



**Planning & Designing  
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5 February 2020

City of Penticton  
Attn: Mr. Ian Chapman, P.Eng. and Ms. Tobi Pettet, EIT  
616 Okanagan Avenue E  
Penticton, BC V2A 3K6

## **Re: Nanaimo Ave E Bridge Removal over Penticton Creek - Transportation Review**

### **Introduction**

This report is based on our discussions, emails and my site visit regarding the potential removal of the Nanaimo Avenue E bridge over Penticton Creek. This brief report outlines my review methodology and provides a recommendation from a transportation perspective.

### **The Issue**

It is my understanding that the City of Penticton (City), as a part of Penticton Creek naturalization, is considering removal of the bridge (without replacing it), due to potential restrictions the bridge creates with high flood levels. Further, from a structural perspective, it is my understanding that the bridge is nearing the end of its lifespan.

In late 2019, the City commissioned me to have an independent look at the area from a transportation planning/operations perspective to see what potential impacts may occur if the bridge is removed.

## Site Overview

The Nanaimo Avenue E bridge, as shown in **Figure 1** below represented by the purple star, currently provides one of several connections into the area bounded by Pentiction Creek to the west, to the toe of the bluff on the east (the 'flats' below the Uplands neighbourhood), Vancouver Ave to the north via Van Horne Street and Abbott Street, and converging to a single point in the south at the intersection of Haven Hill Rd/Pickering St.

