

TO: CHAIR AND MEMBERS
FINANCIAL MANAGEMENT COMMITTEE

DATE: 2021 February 10

FROM: MAJOR CIVIC BUILDING PROJECT
COORDINATION COMMITTEE

FILE: 4230 12
Reference: Hwy 1 Overpass

**SUBJECT: BURNABY LAKE – HIGHWAY 1 PEDESTRIAN OVERPASS
PHASE ONE FEASIBILITY STUDY**

PURPOSE: To present a summary of the findings for the Burnaby Lake – Highway 1 Pedestrian Overpass Phase One Feasibility Study and request approval to proceed with the next phase of design.

RECOMMENDATIONS:

1. **THAT** the Financial Management Committee recommend Council approve the schematic design of the Highway 1 Pedestrian Overpass project in principal and authorize staff to proceed to the detailed design of **Option 1** of the western crossing options, as outlined in this report.
2. **THAT** the Financial Management Committee recommend Council authorize staff to undertake the first phase of selecting location and schematic design works for a possible future second (eastern) crossing.
3. **THAT** a copy of this report be forwarded to the Parks, Recreation and Culture Commission for information purposes.

REPORT**1.0 INTRODUCTION**

The objective of the Burnaby Lake – Highway 1 Pedestrian Overpass project is to construct a pedestrian-cyclist overpass across Highway 1 to provide a safe north-south cycling and pedestrian link, supporting healthy living and providing alternatives to driving. The overpass will connect Burnaby Lake and Deer Lake areas, and integrate into the existing Urban Trail System of the City and the new Central Valley Greenway as part of the Regional Greenway Strategy 2050. The overpass will be located across the section of Highway 1 (Trans-Canada Highway) within the Rayside Community Plan Area, and adjacent to Burnaby Lake Regional Nature Park.

In 2019, the City engaged McElhanney to undertake the first phase of work which included Multiple Account Evaluation analysis to select a bridge location, as well as undertake environmental, geotechnical, and archaeological analysis and complete a schematic design.

2.0 POLICY SECTION

The advancement of the proposed Burnaby Lake – Highway 1 Pedestrian Overpass project align with the following goals and sub-goals of the Corporate Strategic Plan:

- **A Connected Community**
 - Geographic connection – Ensure that people can move easily through all areas of Burnaby, using any form of transportation
- **A Healthy Community**
 - Healthy life – Encourages opportunities for healthy living and well-being
- **A Dynamic Community**
 - City facilities and infrastructure – Build and maintain infrastructure that meets the needs of our growing community

3.0 SCHEMATIC DESIGN SUMMARY

3.1 Architectural and Structural Design

McElhanney and their sub-consultants working in concert with City staff, established the following design rationales to provide guidance/insight in architectural and structural:

- Explore strategies to utilize wood in both a functional and visible manner.
- Use a memorable architectural design to create a strong gateway to the highway and a community portal to surrounding nature.
- Utilize lighting to highlight the superstructure and create safe functional path lighting for cyclist and pedestrians.

The resultant schematic design for this project proposed paired symmetrical and intersecting arches attached at the bridge deck by intersecting cables. At the ceiling where the arches interlock, mass timber is proposed for bracing as well as to create a memorable and warm gateway experience for the bridge users. For protection and additional comfort, a glazed highway barrier is provided at the bridge deck while cable netting is provided at the approach paths. Uplights mounted in the deck illuminate the arch to highlight this gateway element and lighting integrated into the bridge creates the functional trail lighting for overpass users. Refer to the bridge images in Attachment 1, *attached*.

3.2 Bridge Location Analysis

Selection of preferred crossing locations considered how selected locations would improve the connectivity between city and regional park destinations at Burnaby Lake, Deer Lake, and Robert Burnaby parks. The connection between Burnaby Municipal Complex and Sperling-Burnaby Lake Skytrain station was also considered. Other considerations in selecting locations included existing

soil conditions, impacts to BC Hydro overhead and underground utilities as well as constraints imposed by Highway 1 and other environmental impacts.

Users in the area currently cross the highway using either Kensington Avenue or Cariboo Road overpasses. In order to improve connectivity for users and achieve even density in future cycle networks, two overpass crossings evenly spaced between Kensington Avenue and Cariboo Road were envisioned. The western crossing would be between Kensington Avenue and Lakefield Drive, while the eastern crossing would be between Lakefield Drive and Cariboo Road. Analysis in this report has focused on the western crossing. A possible future eastern crossing would connect Burnaby Lake Park to the Robert Burnaby Park area. If Council accepts moving forward with the eastern crossing then it will be added to the 2021-2025 Annual Financial Plan.

