNITY INPUT METHODS



TAKE THE SURVEY ✓

We would like to hear from you!

To provide additional feedback please complete our online survey at home, or a paper survey today!

The information you provide by completing the survey will help us ensure the design and implementation of the walkway reflects the community's values and is a true asset for residents and visitors alike.

We look forward to receiving your input and ideas.



PROJECT OPEN HOUSES

Wednesday 10am to 6pm
MAY 17 Kin Hut
2730 Departure Bay Road



Saturday 10am to 4pm
MAY 20 Kin Hut
2730 Departure Bay Road



Thursday 10am to 6pm
MAY 18 Maffeo
Sutton Park



Late June All day stakeholder and community workshop to identify preferred options



PURPOSE OF TODAY

HOW DOES SHARING A VISION HELP GUIDE THE DEVELOPMENT OF THE WATERFRONT WALKWAY?

A vision is an idea of a desired future, and provides a framework to guide decision-making as it relates to the design of the future route.

A strong vision should:



Consider
future needs



Inspire



Include
desired
outcomes
and benefits

During this stage of engagement and planning, we want to obtain input on:

- Vision
- Route alignment
- Walkway treatments & design
- Priorities
- Other items that are important to you



GEOTECHNICAL CONSIDERATIONS

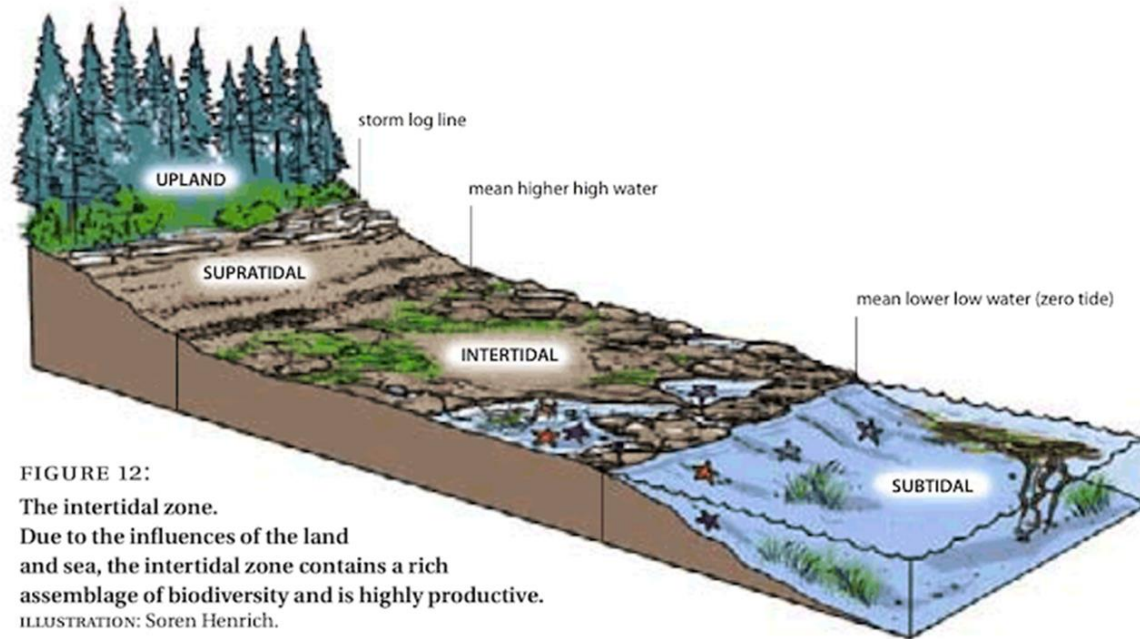
- Unmapped, reclaimed land of variable thickness and quality (e.g., Brechin Boat ramp, Maffeo Sutton Park, Boat Basin, Assembly Wharves)
- Highly variable soil conditions throughout
- Abandoned underground mine workings, some of which are relatively shallow (e.g., Brechin Mine, Douglas Mine, Nanaimo No. 3 Mine)
- Steep slopes that vary in stability
- Nanaimo is located in an area of high seismic activity

What this means: Variable design needed, constraints to some design options, cost uncertainty. Geotechnical investigations needed to better understand geotechnical constraints and design parameters.



ENVIRONMENTAL CONSIDERATIONS

- Varying tidal zones : subtidal, intertidal, supratidal, upland riparian
- Some areas along waterfront already highly developed and disturbed
- Nanaimo River Estuary's biodiversity (Nanaimo Estuary Management Plan)
- Contaminated soils from historic developments



GREEN SHORES



Green Shores is based on four guiding principles:

1. **Preserve** or restore physical processes—water and sediment movement
2. **Maintain** or enhance habitat function and diversity
3. **Prevent** or reduce pollutants entering the aquatic environment
4. **Avoid** or reduce cumulative impacts

DESIGN TECHNIQUE TYPE		DESIGN TECHNIQUE	COST	PROJECT COMPLEXITY
NATURAL <small>Hugh Shipman</small>	Natural	LEAVE NATURAL	N/A	N/A
		VEGETATION	\$	
		DRAINAGE	\$ - \$\$	
		BUILDING LOCATION	\$ - \$\$\$	
SOFT <small>Hugh Shipman</small>	Soft	LOG PLACEMENT	\$	
		BEACH NOURISHMENT	\$\$	
		RESLOPE AND REVEGETATION	\$ - \$\$\$	
HARD <small>Theresa Mitchell</small>	Man-Made Structures	STRUCTURE INSTALLATION	\$\$\$	
REMOVAL <small>Before: David Salmon, After: Hugh Shipman</small>		STRUCTURE REMOVAL	\$ - \$\$\$	



CLIMATE CHANGE AND SEA LEVEL RISE

More intense precipitation during fall and winter:

- Increase stress on local ecosystems
- Increase potential for local flooding
- Increase the risk of erosion

Sea level rise and storm surge

In Nanaimo, an 80 to 100 cm sea level rise can be expected by the Year 2100. With intense storm activity, an increased risk of storm surges along the coast will be expected.



RIPARIAN RIGHTS

- An owner of land abutting water is entitled to access to and from the water
- Applies to non-tidal river, tidal river, lake, or the sea where there is contact with the property frontage
- Riparian owner must be physically able to access the water from their property and cannot be prevented from doing so by an obstruction erected in the foreshore
- Construction of a trail in the foreshore requires 'consent' from the owner



ARCHAEOLOGICAL CONSIDERATIONS

There are archaeological sites along the entire length of Nanaimo's waterfront.

Provincial Legislation: Heritage Conservation Act

Encourages and facilitates the protection and conservation of heritage property in British Columbia.

Local Policy

- Official Community Plan has policies to conserve archaeological resources and encourage public awareness, understanding and appreciation of Nanaimo's cultural and architectural history (including interpretive signage and brochures)
- Cultural Plan recommends showcasing cultural assets in public gathering spaces including the waterfront walkway



ORDER OF MAGNITUDE COSTS

- Nature Trail = \$100/l.m. (surface only)
- Urban Soft Surface Trail = \$200/l.m. (surface only)
- Asphalt Walkway = \$500/l.m. (surface only)
- Concrete Walkway = \$600/l.m. (surface only)
- Elevated Boardwalk = \$7,000/l.m.
- Cantilevered Walkway = \$10,000/l.m.

*These costs are
Order of
Magnitude only*



SURVEY RESULTS

- I currently use the waterfront walkway to....



PRIORITIES

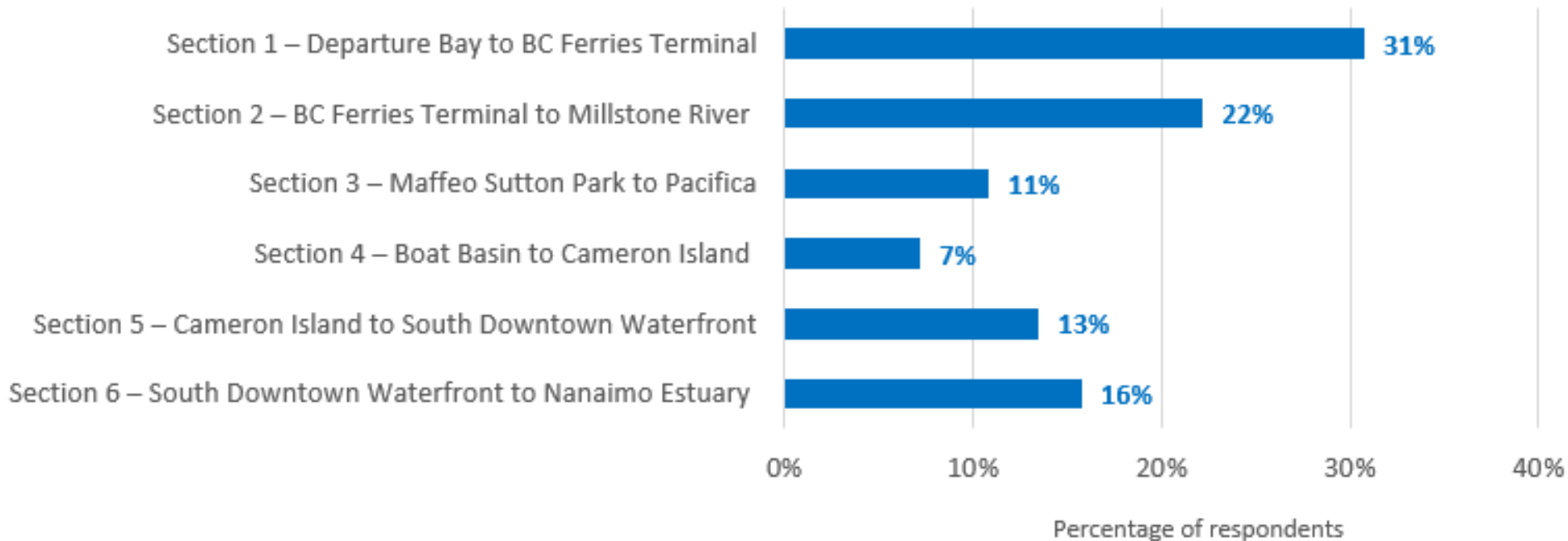
Which section of the waterfront walkway would you like to see developed or upgraded first?

POTENTIAL WATERFRONT WALKWAY ROUTE



SURVEY RESULTS

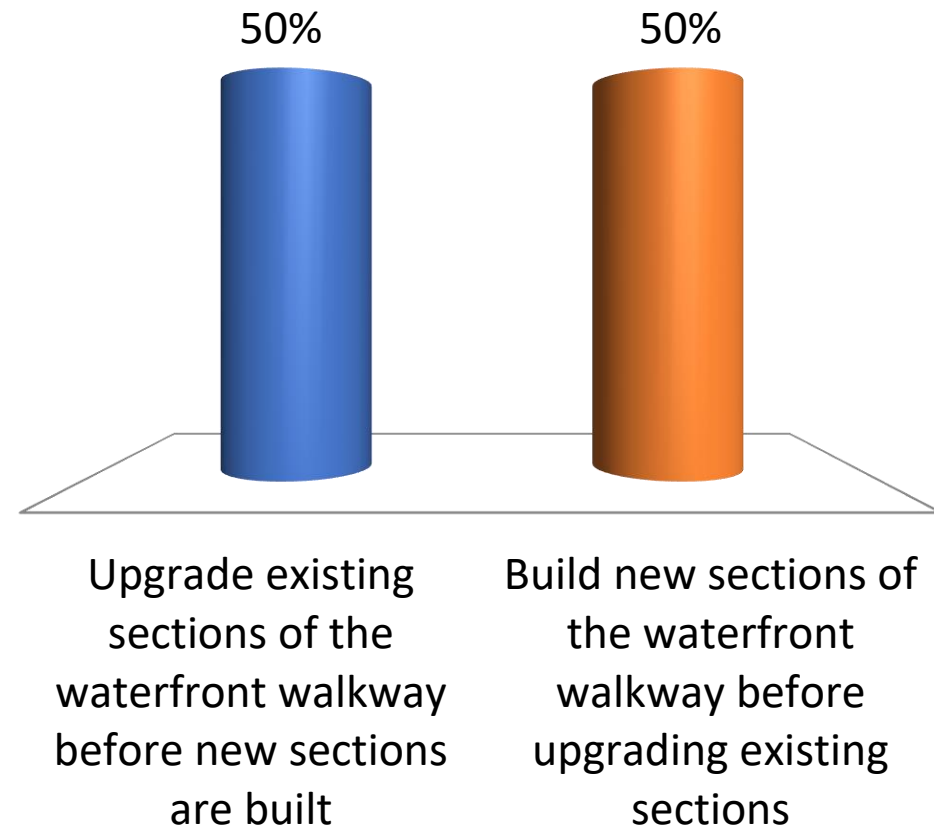
Which sections of the walkway would you like to see developed or upgraded first?



TODAY'S RESULTS

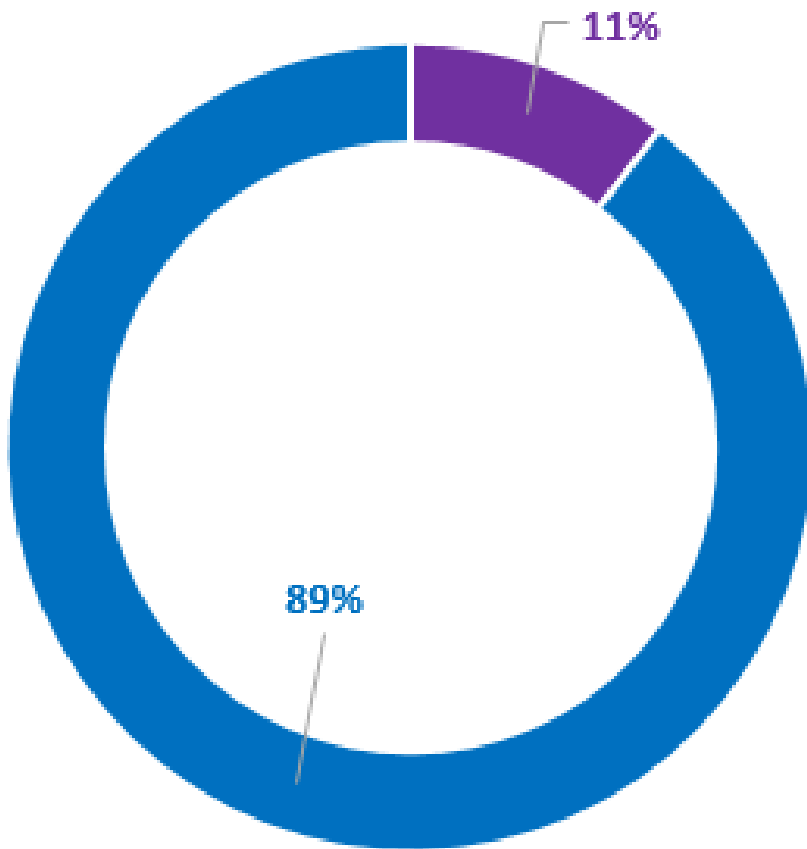
Would you rather that the City of Nanaimo...

1. Upgrade existing sections of the waterfront walkway before new sections are built
2. Build new sections of the waterfront walkway before upgrading existing sections



SURVEY RESULTS

Would you rather that the City of Nanaimo...



