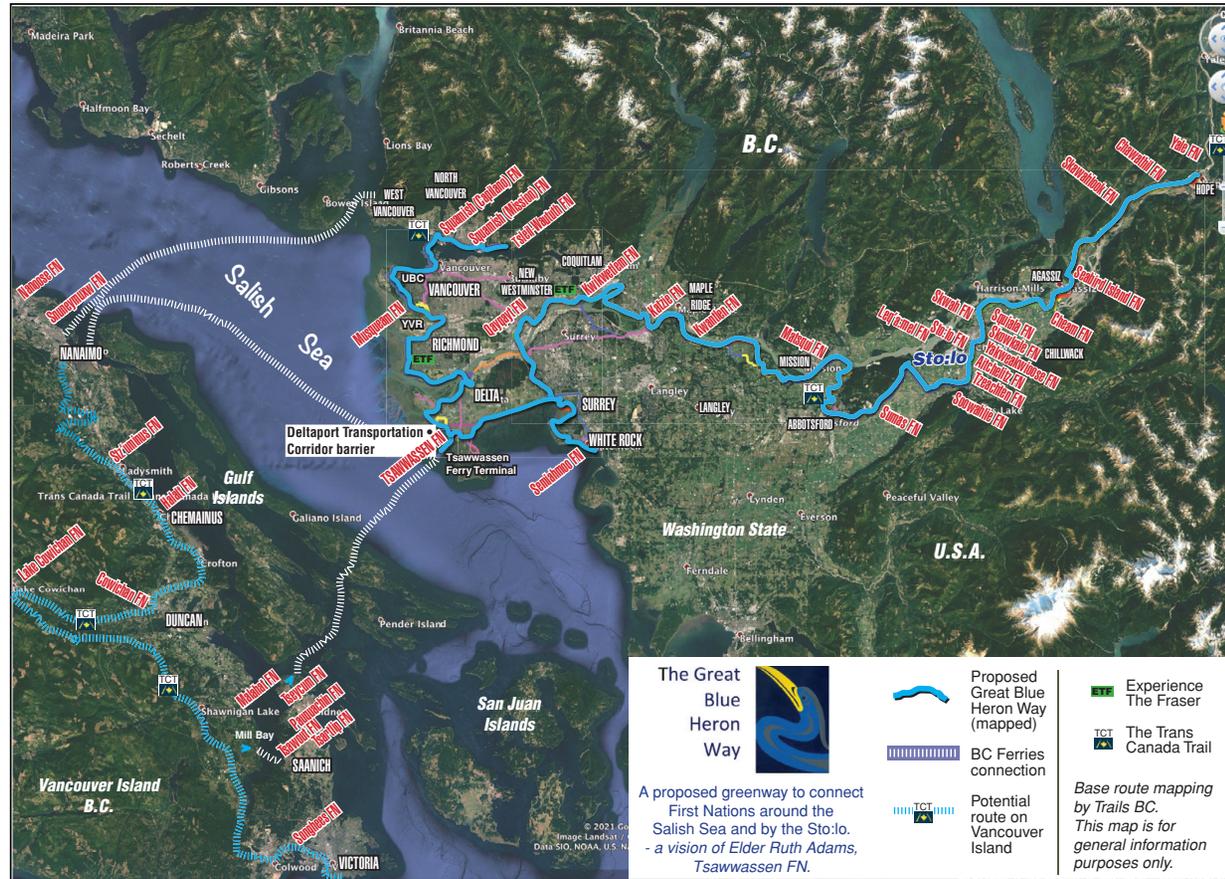


Business Case for Restoration of Active Transportation Infrastructure at Deltaport Way Road/Rail Corridor and Tsawwassen First Nation sea protection dike.

Prepared March 2021 by D. Grigg

Executive Summary



This business case focuses on an area where the Great Blue Heron Way (GBHW) is severed by a transportation corridor serving port facilities at Roberts Bank. The project goal is to restore the continuity of the Salish Sea shoreline trail, between the Tsawwassen First Nation (TFN)'s ocean frontage Breakwater Path and the Brunswick Point Dike Trail to the north, allowing Tsawwassen First Nation to access their land on both sides of the rail corridor along the GBHW.

