October 9, 2018

To: Gerry Hamblin, Project Assessment Manager, Environmental Assessment Office

From: HUB Cycling[1] and BC Cycling Coalition[2]

Subject: Pattullo Bridge Replacement Project Environmental Assessment

Our Concerns:

- Indirect access to the bridge for people walking and cycling as shown in project drawings would significantly increase travel distances, times and effort, thereby decreasing the effective range and limiting the potential growth of these modes of transportation.
- High levels of exposure to traffic pollution and noise for people walking and cycling due to insufficient separation or buffering between traffic lanes and walking and cycling facilities.

Our recommendations and comments include:

1. Walking and cycling access to the bridge designed to minimize travel distances, travel times and grades throughout the project area.
2. Walking and cycling facilities designed to connect not only to existing facilities but also to potential future facilities, recognizing that cycling facilities in particular are incomplete and further development is anticipated on both sides of the bridge.
3. Separation of traffic lanes and walking/cycling facilities by placing the latter beneath the bridge deck.
4. If below bridge deck facilities are not possible, effective pollution and noise barriers between motor vehicle traffic lanes and the physically protected walking/cycling facilities.

1 & 2. Walking and Cycling Access to the Bridge

The Pattullo Bridge plays a central role in TransLink's conceptual Regional Bikeway Network. Among Fraser River crossings it provides the shortest, most efficient connection between major regional population, employment and education centres

[1] HUB Cycling is a charitable organization working to get more people cycling, more often in Metro Vancouver.

[2] The British Columbia Cycling Coalition is the voice for cycling in British Columbia.

on opposite sides of the river. As with motor vehicle access, walking and cycling access should be direct, intuitive and efficient. Cycling facilities should be designed for speeds of at least 50 km/h bearing in mind the grades involved.

Designs that do not minimize the distance, time and effort required for cycling can significantly decrease destinations that can be reached within a given amount of time and effort and thereby reduce the number of trips that people are willing to make by bicycle. When evaluating options, walking and cycling travel times should be estimated to help choose the most efficient options. We are deeply concerned that the conceptual project drawings illustrate proposed routings that are significantly longer and less efficient than motor vehicle routings, in at least one case by over a kilometre. Any incremental increases in time and effort are cumulative with others along a route and collectively make cycling a less attractive option. This is our one opportunity to maximize the potential of the Pattullo project to increase the mode share of active transportation and decrease GHG emissions as municipalities on both sides of the river, in partnership with TransLink, continue to improve their cycling networks.

3. Separation of Walking/Cycling Facilities from Traffic Deck

The possibility of placing the cycling and walking paths beneath the bridge deck as on the Canada Line North Arm Bridge should be seriously considered. Placing the paths underneath the bridge deck could have several advantages for user comfort, convenience and health and may also be less expensive to build. This would encourage more people to cycle and walk leading to less traffic, pollution and GHG emissions. Specific advantages include:

- Less user exposure to traffic pollution and noise
- Weather protection
- Potential for more direct, efficient connections
- Potential to reduce the size of the structure as well as GHG emissions associated with material production and construction by replacing directional bike paths and sidewalks on each side with a single 2-way bike path and adjacent single sidewalk below deck

A digital image of the proposed Skypath across the Auckland, NZ Harbour Bridge.

4. Noise and Pollution Barriers

In the event that walking and cycling facilities are designed at the level of the traffic deck measures should be taken to mitigate the effects of traffic noise and pollution (both exhaust and road dust) on users. It should be noted that climbing the proposed grades will result in increased ventilation rates for cyclists and possibly pedestrians while at the same time vehicles travelling uphill will be emitting more pollution. Increased ventilation rates may result in more harmful doses of pollution than inhalation at lower ventilation rates. Noise is an irritant that can reduce user comfort, ability to communicate and the attractiveness of the facility, potentially resulting in lower levels of usage and GHG reduction. Please see Appendix A for more information.

Conclusion

The new Pattullo Bridge, located at the centre of the region and providing access to the fastest growing parts of it, will be a key link in the comprehensive regional cycling network that will be needed to meet TransLink's Transport 2040 mode share and GHG reduction targets. Given the substantive concerns outlined above, we respectfully ask that the Environmental Assessment Office direct the proponent to consult with and receive the endorsement of HUB Cycling and the BC Cycling Coalition, representatives for transportational cycling in Metro Vancouver and the Province of BC respectively, as a condition related to the Pattullo Bridge Replacement Project.

Appendix A

Exposure to pollution

Increased cycling distance and trip duration increases cumulative exposure to pollution

Increased ventilation rate when cycling may result in a more harmful dose than inhalation at a lower ventilation rate. This is of particular concern on the east side of the bridge where cyclists will be going uphill increasing ventilation rate and vehicles travelling uphill will be emitting more pollution.

Ventilation is 4.3 times higher for cyclists than for car drivers

Prolonged exposure to high levels of noise generated by road traffic can also cause health problems and have detrimental effects on individuals' well-being.

Particulate pollution levels drop off rapidly within the first 150m of the centre of a highway

The result shows that winter is more polluted than spring, and in morning pollution level is much higher than other times of the day.

Furthermore, a clear distance decay effect was detected, with particulate concentrations significantly higher curbside than along the building facade.

Road Dust

Road dust was found to have harmful effects on the human body, especially on the respiratory system.

The estimated effect of PM10 on asthma visits was 3.4% per 10 μg/m3 for road dust days.

In Stockholm, measures to reduce non tail-pipe emissions have included banning the use of private cars with studded tires in some streets to reduce road wear. The road material is also important - as the harder it is, the lower the emissions (but this results in more noise than soft asphalt).
There were 93,398 deaths during the study period, or, on average, 28.4 per day, and on average coarse particles made up 42% of total PM10 concentration. The researchers found that an increase in the coarse particle concentration of 10μg/m3, resulted in a 1.7% increase in the daily death rate.

Having already accounted for the effect of factors such as weather (temperature and humidity) on daily mortality, the researchers attribute the higher concentrations of coarse particles during November-May to a greater amount of suspended road sediment caused by the use of studded winter tyres, road salt and traction sand in winter.

Sound Wall

A sound wall with no gaps can reduce exposure to pollution.

Noise barriers reduce noise levels from traffic by blocking and deflecting sound waves. These barriers may also affect air pollutant dispersion, leading to increased vertical mixing due to the upward deflection of airflow caused by the structure. Studies suggest that this upward deflection of air may create a recirculation cavity downwind of the barrier, extending from 3 to 12 wall heights downwind, containing a well-mixed, and often lower, zone of pollution concentrations (Nokes and Benson, 1984; Paul-Carpenter and Barboza,1988; Holscher et al.,1993; Swamy et al.,1993).