- Upgrade existing sections of the waterfront walkway before new sections are developed
- Build new sections of the waterfront walkway before upgrading existing sections

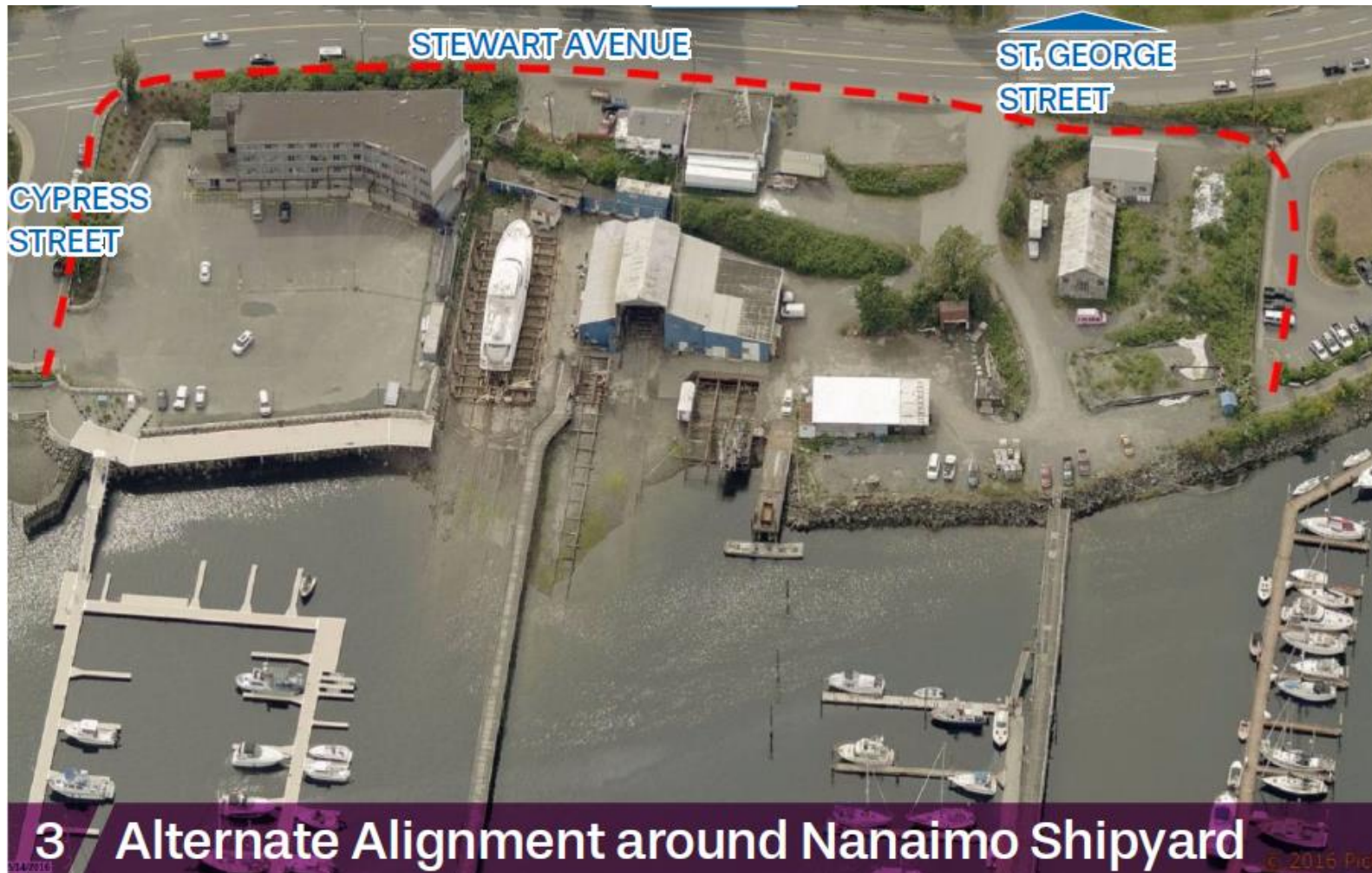
QUICK WINS



QUICK WINS



QUICK WINS



QUICK WINS



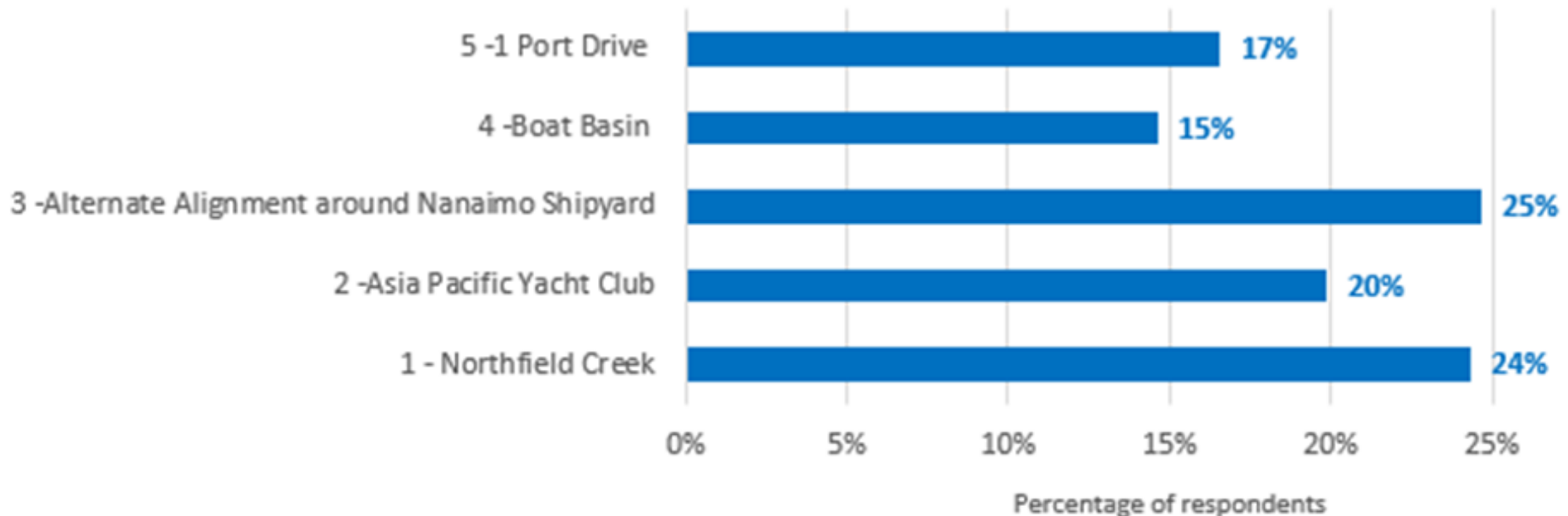
QUICK WINS



SURVEY RESULTS - QUICK WINS

Council has identified five key connections along the walkway to be completed in the short term.

In what order would you like to see these key connections prioritized?

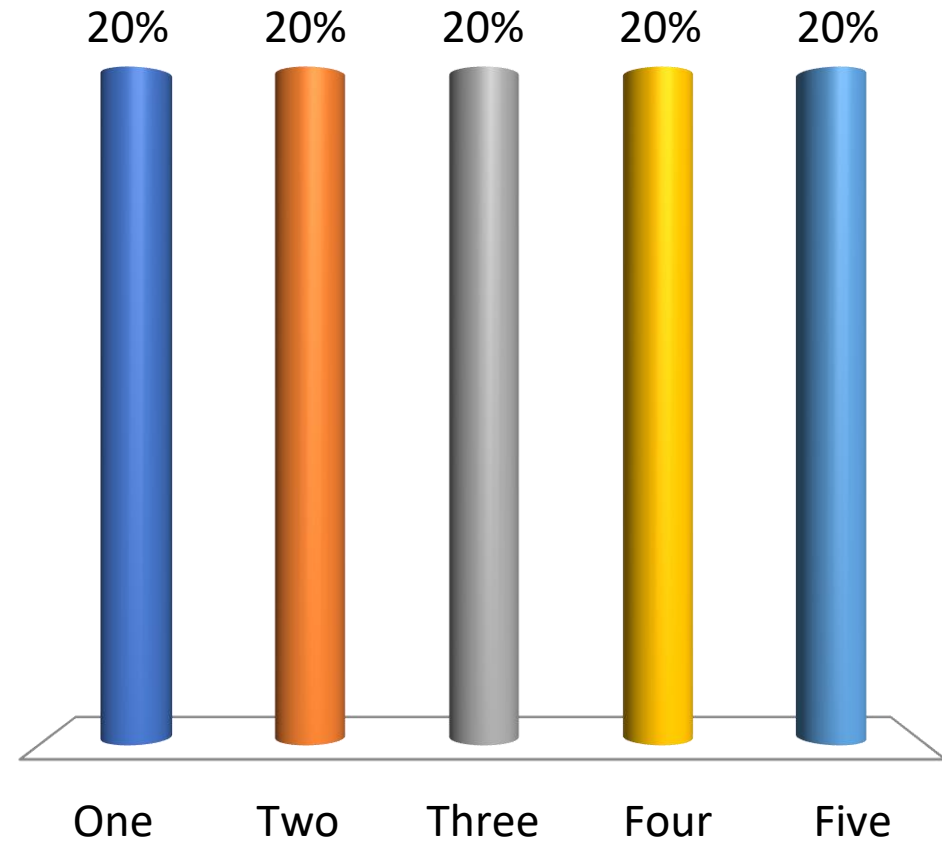


VISIONING



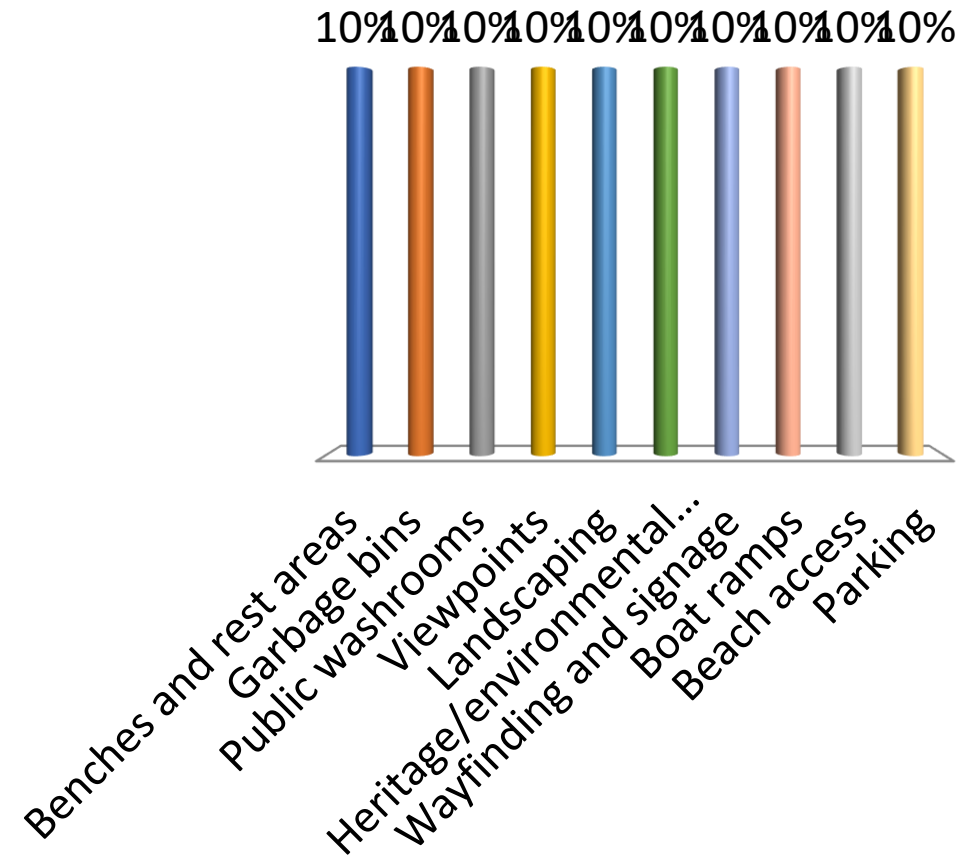
WHAT IS YOUR VISION FOR THIS PROJECT?

1. One
2. Two
3. Three
4. Four
5. Five



WHAT AMENITIES ARE MOST IMPORTANT ALONG THE ROUTE?

1. Benches and rest areas
2. Garbage bins
3. Public washrooms
4. Viewpoints
5. Landscaping
6. Heritage/environmental information / public art
7. Wayfinding and signage
8. Boat ramps
9. Beach access
10. Parking



Departure Bay to BC Ferries Terminal



Tables 1A and 1B

Table 1A: Departure Bay north of Battersea Rd

Table 1B: Departure Bay south of Battersea Rd to BC Ferries

Things to consider

Currently pedestrian only (where pathway exists)

Limited space

Riparian property rights

Archaeological impacts

Connections and accessibility to pathway

Intersection at Stewart Avenue

Opportunities to keep in mind

Beach access

Potential improvements to Kinsmen Park

Boardwalk potential

Green Shores considerations

Wayfinding improvements & overall community connectivity

Connection to BC Ferries Terminal

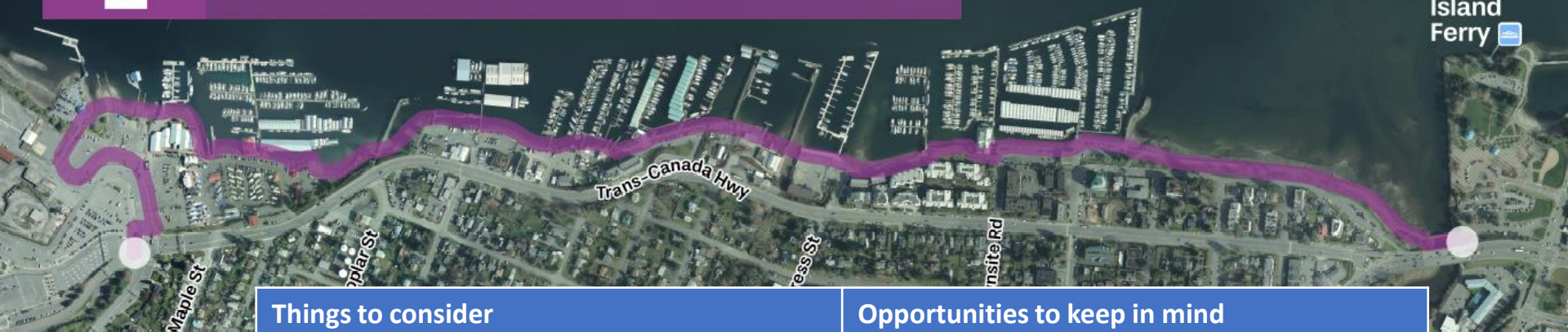


Table 2

Things to consider	Opportunities to keep in mind
Suncor overpass is low	Connects Departure Bay to Downtown Nanaimo
Right of way needed for walkway	High pedestrian and vehicle volumes (boat launch and summer markets)
Existing pathway is narrow and in poor condition in some places	Interim options until property can be acquired
Geotechnical conditions (slope stability, etc.)	Retail revitalization
Some segments considered final design	Observation opportunities for marine activities and lookout locations for Newcastle Island
Few access points along existing sections	Potential for improvements through future development

Maffeo Sutton Park to Pacifica



Table 3

Things to consider	Opportunities to keep in mind
Currently pedestrian only	Maffeo Sutton is a destination for the city
Interim design in place	Connection to Newcastle Ferry
Accommodation of high volume seasonal events	Connections to marine activities
Archaeological impacts must be accommodated	Waterfront observation opportunities, marine activities and lookout locations for Newcastle and Protection Islands
Maffeo Sutton Park Plan in place	Potential cycling connection to Front Street

Boat Basin to Cameron Island

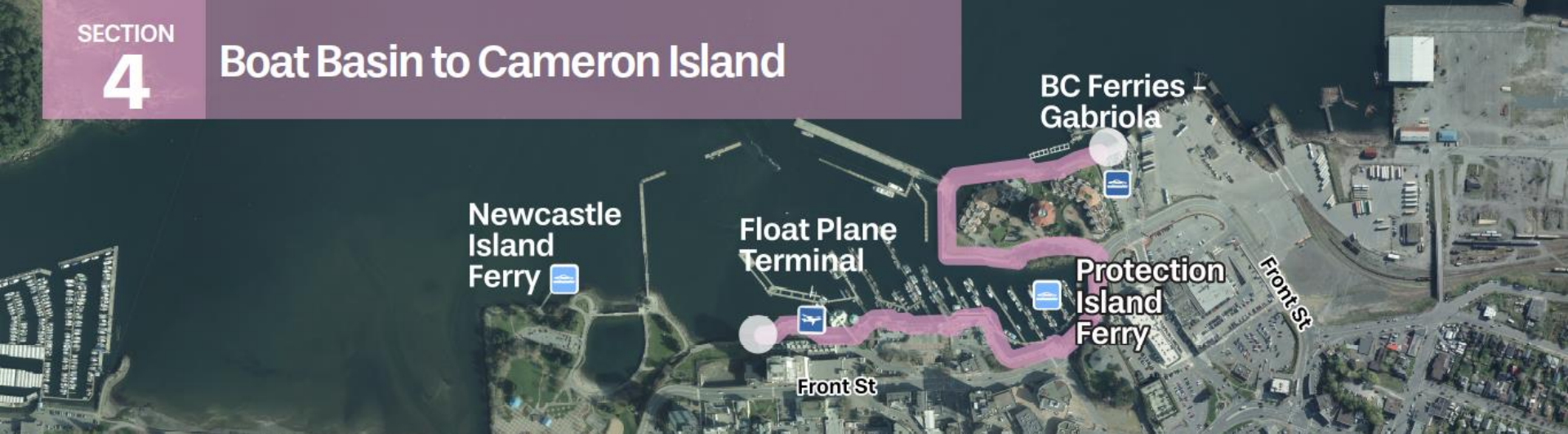


Table 3

Things to consider	Opportunities to keep in mind
Currently pedestrian only	Segment design considered final
No cycling connections	Improvements to public spaces
Popular year-round – accommodation of all users could be a challenge	Improve cycling connection to Front Street
Walkway constrained by adjacent businesses	Connection to Gabriola Ferry Terminal
Private property and privacy impacts	Connection to waterfront businesses
Geotechnical considerations at McGregor Park	Observation opportunities to waterfront, marine activities, businesses, and lookout locations

