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Kevin Volk, Chair  
KHCP4 Transition Project Board

**Re: Updated Cost Estimate for Kicking Horse Canyon Phase 4 Improvement Project.**

## BACKGROUND

Kicking Horse Canyon is a 26-kilometre-long segment of Highway 1 from the junction of Highway 95 in Golden to the western boundary of Yoho National Park. Construction has been completed on 21 of the 26-kilometre corridor through Phases 1 to 3. Phase 4 is the final phase of the overall project (Figure 1).

The existing Phase 4 segment is a winding two-lane undivided highway. There are 13 sub-standard curves, poor vertical geometry, a narrow highway cross-section and minimal shoulders. It also contains natural hazards including seven rock fall/landslide/debris torrent hazard sites as well as 13 avalanche paths.

Summer traffic volumes exceed 10,000 vehicles per day. The combination of challenging road geometry, high traffic volumes, and no passing lanes results in operating speeds of 55 – 65 km/h. Traffic becomes congested behind slower commercial trucks and recreational vehicles. As a result, the collision rate is more than three times the provincial average for a highway of this type.



FIGURE 1 – KICKING HORSE CANYON PROJECT PHASES 1-4

## 2016 BUSINESS CASE

In 2016, a project proposal was developed for federal and provincial funding consideration that included:

- The realignment and upgrading of four kilometres of existing two-lane undivided highway to a four-lane divided highway at a 100 km/h standard with concrete median barrier;
- An additional 0.8 kilometre upgraded from an existing three lane undivided highway to four lanes of divided highway at a 100 km/h standard with concrete median barrier;
- Mitigation of the significant avalanche and geotechnical hazards using a combination of high energy rock fall attenuation mesh, wide rock catchment ditches and other measures;
- Safer access for local roadway connections to the Dart Creek Forest Service Road and two CP Railway access points;
- Provision of wildlife fencing; and
- Provision of 2.5-metre-wide paved outside shoulders to allow for accommodation of cyclists.

Total project costs, including property, design, engineering, procurement and construction were estimated in 2016 to be \$450.0 million. The cost estimate was done using the parametric estimating method. The parametric method applies historical cost data from previous projects to the labour, material and equipment requirements for the current project. This method is used at the early stages of a project when a reference concept is being developed, but when a final design and detailed engineering have not yet been completed.

The 2016 business case recommended the following:

- The Kicking Horse Canyon Phase 4 Project be approved on the basis of improved mobility, reliability, safety, highway corridor design consistency and consistency with federal objectives.
- The Trans-Canada Highway within the Kicking Horse Canyon Phase 4 Project area be upgraded to a 4-lane 100 km/h highway with concrete median barrier.
- Total Funding of \$450.0 million for this project be approved with a Federal contribution to this funding of \$215.2 million over seven years.
- That the project be delivered using a Design-Build or Design-Build-Finance model.

## 2017 BUDGET ALLOCATION

Based on the business case, the federal government agreed to contribute \$215.2 million through the New Building Canada Fund. The province approved \$234.8 million to fund the balance of the project's \$450.0 million budget.

The Province included the Kicking Horse Canyon Phase 4 project in the 2017/18 Budget and Fiscal Plan with an anticipated completion date of 2024. As a capital expenditure greater than \$50 million, the project name, budget, funding sources and completion date are listed annually in the Budget and Fiscal Plan.

## UPDATES SINCE THE 2016 BUSINESS CASE

Starting in 2018, the reference concept was updated in preparation for procurement. The first step was to update the engineering and costs for the reference concept used in the 2016 business case. This included risk assessment revisions and due diligence review utilizing third parties. The ministry established a final cost estimate of \$601.0 million, an increase of \$151.0 million over the 2016 budget. The \$151.0 million increase includes two components - a \$128.0 million incremental increase in the estimated cost of the project and \$23.0 million in interest during construction (IDC). IDC was previously provided for on a portfolio basis within British Columbia Transportation Financing Authority, rather than on a project specific basis.