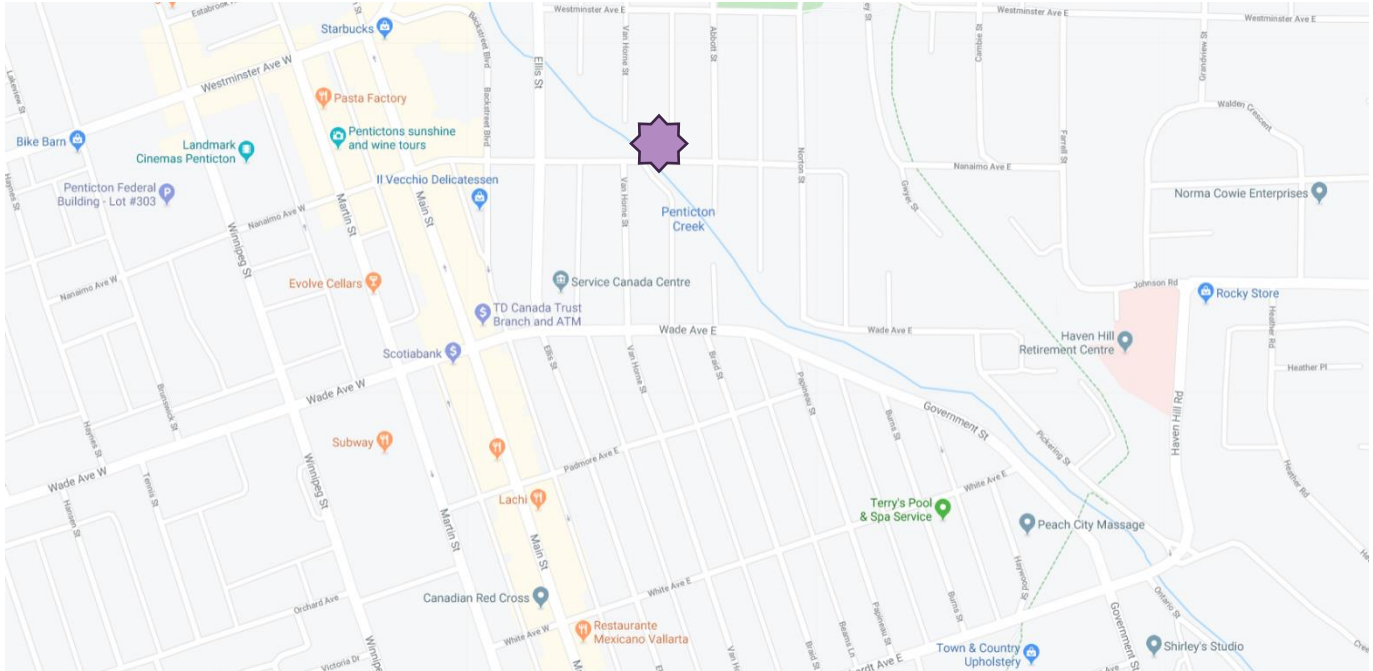


Image Source: Google Maps

**Figure 1: Aerial View of Area Around Nanaimo Avenue E Bridge Over Pentiction Creek**

## Vehicular Traffic Volumes

Data collected on a typical day in December 2019 shows that the bridge currently carries approximately 1,350 vehicles per day, with a maximum of 140 (both directions) in the peak hour of 15:30-16:30. Overall, this bridge carries what would be considered a very low amount of vehicular traffic, and would fall under the classification of a local road, based on traffic volumes. Heavy vehicle percentages are in line with expectations for a local road, falling under 3% including all buses (1.3%) and anything larger than a passenger car (1.5%).

For the same time period, approximately 236 pedestrians were counted to use the bridge, and nine cyclists over a 24 hour period. With cooler temperatures, and snow on the ground during the count day, the number of cyclists although low, would be in line with expectations for the conditions. It is likely in better weather conditions that more cyclists would use the bridge.



## Analysis of Risks

From my perspective, complete removal of the bridge could result in the following risks from a transportation perspective:

- 1) Increase of vehicular traffic on other corridors resulting in the need for improvements.
- 2) Decrease of people using active modes due to the loss of a direct connection to downtown.
- 3) Increased emergency response times, particularly for fire response.
- 4) Decreased options for emergency egress of residents in event of a catastrophic event requiring evacuation of the area (eg wildfire, flash flood, act of violence).

Each is considered in more detail below.

### 1) Increase of vehicular traffic on other corridors resulting in the need for improvements

It is somewhat difficult to say how removal of the bridge would redistribute vehicles from the traffic patterns of today. In absence of additional data as to where traffic is going to/from that currently uses the bridge, professional judgement is the best methodology to use.

It is quite likely vehicular traffic would disperse in some proportion to the other four routes in and out of the area, namely Pickering St to Haven Hill Road/Eckhardt Ave, Van Horne St to Vancouver Ave, Abbott St to Vancouver Ave, and Westminster Ave to Ellis St. Likely, much of it would use the Westminster Avenue to Ellis St route. However, from a traffic perspective, the worst case scenario is if *all* traffic currently using the bridge was to use *only one* of the routes.

To assess the four worst case scenarios, I completed analysis using a Synchro 10 model comparing existing conditions with a bridge removal scenario for the peak hour in the day (15:30-16:30). Three of the four intersections showed little to no change in forecasted Level of Service (LOS) on the stop control approach between the two scenarios, all with LOS C or better. The fourth location at the intersection of Haven Hill Road/Eckhardt Ave/Pickering Street however, showed a change that, if all traffic routed through this location, could potentially be an issue. **Table 1** shows the results.



**Table 1: Performance Measures for Haven Hill Road/Eckhardt Ave/Pickering Street Intersection**

| Scenario           | NWB LTR (from Eckhardt) | SEB R (from Pickering) | SEB LT (from Pickering) <sup>1</sup> |
|--------------------|-------------------------|------------------------|--------------------------------------|
| Existing           | D, 0.19, 4m             | B, 0.07, 1m            | C, 0.03, 1m                          |
| Rerouted           | F, 0.36, 8m             | B, 0.25, 6m            | D, 0.05, 2m                          |
| Rerouted (With LT) | E, 0.34, 8m             | B, 0.25, 6m            | D, 0.05, 1m                          |

If all bridge traffic rerouted, there would be a delay of 52.4s for traffic coming from the east leg of Eckhardt Avenue. It is important to note that the major flow of traffic going from/to Haven Hill Road and Eckhardt Avenue West Leg is unaffected and operates at LOS A. Although the east leg is technically a LOS F, the v/c ratio is low, and queue is expected to only be an average of 1.4 vehicles long. If it was seen that all traffic rerouted from the bridge to this location, a short (10m) eastbound left turn bay could be painted on Eckhardt Avenue to allow for all movements to operate at LOS E or better during the peak hour. It is not anticipated that curb modifications are required to accommodate the changes, just paint modifications.