Cameron Island to South Downtown Waterfront

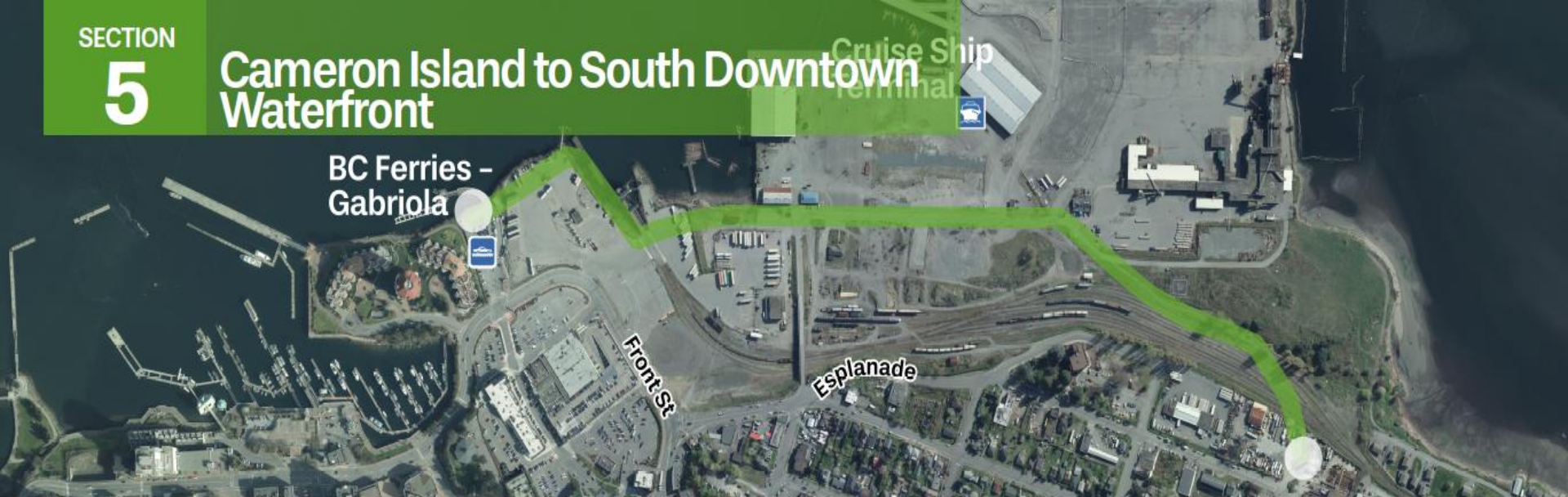


Table 4

Things to consider	Opportunities to keep in mind
No existing walkway	Connections to cruise terminal
No defined alignment	Viewpoints to Duke Point, Gabriola, Newcastle and Protection Islands
Safety concerns regarding industrial activities, rail crossings and barge ramps	Industrial presence and activities offer educational opportunities and sense of place

South Downtown Waterfront to Nanaimo Estuary

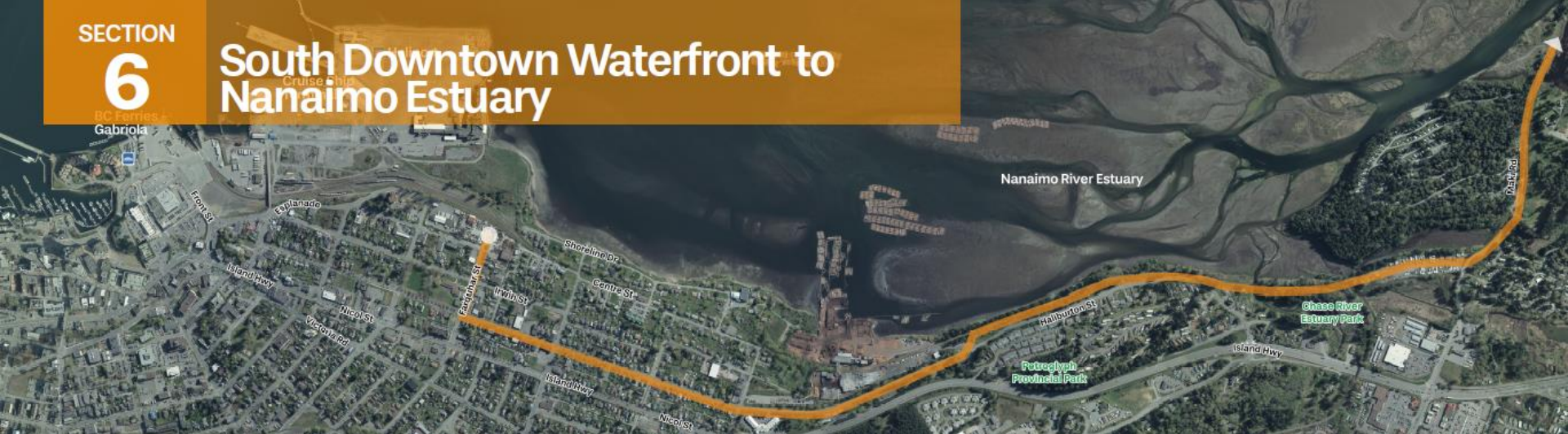


Table 5

Things to consider	Opportunities to keep in mind
New existing walkway and no defined alignment	Unique mix of residential, industrial, commercial, and recreational opportunities
Archaeological impacts must be accommodated	Scenic environment
Active railroad corridor and industrial activity	Educational opportunities
Improving access to estuary could have impact on sensitive habitats	Potential long-term extension to Duke Point

GROUND RULES AND CONSIDERATIONS

- Allow time for everyone's input
- Today's discussions will not be decisive – they will help guide the design and implementation of the walkway
- Participants are to go to a different table for each session
- Maximum 6 persons per table please



DESIGN WORKSHOP

2:15 – 3:00 Table Rotation #1 (45 Minutes)

3:00 – 3:15 Break (Refreshments)

3:15 – 3:45 Table Rotation #2 (30 Minutes)

3:45 – 4:15 Table Rotation #3 (30 Minutes)

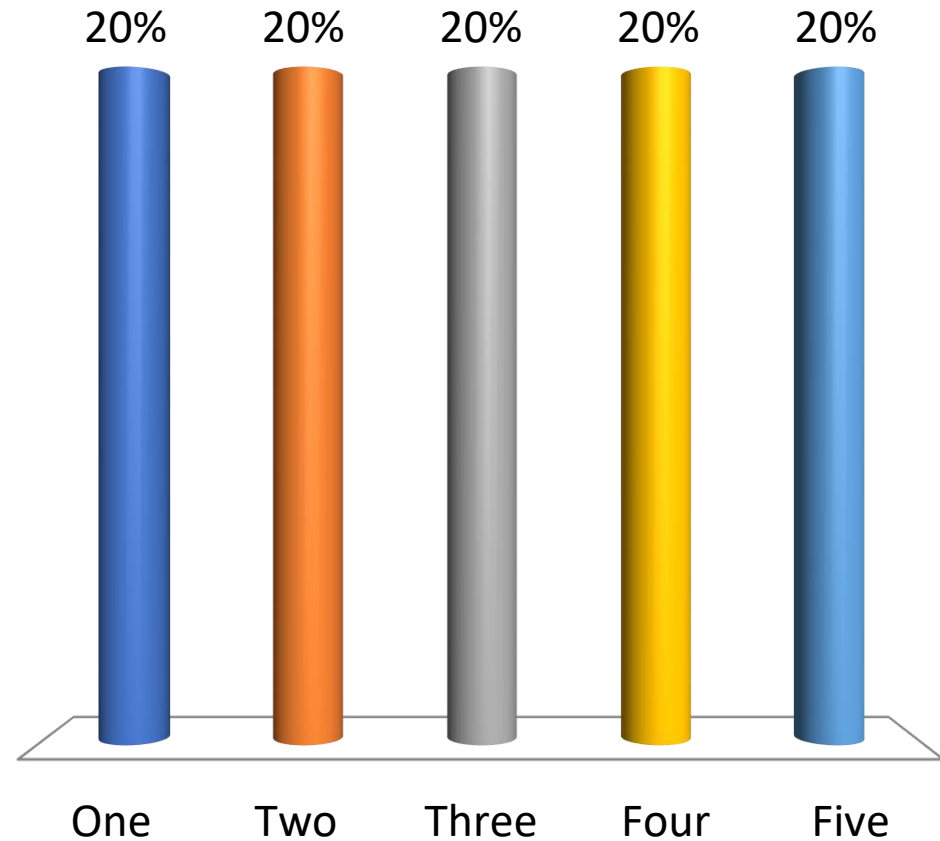


TASKS

- Route alignment
- Walkway cross-sections and materials
- Amenities and connections to other trails
- Summary of key input for each section
- Design principles for the entire corridor (arising from table discussions)

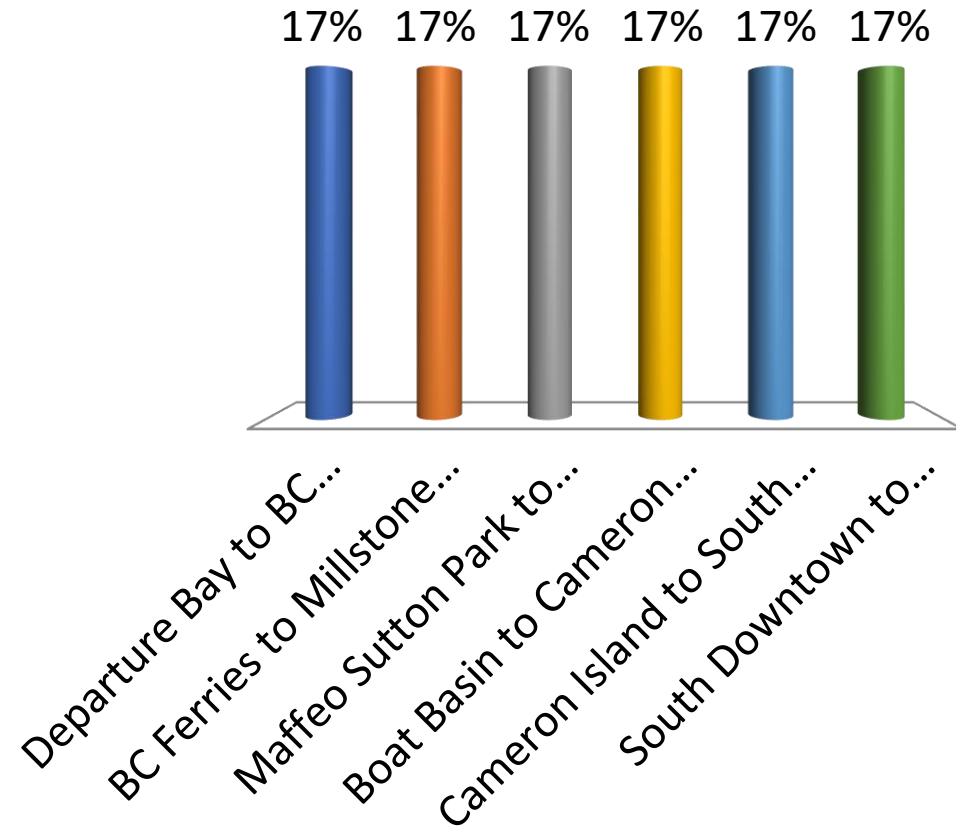
WHAT ARE THE IMPORTANT DESIGN PRINCIPLES?

1. One
2. Two
3. Three
4. Four
5. Five



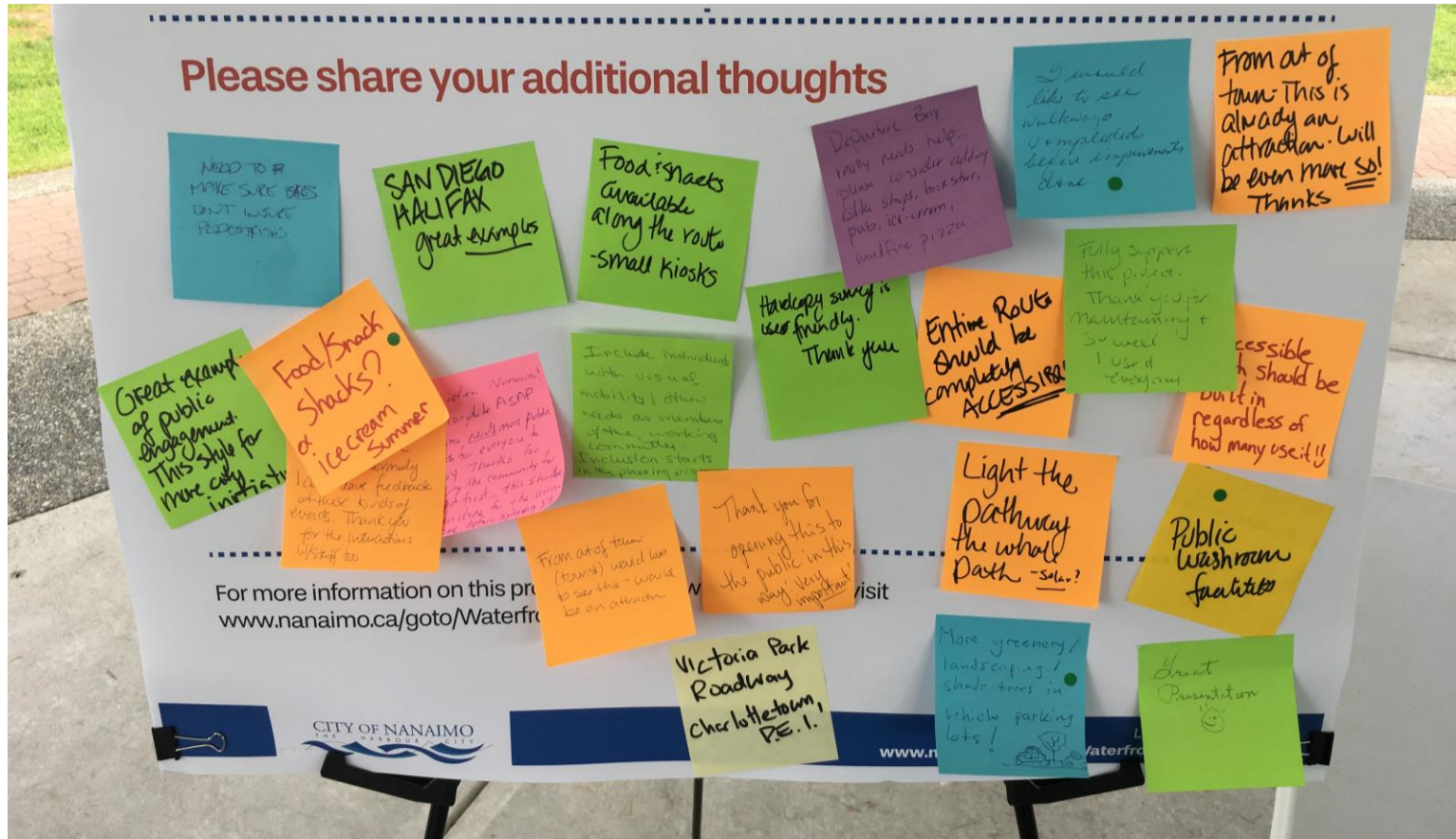
WHAT SHOULD BE THE PRIORITY OF THE SECTIONS?

1. Departure Bay to BC Ferries
2. BC Ferries to Millstone River
3. Maffeo Sutton Park to Pacifica
4. Boat Basin to Cameron Island
5. Cameron Island to South Downtown
6. South Downtown to Nanaimo Estuary



WRAP UP

- Open Discussion



THANK YOU





City of Nanaimo Waterfront Walkway Implementation Strategy

Information Sharing
5:00 – 7:00pm

Attachment B

Engagement Summaries



Waterfront Walkway Design Workshop – Table Comments

Table 1: Departure Bay – RDN Sewer Pump Station to Battersea Road

All Sessions

<ul style="list-style-type: none"> Alignment along beach, full 7m if possible <ul style="list-style-type: none"> 5m acceptable - Session 2 5m or 7m depends on location – Session 3
<ul style="list-style-type: none"> Multi-use, <u>everywhere</u> <ul style="list-style-type: none"> Divert bikes onto Dep. Bay Road for 4m wide section – Session 2 Divert bikes from walkway until Battersea (bikes on Randall) – Session 3
<ul style="list-style-type: none"> Build to final standard, if possible
<ul style="list-style-type: none"> Maintaining beach access essential, functioning beach
<ul style="list-style-type: none"> This piece should be connect to entire network but also be able to stand alone as its own attraction
<ul style="list-style-type: none"> Family friendly, lookouts, bike stands, picnic tables, food trucks, public washrooms, historical signage, wayfinding, benches
<ul style="list-style-type: none"> Departure Bay Rd. not favoured as route
<ul style="list-style-type: none"> Separate walkway bikes/pedestrians (painted line) <ul style="list-style-type: none"> Formal separation preferred where possible (ie: landscaping) – Session 3
<ul style="list-style-type: none"> Materials: <ul style="list-style-type: none"> Accessible – hard surface asphalt <ul style="list-style-type: none"> Naturalized approach in front of Randall properties – Session 3 Rip Rap, diffuse wave action Level with Battersea Road <ul style="list-style-type: none"> Or Woonerf approach – Session 3 Easy maintenance essential
<ul style="list-style-type: none"> Overall Principles: <ul style="list-style-type: none"> Multi-use, part of transp. network Alignment on waterfront preferred Connects communities Should be lit, lower/dimmer in residential areas Maintain a level of design continuity throughout End points of walkway should be CELEBRATED

Table 2 – Battersea Road to BC Ferries Departure Bay Terminal

All Sessions

<ul style="list-style-type: none"> Must find out more about Riparian Rights issue
<ul style="list-style-type: none"> Do we have a walkway that deals with these issues rather than avoid them?
<ul style="list-style-type: none"> Ok to reduce width to 5m to reduce costs and impacts
<ul style="list-style-type: none"> Does RDN need to upgrade sewer? If so service road/access would be needed
<ul style="list-style-type: none"> Add water fountains/taps
<ul style="list-style-type: none"> 1 metre above high water, have gates to close at high storms
<ul style="list-style-type: none"> Accessible to bicycle police – security**
<ul style="list-style-type: none"> Needs to be fully accessible – bikes, wheelchairs
<ul style="list-style-type: none"> Needs to have good lighting
<ul style="list-style-type: none"> Garbage cans

