

Date: 2022-07-27

Re: Work Assignment Letter - Hwy 95, Kicking Horse River Bridge Replacement Business Case Update

Procurement:

Assignment under: As & When Contract 254CS1805

Cost to be determined by proposed work plan approved by MOTI

Reasons for Update:

Update Business Case to:

1. Align with 100% functional design **FORWARD**
 - a. Revised scope, schedule, budget and risk register
 - i. Scope changes:
 1. Change to the type of structure allows it cross at a lower elevation (still meets Q200 elevation requirements)
 - a. Shortens approach works (tighter project limits: Segment 2161, km 103.25 to km 103.75 = 0.5 km length)
 - b. Changes to access management scope on approaches
 2. Schedule changes
 - a. Will discuss with Project Manager
 3. Budget changes:
 - a. New cost estimate pending (Project Manager)
 4. Risk Register:
 - a. New Risk Register pending (Project Manager)
2. Reflect any updates to Existing and Future Conditions with Problem Statement update if applicable
3. Updated Business Case to support advancement of project funding through Capital Program Board and Treasury Board

Key Elements of Proposed Assignment:

- 1) Existing/Future Conditions/Problem Statement
 - a. Safety Update
 - i. To reflect new project limits
 - ii. To reflect 2011 to 2020 collision data
 - b. Mobility Update
 - i. To reflect new project limits
 - ii. To reflect new Highway 95 traffic data (August 2022 pending)
 1. Will need to use MOTI factoring tables to convert daily volumes into AADT equivalent
 2. Reassess Level of Service as required if Highway 95 traffic volume changes warrant, or impact recent previous analysis
 - a. We will not have any new side road data

- iii. Reassess parameters for construction delay and reassess if required (I think likely no changes, but we should account for a meeting with Project Manager to discuss)
 - c. Bridge Condition Update:
 - i. Update with input from Bridge Engineer (likely Teams Meeting to review)
 - d. Reliability History Update
 - i. Update with input from District Area Manager (likely Teams Meeting to review)
- 2) Cost Updates:
 - a. Replacement Option Total Project Cost
 - i. Update with input from Project Manager (likely Teams Meeting to review)
 - b. Base Case Rehab Cost Estimate
 - i. Update with input from Bridge Engineering (likely Teams Meeting with Bridge Engineer, Project Manager and Planning
 - 1. MOTI has an existing Rehab cost template that we can utilize to update (joint effort)
 - c. Maintenance Costs:
 - i. Possibly update to reflect inflation (we can discuss approach and if needed)
- 3) Social Community Account:
 - a. Update as required to reflect scope changes and new project limits
- 4) Environmental Account:
 - a. Update to reflect Environmental Assessments completed to date as part of Functional Design (likely Teams Meeting with Environmental lead)
- 5) Economic Account:
 - a. No changes to the damage loss section.
 - b. Requires Input Output Model (suggest Mark Lynch undertake – we can discuss)
- 6) Update MAE Table and Related Discussion
 - a. Includes updating sensitivity analysis
- 7) Risk Analysis
 - a. Update based upon new Risk Register (pending)
 - i. Suggest Teams Meeting with Project Manager to review key risk items
- 8) Alignment with Objectives
 - a. Update to reflect Federal DMAF funding submission in October 2021
 - b. If we get a response on our DMAF funding application we will need to integrate into Business Case
- 9) Schedule Updates
 - a. Will get new project schedule from Project Manager
- 10) Cost Estimate & cash Flow
 - a. Will get cost estimate and cash flow from Project Manager
- 11) Conclusion
 - a. Update based upon findings
- 12) Appendices
 - a. Update to reflect new information and analysis as needed
- 13) Other Considerations:
 - a. New section of GBA+

- i. Review GBA+ Register from Project Manager and summarize any key findings or integrations with project scope
- b. New Resiliency Section:
 - i. Likely repackaging (or new heading) to discuss ice jams, debris flows, and other risks related to bridge elevation, climate change est.

Assignment Cost Estimate:

There could be variable levels of effort associated with each key task. I am fine with ranges of effort and/or expected effort with a contingency allocation.

