CALGARY RIVER VALLEYS

Weaselhead/ Glenmore Park PRESERVATION SOCIETY

Design Considerations and Recommendations for the South West Calgary Ring Road (SWCRR) Crossing of the Elbow River Valley

Submitted September 14, 2015

EXECUTIVE SUMMARY

Design Considerations and Recommendations
for the South West Calgary Ring Road (SWCRR)
crossing of the Elbow River Valley

The following recommendations are the product of facilitated meeting held in June 2015 between Calgary River Valleys (CRV), Weaselhead/Glenmore Park Preservation Society (WGPPS), Alberta Transportation (AT), and invited guests with technical expertise in biology, hydrology, and riparian ecology. Implementation of these recommendations will reduce the long term negative impacts of the crossing on the environment. While it is encouraging to see that that the functional design of the crossing now includes an extended length of the bridge, we consider the modelling of the Elbow River to be paramount and we hope that the results of modeling will also be considered in any further design modifications. Each of these recommendations is supported with more detailed descriptions in the full Report attached.

RECOMMENDATIONS:

1. Model the hydrology and fluvial geomorphology of the meandering Elbow River in relation to potential bridge spans and proposed channelization.

2. Investigate alternative stormwater management and spill containment strategies that will minimize the footprint of the stormwater ponds and ensure adequate management of stormwater quality and quantity.

3. Create detailed Request For Proposal (RFP) Requirements for design of crossing to minimize environmental impacts.

4. Create a separate Request For Proposal (RFP) for environmental mitigation/rehabilitation and on-going maintenance to the area following construction.

5. Include both the Department of Fisheries and Oceans, and Alberta Environment and Parks at the early stages of the design**.**

6. Ensure provision of conditions for migration and spawning during the transitional period of realignment and construction to avoid the impact on the fishery.

7. Compensation for lost wetland should be made locally.

8. Use triple bottom line accounting that includes the impact of environmental and social impact of various designs.

9. Consider a change in provincial policy to encourage use of Noise Attenuation in transportation infrastructure adjacent to significant natural areas such as river crossings.

10. Continue to collaborate with others and draw on local environmental knowledge and experience.

Introduction

On June 17, 2015, a special facilitated meeting was held between Calgary River Valleys (CRV), Weaselhead/Glenmore Park Preservation Society (WGPPS), Alberta Transportation (AT), and invited guests with technical expertise in biology (fish, birds, and mammals), water (water treatment, watershed management, water quality, and river behaviour), and river / land interfaces (parks ecology, land conservation, stewardship, and environmental management).

The location of the Elbow River crossing is not optimal with regard to environmental considerations. However, the crossing location is constrained by the agreement with Tsuut'ina Nation, to avoid bisection of their land, as well as the accommodation of existing Calgary communities and their parks, recreation areas, and road infrastructure. The functional design of the South West Calgary Ring Road (SWCRR) crossing of the Elbow River Valley will result in realignment and channelization of the river, the crossing of wetlands and the alluvial aquifer, long term impact on the riparian habitat in the zone of influence, as well as creating a barrier across a significant wildlife corridor. These impacts will only be magnified with future urban and suburban development that will follow the establishment of this infrastructure. In view of this less than optimal location, the special considerations and standards noted below are warranted.

The assembled group discussed a set of criteria that would improve the design of the proposed crossing of the Elbow River Valley by the SWCRR to ensure it will have fewer long term negative impacts on the environment. Below are the recommendations that came as a result of the discussions at the June meeting, and that we believe should be considered and, insofar as possible, included in the design of the SWCRR crossing of the Elbow River valley.

The recommendations also draw from and are consistent with information included in:

- Our BiodiverCity (2015) - Calgary's Biodiversity Plan
- South Saskatchewan Regional Plan: An Alberta Land-Use Framework Integrated Plan (2014)
- Alberta Wetland Policy (2014) - encourages projects to conserve, restore and protect Alberta's wetlands
- Stepping Back from the Water (2012) - Alberta's management practices guide for new development near water bodies in Alberta's settled region
- Calgary Transportation Plan: Principles and Design Considerations for River Crossings Appendix B (2009) - outlines appropriate strategies for river crossings
- Government of Alberta. Transportation, Best Practice Guideline, Planning Considerations for Wildlife Passage in Urban Environments (2011)
- Elbow River Basin Water Management Plan (2009)

RECOMMENDATION 1.

Model the hydrology and fluvial geomorphology of the meandering Elbow River in relation to potential bridge spans and proposed channelization.

Modelling of this nature can be done within the timeframe required to complete the project and will avoid loss of time and resources, if significant environmental impacts are discovered that would be addressed more cost effectively with design, rather than mitigation measures.