This business case location is at a key point in greenway routing from Tsawwassen to Vancouver. It connects the Trans Canada Trail (TCT) northern route on the Squamish Nation's Spirit Trail to the new southern TCT route from Langley through the Gulf Islands via Tsawwassen Ferry Terminal to Vancouver Island.

The GBHW is a vision of Elder Ruth Adams of the Tsawwassen First Nation, to connect First Nation communities and welcome all users, to safely walk and wheel on a cultural education pathway around the Salish Sea as close to wildlife habitat as is possible. The GBHW team includes Trails BC, to help ensure the most appropriate links in BC's existing and proposed trail network.

Project Identification

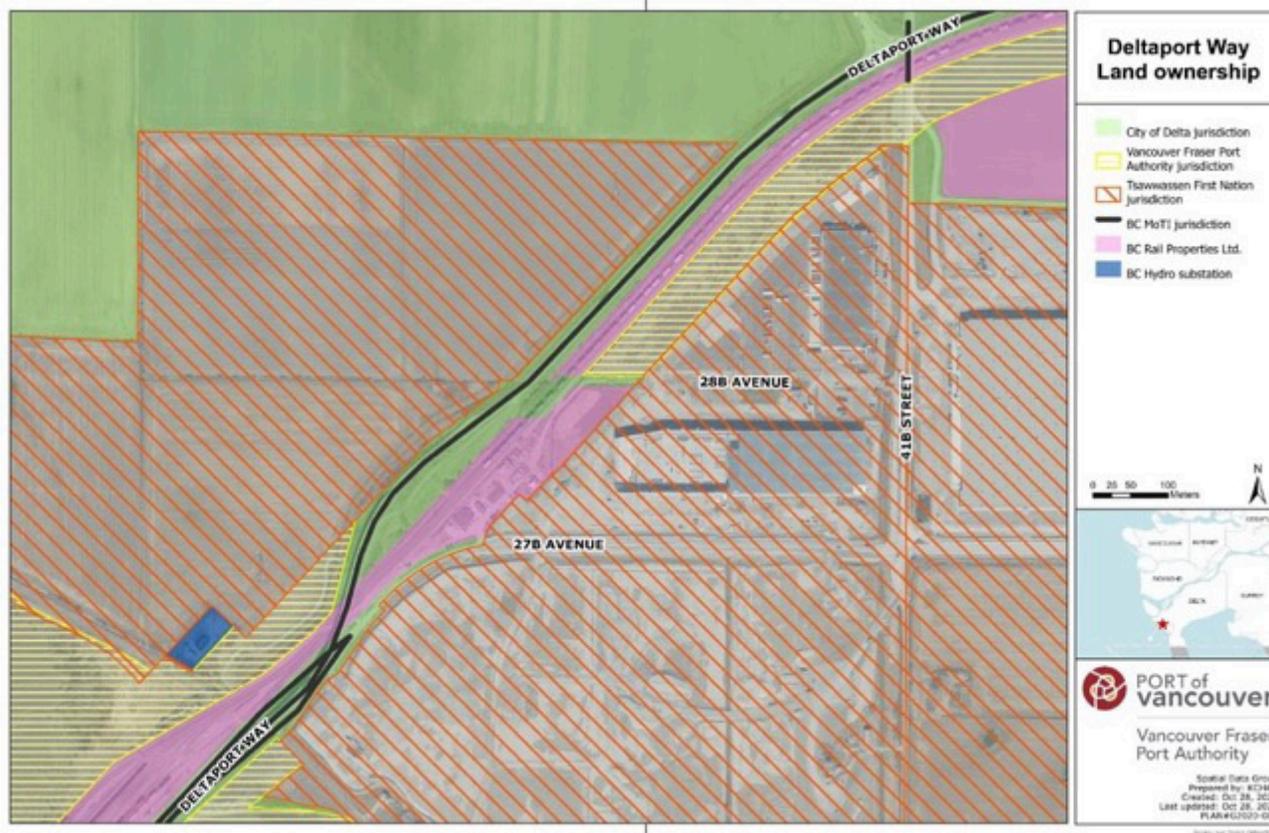
The project area covered in this business case is from the 41B Street bridge that spans over Deltaport Way and rail tracks; the Deltaport Way highway itself and the Deltaport Way overpass south to the sea dike.