Over and above any contingencies required for the above tasks, please add a \$5,000 contingency item to your estimated cost/level of effort to account for any changes that might be required to align business case draft with pending Treasury Board Submission.

Other Items:

Any other critical items not mentioned above should be added to your work plan cost estimate if you feel there are gaps in this request.

Schedule:

We estimate the following parameters

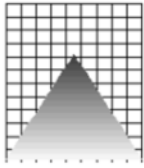
- Initiate assignment by mid-August 2022
- Draft update by end of September 2022
- Final Draft by end of October 2022

Please submit a work plan/cost estimate for our consideration.

Thanks

Tom Freeman

Cell: 250-371-7932



Client: Ministry of Transportation & Infrastructure - British Columbia

Tom Freeman,
Manager, Project & Program Development
Project Delivery and Planning Services, Kamloops
Tom.Freeman@gov.bc.ca
778 362-4535 / 250 371-7932

Contract: Contract No. 254CS1805 - As and When Advanced Business Case Support 2022/23

Project: Highway 95, Kicking Horse River Bridge Replacement Business Case Update

Subject: Work Plan and Fee Estimate

We are pleased to submit to you our work plan and fee estimate for the above-mentioned project. The work plan includes our technical scope of work, methodology and schedule based on the work assignment letter received on July 27, 2022.

SECTION 1: SCOPE OF WORK

Apex Engineering Ltd has completed the draft Business Case documentation for Highway 95 Golden Kicking Horse River Bridge #1 and #2 in the report issued April 9, 2021. The purpose of this assignment is to update this report to align with the 100% functional design and reflect the latest project updates on the Business Case.

Task 1. Work Plan & Background Data Review

We reviewed the previous report and understood the extent of the analysis. Due to the changes in the project scope limits to be at LKI Segment 2160 KM 103.25 (9 St. S) to KM 103.75 (5 St. N), almost all the calculations will be updated to follow this segment. We will use the same models developed for the project by updating the limits and relevant analysis as per MoTI Business Case Guidelines (November 2015)

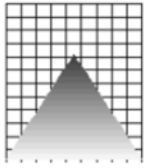
Task 2. Road Safety Performance Update

We will request from the MoTI the latest available collision data (from 2011 to 2022), but we will use the 10-year data from 2011 to 2020, inclusive. The data requested will include Segment 2126 103.15 to KM 103.85, which includes an additional 100 meters at each end for review, but only collisions within the study segment will be used within the analysis. We will estimate the collision reduction of the new alignment based on the comparison of the base case and the proposed case using the MoTI SafetyBenCost model.

Task 3. Mobility Assessment Update

We understand that new traffic counts for Highway 95 are being prepared and will be provided to Apex in August 2022. We will use the updated daily volume to convert it to an AADT equivalent using the nearest permanent count station pattern by estimating the day of the week to MADT and from MADT to AADT. The factors will be discussed with the MoTI before finalizing the demand for the Business Case.

The Level of Service and delay for intersections within the scope limits will be developed to inform the travel time cost for the MAE and traffic re-routing. The new design does not include the intersection at 9th Avenue N as the previous design. However, the movement restriction still applies at the intersection of Park Drive/8th St. S. Therefore; the local traffic impact is to be revised as per the latest design. The construction delay will be reviewed and updated based on the meeting with the Project Manager.



Task 4. Financial Account Update

The financial account update includes reviewing the base case and proposed design cost estimates and reflecting them into the MAE. The rehabilitation cost will be based on an existing MoTI template (to be provided to Apex). The maintenance cost approach will be reviewed and updated to reflect the inflation.

Task 5. Social Community Account Update

As the new design keeps the same alignment of Highway 95, the expected benefits of opening up the area to the farmers' market may not be applicable. However, community acceptance may not be impacted. Other factors such as noise, community, and barrier effects will be updated.

Task 6. Environmental Account Update

We will meet with the environmental lead to understand the updated assessment and reflect that into the MAE.

Task 7. Economic Account Update

The economic account is to be updated. We have worked with the input-output model before. If the model is available with MoTI, Apex can utilize the model and update the economic account in coordination with Tom Freeman. If needed, we can ask Lynch and Associates to update.