• Could be gravel (possibly more resilient)
• Bike parking at ferry
• Cannot be a gravel surface
• Need to understand impacts to inter-tidal zones etc. so we can pick a design that lessens impact
• Multi-use is very important
• New sections of walkway needs to be 7m, no compromises – just solutions, compromises should be considered to lessen costs or impacts
• Walkway needs to be accessible for appropriate service vehicles
• EMS/Emergency, response/access
• Everyone should be able to enjoy (all users)
• Improve trail from Beach Drive
• Lessen disturbance to residents above (ie: noise, lighting levels)
• Retaining wall at toe of slope to prevent slope material (soil/rocks/trees) from falling onto trail
• Benches
• Viewpoint at trail (from White Eagle Terrace)

Table 3 – Newcastle Channel
Session 1

• Remove hairpins for bikes
• Bikes on Stewart?
• Invasive species on Queen Elizabeth P. – goats to eat weeds?
• Enforcement of cyclists
• Physical separation with barrier
• Safety with active business – ie boatyards
• Continuity to BC Ferries
• Focus on areas with no access
• Natural
• Snow maintenance
• Stewart Avenue cycle track
• Access at Bryden & Dawes
• More small businesses – Seasonal
• Improved signage
• Parking for visitors/users – parkade?
• Restaurants, cafes
• Drinking fountains – people and dogs
• If shared – need separation and greenery
• Continuous, safe, highly accessible
• Attention to bike section and walkway sections
• Attention to bikes, away from a slower walking sections for elderly

Session 2

• Pedestrian safety crossing Stewart Ave., “refugees” in middle of road
• Stones, shipyard and waterfront suites, will see redevelopment
• Gathering places and cookouts

• Draw Brechin population down to Waterfront
• Park boats (kayaks) at businesses
• Connection from Brechin boat ramp to Newcastle Island
• Preserve on-street parking
• Mixed use – safety
• Shipyard – walkway on water around the shipway – great view point and narrowest point to Newcastle Island

Session 3

• More access points from Stewart Avenue to the walkway
• Line access and transit hubs and washrooms
• View corridors with amenities
• Biking and walking from one end to another
• Wayfinding and signage needs to be improved connection from BC Ferries to Brechin/Stewart
• Signage to be improved, if completely separated – Stewart Ave. Would be okay, but multi-use path is a must!! Along water!

Keypoints

• Stewart Ave. for a cycle track
• Marine activity as educational opportunity
• Access to the water for kayaks
• Mixed opinions on bike/pedestrian
• Create gateways (ie: BC Ferries)
• Maintenance of existing sections
• Wayfinding
• Redevelopment opportunities to build walkway
• Continuous walkway

Table 4 – Maffeo Sutton Park and Boat Basin

Session 1

<ul style="list-style-type: none"> • Bikes – No Bikes, How do you have both? <ul style="list-style-type: none"> ▪ Area between? Maffeo Sutton & Boat Basin ▪ Signs are too small on bridge ▪ Dismounting ▪ Look to other seawalls ▪ On top of retail ▪ Parkade – route ▪ Want to be on waterfront – bikes ▪ Bike route or shared pathway through park ▪ What is your vision?
• Continuation of trail at street level
• Safety – trail crossing at dock
<ul style="list-style-type: none"> • Signage on streets <ul style="list-style-type: none"> ▪ Signs for littering/dogs ▪ Bins – dogs
• Permanent art at Port crossing – collection

• Art installation – iconic
• Georgia Park – gathering place
• Sea level rise / climate change? – where does the water go then?
• Maffeo Sutton <ul style="list-style-type: none"> ▪ Meandering trail ▪ Green shore development
• Tidal art – high tide safety display
• Separate lanes
• Front Street plaza
• Boat Basin onto Front Street – boardwalk ok
• Maffeo Sutton – green shore lighting

Session 2

• Surfaces: asphalt - cost
• Maffeo – Plaza – shuttle
• Parking – cohesive design
• Lighting – Swylana – Maffeo Sutton – downlight
• “dark skies” – motion activated
• Safety – lighting for eents
• Boat Basin – on water – level – avoid stairs/ramps – no stairs – accessible – dock is secondary
• Flexible in widths, 5 – 10m, plazas – keeps people there
• Pedestrian only – Front Street plaza
• Benches
• Vendors on waterfront – Victoria
• Front Street more pedestrian friendly 30km/hr.
• Separate use/spaces along waterfront
• Vantage point on Front Street
• Cross walk/light in Maffeo Sutton Park
• Boardwalk
• Tile
• Main traffic area – consistent
• Permeable surfaces, powers, parking, environment – natural
• Access to water – kayaking – ramps – landings
• Bike share/storage – secure – in parkade
• More racks – art work
• More public art – plazas
• Park bike to walk into downtown
• Views, bike specific nodes
• Continuous – cohesive throughout
• Shared – pedestrians/bikes
• Maffeo – central focus, everybody goes here
• Central, bike/pedestrian or Front Street
• Info kiosk – tourism
• Ground

Session 3

• Between Georgia and Maffeo – pinch point
• Commercial space at Front Street Plaza
• Should be multi-use
• Cycle path – TMP – segregated (lose one parking portion)
• Love the beach at Georgia
• Corner at G.P. – safety issue
• Options: multi-use – speed limits for bikes
• Cyclists yield
• Where do you leave the bike? – lockers
• Bike/lockers and racks at locations along the walkway
• Events – have volunteers to watch bikes at site
• Cyclists to enjoy park as well
• Connection Gabriola ferry – transportation all hooks up
• Bikes on ferry – electric bikes, it's increasing, bike share
• Merchants start to cater to cyclists
• Materials – asphalt (boring) and concrete – good for accessibility – but pavers – interesting, not stamps, wood – nice material, dock – warranty
• New sections – first
• Game changer – harbour City
• Ferry – downtown
• Connection to New Castle? PPP?

Key Points

• Central focus area
• Accessibility (bikes, pedestrian, universal)
• Flexible widths (5-7-10m)
• Gathering space
• Grand expressions here!

Table 5 – 1 Port Drive and South End Neighbourhood
All Sessions

• Alignment: rubber for walking, asphalt/concrete for cycling
• Width – multi-use
• Materials: asphalt, concrete
• Potential new Port Drive walkway
<ul style="list-style-type: none"> Challenges: <ul style="list-style-type: none"> Land uses restrict public access <ul style="list-style-type: none"> Port Authority docks – active loading Helijet Flight Path – see map Southern Rail – how to manage conflict Gabriola Ferry Port Drive Trestle – age/condition - \$6mm to replace? Future rail crossing locations – Farquhar
• Opportunities

<ul style="list-style-type: none"> ▪ Front Street extension – Pedestrian/cycle connectivity ▪ Either (a) replace Port Drive Trestle but shorten rail crossing to reduce costs or (b) connect Trestle to pedestrian/cycle and provide new access (Farquhar) ▪ Formalize “informal” trail on rail ROW from Milton to SFN (Island Corridor Foundation Rep. was open to suggestion) ▪ Move Helijet pads to SE corner of Port Lands – lessens the flight path restricted area ▪ Connectivity through SFN Lands ▪ Distinguish between on-road facilities (ie: Irwin, Haliburton, Front St. Extension – single uses) vs. off-road/waterfront paths – multi-use ▪ Create multiple points of connection
<ul style="list-style-type: none"> • Materials: <ul style="list-style-type: none"> ▪ Wooden boardwalk less desirable (for wheelchairs, bikes, strollers) – composite decking? ▪ Concrete most durable, but expensive ▪ Combination of asphalt and pavers ▪ Permeable asphalt?
<ul style="list-style-type: none"> • Amenities: <ul style="list-style-type: none"> ▪ Washrooms ▪ Vegetation – area is stark! ▪ Signage – create a walking loop ▪ Marine/Industrial theme

Table 6 – South End Neighbourhood to Nanaimo River Estuary
Session 1

• Connectivity to surrounding neighbourhood
• Surface treatment for trail (natural v. urbanized) – use natural as interim standard
• Multi-use preferred (bike/pedestrian)
• Locate near waterfront where possible (not possible in SFN Reserve #1 Site? And coastland site)
• Section lowest priority
• Link around SFN reserve site important
• Multi-purpose trail key
• Bias
• Often issue between bikes and pedestrians
• Consider where parking will be placed for folks using trail
• 3 metre width can work – larger width is good but can fluctuate – 7 metres minimally wide – somewhat arbitrary
• Establish and recommend width and why
• Rail use active on rail line, 2 – 3 times a week
• Haliburton Street not preferable route
• Could consider running through Coastland mill site by rail line but it is tight area – would be difficult
• Amenities – strategically place in existing parks/open spaces
• Connection to Living Forest needs to be controlled at night
• Short term thinking not to consider multi-modal
• Look at connectivity to Parks/open space off of trail
• Real opportunity for bike connection on waterfront – other routes not so good
• Height of ferry along trail can be an issue

<ul style="list-style-type: none"> Concerns with how to work around Coastland site – likely have to use Haliburton
<ul style="list-style-type: none"> At Chase River area – go under trestle bridge – run through Chase River Park to Island Highway then along Maki Road
<ul style="list-style-type: none"> Having a trail along rail line should be possible but main consideration is safety
<ul style="list-style-type: none"> Disarm about how to go through SFN Reserve #1 Site or to go around, a connection could be made along rail line through to north of Reserve site, rail line is too tight
<ul style="list-style-type: none"> How will various City neighbourhoods connect to waterfront trail – important consideration
<ul style="list-style-type: none"> Link from Chase River neighbourhood through South Gate to Chase River park and trail
<ul style="list-style-type: none"> Lacking SFN support then Haliburton only option but not preferable
<ul style="list-style-type: none"> Look to experience of Victoria connection in laying out trails/and how they do connectivity into trails
<ul style="list-style-type: none"> South of coastland could look at trail near water
<ul style="list-style-type: none"> Ideal to keep people on the same section of a road/rail line the whole way along route
<ul style="list-style-type: none"> Have covered areas, not just benches for seating – place in scenic areas
<ul style="list-style-type: none"> Info spots and what you are looking at - at points of interest

Session 2

<ul style="list-style-type: none"> Rail is still actively being used – 2-3 times per week
<ul style="list-style-type: none"> Trail along waterfront possible – needs to be above high tide and able to handle wave action
<ul style="list-style-type: none"> SFN connection? – don't know without input from SFN
<ul style="list-style-type: none"> Haliburton may be only option by default – preferred if waterfront walkway could be on waterfront – maybe start simple gravel trail and then upgrade over time if can be done along waterfront
<ul style="list-style-type: none"> Start nature trail just south of Coastland
<ul style="list-style-type: none"> Consider kayak launch – perhaps out near large metal wheel
<ul style="list-style-type: none"> Noted that this section has most potential for dramatic change to economic development in City and is virgin territory so to speak
<ul style="list-style-type: none"> If we have too high a standard in this area it may never happen
<ul style="list-style-type: none"> Start natural trail just south of Coastland
<ul style="list-style-type: none"> Amenities – way finding signs, information signs, washrooms (could be port-a-potty – place at entry/parking areas), benches to take advantage of views
<ul style="list-style-type: none"> Interim may be natural trail and sets up for asphalt path after
<ul style="list-style-type: none"> Trail should eventually connect out to Biggs Point at Duke Point
<ul style="list-style-type: none"> Trail design – looked at various options – mixed use trail v. only bike or pedestrian
<ul style="list-style-type: none"> Nanaimo River Delta is a wonderful view – aesthetics are great
<ul style="list-style-type: none"> Noted that Estuary used to be prolific crabbing area – lost with log storage activity
<ul style="list-style-type: none"> Trail standard should be rugged in short and long term – just basic gravel or wood chip (this should be ultimate trail standard – natural trail that is multi-use)
<ul style="list-style-type: none"> Rail line could be shared with trail where it's safe
<ul style="list-style-type: none"> Coastland site along problematic due to access issues for waterfront and rail line

Session 3

<ul style="list-style-type: none"> Disarm about what standard is
<ul style="list-style-type: none"> Connectivity – have to connect folks to trail, would like to see connection from trail to Island Highway

<ul style="list-style-type: none"> • Connection to Duke Point would be desirable from BC Ferries perspective to encourage bike traffic
<ul style="list-style-type: none"> • Amenities – maybe just a few garbage cans periodically for nature trail, washrooms at entrance
<ul style="list-style-type: none"> • Usage – multi-modal would be desirable
<ul style="list-style-type: none"> • Look at getting trail in a more logic manner, be strategic then upgrade over time
<ul style="list-style-type: none"> • Consider cross section for Haliburton – look at

Key Points

<ul style="list-style-type: none"> • Connectivity to
<ul style="list-style-type: none"> • Surface treatment (natural v. urbanized) – use natural, interim standard
<ul style="list-style-type: none"> • Multi-modal preferred
<ul style="list-style-type: none"> • Waterfront preferred (but not always possible ex. At Reserve and Coastland mill sites)

Wrap-Up Comments

<ul style="list-style-type: none"> • Theme – nature
<ul style="list-style-type: none"> • Walkway – showcase the City, enhance what we have
<ul style="list-style-type: none"> • Preserve marine industries
<ul style="list-style-type: none"> • Important project for City

Nanaimo Waterfront Walkway | Implementation Survey Summary 2

November 2017

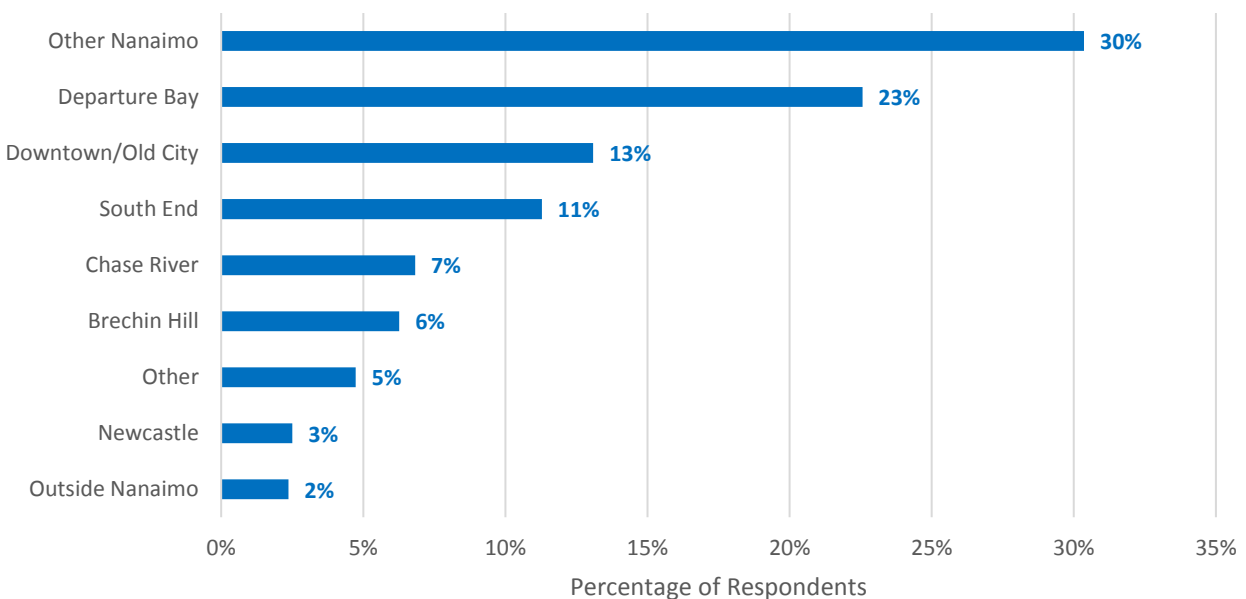
In the fall, 2017 the City of Nanaimo distributed a second survey to residents as part of the implementation process for the Waterfront Walkway project, a 13 km multi-use trail along Nanaimo's waterfront. The survey was available both online and in hardcopy. In total, 714 people responded to the survey. Of those who responded to the survey, 31% had participated in the first Nanaimo Waterfront Walkway Implementation survey, distributed in May, 2017.

The following is a summary of the input provided by those who responded to the second Nanaimo Waterfront Walkway Implementation Survey. The input will be used to establish the sections to be constructed as a "Quick Win", confirm specific preferences for prioritizing construction of the various sections of the walkway, confirm the preferred concept for the walkway in Section 1 – Departure Bay to BC Ferries, and establish the suite of amenities to be included in the walkway designs.

Q: Where do you live?

Respondents were first asked to indicate where they live in order to better understand who responded to the survey and their relationship to the waterfront. As shown in Figure 1, 30% of respondents indicated that they live in "other Nanaimo" and 23% identified that they live in Departure Bay. These results were similar to the May 2017 survey. Those who selected "other Nanaimo" were able to specify where, with responses including North Nanaimo, Diver Lake, Hammond Bay, the hospital area and Westwood Lake.