Project Definition

The continuity of the Salish Sea shoreline trail, between the Tsawwassen First Nation (TFN)'s ocean frontage Breakwater Path and the Brunswick Point Dike Trail to the north, was interrupted in 2017 by the fencing-off of the informal but signed at-grade rail level crossing. Following a serious-injury workplace incident in December 2016 at the rail yard, workplace safety protocols were reviewed. This, combined with the much-increased rail traffic to the port, led to the pedestrian and cyclist rail crossing being shut down. Unfortunately, no consultation for a safer at-grade crossing was pursued and no alternative routes were offered after 2016, to access the shoreline trails.

It is worthy of noting that the sea dike trail is just the more recent version of the earlier shoreline first nation trail through Tsawwassen Traditional Territory from the TFN village to the Fraser estuary where fishing pier infrastructure is still in use today, marked by a 10-year TFN Treaty anniversary welcome post.

While the project could, potentially, take on many iterations- ranging from a new pedestrian/ cycling overpass to a new replacement level crossing- alternative options are also evaluated in the context of ease and safety of Active Transportation users as well as a difference in the order of cost magnitude.



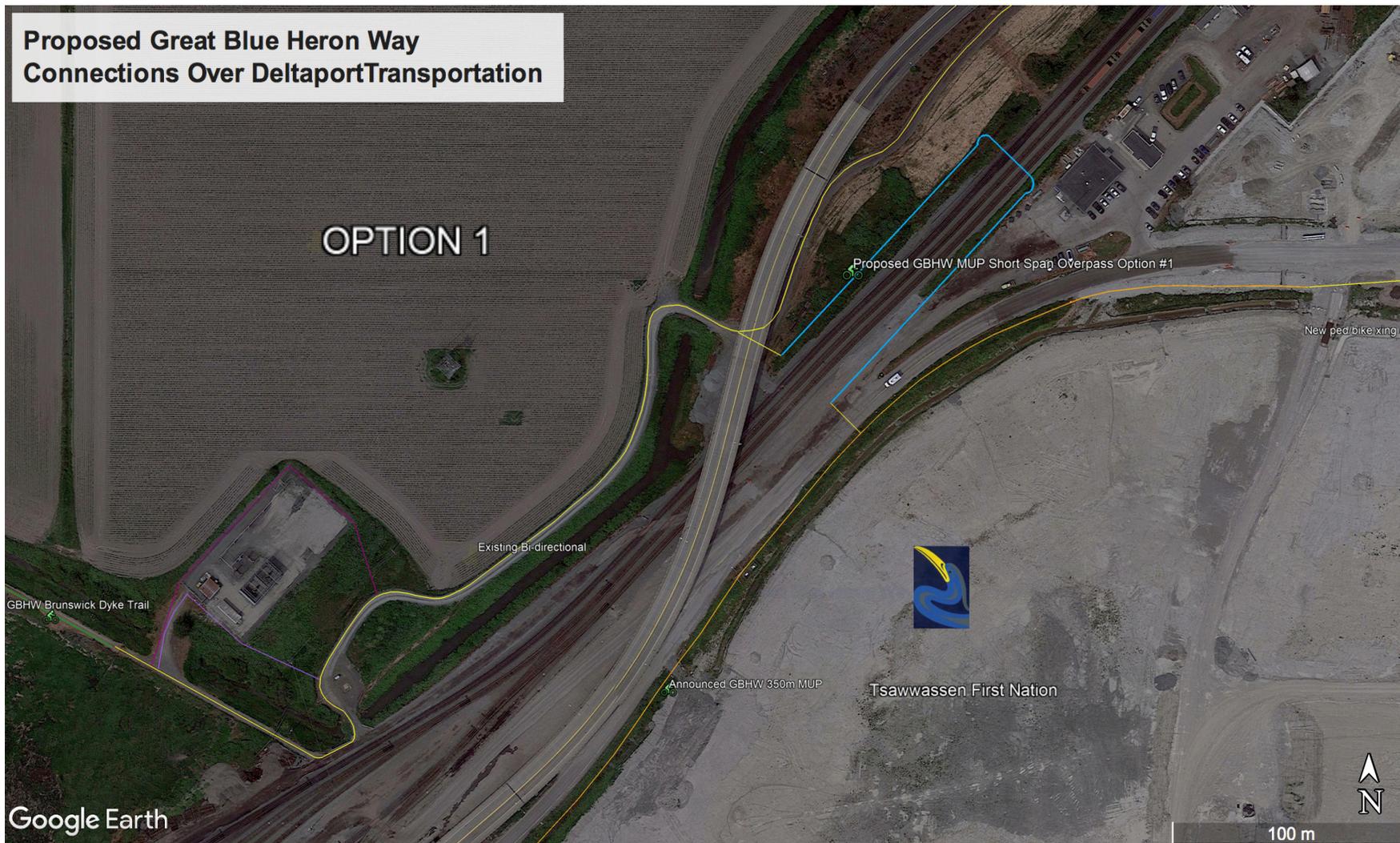
Another significant parameter that influences the choice is that of stakeholder and land jurisdiction. The sole purpose of the provincial government's rail corridor and Deltaport Way highway is to serve the Roberts Bank coal and container terminal but the Vancouver Fraser Port Authority is the owner of the sea terminal and accessing-causeway and is the de-facto principal stakeholder. More recent sublease tenants, such as Global Container Terminals, have also contributed to the need to close off the rail corridor to casual public access.