Task 8. Multiple Account Evaluation (MAE) Update

All the Business Case updates will be reflected in the MAE for the base case and the proposed design, including the sensitivity analysis. Updates will be reflected in the executive summary and the conclusion.

Task 9. Risk Analysis Update

The risk analysis will be updated based on the latest risk register. We will meet with the Project Manager to discuss the key risk items. Additional meetings may be needed with discipline leads for some risk items if needed.

Task 10. Alignment with the Provincial and Federal Objectives

We will update the report to reflect how the updated proposed design aligns with the Provincial and Federal objectives and the Federal Disaster Mitigation and Adaptation Fund (DMAF) funding application submission in October 2021. The response of the application – if received- will be reflected in the draft Business Case.

Task 11. Implementation Plan Update

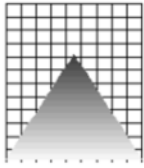
We received the updated schedule for the project. The implementation plan in the Business Case will be updated to follow this schedule and any further timeline updates agreed with MoTI.

Task 12. GBA+

GBA+ assessment will be developed for the Business Case. Eng. Haytham has completed the Federal Government training of the GBA+. We will use the GBA+ research checklist available on the Federal Government website to develop the analysis for inclusion in the Business Case.

Task 13. Resiliency, Reliability and Climate Change

The previous report has already included parts about the reliability and resiliency of Highway 95 Kicking Horse bridges. These parts will be merged and moved to a new separate section in the Business Case. This will



include discussions about ice jams, debris flows, risks to the bridge elevation, climate change, highway incidents, etc.

Task 14. Project and Quality Management

We follow our project management and quality management processes and procedures. The work will be conducted in close coordination with the MoTI team. Project work hours are to be reflected in Polaris, our project management web platform. This includes timesheets, resources, and billing information. Project progress reports will be submitted to MoTI monthly, including the technical and financial progress of the assignment. Quality reviews are budgeted for key tasks by Peter Lyall.

Task 15. Contingency

A contingency budget for each task is added based on the expected level of risk for each task. We also added a \$5000 dollars contingency for the whole assignment to account for any changes that might be required to align the Business Case draft with the pending Treasury Board Submission.

SECTION 2: TIME SCHEDULE

The assignment timeline is shown in Table 1.

Table 1: Assignment timeline

Stage	Timeline
Draft Work Plan	August 7, 2022
Background Data Review, Gather Info, etc.	Mid-August 2022
Draft Business Case	Week of September 19, 2022
MoTI Feedback	Week of October 3, 2022
Final Draft Business Case	Week of October 16, 2022

SECTION 3: FEE SCHEDULE

The fee schedule for this contract is shown in Table 2 (next page), exclusive of GST. Invoicing will be monthly for this Business Case Update.

If this proposal is acceptable to the Client, please sign below or provide your email approval.

Client Name: **Ministry of Transportation and Infrastructure**

Representative:

Date:

Consultant: **Apex Engineering Limited (Subsidiary of Seero Engineering Consulting Ltd.)**

Director: Haytham Sadeq, MASc, PMP, P.Eng,
Senior Transportation Planning and Road Safety Engineer

Date: August 7, 2022

Haytham Sadeq

Table 2: Level of Effort Estimate

Role		SEERO					Other			Overall	
		Project Manager, Senior Transportation Planning Engineer	Specialist / Expert	Junior Transportation Engineer	Total Hours	Total Seero HR Budget	Contingency		Sub- Consultant 1	Total Other	Total
Team		Haytham Sadeq, MASc, PMP, P.Eng.	Peter Lyall	EIT			Hours	Budget	Lynch and Associates		
Charge Hourly Rate (\$CAD)		s.17									
No.	Task Description	Estimated Hours for each task									
Task 1	Work Plan & Background Data Review	s.17			12	s.17					
Task 2	Road Safety Performance Update				14						
Task 3	Mobility Assessment Update				30						
Task 4	Financial Account Update				16						
Task 5	Social Community Account Update				4						
Task 6	Environmental Account Update				4						
Task 7	Economic Account Update				4						
Task 8	MAE Update				20						
Task 9	Risk Analysis Update				8						
Task 10	Alignment with Provincial/Federal Plans				8						
Task 11	Implementation Plan Update				2						
Task 12	GBA+				16						
Task 13	Resiliency, Reliability & Climate Change				28						
Task 14	Project & Quality Management				14						
Task 15	Contingency				0						
	Total Hours	126	10	44	180						
	Grand Total Budget	s.17									