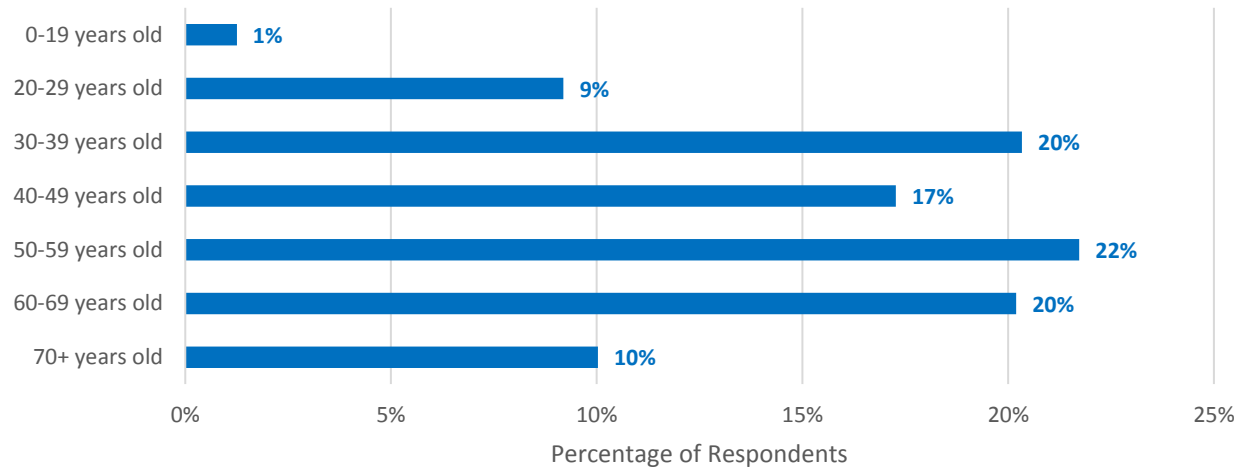
Figure 1: Where respondents live



Q: In which age group are you in?

Respondents were asked to indicate which age group they fall into, with more than half of respondents (59%) are between 30 and 60 years old. Respondents 19 and younger made up the smallest percentage of respondents at 1%, followed by those between 20 and 29 years old (9%).

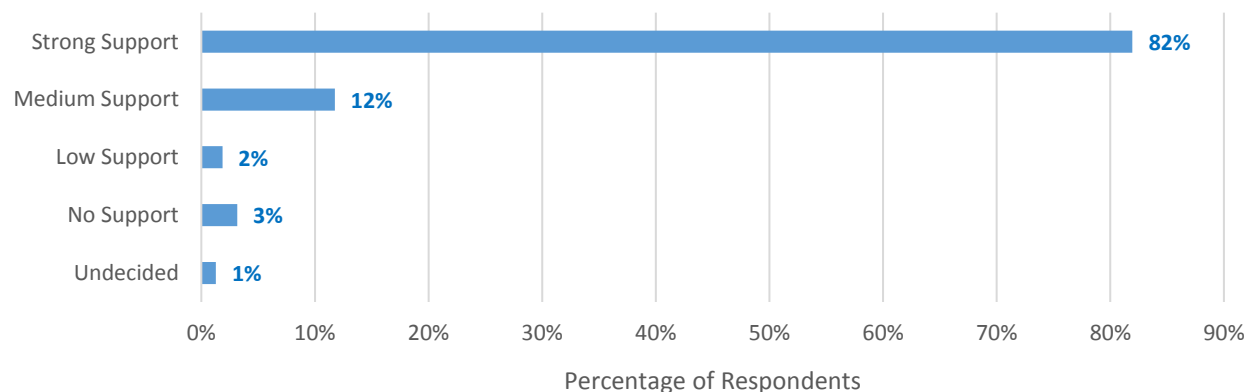
Figure 2: Age of respondents



Q: Overall, do you support the development of the Nanaimo Waterfront Walkway?

Survey participants were then asked to identify their overall level of support for the development of the Nanaimo Waterfront Walkway. The results show a high level of support for the City's plans for developing a waterfront walkway, with 82% indicating they have strong support. A breakdown of the responses are shown in Figure 3.

Figure 3: Support for development of the Nanaimo Waterfront Walkway

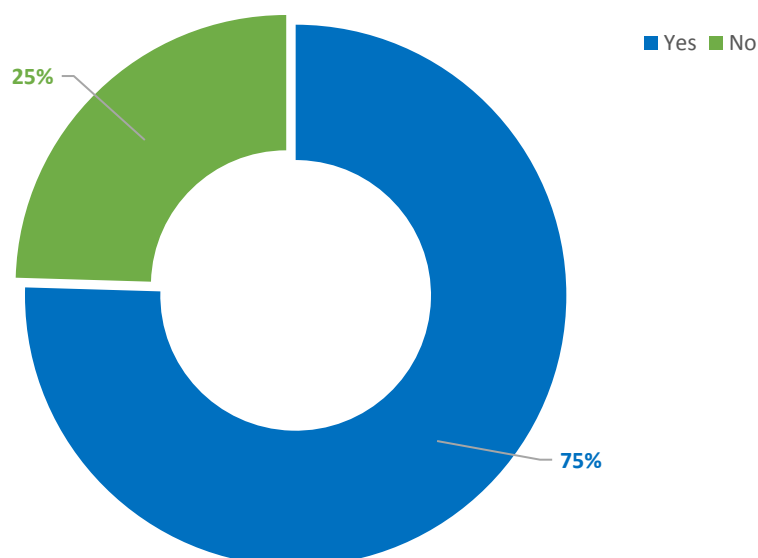


Q: Do you agree with Section 1 being identified as the top priority for development

In the May, 2017 survey, participants were asked to indicate which of the six (6) sections they would like to see developed or upgraded first. The results from the May, 2017 survey indicated that the majority of respondents would like to see Section 1 – Departure Bay to BC Ferries Terminal developed first.

To confirm this sentiment, those responding to the second survey (fall, 2017), were shown the results from the May, 2017 survey and asked if they agree. As shown in Figure 4 below, 75% of respondents are in agreement with Section 1 – Departure Bay to BC Ferries Terminal being identified as the top priority for development.

Figure 4: Support for Section 1 being identified as a top priority for development



Of those who provided a response to this question, 170 (25%) disagreed with Section 1 being identified as the top priority for development. These respondents were provided the opportunity to specify which segment they believe should be the top priority for development. The results as shown in Table 1 below.

Table 1: Number of respondents planning to use one segment frequently

Section	# of Respondents	% of Respondents
Section 2	82	49%
Section 3	4	2%
Section 4	3	2%
Section 5	31	19%
Section 6	47	28%

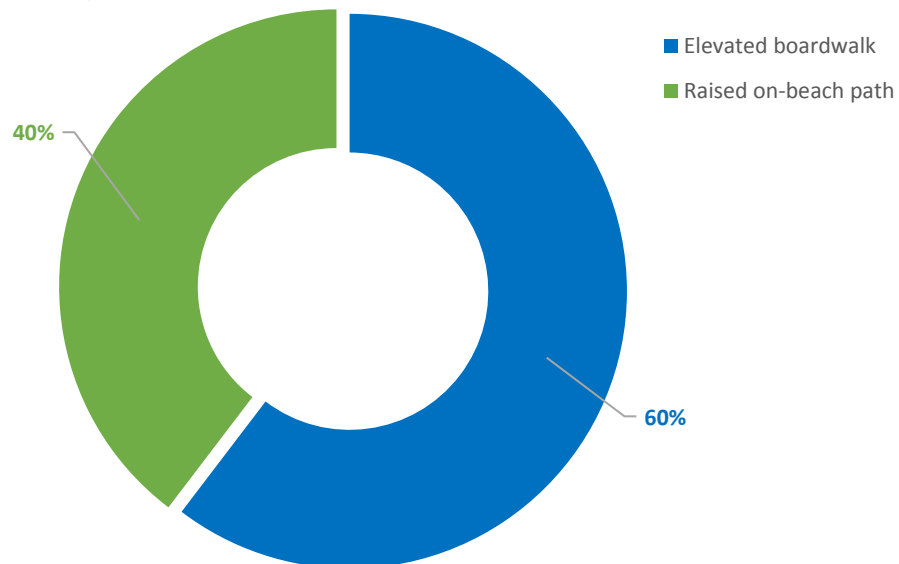
Note: of the 170 who disagreed, 167 provided an alternative preference. Three (3) respondents chose to not provide a response.

Q: Would you prefer an elevated boardwalk or raised on-beach path for Section 1

Currently, the City is considering two design options for Section 1, an elevated boardwalk or a raised on-beach path, as illustrated below. Respondents were asked to indicate which design option they prefer for Section 1. The results show that more than half of respondents (60%) are in favor of the elevated boardwalk design for Section 1.



Figure 5: Preference for Section 1 design

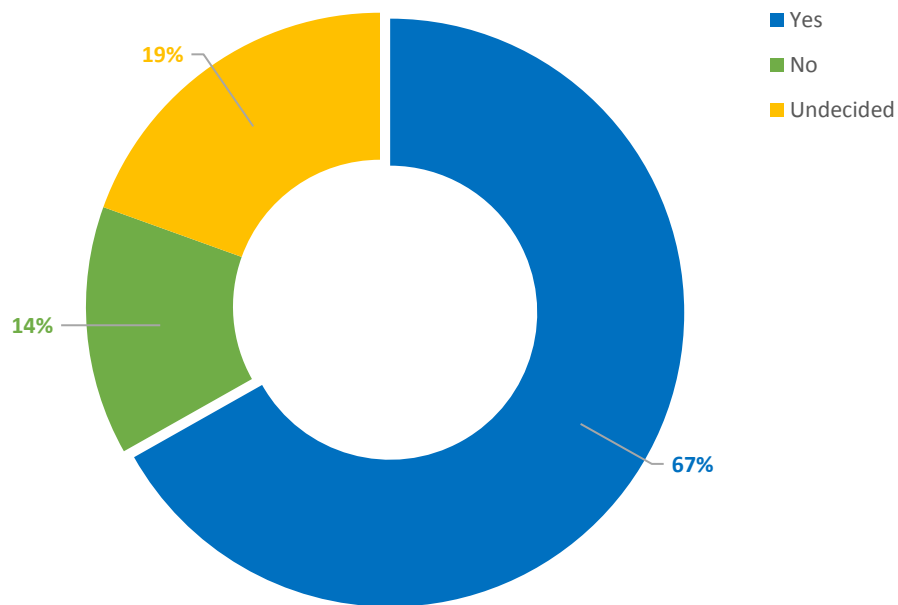


Q: Do you support the development of a temporary walkway for Section 6B?

Consideration is being made for the development of a temporary walkway for Section 6B (Coastland to Nanaimo Estuary). The temporary walkway would be built to a lower standard (e.g. gravel surface) to improve overall connectivity in the short-term, with construction to the final standard completed as public use increases on this section.

Survey participants were asked whether or not they would support this temporary measure for Section 6B. As shown in Figure 6, more than half of respondents (67%) are in favor of this temporary measure.

Figure 6: Support for a temporary walkway for Section 6B

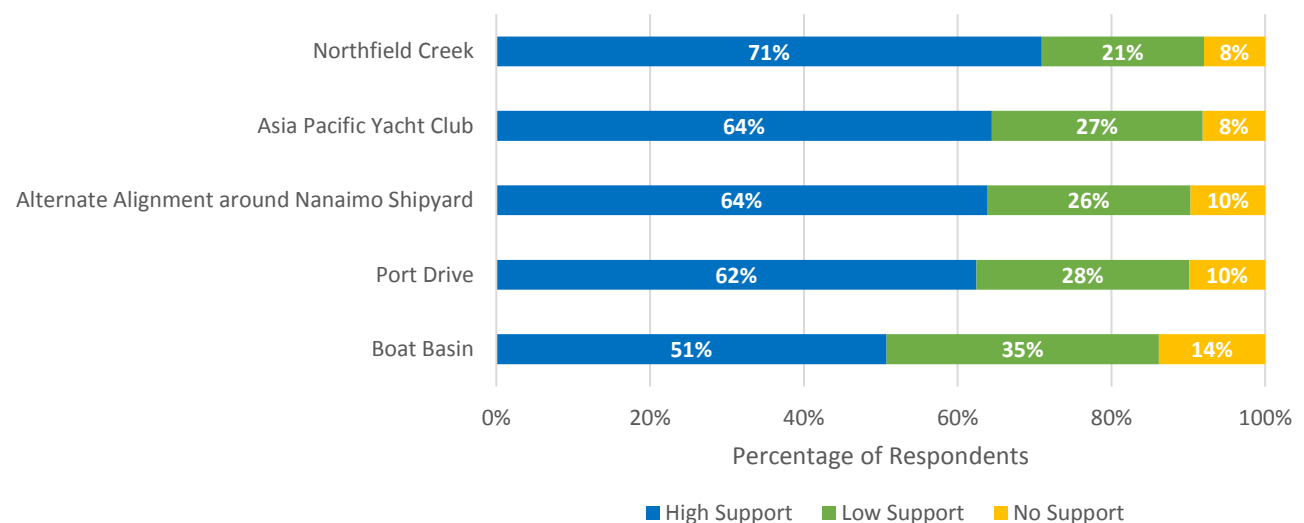


Q: In what order would you like to see these key connections prioritized?

Council has identified five key connections along the walkway to be completed in the short term to help maximize the functionality of the current waterfront walkway by filling existing gaps. In the May, 2017 survey, respondents were asked to select the three key connections that they would like to see prioritized. The results were fairly split, with 10 percentage points separating the highest and lowest selections.

To assist Council in better understanding the support for these key connections, those responding to the second survey were asked to indicate their level of support for each key connection. The Northfield Creek connection received the highest support, as shown in Figure 7 below.

Figure 7: Priorities for key connections



Q: Are there other amenities that you would like to see that have not been considered?

A variety of amenities have been identified along the proposed walkway, including beach access, fishing and crabbing areas, boat ramps, interpretive signage, trail connections and viewpoints. Other amenities, such as benches, trash cans, water fountains, signage, washrooms and pet waste stations will be appropriately spaced along the walkway.

Survey participants were asked if there are any other amenities they would like to see that have not already been considered. In total 262 suggestions were given. Providing opportunities for vendors, including coffee shops, restaurants, food carts and souvenir shops, among others was the most popular suggestion. Table 2 shows the suggestions with at least 10 mentions.

Table 2: Amenities to consider

Section	# of Mentions	Section	# of Mentions
Commercial Vendors	58	Historical/First Nations Signage	14
Lighting	33	Landscaping	11
Separated Bike Path	15	Picnic Tables/Gazebo	11

Q: Do you have any additional comments?

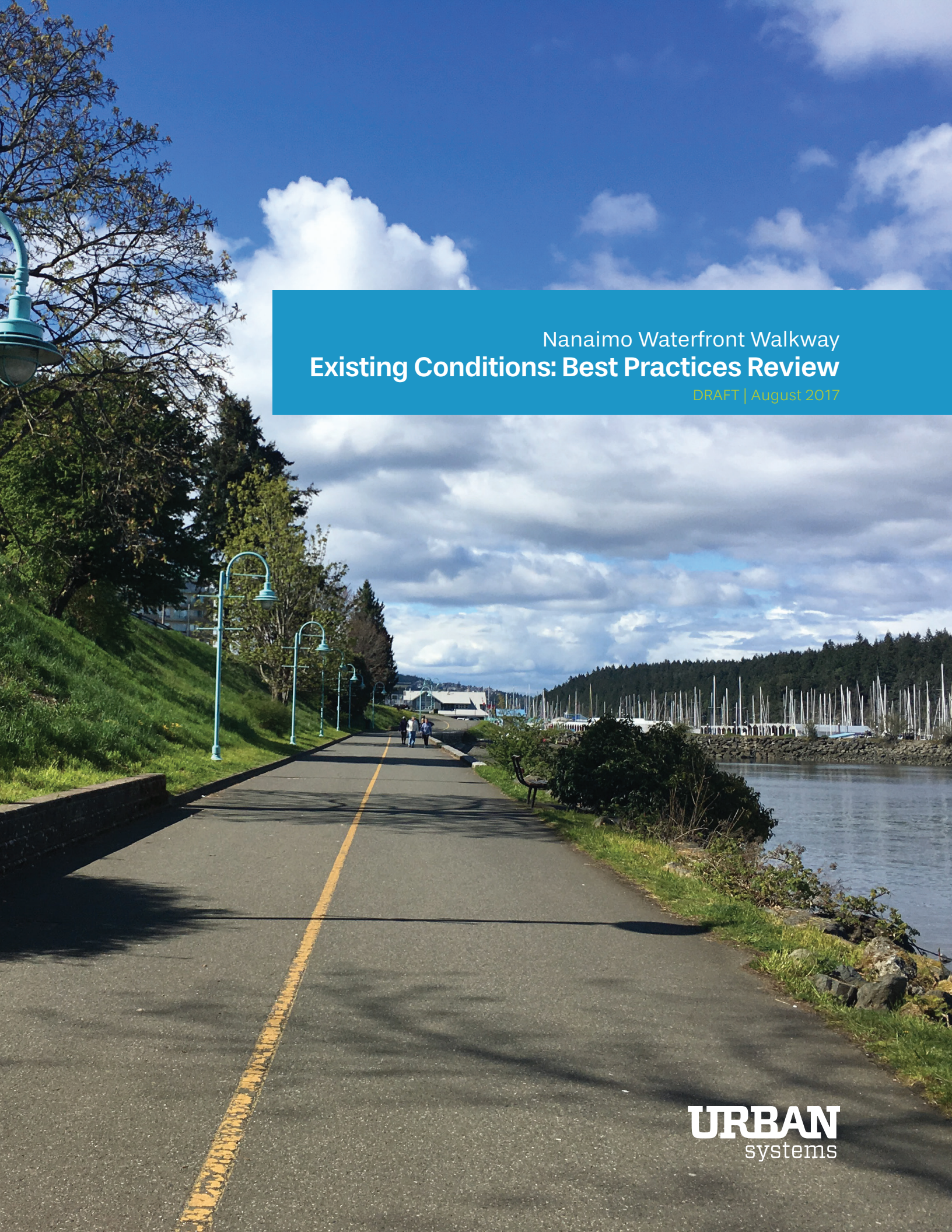
To finish the survey, participants were asked to provide any final comments. In total, 298 final comments were made. Although there were numerous general comments provided, there were a handful of themes/issues that were more prevalent and suggest a common specific interest. These issues, in order of most commonly expressed, were:

1. Enthusiastic support for the project in general and an overwhelming interest in seeing the project proceed as soon as possible. There were 99 comments of this nature.
2. A specific interest in preserving the natural beauty and environmental resources of the area and in specific maintaining the character of the Departure Bay Beach. There were 33 comments of this nature.
3. 17 comments were received confirming their interest in the walkway being a multi-use facility.
4. 17 comments were received requesting that amenities be a key consideration in the design such that the walkway is for more than just walking/riding on.