The rail corridor and Deltaport Way are both within the Ministry of Transportation and Infrastructure's jurisdiction- although reporting through different executive structures to the Deputy Minister. The City of Delta and the Tsawwassen First Nation also have jurisdiction over adjacent land -all of which is illustrated on the Port-provided map on the left, and they also may be considered stakeholders along with TransLink who sponsor transportation infrastructure between different jurisdictions.

Options

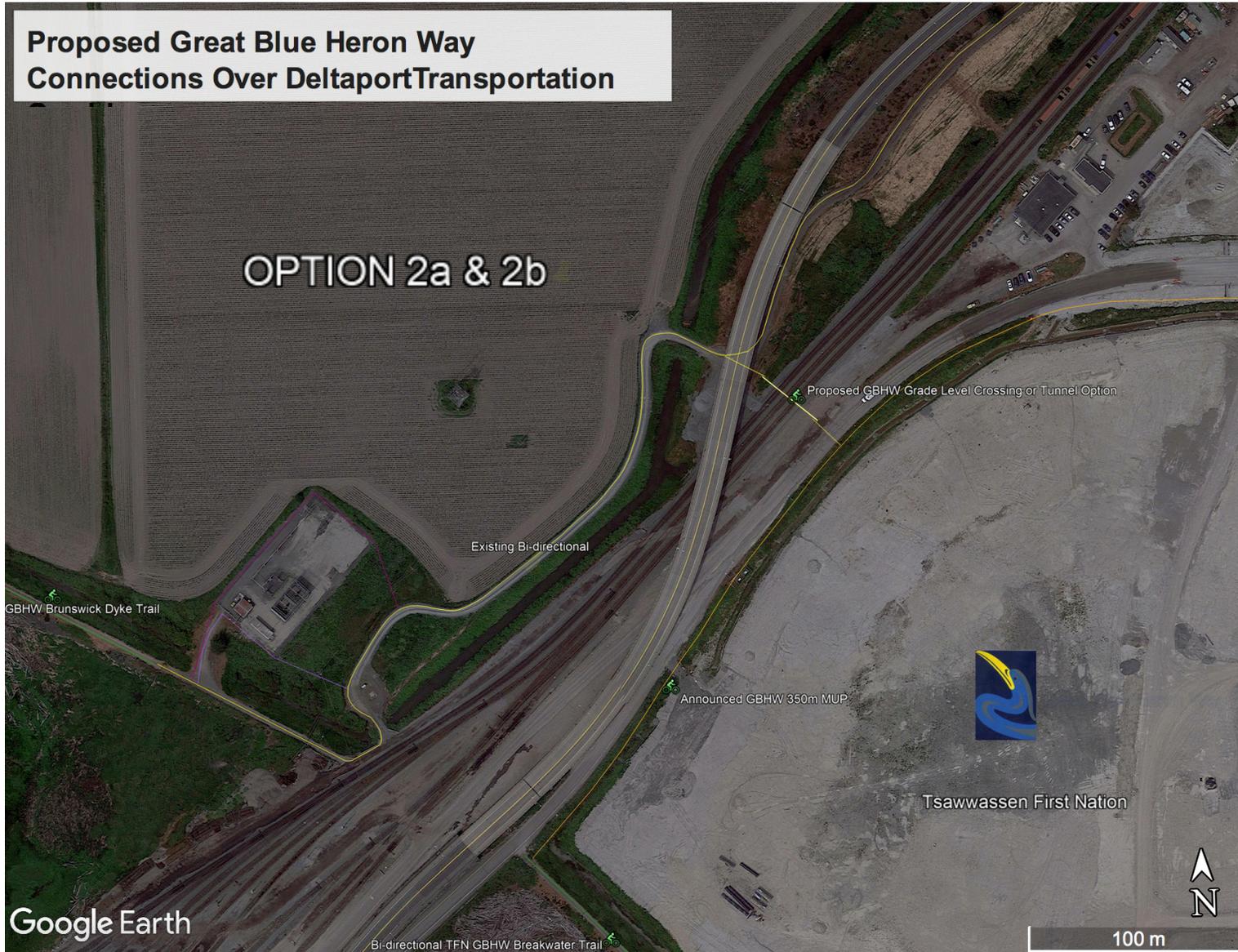
There are three physically viable options. They are-

1. **Bridge only option.** A new pedestrian/cycle bridge connecting the now severed south end of the Brunswick Point Trail with the north end of the Tsawwassen First Nation Breakwater Path, via MUP amenities.



2. **A tunnel or at-grade level crossing option.**

Either a tunnel or at grade level crossing at 27B Avenue where the rail corridor has narrowed down to three tracks- routing via an upgraded Deltaport Way service road to MUP standard on the north-west side and the soon to be upgraded southwest bound component of 27B Ave to the TFN Breakwater Path on the east side.



3. Existing road options.

3a. An adaptive solution incorporating the proposed MUP extension alongside Deltaport Way to the 41B St bridge; improved bridge and traffic light signalling for Active Transportation users and protected bike paths alongside 41B St- right through to the 27B Avenue intersection and, thereafter, connecting with the existing 27B Avenue MUP path to the rail corridor where 27B veers to the south-west and is planned for an upgraded MUP to the Tsawwassen Breakwater Path.

OR...