Rationale: The results of the modelling exercise would:

i) define the extent and severity of the zone of influence that the proposed bridge span and river channelization will have, outside the immediate corridor of the Ring Road – both upstream and downstream,

ii) offer a better understanding of the dynamics of change that have occurred in the past, and cumulative impacts that are likely to occur in the future as a result of various bridge lengths, restrictions to the meander belt and channelization strategies,

iii) identify any shortfalls of infrastructure design to withstand annual and catastrophic flood events,

iv) identify what needs to be addressed through mitigation that cannot be achieved by design of the crossing.

The model should address and offer design or mitigation solutions with respect to the following:

- What impact will the crossing and river channelization have on vertical and horizontal scouring of the riverbed, and erosion around the bridge supports, especially during spring flood conditions?

- How will the energy of the river be influenced by the river channelization during annual and extreme flooding under the crossing? Will the change of flow/energy be effectively dissipated without breaching the riverbank downstream or cause other significant impacts?

- What impacts will channelization of the Elbow River have during normal flow on scouring of the riverbed, and how will this impact habitat for fish and other aquatic organisms, and riparian species locally as well as upstream and downstream?

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- Can the open span accommodate enough of a residual meander belt to enable transfer of some vertical scouring to horizontal movement, as the naturally meandering river does now?

- Can the bridge be designed in such a way as to avoid a bridge abutment inside the river channel and meander belt? Any abutments should be hydro-dynamically smooth.

- Identified impacts are to be addressed by mitigative measures set out in ultimate design and addressed in maintenance agreements.

We were pleased to see that that the functional design now includes an extended length of the bridge at the river-level from the original 60m to the current 112m. However, without completing the modelling described above, we will not know if the new length is sufficient to address any issues that the modelling may identify.

RECOMMENDATION 2.
Investigate alternative stormwater management and spill containment strategies that will minimise the footprint of the stormwater ponds and ensure safety and adequate management of stormwater quality and quantity.

Rationale: The Elbow River valley is 1.2 km wide at the SWCRR crossing. The natural water table is at or just below the surface, above a deep alluvial aquifer, resulting in a complex and wide range of natural wetlands and associated rich biodiversity. We recommend avoiding the use of natural wetlands as stormwater ponds in keeping with the Alberta Wetland Policy.

Stormwater management and spill containment management design should consider the following:

i) Can the stormwater treatment ponds be made smaller and still be equally efficient, i.e. through using new technology such as oil-grit separators, Nautilus Pond or other water cleaning strategies?

ii) What volume of storage is required to meet current City of Calgary and Alberta standards? How can the footprint of the storage areas in the river valley be minimized while ensuring appropriate spill containment?

RECOMMENDATION 3.
Create detailed Request for Proposal (RFP) Requirements for design of crossing to minimize environmental impacts.

Rationale: These design standards may be in addition to provincial or federal standards or guidelines but are appropriate to address specific characteristics and challenges of this site. The

Government of Alberta has provided Best Management Practices for designing wildlife crossings in urban settings. It is recognized that these practices are not regulatory but it is expected that these guidelines will be reflected in the RFP. In addition to the direction provided in that document the following specific design elements should be required through the RFP.

The RFP should include:

i) Any design criteria or mitigative measures identified through the modelling process outlined in Recommendation 1 of this document,

ii) Rather than hard bank armouring to stabilise the re-designed riverbank, use soft bio-engineering, such as willows, and plantings which are designed to attract and provide habitat for insects, songbirds, and small mammals specific to this area,

iii) Provision of bat maternity roosting sites (used only 2-3 weeks, May/June) under the bridge to help better accommodate bat species that are classified as a sensitive species in the province of Alberta,

iv) Bridge design to allow more sunlight and precipitation to reach the valley bottom below the bridge so as to better ensure the land and water-based plants survive and thrive.

RECOMMENDATION 4.
Create a separate RFP for environmental mitigation/rehabilitation and on-going maintenance to the area following construction.

Alternatively, the RFP could be written to prioritize and set a separate budget for environmental considerations.

Rationale:

i) If both construction and environmental mitigation are contained within the same RFP, the environmental mitigation and rehabilitation portion may be sacrificed to cut costs if the construction costs escalate.

ii) If environmental considerations are compromised to cut short term costs, the long term impacts and costs will escalate.

iii) The Elbow River valley is a significant wildlife corridor. The current proposal would reduce the corridor to less than 10% of the current width on the valley floor, as well as eliminating the natural functionality of the escarpment and uplands as part of the Elbow River wildlife

corridor. Optimization of the dramatically reduced, remaining corridor is critical to continued health of the wildlife species that inhabit the Elbow River valley.

RECOMMENDATION 5.
Include both the Department of Fisheries and Oceans, and Alberta Environment and Parks at the early stages of the design.