That said, it is unlikely that this location would see all traffic reroute here, but, in either event, either the City could either accept a slight delay to the movement from the east leg of Eckhardt Avenue, or could implement a very low cost improvement could be made to ensure adequate operations in the peak hour.

**2) Decrease of people using active modes due to the loss of a direct connection to downtown**

Not unlike vehicular traffic, it is somewhat difficult to say how removal of the bridge would redistribute active transportation modes (pedestrians and bikes) from the traffic patterns of today. In absence of additional data as to where traffic is going to/from that currently uses the bridge, again, professional judgement is the best methodology to use.

In many ways, active transportation modes are even less inconvenienced/rerouted by a closure of the Nanaimo Avenue bridge as there are additional crossings via Westminster Avenue (one block north) and

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<sup>1</sup> Note that this movement is prohibited, but was observed in the field.

Ellis St at the Creek Crossing, and one block south at corner of (intersection of) Norton St and Wade Avenue E.

To provide the best level of service to active modes, the City should ensure a multi-use corridor continue on the south side of Penticton Creek from Nanaimo Avenue to Wade Avenue, ideally at a width of 3.5m minimum, desirably 4.5m width. This may require working with private landowners to facilitate if it can't be incorporated into the creek redevelopment right-of-way. The City can take a staged approach, first using the existing corridor until such time that a full corridor can be developed on each side of the creek.

### **3) Increased emergency response times, particularly for fire response.**

As shown in **Figure 2**, it is anticipated that a swath of the area will see a potential increase in fire response times by approximately 32-35 seconds, if attended from Station 201. There will be minimal to no impact in response times from if being serviced from other stations, except for areas to the north of Nanaimo Avenue which would experience the 32-35 second delay. As per vehicular traffic, there are four other access routes by road that the fire department can use to gain access to the area, most likely through Ellis St and Westminster Ave.

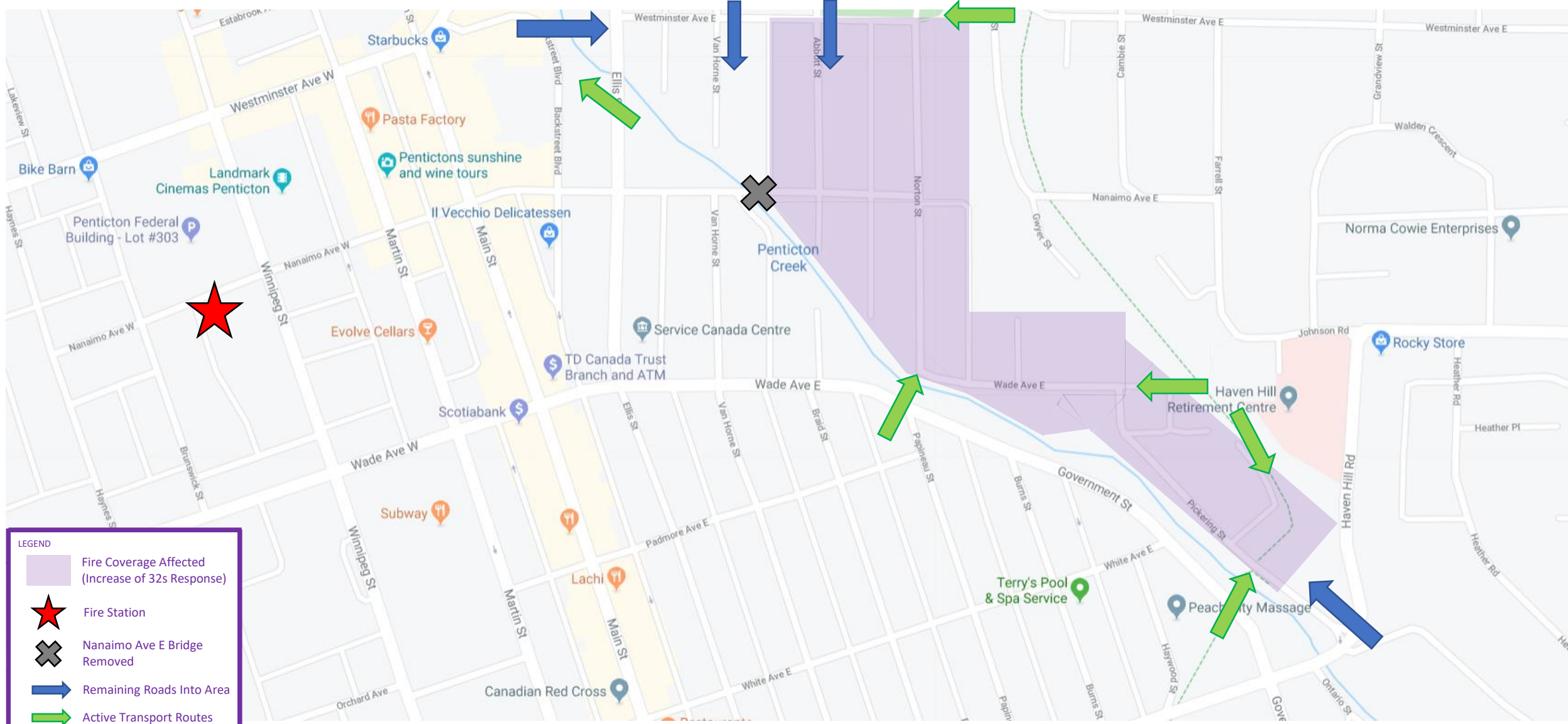
Police and EMS response times will have impacts ranging from the 35 second maximum, down to zero, due to the location of stations for each/roaming nature of each of these services.