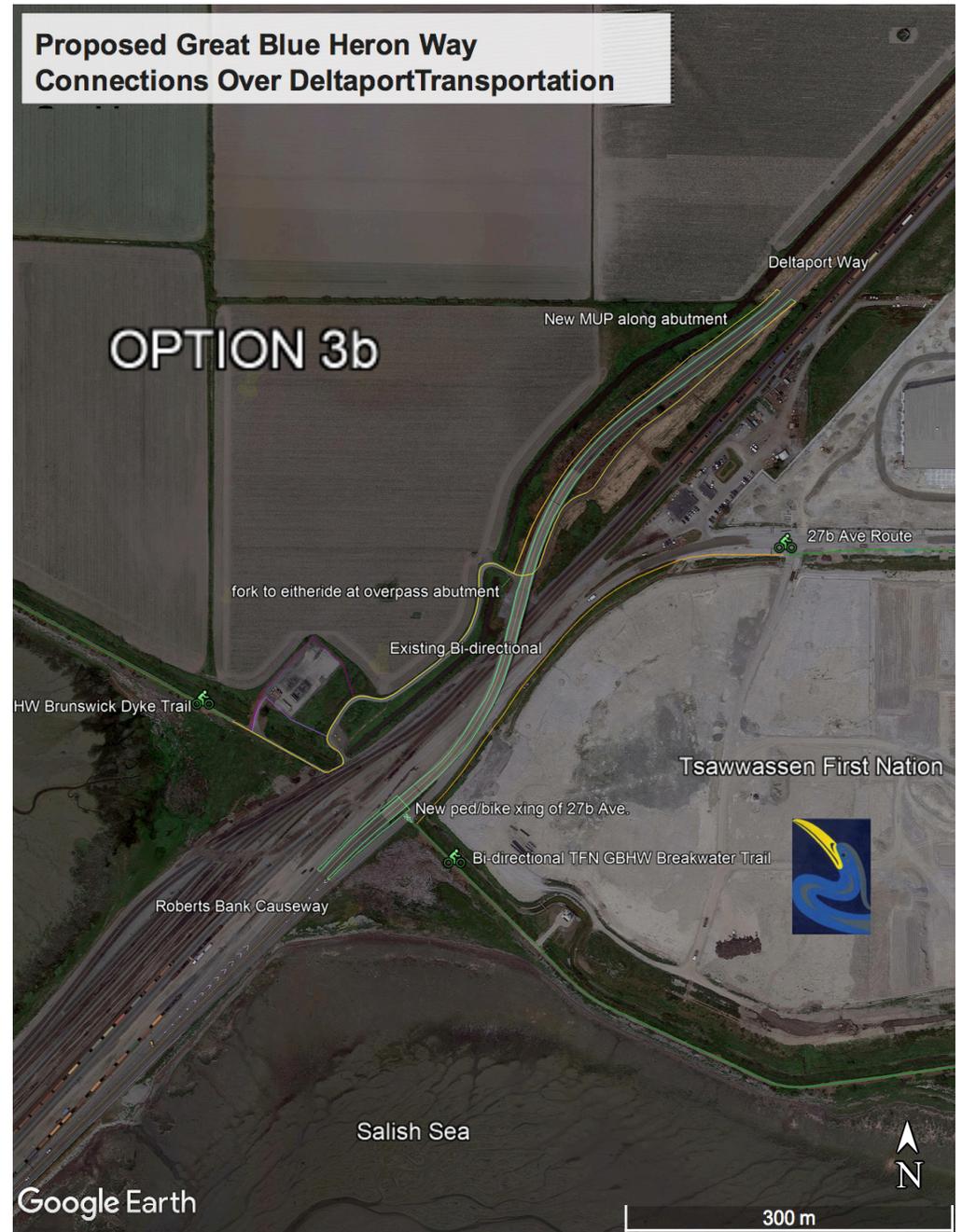


3b. Utilizing the same proposed service road MUP upgrade alongside the Deltaport rail corridor road from the Brunswick Point Dike Trail to the northeast end abutment of the Deltaport Way overpass. At the abutment the MUP to be bifurcated to include a new short length trail along the north side of the highway allowing connections to both sides of the overpass at the east end. At the overpass east end access provided to new protected and raised pedestrian/ bike paths on both sides of the overpass to the west end with connections, via the west end abutment, to the TFN Breakwater Path.

June 2020 photos:

Top. Breakwater Path entrance at 27B Avenue and Deltaport Way off-ramp, looking west towards Roberts Bank.

Bottom. Deltaport Way and overpass, looking west.



Option detail

Option 1- Bridge only

1a. Provision of a 45m long-span (approx) x 4m wide pedestrian/cycling bridge over the rail corridor located adjacent to the east side of the Deltaport overpass to provide an off-road greenway connection to the sea dikes on both sides. The south end of the proposed bridge already has MUP on 27B Avenue. The connection from the ped/bike bridge to the Brunswick Point Dike Trail would be via the proposed upgraded service road to MUP standard.

Option 2- Inland tunnel or at-grade level crossing at 27B Avenue

2a. A 45m long(approx) x 4m wide x 3m high concrete box culvert tunnel below the rail corridor and connecting to existing road infrastructure.