Attachment C

Current Conditions and Best Practices Report





Nanaimo Waterfront Walkway Existing Conditions: Best Practices Review

DRAFT | August 2017

Introduction

The City of Nanaimo has commissioned Urban Systems to prepare a long-term implementation strategy for the City of Nanaimo's waterfront walkway. In addition, the City will be provided with conceptual plans, detailed design and costing for specific sections of the walkway to be built in 2018. These sections are referred to as "Quick Wins." Five quick wins have been identified by the City.

The City of Nanaimo is committed to providing public access to, and recreational use of, the City's waterfront. In addition, the City is also committed to building a more sustainable community through investments that reduce dependence on private automobiles and encourage and support active modes of transportation. Improving and building more walkways, bicycle routes, parks and trails will increase transportation options and provide critical connections to Nanaimo's iconic waterfront and between the City's many neighborhoods.

The Waterfront Walkway Implementation Plan is the first step to achieving the City's stated goals and objectives and therefore is a keystone project in the City's ongoing commitment to investing in outdoor recreational facilities, alternative transportation and a waterfront walkway from Departure Bay to the Nanaimo River Estuary – a unique route that forms the heart of Nanaimo's working waterfront and is a major amenity supporting significant marine industries, commercial enterprises, tourism opportunities, recreation, entertainment, and community livability.

The City of Nanaimo values its waterfront from four perspectives:

- » the iconic distinctiveness
- » public enjoyment
- » maritime employment
- » and habitat protection

Currently, Nanaimo's waterfront walkway is one of its most iconic assets and is a draw to the 'Harbour City' for residents and tourists alike. The walkway currently starts in the downtown core and heads north through Maffeo Sutton Park, along the foreshore on the Queen Elizabeth Promenade and continues intermittently along the Newcastle Channel and Stewart Avenue to BC Ferries Departure Bay Terminal.

The various needs of the waterfront area must be recognized, accommodated and enhanced wherever possible through the development of the Waterfront Walkway and will be considered throughout the planning and design process.

This document will provide a summary of background planning and associated City policies. In addition, the waterfront walkway's existing conditions and considerations for each of the route's distinct segments and sub-sections will be addressed.

Unique pathway user needs, accessibility considerations and a visual review of other local waterfront routes will be included for consideration.

Goals and Objectives

Existing City policies share a long term goal of building an uninterrupted waterfront trail from Departure Bay Beach to the Nanaimo River Estuary. The City also strives to support alternative transportation modes and increase opportunities for travel by pedestrians, cyclists and transit users. As such, connectivity to existing and proposed pedestrian and cycling facilities as well as to existing and proposed transit services will be important considerations to ensure the route is easily accessible along its length.

Nanaimo City Council is committed to providing:

- » Enhanced public access to, and use of, the waterfront.
- » A continuous, uninterrupted and accessible route connecting Departure Bay Beach to the Nanaimo River Estuary.
- » A working waterfront that supports commercial enterprises, tourism opportunities, recreation, marine industries, and entertainment.
- » Protected view corridors to the waterfront.
- » Protected and enhanced marine habitat.

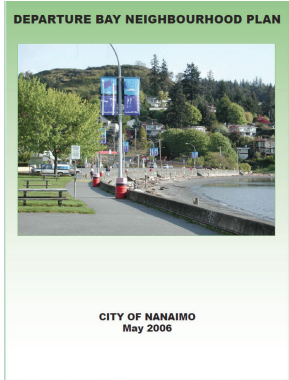
The Waterfront Walkway Implementation Plan is the first step to achieving the City's stated goals and objectives and therefore is a keystone project in the City's ongoing commitment to investing in outdoor recreational facilities, alternative transportation and a waterfront walkway from Departure Bay to the Nanaimo River Estuary.

Existing City Policies

Existing City policies will help inform the implementation of Naniamo's waterfront walkway and will be considered throughout the Implementation Strategy. These policies include the Trail Implementation Plan (2007), Naniamo Transportation Master Plan (2014), planNanaimo (Official Community Plan, 2008), Nanaimo's Strategic Plan (2016–2019 Update), Trails, Recreation and Culture Master Plan (2005) and the South Downtown Waterfront Initiative (2013). Neighborhood Plans have also been considered including: Departure Bay Neighborhood Plan (2008), Newcastle + Brechin Neighbourhood Plan (2011), Downtown Neighborhood Plan (2002), South End Neighbourhood Plan (2010), and the Chase River Neighborhood Plan (1999).

					
planNanaimo (Official Community Plan, 2008)	Strategic Plan (2016–2019 up- date)	Nanaimo Transportation Master Plan (2014)	Trails, Recreation and Culture Master Plan (2005)	South Downtown Waterfront Ini- tiative (2013)	Trail Implementation Plan (2007)
<p>The City's Official Community Plan (planNanaimo) presents the community's vision, goals, and aspirations for future growth and is the City's guide for planning and land use. The transportation priorities and policies expressed throughout planNanaimo support greater accessibility and more opportunity for safe and convenient movement around the city by transit, cycling, and walking, as well as enhanced regional connections. The Plan also provides a vision for Nanaimo's waterfront including land use designations that apply to ocean and foreshore areas including recreation, open space, and pedestrian activity in addition to marina's, ocean-focused industrial uses, and commercial and residential uses.</p> <p>The Plan outlines several distinct goals for the City, two of which have to do with the waterfront walkway.</p> <p>Goal Two: Build a More Sustainable Community which includes policies related to developing an uninterrupted waterfront trail from Departure Bay Beach to the northerly extent of the Nanaimo River Estuary and the necessary considerations and actions to achieve this goal.</p> <p>Goal Six: Improve Mobility and Servicing also includes objectives to support the development of a comprehensive trail system that can support safe cycle and pedestrian travel for commuting, recreation, and tourism.</p>	<p>The Strategic Plan (2016–2019 update) outlines Council's strategic vision, the City's progress on strategic initiatives adopted by the 2012 Council, identifies key projects and initiatives, and identifies Council's strategic priorities including Priority 5: Community Wellness, which addresses investing in bike routes, improving existing parks and trails, and facilitating discussions on topics of strong community interest including accessibility and functionality, among others. The Waterfront Walkway is identified as a key capital project.</p> <p>The 2012–2015 Strategic Plan identified 'Waterfront Enhancement' as a key strategic priority for Council. The plan identified the vision of a continuous, uninterrupted and accessible waterfront trail/connection from Departure Bay Beach to the Nanaimo River Estuary. This vision remains relevant today and will inform the implementation plan.</p>	<p>The Nanaimo Transportation Master Plan is the basis that will guide the expansion of travel choices within Nanaimo over the next 25 years and beyond. Making walking and cycling more comfortable, convenient, and accessible throughout the community for people of all ages and abilities is also emphasized throughout the plan. The Plan also sets targets and defines goals to ensure the City can measure its successes upon implementation of the Plan.</p> <p>On-street bicycle facilities and challenges connecting existing infrastructure to the existing E&N trail have been identified within in this plan. Opportunities for active transportation improvements including proposed networks have also been identified. A multi-use path along the waterfront from Departure Bay Road to Downtown Nanaimo, an area with the highest levels of current cycling activity and the greatest potential for future expansion, has been identified as a medium-long term priority for the City.</p>	<p>The Trails, Recreation and Culture Master Plan supports more and better access to the City's waterfront. The Plan represents Nanaimo residents' pride in the evolving trail system that gives them access to parks and open spaces and supports healthy lifestyle and transportation choices. The Plan identifies access to the waterfront as a high priority in terms of outdoor recreation and appreciation. Nanaimo is, indeed, the Harbour City, and access to water is understood to be a fundamental reason for living in the community.</p> <p>In order to improve upon the existing waterfront walkway the Plan identifies opportunities to acquire key waterfront properties and improve access to the ocean shoreline for public open space, ensuring access as redevelopment/rezoning occurs, and providing walkways/routes through commercial areas linking neighborhoods to the waterfront. The plan also recommends restricting the existing waterfront walkway to joggers and walkers, but including provisions for cyclists and roller bladers if the walkway is widened in the future. In addition, in areas where the coast is too steep to allow access along the waterfront , access to the shoreline is recommended at a minimum of every 500 meters.</p>	<p>The South Downtown Waterfront Initiative includes several guiding principles including Principle 1: Promote Access and Connectivity to Local Neighborhoods, the City, and the Region. This principle encourages physical connections such as walkways, roads, and waterfront development that positively links the site to its surroundings and encourages activities that promote social diversity and integration.</p> <p>In addition, cycling and pedestrian-friendly access to and through the site is outlined as a priority as is a continuous walkway along the water's edge connecting to the existing waterfront walkways in the Downtown.</p> <p>Overall the initiative promotes pedestrian networks, pedestrian friendly development, cycling, connections to adjacent neighborhoods, and a reduced automobile dependency.</p>	<p>The 2007 Trail Plan outlines trail types for the City of Nanaimo. The Harbourfront Walkway, beachfront access, and boardwalk standards are addressed within the Plan. Surface treatments, trail widths, and other critical considerations for trails development. The plan also outlines projects completed in partnership with community volunteers, Harbour Commission, and/or developers, etc.</p> <p>In addition, trail development priorities are outlined and assigned by network connections, ease of implementation, safety and cost.</p>

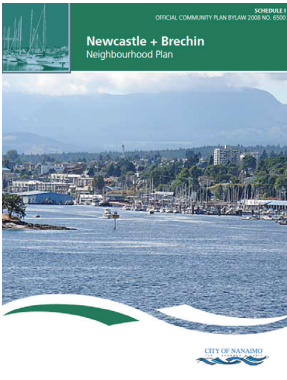
Neighborhood Policies



Departure Bay Neighborhood Plan (2008)

The Departure Bay Neighbourhood Plan recommends the use of permeable trail surfaces (or other ecologically appropriate alternatives) where suitable to minimize erosion and improve absorption. The Plan also expresses interest in maintaining the ecology of Departure Bay as a habitat for local and migrating wildlife while providing long-term benefits to residents and beach users. The Neighbourhood Plan also emphasizes the importance of ensuring connectivity of bike facilities and routes throughout the neighborhood and the rest of Nanaimo, and increasing public amenities along the waterfront. The community's desire for an extension of the City's waterfront walkway from downtown to Departure Bay is clear throughout this document.

Overall, there was a desire among the Departure Bay community to increase the accessibility, beauty and safety of the beach, trails, and parks, while at the same time respecting the ecological integrity of these desirable areas. Pedestrian-oriented activities are a priority, including new walking opportunities and the enhancement of existing ones.



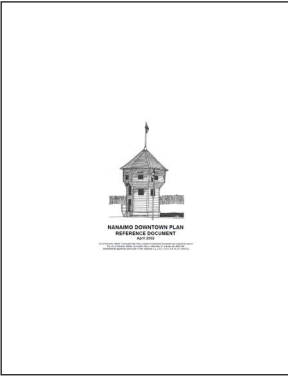
Newcastle and Brechin Neighbourhood Plan (2011)

The Newcastle and Brechin Neighborhood Plan supports a community that emphasizes a strong sense of place, providing for an attractive, vibrant community through mixed uses, pedestrian enhancements, economic opportunities, and environmental quality. The Plan conveys that the City will continue to pursue the expansion of an uninterrupted waterfront promenade from Newcastle Avenue to Departure Bay. A promenade is recommended along the east side of Newcastle Avenue complementing the lower level waterfront walkway and providing an amenity for the neighbourhood.

The Plan states that "the waterfront is a focal point for the neighbourhood and the broader community and that the natural environment is to be enhanced and the area's unique heritage character should be promoted; as should parks, open spaces, trails and greenways.

The Neighbourhood Plan also recommends minimum cross sections for a waterfront walkway (7m), natural shoreline considerations, surface materials, pedestrian access to the Waterfront, green space, and public realm design as they relate to the construction and implementation of the waterfront walkway.

Developing a water fronting pedestrian sidewalk up to 4.5 metres in width along the east side of Newcastle Avenue which would perform as a upper promenade with connections to the waterfront walkway is included within this plan. In addition, the Plan recommends a minimum cross section of 7.0 metres to allow for separate parallel pathways for pedestrians and cyclists with pedestrians travelling closest to the waterfront and the cycling pathway located on the upland side closest to the neighboring Newcastle Avenue promenade.

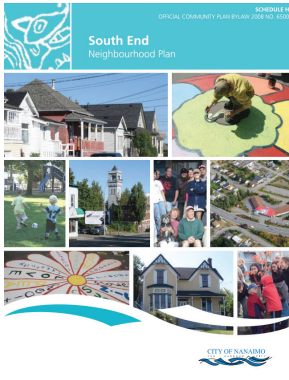


Downtown Plan (2002)

The Downtown Neighbourhood Plan recommends improving access to the waterfront and increasing and improving pedestrian and cyclist connectivity between the waterfront walkway and the rest of Downtown.

The Plan recognizes the central waterfront as one of the major physical assets of Nanaimo with responsible authorities establishing it as a major public attraction based on a sequence of walkways and open spaces with commercial uses, all incorporated into a vital working port. Because of this, protecting and enhancing the waterfront walkway to ensure its continuity, convenience and attractiveness to the public is critical.

The Plan recommends developing design guidelines which enhance and express a strong visual and functional relationship between Downtown and the waterfront to ensure the City Centre, the waterfront, and the walkway remain major attractions.

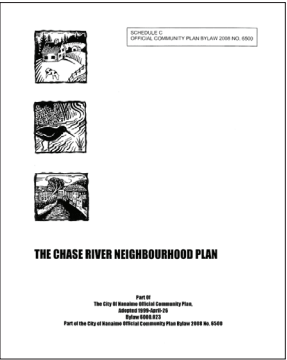


South End Neighbourhood Plan (2010)

Throughout the South End Neighborhood Plan walkability and connectivity are shown to be critical as is the protection and enhancement of the waterfront walkway to ensure its continuity, convenience and attractiveness to the public.

The Plan recommends developing a strategy to create stronger more attractive and convenient pedestrian linkages between the waterfront and adjacent areas of Downtown giving priority to those routes and formalizing them throughout the neighbourhood. In addition, the Plan supports the creation of greenways that give increased priority to cyclists and pedestrians.
























































































The Plan also identifies additional considerations for the waterfront walkway such as seating, environmentally friendly alternatives to traditional materials and the provision of permeable surfaces whenever possible.




Chase River Neighbourhood Plan (1999)


The Chase River Neighborhood Plan supports the expansion of the bicycle and pedestrian network which could include dedicated pathways, and an aggressive land acquisition program for parks, open space, and other recreational opportunities. The Plan supports maintaining the neighbourhood's "green character" by developing greenways along waterways, preserving mature trees, and acquiring the protection and enhancement of water ways and surrounding habitat is paramount throughout this Plan.