3.3 Western Crossing Location Analysis:

The following four western options were analysed and reviewed (see *Figure 1* below):

- **Option 1 (Claude Avenue/McCarthy Court Crossing):** This crossing is the preferred option on the strength of its proximity to key destinations in Burnaby's civic precinct on the south side of Highway 1 and the Glencarin Trailhead to the north; lower delivery cost due to the raised height of existing ground at each proposed embankment location, along with its reduced impacts to the environment, private property, and third-party infrastructure. Furthermore, the City of Burnaby Trail Inventory and Development Program report of September 1986 recommended a grade-separated bridge crossing the highway at this location in order to access the Burnaby lake area. It is recommended that this option proceed to detailed design.
- **Option 2 (Claude Avenue/Wilton Avenue Crossing):** This option is located approximately 170m from Claude Avenue/McCarthy Court Crossing. Terrain is flatter and will require longer embankments at both sides of the highway which negatively impacts aesthetic appearance and increase cost.
- **Option 3 (Sperling Avenue Perpendicular) and Option 4 (Sperling Oblique Crossing):** This option at Sperling Avenue crosses the highway at a perpendicular angle, minimizing the length of the main span and provides reasonable connections to both the Glencarin Trailhead and destinations north of Sperling Avenue. The oblique option on the other hand crosses the highway directly along Sperling Avenue to create the most direct possible linkage between origins and destinations located along the Sperling Avenue access, which de-prioritizes access to the Glencarin Trailhead. It is noted that there are two known archaeological sites in proximity to the Sperling Avenue options. No other known archaeological sites are found to be in proximity to the other options.

Both BC Hydro and Ministry of Transportation (MoT) own a significant amount of infrastructure in the vicinity of the proposed bridge locations and City staff inquired with both BC Hydro and Ministry of Transportation in order to understand how the locations will impact adjacent and nearby existing infrastructure. BC Hydro expressed serious concerns and strongly advised against

any crossings at Sperling Avenue. Discussions with BC Hydro revealed that both Sperling Avenue crossing options will impact their infrastructure the most, while crossings at Claude Avenue and Wilton Avenue will have little or no impact to BC Hydro infrastructure. BC Hydro confirmed that any crossing at Sperling Avenue will impact the high-voltage transmission corridor parallel to Highway 1 at the north landing and associated overhead distribution line. BC Hydro advised a relocation of both transmission structure and distribution will be required if any crossing at Sperling Avenue is selected. BC Hydro also advised they will need to see a detailed design before committing to any timelines, however they estimate transmission and distribution relocation work typically takes up to two years.

The Ministry of Transportation (MoT) advised that there are a number of structural and operational challenges associated with crossings at Sperling Avenue due to the proximity of the proposed crossings to the on-/off ramps of Highway 1, the grounds of which have historically experienced settlement issues. Staff at Ministry of Transportation indicated that despite installing multiple piles to address settlement issues at the off-ramp, the structure is still experiencing a number of ground movements due to thick soft ground. There are major concerns that if the pedestrian bridge and its abutment are to be built near Highway 1 or the off-ramp, it will cause further ground settlement in the area and have a detrimental impact on existing MoT infrastructure.

Tsleil-Waututh Nation (TWN) has reviewed the proposed locations and provided feedback in accordance with TWN Stewardship Policy (2009). TWN confirmed that locations with little or no impacts to water quality, fish habitat and sensitive ecosystems are desirable. The presence of watercourses and species at-risk critical habitats at the Sperling Avenue option poses increased impacts to the environment in this area. TWN has requested Archaeological Overview Assessments (AOA) be conducted as part of the design process.

Figure 1 - Western Crossing Options



To: Financial Management Committee
From: Major Civic Building Project Coordination Committee
Re: Burnaby Lake – Highway 1 Pedestrian Overpass Phase One Feasibility Study
2021 February 10Page 5

4.0 RECOMMENDATIONS

It is requested that the Financial Management Committee recommend Council approve the schematic design of the Highway 1 Pedestrian Overpass project in principal and authorize staff to proceed to the next phase, design development and detailed design of Option 1 of the western crossing options. It is also recommended that Financial Management Committee recommend Council authorize staff to begin the feasibility study for a possible future second eastern crossing as outlined in this report.

The next phase of work would include integration of the design with wider community improvements and trail connections on the south end, and other trail improvement projects in Burnaby Lake Regional Park. This phase would also include public consultation in April or May 2021, including further consultation with key stakeholders, including the appropriate first nations.

The results of the next phase of design would be the subject of a future report to Committee and Council.

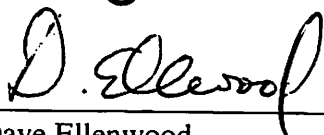
It is further recommended that a copy of this report be forwarded to the Parks, Recreation and Culture Commission for information.



E.W. Kozak, Chair, Major Civic Building Project
Coordination Committee



Leon Gous, Director Engineering



Dave Ellenwood
Director Parks, Recreation and Cultural Services

JN/sla

Attachment

cc: City Manager
Director Corporate Services
Director Public Safety and Community Services
Director Finance
Purchasing Manager
City Solicitor
City Clerk

ATTACHMENT 1



DESIGN ELEMENTS - AESTHETIC LIGHTING

- Secondary aesthetic lighting of the soffit will create a strong gateway effect at night.