February 17, 2023

File: CD1961.0000.00

Ministry of Transportation and Infrastructure
Southern Interior Region
342-447 Columbia Street
Kamloops, BC V2C 2T3

Attention: Tom Freeman

RE: CLIMATE LENS ASSESSMENT FOR KICKING HORSE RIVER BRIDGES

INTRODUCTION

Thank you for the opportunity to provide this scope of work to advance the required Climate Lens Assessment – greenhouse gas (GHG) mitigation for the Kicking Horse River Bridges. We appreciate the opportunity to continually support the Ministry on this project's development.

BACKGROUND

A requirement of the DMAF funding includes the completion of a Climate Lens assessment, which includes the greenhouse gas (GHG) mitigation assessment.

As requested, Urban Systems has developed the proposed scope of work to prepare the GHG mitigation assessment required to meet the Climate Lens Assessment requirements. The scope is based on the general methodology outlined in the Infrastructure Canada – Climate Lens – General Guidance webpage, [Section 2. Greenhouse Gas Mitigation Assessment](#). Furthermore, the assessment will follow the general methodology outlined by [ISO 14064 Part Two: Specification with Guidance at the Project Level for Quantification, Monitoring and Reporting of Greenhouse Gas Emission Reductions or Removal Enhancements](#). The assessment will culminate with a written report, which can be submitted to Infrastructure Canada and other applicable agencies in support of the Ministry's DMAF application for the Kicking Horse River Bridges project.

SCOPE OF CLIMATE LENS GHG ASSESSMENT

The key tasks to be completed as part of the GHG assessment include the following:

- Project initiation
- Gather relevant data & information
- Establish assessment boundary and forecast window
- Identify GHG emissions sources, sinks & reservoirs
- Quantify current baseline or business-as-usual (BAU) GHG emissions trajectory. The BAU emissions trajectory will form the baseline scenario representative of the most probable emissions in the absence of the proposed project.
- Quantify the project's GHG emissions trajectory and compare to the baseline

- Identify potential GHG mitigation opportunities (if applicable)
- Quantify potential GHG mitigation opportunities (if applicable)
- Prepare GHG assessment report, which would follow the general format below:
 - Executive Summary
 - Introduction / Project Overview
 - Methodology
 - Boundary of the assessment
 - Greenhouse gases considered
 - Emission scopes
 - Data collection and calculation procedures
 - Exclusions from the assessment
 - Assumptions
 - Baseline Scenario
 - Construction
 - Operations & Maintenance
 - Estimated Project Emissions
 - Construction
 - Operations & Maintenance
 - Estimated Net Increase or Reduction in Emissions
 - Other Potential Mitigation Measures
 - Options for avoidance of impacts
 - Options for mitigation of impacts
 - Estimated Cost-Per-Tonne
 - Conclusion
 - Bibliography / References

DELIVERABLE:

We will prepare a draft GHG Climate Lens report for review and comment by the Ministry. Upon incorporation of the provided comments, we will issue a final GHG Assessment Report for the Ministry's submission submitted to Infrastructure Canada and other applicable agencies in support of the Ministry's DMAF application for the Kicking Horse River Bridges.

BUDGET AND SCHEDULE:

To complete this project scope, we estimate a budget of ^{s.17} plus a contingency of ^{s.17}. We will complete the above scope of work within 4 weeks of project approval, or if required for funding purposes within a more expedient time period.

CONCLUSION

Thank you for the opportunity to complete this assignment. Should you have any questions, please contact the undersigned.

Sincerely,

URBAN SYSTEMS LTD.

Natasha Elliott
Transportation Engineer

John Kenney
Community (Energy) Advisor

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Enclosure

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