	SECTION 1a	SECTION 1b	SECTION 1c	SECTION 2a.1	SECTION 2a.2	SECTION 2a.3	SECTION 2b.1	SECTION 2b.2	SECTION 3	SECTION 4a	SECTION 4b	SECTION 5	SECTION 6
Existing Path Width	3m		4m	2.5–3.5m	2.5m	7m	6m permanent 3–4m interim	5m	2–3m	3–6m	2.5m not built 3.5m permanent		
Existing Surface	 			  	 								
Wayfinding and Signage													
Existing Users													
Site Furniture													
Interpretive Signs or Public Art													
Accessst to Water													
CPTED Considerations													


LEGENDS


 asphalt


 sand


 synthetic


 wooden

 pedestrians

 concrete

 gravel

 tile

 cyclists

Section 1a

Departure Bay – Bay Street to Kinsmen Park



Connections to Public Use Areas

Adjacent to Kinsmen Park

Issues/Constraints

- » Pedestrian Only
- » Constrained Space
- » No accommodation for cyclists along waterfront route
- » High potential for archaeological impacts

Opportunities

- » Connection from Departure Bay beach and BC Ferries
- » Upgrading of Kinsmen Park

General Comments

- » First Nations art in Kinsmen Park and adjacent to traditional winter village location
- » 250m of waterfront pathway was recently updated and built to final standard
- » Kinsmen Park frontage has not yet been fully upgraded



Section 1b

Beach from Loat Street south to Existing Pathway



Connections to Public Use Areas

Connections to existing trails in Beach Estates Park

Issues/Constraints

- » Constrained Space
- » Potential riparian rights issues
- » Geotechnical considerations (slope stability, soil conditions)
- » Impacts to existing trees
- » High potential for archaeological impacts
- » Accommodation of various users (pedestrians, cyclists, and mobility challenged)
- » Accessibility to walkway

Opportunities

- » Access to Beach
- » Connection between Departure Bay and Ferry terminal
- » Commuter cycling route
- » Chance for an iconic boardwalk
- » Incorporating green shores design



Section 1c

Existing Pathway adjacent to BC Ferries



Connections to Public Use Areas

Connection to Departure Bay Ferry Terminal

Issues/Constraints

- » Constrained area – Adjacent to slope and large fence
- » Large intersection crossing at Stewart Avenue – Long crossing distance

Opportunities

- » Wayfinding
- » Commuter cycling route
- » Existing route ends at foreshore and can only be accessed at low tide



Section 2a.1

BC Ferries to south of Poplar Street



Connections to Public Use Areas

Restaurants, pubs, park, Ferry terminal

Issues/Constraints

- » Low underpass at Suncor Terminal (off east end of Poplar Street)
- » Constrained space adjacent to retail area and parking lot
- » Not a great choice for cyclists. Alternative solutions need to be explored – Stewart Avenue
- » Very Busy in summer for market and boat launch
- » Wayfinding

Opportunities

- » Retail revitalization – Sealand Market
- » Wayfinding



Section 2a.2

South of Poplar to 1300 Stewart Ave



Connections to Public Use Areas

Marina, parking lots

Issues/Constraints

- » Property requirements
- » Constrained Space
- » Interim Routes/Detours
- » Wayfinding

Opportunities

- » Connection between Ferry Terminal and Downtown
- » Viewpoints to Newcastle Island



Section 2a.3

South of 1300 Stewart Ave to Waterfront Suites



Connections to Public Use Areas

Marina, and Marinaside Resort

Issues/Constraints

- » Property requirements
- » Constrained Space
- » Interim Routes/Detours
- » Wayfinding
- » Existing Path at 1250 Stewart built to substandard conditions

Opportunities

- » Connection between Ferry Terminal and Downtown
- » Viewpoints to Newcastle Island
- » Potential Upcoming Redevelopment



Section 2b.1

South of Cypress Street to end of Permanent Path



Connections to Public Use Areas

Queen Elizabeth Promenade

Issues/Constraints

- » Constrained space – Marina parking lot
- » Connection/Wayfinding at the Marina/Yacht Club
- » Widening the pathway in this location requires Nanaimo Port Authority, tenants, and City of Nanaimo work together
- » Slope/geotechnical considerations

Opportunities

- » Viewpoints
- » Extending bicycle connection



Section 2b.2

South of Mt. Benson St.



Connections to Public Use Areas

Parks

Issues/Constraints

- » Constrained space – especially at Bridge, Cyclists to dismount now
- » Considered final condition
- » Few access points

Opportunities

- » Educational opportunities
- » Wayfinding
- » Connections to other cycling facilities



Section

3

Maffeo Sutton Park to Georgia Park



Connections to Public Use Areas

Large park and playground area (Maffeo Sutton Park)

Issues/Constraints

- » No cycling connection
- » Interim path
- » Large parking lot
- » Large usage
- » High programming spot (events, markets, concerts, etc)
- » High potential for archaeological impacts

Opportunities

- » Prime destination for City of Nanaimo
- » High quality materials focused here
- » Cycling connection to Front Street
- » Educational opportunities/ Public Art
- » Viewpoints



Section 4a

Georgia Park to Museum Way



Connections to Public Use Areas

Restaurants, shops, marina, and Bastion Square Park

Issues/Constraints

- » No cycling allowed – potential route on Front Street to provide cycling connection
- » Heavy usage year-round especially in summer
- » Walkway space used by adjacent businesses (patios, displays, signs, etc) constrains space

Opportunities

- » Segment considered final
- » Educational opportunities/ public art
- » Rehab of existing path if needed



Section 4b

Georgia Park to Museum Way



Connections to Public Use Areas

Piper Park, McGregor Park, Protection Island Ferry, and Diana Krall Plaza

Issues/Constraints

- » Private property impacts/privacy
- » No destinations along pathway
- » Narrow sidewalk along Front Street
- » Unstable/Brittle rock at McGregor Park
- » No cycling connection
- » Ferry Terminal crossing – detour to Front Street

Opportunities

- » Extending existing promenade/ increasing public space
- » Improved cycling connection on Front Street
- » Improve conditions along Front Street
- » Improve connection with Ferry Terminal
- » Educational opportunities/ public art



Section 5

Ferry Terminal to South Downtown Waterfront



Connections to Public Use Areas

Future connections to be established as area is currently in planning process

Issues/Constraints

- » No existing facilities
- » No defined path alignment
- » Industrial activity/train crossings
- » Potential developments
- » Safety concerns near pier
- » Connection at Ferry Terminal

Opportunities

- » Connections to cruise terminal
- » Connections to future developments
- » Viewpoints
- » Educational opportunities/public art
- » Ability to dictate development



Section 6

Assembly Wharves to Estuary



Issues/Constraints

- » No existing facility
- » No determined alignment
- » Conflicts with First Nation Land
- » Conflicts with existing active railway
- » High potential for archaeological impacts along waterfront
- » Environmental impacts/important estuary
- » Constrained space along Haliburton Street

Opportunities

- » High potential for recreational opportunities
- » Connection to popular campground
- » Potential connection to Duke Point
- » Education opportunities/Public Art

Comments

- » Nanaimo estuary is largest on Island and is an important environmental area



Walkway Examples from other Communities

South Bay Trail

Bellingham, WA



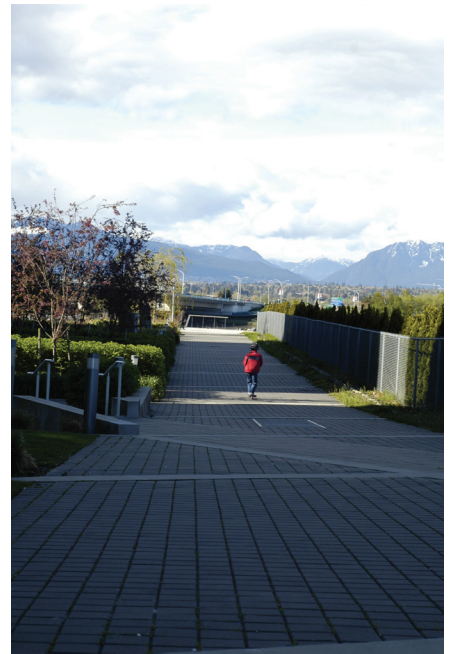
Peachland Waterfront Walkway

Peachland, BC



Middle Arm Trail and Waterfront Greenway

Richmond, BC



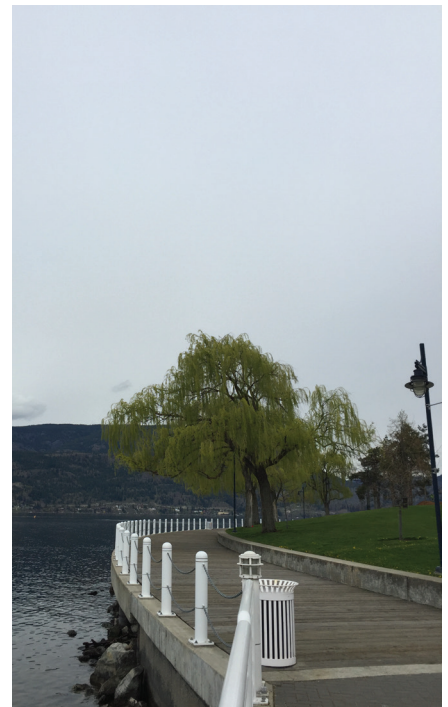
Steveston Greenways

Richmond, BC



Waterfront Promenade

Kelowna, BC



Attachment D

Geotechnical Summary Memo





**FOR
CLIENT REVIEW**

August 2, 2017

WSP File Ref: 171-03507-00

Urban Systems Ltd
550 - 1090 Homer Street
Vancouver, BC V6B 2W9

**Attention: Greg Smith, P.Eng., PMP
Senior Transportation Engineer**

**Subject: Waterfront Walkway Implementation Plan, Nanaimo, BC
Geotechnical Commentary – Seismic Design ISSUED FOR CLIENT REVIEW**

1.0 GENERAL

WSP Canada Inc. (WSP) is providing geotechnical engineering services in support of planning for the future development of the Waterfront Walkway project in Nanaimo, BC. This letter presents geotechnical commentary regarding seismic design philosophy in the context of anticipated ground conditions and seismic ground response and potential design and construction implications. The intent of this letter is to provide some upfront discussion of seismic performance expectations prior to detailed design as this will influence the geotechnical scope and level of effort that may be needed in support of structural and civil design. Our discussion is broadly divided into the three in-fill segments selected by the City for detailed design this year:

Segment 1: BC Ferries to the Northfield Creek Trail (assumed elevated boardwalk portions)

Segment 2: Shipyard Detour & Asia Pacific Yacht Club (widen with rip rap with trail built on top)

Segment 3: Boat Basin (elevated pile supported boardwalk connecting back to shore, similar to current construction).

This letter incorporates feedback from Mott Macdonald (Structural Engineer) and Urban Systems. It is issued “for client review” and will be finalized once feedback has been received.

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2.0 DISCUSSION

The City has proposed a “life safety” performance criterion for seismic design. With this approach, significant damage could occur to structures and embankments as a result of seismically induced permanent ground movements, up to and including a rebuild. In the case of new structures (i.e. Segments 1 and 3) it is the intent that structures would not collapse before occupants can safely egress.^{1,2,3} In the case of grade supported portions of the walkway that may include an outer embankment slope (i.e. Segment 2), it is expected that trail users would egress to other parts of the walkway and that deformation or local failures of the walkway under strong seismic shaking would not prevent the ability to egress. A general overview of geotechnical conditions as they relate to seismic performance and discussion of implications for each of the subject segments of the Walkway are presented below.

In terms of geotechnical conditions, a significant component of the proposed walkway (i.e. >50% of the length) is anticipated to be underlain by reclaimed land of variable thickness and quality, often underlain by loose beach deposits with a sloping boundary at the shoreline. Where saturated, the response of these soils to strong earthquake shaking will be variable and could include liquefaction, which could result in potentially large permanent ground movements. Such movement would be expected to impact the walkway. For the most part, there has been no detailed characterization of existing ground conditions along the alignment.

It should be appreciated in terms of detailed design for the upcoming sections, that the limited available data coupled with locally variable ground and generally poor site access make it likely that the cost for collecting reliable geotechnical information could be high, particularly if the walkway design requires an accurate quantification of ground response and deformation in order to satisfy seismic performance criterion. Design approaches that are robust and that are less reliant on an accurate prediction of ground deformation could require significantly less detailed geotechnical analysis.

Segment 1 - BC Ferries to Northfield Creek

For the portion of the trail at the toe of Cilaire bluffs that extends from BC Ferries to Northfield Creek (Segment 1), key geotechnical seismic design considerations include stability of the bluff and potentially liquefiable natural soils in the foreshore. The foreshore slope above the proposed walkway is generally comprised of firm ground but the steep slopes are prone to shallow sliding in colluvial soils (i.e. not deep seated failures). Seasonal shallow sloughing and tree fall occur as a result of heavy rainfall and manmade impacts, which would expect to be exacerbated by seismic shaking. A broad stabilization program for the upslope private properties is not considered practical as a result of land ownership and cost and, therefore, we anticipate that design will need to consider

¹ BC MoTI Bridge Standards and Procedures Manual S6-14 – Other Bridges – Life Safety Service

² ASCE Standard 61-14 – Seismic Design of Piers and Wharves – “Low Design Classification – Life Safety Protection”

³ BC Building Code 2012

the potential impact of slope movements onto and within the walkway, which are anticipated to be similar for both static and seismic conditions.

We understand that the design concept under consideration for at least portions of this segment include an elevated walkway located approximately 10 to 20 m beyond (east of) the toe of the slope. Subject to review during detailed design, the proposed offset from the toe of the slope is expected to provide protection from the impacts of future upslope failures/movements. In addition, the depth to dense till-like soils suitable to support piles or caissons is anticipated to be relatively shallow (to be confirmed during detailed design) throughout much of this segment. As such, there may well only be a limited influence on foundation elements from liquefaction of the upper loose soils. Based on ground expectations, it is anticipated that a performance based design that meets life safety criteria should be feasible with the proposed design approach.

A phased geotechnical assessment is contemplated in this segment with the objective of initially confirming the depth to firm ground and the character of the overlying soils (including seismic performance), and subsequently the nature of the firm ground and the ability to drive or otherwise advance piles to sufficient embedment. Conceptually, geotechnical review would commence with a hand auger/wash probing program at low tide and progress to a drilling program if necessary. There will be influences on the program from environmental and archeological aspects as well as beach/tidal access constraints.

Segment 2 - Shipyard Detour & Asia Pacific Yacht Club

Based on the anticipated seismic design performance requirements, geotechnical assessment for widening the embankment would be focussed on aspects on static performance, erosion and earthwork requirements (i.e. detailed seismic site characterization, analysis or design is not currently anticipated for a grade supported embankment widening with generally good egress potential).

Section 3 - Boat Basin

Conditions are more challenging for the unbuilt trail beside the boat basin. Our local knowledge of the natural soils and extensive mass filling to create the current embankment slope suggests that there is a strong potential for seismic instability and potentially deeper seated lateral spread. Under such conditions, there could be a complex ground response that could impact an elevated boardwalk structure that is located on the slope face. Large ground deformations introduce concerns of partial collapse through structural failure or excessive deflection of vertical piles. If this design approach is followed, the City should anticipate the need for detailed geotechnical investigation and analysis, and the associated higher costs.

In order to assess the seismic ground response of the embankment fills and underlying natural soils, it will be necessary to penetrate the coarse grained (cobbles and boulder) dense embankment material and complete in situ testing of the anticipated sediments or finer grained fill soils. We note that work for the Port Theater encountered over 15 m of fills over liquefiable soils along Front Street that ultimately resulted in the construction of a 10 m wide seismic dyke to limit the lateral spread



of the retained old basin fills to acceptable design amounts. Because this approach to mitigating ground movements through deep ground improvement is not considered practical for the walkway, it will be necessary to complete sufficient assessment to be able to provide an estimation of potential seismically induced movements of the embankment in support of a structural design that will need to accommodate or resist such movements. Conceptual design discussions have included a pile supported structure with increased resistance to lateral movements with either a rigid frame configuration and/or anchors. Assessment for such a concept would include review of available information supplemented by test holes advanced along the proposed walkway alignment both at the crest and, if possible, toe of the slope. Subject to the proximity of the background soil information that is available, test holes within and behind the roadway may also be required for anchor design.

At this time, we would anticipate our analyses being phased; commencing with basic pseudo static modelling and becoming more involved if warranted by the ground conditions, analyses results, and needs of the Structural Engineer. There may be requirements for a review of soil-structure interaction to assess the impact of the dense granular embankment fill deforming around or past the pile and anchor elements of the walk way.

3.0 CLOSURE

This letter has been prepared in accordance with our contract with Urban Systems Ltd. and the attached Terms or Reference for Geotechnical Reports. The City of Nanaimo is considered to be an approved user of this report subject to the terms under which it was prepared. The information presented is interim in nature and intended to advance the discussion on seismic performance requirements as part of the scope development for the main assessment.

We trust that the discussion presented herein assists in providing an overview of the geotechnical aspects of seismic design of the proposed walkway. We look forward to further interaction as the project progresses towards detailed design. If you have any questions, or require further information, please contact the undersigned.

Yours truly,

WSP Canada Inc.