Key reasons for the change in the estimated project cost compared to the 2016 business case include:

### Design – Build Estimate

- Changes to the reference concept resulting from new technical analysis and review of previous engineering assumptions including adjustments to foundation depth and structure lengths, snow avalanche and rock fall provisions, traffic management and constructability, and updated material pricing.
- In July 2018, the Canadian government put in place tariffs on imported US steel. For Ministry of Transportation and Infrastructure projects, most steel components such as girders, rebar and other high-strength steel products have traditionally been sourced from the United States, with steel pipe piles sourced from Asia. It is expected that the Design-Build contractor will attempt to seek the lowest overall cost steel (including transportation costs) that meets the required specifications. While there has been a recent announcement of the lifting of steel tariffs on U.S. steel, the details and risk of future tariffs are still being assessed.
- An updated 2018 protocol agreement with BC Hydro, resulting in amended costs to the project for utility relocations.
- The CP east-west mainline railway lays within the Kicking Horse Canyon directly below the construction on the KHCP4 alignment. Recent engagement with CP, combined with experience from the Evergreen Line project, has resulted in an amended budget for railway operations.
- The Design-Build contract costs assume a construction start in summer 2020, using an accelerated construction schedule from four years to 3 years, with construction completing in winter 2023/24.

### Project Team Costs

- Updates to ministry project management costs, including:
  - Additional technical resources to address key cost drivers (constructability, rockfall and avalanche control);
  - Additional expertise in quantity surveys, etc. to verify cost estimates;
  - Additional archaeological work (field investigations);
  - Updated stipends paid to the unsuccessful design-build bidders, property acquisition costs and expensed past costs; and
  - Expensed past planning costs.

### Indigenous Accommodation

- The Secwepemc Parties (Shuswap Indian Band, Little Shuswap Indian Band, Adams Lake Indian Band, Neskonlith Indian Band and Splatshin ) and the Ktunaxa Nation Council (?skisqnuq FN, Tobacco Plains, ?Aqam, and Lower Kootenay) have asserted aboriginal interests in the area. There are nine registered archaeological sites, and Indigenous groups have stated that construction of the four-lane corridor has the potential to impact multiple Aboriginal Interests. The updated budget for Indigenous consultation and accommodation is based on a 2018 assessment by the Ministry of Transportation and Infrastructure. It includes both the impacts associated with the construction of a four-lane corridor, the identified Indigenous interests in, and strength of claim to, the project area, and alignment with the province's 10 principles for its relationship with Indigenous peoples.

### Community Benefits Agreement

- The Community Benefits Agreement (CBA) was announced by the Province in July 2018 and was therefore not contemplated within the original 2016 approved budget. The Ministry and Transportation Investment Corporation (TI Corp) have worked with British Columbia Infrastructure Benefits (BCIB) to estimate the incremental costs associated with a CBA project.

### Contingency

- Following a review of project risks, including independent review by third parties, and the contingency levels on similar projects, the contingency level was adjusted.

### Interest During Construction

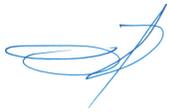
- IDC is calculated based on the cost of borrowing during construction. The 2016 approved budget did not include IDC as this cost was reflected on a portfolio basis within the BC Transportation Finance Authority (BCTFA), rather than allocated specifically to the project. Major projects now have the IDC reflected as a project cost. Based on the incremental costs outlined above, offset by a shorter construction season, IDCs have been calculated. The IDC has been reallocated to the specific project and reduced from the unallocated portfolio account held within the BCTFA where it was previously reported.

#### UPDATED PROJECT BUDGET AND SCHEDULE

Based on the updated cost estimates, the project budget is increased from \$450.0 million to \$601.0 million. The project will be delivered using a Design-Build model.

The project schedule includes:

- Summer 2019: Release Request for Qualifications to potential bidders;
- Fall/Winter 2019: Release of Request for Proposals to a shortlist of qualified bidders;
- Summer 2020: Award contract to successful bidder; and
- Winter 2023/24: Substantial Completion.



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Kicking Horse Canyon Project – Phase 4