In my professional opinion, this is not a significant enough increase in response time to warrant requiring the bridge be replaced, but this should be confirmed by Penticton Fire Department. It is my understanding that as of the date of this letter, PFD has confirmed that there are not significant drawbacks to removing the bridge.

### **4) Decreased options for emergency egress of residents in event of a catastrophic event requiring evacuation of the area**

As shown in **Figure 2**, there are numerous emergency egress points for evacuation if needed, including several in each direction. Again, in my professional opinion the loss of the Nanaimo Avenue East bridge does not impact emergency evacuation for the area.





**LEGEND**

- Fire Coverage Affected (Increase of 32s Response)
- Fire Station
- Nanaimo Ave E Bridge Removed
- Remaining Roads Into Area
- Active Transport Routes

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Delivering Collaborative Solutions with  
Technical Expertise and Passion



| REV | DATE        | DESCRIPTION                |
|-----|-------------|----------------------------|
| 0   | 15 Jan 2020 | Issued For City Review     |
| 1   | 28 Jan 2020 | Issued With Technical Memo |
|     |             |                            |
|     |             |                            |

**CITY OF PENTICTON**  
**NANAIMO AVENUE BRIDGE CLOSURE ANALYSIS**

**Impacts on  
Fire Servicing**

| DATE        | FIGURE   |
|-------------|----------|
| 15 Jan 2020 | <b>2</b> |
| DRAWING     |          |
| 101         |          |
| SCALE       |          |
| NTS         | JOB      |
|             | AC02     |

## Ideal Improvement Recommendations

Given the above risk assessment, from a transportation perspective, the ideal solution for the City to implement would be to widen the multi-use corridor on the south side of Penticton Creek from Nanaimo Avenue to Wade Avenue to 4.5m. Although not technically necessary, an ultimate solution would be to replace the bridge with an active modes only bridge connection of a 4.8m width, which helps improve active modes connectivity giving those modes an advantage over vehicles.



### Closure

I deliver every project with technical expertise, collaboration and passion to build communities and community. With several other routes existing in and out of the area currently served by the Nanaimo Avenue bridge, I believe that no significantly adverse impacts will be created if the City chooses to remove said bridge over Penticton Creek. Ideally, active transportation routes as described above would be in place paralleling the creek on the south before the bridge is removed, however it is not imperative in order for the bridge to be removed, as the connection already exists, albeit narrower.

Yours in Service,

Peter A. Truch, P.Eng., PTOE, FITE, IAP2 Trained

cc: Mitch Moroziuk, City of Penticton