Reviewed by:

Darryl Furey, M.Eng., P.Eng.
Senior Geotechnical Engineer

Carl Miller, M.Sc., P.Eng.
Senior Geotechnical Engineer

Encl: Terms of Reference for Geotechnical Reports



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TERMS OF REFERENCE FOR GEOTECHNICAL REPORTS ISSUED BY WSP CANADA INC. (continued)

5. INTERPRETATION OF THE REPORT

- a. Nature and Exactness of Descriptions:** The classification and identification of soils, rocks and geological units, as well as engineering assessments and estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1 above. The classification and identification of these items are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations or assessments utilizing the standards of Paragraph 1 involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to changes over time and the parties making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or when the Client has special considerations or requirements, the Client must disclose them to WSP so that additional or special investigations may be undertaken, which would not otherwise be within the scope of investigations made by WSP or the purposes of the Report.
- b. Reliance on information:** The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site investigation and field review and on the basis of information provided to WSP. WSP has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, WSP cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.
- c. Additional Involvement by WSP:** To avoid misunderstandings, WSP should be retained to assist other professionals to explain relevant engineering findings and to review the geotechnical aspects of the plans, drawings and specifications of other professionals relative to the engineering issues pertaining to the geotechnical consulting services provided by WSP. To ensure compliance and consistency with the applicable building codes, legislation, regulations, guidelines and generally-accepted practices, WSP should also be retained to provide field review services during the performance of any related work. Where applicable, it is understood that such field review services must meet or exceed the minimum necessary requirements to ascertain that the work being carried out is in general conformity with the recommendations made by WSP. Any reduction from the level of services recommended by WSP will result in WSP providing qualified opinions regarding adequacy of the work.

6. ALTERNATE REPORT FORMAT

When WSP submits both electronic and hard copy versions of the Instruments of Professional Services, the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding upon WSP. The hard copy versions submitted by WSP shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions; furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed and sealed versions of the Instruments of Professional Services maintained or retained, or both, by WSP shall be deemed to be the overall originals for the Project.

The Client agrees that the electronic file and hard copy versions of Instruments of Professional Services shall not, under any circumstances, no matter who owns or uses them, be altered by any party except WSP. The Client warrants that the Instruments of Professional Services will be used only and exactly as submitted by WSP.

The Client recognizes and agrees that WSP prepared and submitted electronic files using specific software or hardware systems, or both. WSP makes no representation about the compatibility of these files with the current or future software and hardware systems of the Client, the Approved Users or any other party. The Client further agrees that WSP is under no obligation, unless otherwise expressly specified, to provide the Client, the Approved Users and any other party, or any or all of them, with specific software and hardware systems that are compatible with any electronic submitted by WSP. The Client further agrees that should the Client, an Approved User or a third party require WSP to provide specific software or hardware systems, or both, compatible with the electronic files prepared and submitted by WSP, for any reason whatsoever included but not restricted to an order from a court, then the Client will pay WSP for all reasonable costs related to the provision of the specific software or hardware systems, or both. The Client further agrees to indemnify and hold harmless WSP, its officers, directors, employees, agents, representative or sub-consultant, or any or all of them, against any claim or any nature whatsoever brought against WSP, whether in contract or in tort, arising or related to the provision or use of any specific software or hardware provided by WSP.

Attachment E

Environmental Summary Memo



MEMORANDUM

Date:	July 25, 2017
To:	Greg Smith, Urban Systems
From:	Scott Northrup, R.P.Bio.
File:	686-004.02
Re:	Nanaimo Waterfront Walkway, Environmental Setting

1.0 INTRODUCTION

The City of Nanaimo's Strategic Plan and Strategic Plan Updates have identified Waterfront Enhancement and the Waterfront Walkway as key priorities. The Nanaimo waterfront is one of the city's greatest natural assets. Completing the links between existing portions of the walkway is a goal shared by the City and its citizens. As part of an integrated project team, Urban Systems Ltd. retained Hemmera Envirochem Inc. (Hemmera) to provide environmental advice and input for the project.

The walkway route spans 13 km from Departure Bay in the north to the Nanaimo estuary in the south. The alignment traverse's natural, modified, commercial, residential and industrial shoreline along its length. As existing and proposed sections of the walkway are located in environmentally sensitive areas along the waterfront, planning and proposed development in marine riparian or foreshore areas will need to consider best practise during design, permitting and implementation.

Following is an overview of the environmental features of the waterfront walkway route.

2.0 APPROACH/METHODS

A desktop review of available online biophysical site information relevant to Nanaimo Waterfront Walkway sections was obtained from the following sources:

- Sensitive Habitat Inventory and Mapping (SHIM 2013);
- BC Coastal Resource Information Management System (CRIMS database);
- BC Eelgrass Inventory Application;
- Canadian Hydrographic Service nautical charts;
- British Columbia Marine Ecological Classification (BCMEC) system (Province of BC 2002);
- BC Marine Conservation Analysis (BCMCA) Marine Atlas of Pacific Canada (BCMCA 2016);
- Results of existing impact assessment reports for other foreshore projects; and,
- BC Conservation Data Centre (CDC) Species and Ecosystems Explorer (BC Ministry of Environment 2013).

Field reconnaissance was not part of this assessment. Field reviews will be conducted in support of specific design elements for the walkway project.

3.0 OVERVIEW

The walkway alignment lies within the Coastal Douglas Fir moist maritime (CDFmm) biogeoclimatic zone (CMN 2013). The CDFmm occurs at elevations <150 m above sea level and typically has warm, dry summers and mild, wet winters; mean annual temperature is 9.2 to 10.5°C and mean annual precipitation ranges from 647 to 1263 mm (Nuszorfer et al. 1991). It is also a part of the Strait of Georgia (SOG) Marine Ecoregion, a component of the Georgia Basin Marine Ecoregion (<http://www.env.gov.bc.ca/ecology/ecoregions/humidtemp.html>). The SOG is described as:

“A broad relatively shallow, semi-enclosed estuarine basin that separates southern Vancouver Island from the mainland. It is mainly marine waters, but it also contains several islands. The islands have very dry mild climates, such as southern Quadra, Cortes, Texada, Lasqueti, Denman and Hornby islands. The southern islands and lower portion of Texada Island area dominated by the dry Coastal Douglas-fir Zone, whereas the northern islands and the upper portion of Texada Island are dominated by the very dry maritime variant of the Coastal Western Hemlock Zone. The marine environment is dominated by the intertidal, nearshore, epipelagic and mesopelagic zones.”

Common species of Commercial, Recreational or Aboriginal (CRA) fisheries species offshore of the route include Dungeness crab (*Metacarcinus magister*), red rock crab (*Cancer productus*), flatfish species (e.g., flounder and sole). These species favour the muddy and sandy substrates in the study area and recreational crab fisheries are popular in Departure Bay and near Mafeo Sutton Park. Fishing in Nanaimo Harbour (Area 17) is typically closed seasonally to all fishing (except for crab). The seasonal closure, which was July 15th to Aug 15th in 2016 varies annually.

Pacific salmon bearing watercourses that discharge along or near the route include the Nanaimo River, Chase River, Millstone River, Departure Bay Creek. Salmon species commonly supported by these systems include coho (*Oncorhynchus kisutch*), chinook (*O. tshawytscha*), pink (*O. gorbuscha*) and chum (*O. keta*) salmon as well as cutthroat trout (*O. clarki*). Juvenile salmon rear and travel along nearshore marine shorelines during their early life stages after emerging from natal watercourses.

Northfield Creek, that discharges near the BC Ferries Departure Bay Terminal, conveys flows through the Brechin Hill neighborhood and Beach Estates Park, is not fish bearing.

The City of Nanaimo maintains a list of Environmentally Sensitive Areas (<http://www.nanaimo.ca/EN/main/departments/Community-Planning/Environmental-Planning/ESAs.html>) and habitat types within city limits. Along the proposed walkway route, several ESA's have been identified including:

- Second growth forest along the bluffs in Departure Bay, north of Northfield Creek.
- Riparian zones of Departure Bay Creek, Northfield Creek, Millstone River and Chase River;
- Tidal wetlands and riparian zone associated with the Nanaimo River estuary.

3.1 AT-RISK MARINE SPECIES

The BC Conservation Data Centre (CDC) (BC CDC 2016) identified a list of 37 At-Risk marine species with potential to occur in the nearshore; nine mammals, nine fishes, 17 birds and two invertebrates (**Table 1**). Of the species identified, 23 are federally listed under the *Species at Risk Act* (SARA) (**Table 1**). The Site does not overlap with Critical Habitat that has been defined under SARA for any of the species identified.

Table 1 At-Risk Marine Species with Potential to Occur at or near the Project Site*.

Common Name	Scientific Name	COSEWIC ¹	SARA ²	BC List ³	Likelihood of Occurring at the Project Site
Marine Mammals					
Grey Whale	<i>Eschrichtius robustus</i>	Special Concern	Special Concern	Blue	Possible
Harbour Porpoise	<i>Phocoena phocoena</i>	Special Concern	Threatened	Blue	Possible
Humpback Whale	<i>Megaptera novaeangliae</i>	Special Concern	Threatened	Blue	Unlikely
Killer Whale (southern resident population)	<i>Orcinus orca</i> pop. 5	Endangered	Endangered	Red	Possible
Killer Whale (West Coast transient population)	<i>Orcinus orca</i> pop. 3	Threatened	Threatened	Red	Possible
Northern Fur Seal	<i>Callorhinus ursinus</i>	Threatened	No Status	Red	Unlikely
Sea Otter	<i>Enhydra lutris</i>	Special Concern	Special Concern	Blue	Unlikely
Steller Sea Lion	<i>Eumetopias jubatus</i>	Special Concern	Special Concern	Blue	Possible
Birds					
American Avocet	<i>Recurvirostra americana</i>	None	None	Blue	Unlikely
American White Pelican	<i>Pelecanus erythrorhynchos</i>	Not at Risk	None	Red	Unlikely
Ancient Murrelet	<i>Synthliboramphus antiquus</i>	Special Concern	Special Concern	Blue	Unlikely
Black-footed Albatross	<i>Phoebastria nigripes</i>	Special Concern	Special Concern	Blue	Unlikely
Brandt's Cormorant	<i>Phalacrocorax penicillatus</i>	None	None	Red	Possible
Caspian Tern	<i>Hydroprogne caspia</i>	Not at Risk	None	Blue	Possible
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Not at Risk	None	Blue	Present
Green Heron	<i>Butorides virescens</i>	None	None	Blue	Unlikely
Laysan Albatross	<i>Phoebastria immutabilis</i>	None	None	Red	Unlikely
Long-billed Curlew	<i>Numenius americanus</i>	Special Concern	Special Concern	Blue	Unlikely
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Threatened	Threatened	Blue	Possible
Peregrine Falcon (<i>pealei</i> subspecies)	<i>Falco peregrinus pealei</i>	Special Concern	Special Concern	Blue	Unlikely

Common Name	Scientific Name	COSEWIC ¹	SARA ²	BC List ³	Likelihood of Occurring at the Project Site
Peregrine Falcon (<i>anatum</i> subspecies)	<i>Falco peregrinus anatum</i>	Special Concern	None	Red	Possible
Pink-footed Shearwater	<i>Puffinus creatopus</i>	Endangered	Threatened	Blue	Unlikely
Red Knot	<i>Calidris canutus rufa</i>	Endangered	Endangered	Red	Unlikely
Short-tailed Albatross	<i>Phoebastria albatrus</i>	Threatened	Threatened	Red	Unlikely
Western Grebe	<i>Aechmophorus occidentalis</i>	Special Concern	No Status	Red	Possible
Marine Fishes					
Basking Shark	<i>Cetorhinus maximus</i>	Endangered	Endangered	None	Unlikely
Bull Trout	<i>Salvelinus confluentus</i>	Special Concern	No Status	Blue	Unlikely
Canary rockfish	<i>Sebastes pinniger</i>	Threatened	No Status	None	Unlikely
Coastal Cutthroat Trout	<i>Oncorhynchus clarkii clarkii</i>	None	Special Concern	Blue	Unlikely
Dolly Varden	<i>Salvelinus malma</i>	Special Concern	No Status	Yellow	Unlikely
Eulachon	<i>Thaleichthys pacificus</i>	Endangered	No Status	Blue	Unlikely
Green Sturgeon	<i>Acipenser medirostris</i>	Special Concern	Special Concern	Red	Possible
Rougheye rockfish	<i>Sebastes aleutianus</i>	Special Concern	Special Concern	None	Unlikely
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	Special Concern	Special Concern	None	Unlikely
Marine Invertebrates					
Northern Abalone	<i>Haliotis kamtschatkana</i>	Endangered	Endangered	Red	Unlikely
Olympia Oyster	<i>Ostrea conchaphila</i>	Special Concern	Special Concern	Blue	Possible

Note: ¹ COSEWIC listing: E = Endangered, T = Threatened, SC = Special Concern, C = Common; DD = data deficient, 1 = Schedule 1, -- = no listing

² SARA listing: 1 = schedule 1, 3 = schedule 3, E = Endangered, T = Threatened, SC = Special Concern, -- = no listing.

³ BC List: Red = Species that are extirpated, endangered, or threatened; Blue = Species of special concern; Yellow = species and ecological communities that are secure.

4.0 PERMITTING REQUIREMENTS

Permits for waterfront walkway will depend on walkway design and construction requirements for each phase or section. Design may include pile supported structures over or near the water, foreshore fill and cantilevered structures.

4.1 TENURE REQUIREMENTS

Walkway sections that extend into the intertidal zone may require tenure from BC Lands. The province of BC manages Crown Land below the High Water Mark. The Project will need to assure the Province that the riparian rights of upland landowners are not affected.

For sections of the walkway that are already under tenure, landowner or leaseholder permission will be required.

Some sections of the walkway may be under the jurisdiction of the Nanaimo Port Authority (NPA). Tenure for these sections would be required from the NPA.

4.2 CANADIAN ENVIRONMENTAL ASSESSMENT ACT 2012

The NPA must satisfy the requirements of CEAA 2012 for proposed works or undertaking on lands within their jurisdiction. If walkway sections are planned on NPA managed land, the project will work with NPA to satisfy CEAA 2012 reporting requirements.

4.3 FEDERAL FISHERIES ACT

Some walkway designs, particularly those that require extensive foreshore fill, may result in Serious Harm and require an Authorization under Section 35(2)(b) of the *Fisheries Act*. Applications for Authorization have regulated information requirements and timelines.

For projects that do not result in Serious Harm, Qualified Environmental Professionals (QEP) that are part of the project team can conduct a self-assessment of project related effects. The Project is under no obligation, in the absence of Serious Harm, to consult Fisheries and Oceans Canada (DFO). The Project may choose to submit a Request for Review to confirm the conclusions of the QEP.

4.4 NAVIGATION PROTECTION ACT

Walkway sections that are designed as elevated structures that are offshore of the High Water Mark may require notification and application under the *Navigation Protection Act*.

4.5 OTHER PERMITS

It is assumed that the project will not require local government permitting for the walkway. The project should aspire to satisfy the requirements of applicable municipal permits.

The requirement for a permit under the federal *Species at Risk Act* (SARA) would be dependent on observing a SARA-listed species in the proposed project footprint. The probability of encountering SARA species is very low.

5.0 OPPORTUNITIES AND CONSTRAINTS

- As the foreshore in general supports fish habitat that is protected under the Federal *Fisheries Act*, design approaches that negatively affect habitat and fish will require more onerous permitting processes. Productive habitat along the walkway includes rocky shorelines that support algae and colonial invertebrate communities, unconsolidated shorelines that support shore spawners and marine riparian vegetation. The project should endeavour to minimize foreshore fill.
- Cantilevered design options that overhang the intertidal zone may negatively affect rocky shore habitat types.
- Elevated, pile support structures will not require Authorization under the *Fisheries Act*, but may *Navigation Protection Act* review and affect upland land owner riparian rights.
- Second growth forest stands near Departure Bay are identified as local ESA's. Impacts to marine riparian vegetation in Departure Bay should be minimized.
- Shoreline reaches along the alignment have been affected by development. Walkway design should incorporate opportunities to enhance nearshore productivity through:
 - Marine riparian habitat enhancement;
 - Nearshore habitat cleanup and enhancement (rocky shore and unconsolidated shores);
 - Project design should include interpretive elements that focus on local nearshore natural history (e.g. shore spawners, juvenile salmon, great blue heron).

6.0 SUMMARY

1. Departure Bay area: City of Nanaimo designated ESA between the swimming beach and BC Ferries (Northfield Creek) for Second Growth Forest. Riparian zones associated with Departure Bay Creek and Northfield Creek. Shore spawner (smelt, sandlance) spawning habitat on upper beaches in Departure Bay (unconfirmed). Departure Bay sustains eelgrass beds which lie offshore of the proposed route.

2. From BC Ferries south to Nanaimo Port Authority Wharves: A series of anthropogenically modified shorelines. Conflicts with sensitive or rare habitats are not expected. Riparian habitat and mature forest is

not well developed. The riparian zone and floodplain of Millstone Creek sustains high values although the walkway has largely been completed in this area. Modified shorelines support rocky shore type fish habitats (barnacles, rockweed, sea lettuce biobands) which can be affected by walkway installation.

3. South of Nanaimo Port to Nanaimo River Estuary: Coastland Mill, the Snuneymuxw IR and the Nanaimo estuary occur along this reach. Further to the south, tidal wetlands represent sensitive fish and wildlife habitats. The Chase River riparian zone and floodplain sustain sensitive and productive habitats.

4. Shellfish harvesting is closed or prohibited along the entire route.

5. Sensitive/rare plant species will likely not be present (CDC data confirms this), although the Northfield Creek riparian zone is identified as a listed plant community.

6. Many of the marine rocky shorelines (anthropogenically modified) that support biobands are susceptible to shading and often subject to infilling for walkway design. Designs that minimize foreshore fill and overwater structures will be beneficial. Many of these shorelines are north-facing which can lower inherent productivity.