2b. A three-rail track at-grade level crossing connecting to existing road infrastructure as in Option 2a above.

All options will require the service road upgrade.

Photo: The service road on the north side of the Deltaport Way and rail lines, looking east, June 2020.



Option 3- Adaptive use of Deltaport Way and existing road systems.

3a. A new MUP extension to the existing but upgraded service road below the Deltaport Way overpass, on the southside of the Deltaport Way right through to the intersection of the 41B St bridge and including the southbound to- westbound cloverleaf off-ramp. Upgraded crossing and pedestrian/cycling signalization to and from 41B St bridge. Added protected bike lanes on both sides of 41B St right through to the intersection with 27B Avenue.



*Photos:
(far left) North end of 41B St bridge – current pedestrian facility only on east side, March 2021*

(left) South end of 41B St bridge, MUPs on 27B Ave looking west, June 2020

3b. An upgraded service road to the northeast end abutment of the Deltaport Way overpass. At the abutment, the new MUP bifurcates to provide access to both sides of the highway allowing access to the above grade overpass. Note-the protection to be afforded to pedestrians and cyclists on both sides of the overpass includes barrier protection from traffic, raised shared sidewalks and complimenting raised height parapet fencing. Safety measures should also include serious consideration of reducing the posted speed limit to 30kph.

Evaluation of options

Evaluation of bridge- Option 1

The above-grade option of a bridge is likely to be more costly than the options set further back inland. But the conceptual plan presented shows bridge users a clear wayfinding route and therefore meets the desired goals of a regional greenway connector for both new residents and existing TFN members and for hikers and cyclists wishing to connect with the ferries or go further to Vancouver or the US/ Can border crossing.

Locally, linking into the MUP infrastructure on 27B Avenue on the east side of the Deltaport Way overpass would span less rail yard infrastructure and has advantages for employees in the new industrial park, and residents living in new housing close to 27B Avenue, to have a better choice of recreational walking and biking access to shoreline paths.

Useful pedestrian bridge benchmarks are rail crossings on the Central Valley Greenway in Burnaby and on the North Shore Spirit Trail that travels through the Squamish Nation.



Photos. Spirit Trail pedestrian / bike bridge, North Vancouver, Feb. 2020

Evaluation of a tunnel v at-grade level crossing -Options 2a and 2b

The shorter rail corridor crossing length at this 27B Avenue location does introduce the possibility of a tunnel. It is unlikely that a cut and cover precast concrete tunnel, requiring multiple rail closures during construction, would even be permitted and so the alternative is for the tunnel elements to be hydraulically jacked through the substrata.

Tunnel jacking technology has been used for rail crossings in Canada and elsewhere worldwide. But is likely to attract a higher cost premium over the steel bridge. Pedestrians could feel safer on a bridge as they are more visible.

An at grade level crossing presents a cost-effective solution and, with gates only lowered at the infrequent times of rail freight movement, option 2b becomes an attractive solution.

Of the two options, a and b, preference, from a users' perspective, would be for the at grade-level crossing, with no ramps to ascend/descend under the rail tracks. Cost is also likely to favour the level crossing over the tunnel option even though there are operational costs associated with the crossing gate. But, when taking into account bridge maintenance painting or tunnel water intrusion issues associated with sea-level rise, the gate operational costs may not be a deciding factor.

Evaluation of adapting existing road systems

Upgrading the existing service road on the north side of the rail tracks and extending eastwards as an MUP, on the south side of Deltaport Way, to the 41B St bridge over Deltaport Way and the rail corridor is likely, by far, to be the lowest cost solution. This component, to the bridge, should be undertaken for all options as a minimum interim solution to the corridor closure. The utilization of the 41B St route, to re-access the dike to the south, will only incur the cost of providing cycle lane and pedestrian protection on 41B St to the intersection with 27B Avenue. (After the intersection, the route westwards and then south to the dike along 27B Ave, an MUP has already been constructed to Triple-A standard for the first 600m with the remaining 350m plus distance, to the TFN Breakwater Path, already at the planning stage). The downside of this option is the extraordinary length of the diversion (total 3km) away from and back to the dike. While this may be a tolerable interim solution for cyclists it is likely to constitute an unacceptable diversion for most walkers.