Rationale:

i) *The realignment of the Elbow River and elimination of wetlands and riparian areas is a matter for consideration under the Canada Fisheries Act, the Alberta Water Act, the Alberta Land Stewardship Act, and the Alberta Wetland Policy.*

ii) *Fisheries in this stretch of the Elbow River are used extensively for recreational purposes. Habitat for recreational fisheries is protected and must be maintained at suitable levels to sustain the health of the fisheries.*

iii) *According to the Fisheries Act, adequate mitigation should be provided. The presence of a bridge, loss of over-hanging habitat in the channelized portion and loss of riparian vegetation will have an impact on fish habitat complexity. To compensate for this, both on-site and off-site mitigation would be necessary.*

iv) *Diversions of water courses require approval under the Water Act, at the discretion of the Director.*

v) *The realignment of the river and construction of the road infrastructure will remove extensive areas of wetlands. Replacement and mitigation where possible, and compensation where the wetlands will simply be covered by the road infrastructure is essential to the long-term cumulative health of the Elbow River valley.*

vi) *Regional plans contain polices regarding wetlands and open water bodies that municipalities and Directors under provincial laws are expected to consider when deciding land use.*

vii) *In addition, the provincial and federal governments have put in place a recovery plan for the Westslope Cutthroat Trout that has a historical presence in this reach of the Elbow River. In anticipation of this recovery effort, extra effort is warranted at this site.*

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RECOMMENDATION 6.
Ensure provision of conditions for migration and spawning during the transitional period of realignment and construction to avoid the impact on the fishery.

Rationale: There are impacts during the actual construction period and there is a time lag until the ecological functions of the reconstructed habitat reach their full potential. As a result, provision of conditions for migration and spawning will be critical to avoid impact on fisheries until the river channel has stabilized.

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RECOMMENDATION 7.

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Compensation for lost wetland should be made locally.

Rationale: While provincial policy allows such compensation to be made anywhere across the province, there is ample opportunity to make compensatory contributions to wetland and riparian function locally.

The Elbow River Watershed Partnership (ERWP) should be consulted for alternative mitigation project suggestions. Some projects that are currently under consideration include opportunities to purchase lands that contain wetlands or drained wetlands in the upper Elbow River valley, construction and maintenance of interpretive trails on perpetually preserved land, construction of a facility that can be used for public education, cattle fencing and out-of-stream water access to protect headwater streams on grazing land, and an upland/wetland pilot project. These and other projects have been identified in collaboration with various stewardship organizations including Weaselhead/Glenmore Park Preservation Society, Calgary River Valleys, Bow River Basin Council, Cows and Fish, Greater Bragg Creek Trail Association, Western Sky Land Trust and others.

RECOMMENDATION 8.
Use triple bottom line accounting that includes environmental and social impacts of various designs.

Rationale: Inclusion of environmental and social issues in cost/benefit analysis of various design options for infrastructure projects can reduce long-term costs of projects. Steps to minimize the environmental and social impacts in the river valley and associated uplands will pay long-term benefits to the citizens of Calgary and Alberta.

RECOMMENDATION 9.

Consider a change in provincial policy to encourage use of Noise Attenuation in transportation infrastructure adjacent to significant natural areas such as river crossings.

Rationale: Traffic noise is well known to impact mating and nesting birds driving them out of the area. Southern Alberta's riparian areas are a fundamental source of biodiversity. A quiet park setting also improves the mental and physical health benefits of park users.

Some options to be investigated include:

i) Sound deflector walls similar to the north west ring road bridge across the Bow River that protects Bowness Park,

ii) Plantings on the top of the berm section of the crossing.

RECOMMENDATION 10.
Continue to collaborate with others and draw on local environmental knowledge and experience.

Rationale: There is considerable local expertise and knowledge in this area that can provide insight into the likely success of various designs. Specifically, Calgary Parks and the Weaselhead/Glenmore Park Preservation Society have extensive expertise and local knowledge about habitat and wildlife in the Elbow River valley. They can help with decisions for:

i) Location of wildlife fences to guide wildlife to the crossing under the bridge from the west end of Weaselhead Natural Environment Park.

ii) Determining a plant list to maintain biodiversity while avoiding introduction of invasive species.

iii) Determining appropriate mitigation or compensation measures within the Elbow River Valley to compensate for the unavoidable deleterious impacts on the valley floor, escarpment and uplands on the existing wildlife, wetland complex and escarpment habitats.

Conclusion:

The Calgary River Valleys, Weaselhead/Glenmore Park Preservation Society, and our partners suggest that Alberta Transportation develop a Request for Proposal that includes a Management Plan, compensation package and on-going monitoring for this area that incorporates the recommendations in this Report. We are willing and able to work collaboratively with Alberta Transportation and their contractors to ensure that the ecological integrity and the existing Natural Capital of the Elbow River Valley is preserved as much as possible, considering the pre-defined location of this crossing.