The alternative solution of adapting the Deltaport Way overpass to accommodate walkers and cyclists with protected raised paths on both sides will shorten the diversion to 1.0km. It is recognized that there are highway regulations regarding the safety of pedestrians and cyclists alongside vehicular traffic but there are many examples of shared pedestrian/cyclist raised paths alongside the outer traffic lane on bridges and causeways.

Evaluation Summary

The ideal option is a pedestrian / cycling bridge over the tracks linking the TFN Breakwater Path with the Brunswick Point Dike Trail via multiuse paths on 27B Avenue and from this new bridge to the Brunswick Point Dike Trail access at the BC Hydro land parcel where a ditch crossing to the dike top already exists..

The second functionally cost-effective option 2b, appears to be the 27B St at -grade level crossing.

The third lower cost option 3b of adapting the Deltaport Way overpass edge lanes to accommodate walkers and cyclists on new raised side paths appears to be a better solution compared with the long 3km diversion route of option 3a via existing roads that is prohibitive to walkers.

Risks and project sensitivity

This project has come about because a historical trail, used by Indigenous peoples, was severed by the construction of the Roberts Bank rail corridor in recent times. Over the 40-year history of the Roberts Bank, sea terminal expansions have resulted in higher rail freight volumes and increased the risk to casual crossings of the rail tracks by the public. Fencing has now eliminated the risk posed to the public. But, while the risk was removed, it was at the expense of public trust in the process for the provision of an alternative-there was no public consultation and that has raised political sensitivities.

There are financing, construction and operating risks associated with this project. The rail corridor capacity of servicing Roberts Bank has increased since its inception to meet the demand for more efficient freight transportation of both bulk and container units. Both the province and national government have been willing, at arm's length, partners in the development of Roberts Bank-the province through BC Rail and the national government through the Vancouver Fraser Port Authority (VFPA). The VFPA has embarked on a \$7.5 billion project called the Asia Pacific Gateway and Corridor Initiative. As recently as 2019 road and rail improvements (\$100m) were made to enhance operating efficiency.

In mid-summer of this year, 2021, the VFPA is required to report back to the Federal Ministry of the Environment to show how they intend to mitigate port expansion impacts to the marine environment, and First Nations, as a condition of the Roberts Bank Terminal 2 Expansion approval process. This necessary walking / biking link is required with or without Terminal 2 expansion approval. *However, addressing the sensitive issue of restoration of dike trail connectivity couldn't be more timely, as provincial and federal stakeholders are already at the table.*

In terms of the proposed GBHW project, there are very few construction and operational risks. The preferred Option 1 -a bridge over the rail corridor presents only a minor risk during hoisting and placing of prefabricated bridge components but, thereafter, the risk during lifetime usage is very small compared with the at-grade level rail crossing of option 2b. (A protected and gated crossing would reduce risks considerably if the installed infrastructure incorporated provision for narrow width wheelchair and bicycle wheel rims).

Finally, Option 3b, if constructed with raised and barrier protected sidewalks would present very few day-to-day risks.

The clear preference is for a pedestrian/ cycle bridge designed for all ages and abilities over the rail and road corridor via MUP paths to tie into the disconnected dike trail ends.

The second choice is for an at grade level crossing at the 27B Avenue location.

The third choice is upgrading the Deltaport Way overpass but there are serious concerns that the sunk costs of this third choice will inhibit future investment in the ped / cycle bridge, a preferred first option.

Recommendations

That the MOTI projects group be directed to engage the consultants who have previously been involved in the planning and design of the Asia Pacific Gateway and Corridor Initiative to carry out a planning and cost-benefit analysis of the option(s) presented above.

That MOTI considers acting as the project initiator in bringing the multiple parties together ASAP while multiple stakeholders are already engaged in the current Port development evaluation process, and also collude with the Port Authority to build the MUP from the north side dike to the 41B St bridge as a permanent component for all possible options.

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