George Massey Crossing Project

Procurement Options Report

April 2021

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

The George Massey Tunnel spans the south arm of the Fraser River between Richmond and Delta on the Highway 99 corridor. It was was completed in 1959. At this time, it was considered state of the art technology, one of the first pre-fabricated immersed tube tunnels in the world and the first in North America.

The existing tunnel is now more than 60 years old and does not meet service needs, modern highway design or seismic standards. The procurement process to construct a replacement ten-lane bridge crossing was cancelled in 2017. In 2018, the Province commissioned an independent technical review of the cancelled project, which concluded that other less costly options for replacement would be better aligned to regional planning priorities.

Technical studies and a consultation program were subsequently conducted to explore alternatives. Two technologies were identified for further analysis: a long-span bridge or an immersed tube tunnel. A strategic options analysis for the George Massey crossing, carried out in accordance with provincial capital planning guidelines, recommended the construction of a new eight-lane immersed tube tunnel (ITT) and removal of the existing tunnel, in combination with works including various corridor improvements for transit and cycling, and interchange upgrades at Steveston Highway.

The George Massey Crossing Project (the Project) is comprised of two key components:

- Replacement of the existing George Massey Tunnel with a new eight-lane immersed tube tunnel (ITT), and removal of the existing infrastructure (the Crossing); and
- A series of improvements to the Highway 99 corridor between Bridgeport Road and Highway 10 to address existing challenges and enhance conditions (Corridor Improvements). The Corridor Improvements include improvements to the Steveston Interchange and various transit and cycling improvements.

1.2 PURPOSE

This report identifies a range of procurement models that could be adopted to deliver the Crossing, and then narrows the options to a shortlist deemed most appropriate for a more detailed analysis. A procurement analysis for the Corridor Improvements was carried out separately from this procurement analysis.

The detailed procurement analysis, which includes risk analysis and quantification, market sounding, multiple criteria analysis (MCA) and financial modeling, are presented in the business case and form the basis for recommending a preferred procurement model for the Crossing.

1.3 STUDY APPROACH

The capital planning guidelines set out in the Capital Asset Management Framework (CAMF), Ministry of Finance Core Policies and Procedures, and Infrastructure BC (formerly Partnerships BC) processes support the development of a procurement strategy to successfully deliver the Project, including the Crossing.

In recommending the most appropriate procurement options for further detailed analysis in the business case, the following activities were carried out:

- Scope elements – Major components of the Crossing scope were described.
- Risks and assumptions – Key risks, timing, coordination, and other procurement considerations were identified.
- Procurement options – A series of workshops were held and analysis conducted to identify procurement models which align with the goals and procurement objectives of the Crossing. Six procurement models were identified and assessed.
- Procurement objectives and requirements – Procurement objectives and related criteria for the assessment of the procurement options were established.
- Assessment of options – Criteria for comparing the procurement options to one another in terms of how each aligns with the procurement objectives were applied through a qualitative multi-criteria analysis (MCA).

All of these activities involved engagement with key specialists and senior Project personnel. Details of these activities and results are described in this report.

2 DESCRIPTION AND SCOPE ELEMENTS

2.1 CROSSING

The key scope elements that comprise the Crossing are summarized below.

- **New eight-lane immersed tube tunnel** – To replace the existing tunnel.
- **Construction of a multi-pier bridge** – Provision of newly constructed traffic lanes between Deas Island and Delta.
- **Casting Basin acquisition and preparation** – Provision of immersed tube tunnels is planned to be completed offsite from the crossing, but nearby at a built-for-purpose dry dock facility.
- **Highway 99 corridor tie-ins and road improvements** – Sections of Highway 99, from Steveston Highway interchange to Westminster Highway and south of the Deas Island new bridge to the Highway 17A interchange.
- **Tunnel decommissioning** – The tunnel will be decommissioned and removed once the Crossing is completed.
- **Property acquisitions** –property requirements are anticipated to accommodate the new infrastructure.
- **BC Hydro transmission line relocation** – BC Hydro currently maintains a 230kV transmission line through the existing tunnel that will need to be relocated.

The main physical elements of the Crossing scope are illustrated in Figure 1 below.

Figure 1- Crossing Scope

The budget for the Crossing is estimated to be approximately $4 billion.

2.2 PACKAGING OF SCOPE ELEMENTS FOR PROCUREMENT

Given the breadth of scope elements discussed above, the Project could be separated or combined so as to be delivered by one or more contractors under one or more contracting structures. Determining an optimal combination (or package) of scope elements involves consideration of:

- design innovation synergies;
- interdependencies of construction works;
- scheduling complexity;
- attractiveness of the opportunity for bidders; and
- efficiency of mobilization, including knowledge of site conditions.

In consideration of these factors for the Crossing, it was determined to be most beneficial for the Province to include all major scope elements in a single contract package. The main scope elements of the ITT contract would include construction of a casting basin and fabrication the tunnel elements, construction of the ITT, roadworks, and removal of the Existing Tunnel. Relocation of the transmission line in the Existing Tunnel would be delivered by BC Hydro to meet the schedule for removal of the Existing Tunnel.

There are synergies and interdependencies in the relationship between innovation potential in the casting basin approach and the ITT construction program, scheduling complexity of the instream works to manage environmental and navigational constraints, as well as the interdependence of construction works for the new ITT and removal of the Existing Tunnel. Regarding the removal of the Existing Tunnel, this scope element would be less attractive to bidders as a stand-alone project, largely due to the risk profile and the competitive advantage of the onsite contractor for the new ITT, such as mobilization costs. It is anticipated that the work will be more competitively bid as part of the larger scope. In addition, the contractor for the new ITT will have developed specialized site-specific expertise in the type of work required for removal of the existing tunnel.

2.3 CORRIDOR IMPROVEMENTS

The Corridor Improvements are planned to be delivered as advanced works, prior to commencement of the Crossing. These scope elements can be constructed early under the current Environmental Assessment Certificate (EAC) with minor amendments, while the Crossing and associated scope, which requires a new environmental assessment, is under review. As a result, procurement of the Corridor Improvements is not addressed in the analysis in the remainder of this report.[1]

[1] A description of the procurement analysis for the Corridor Improvements can be found in the George Massey Crossing Project Business Case.

3 PROJECT AND PROCUREMENT OBJECTIVES

The assessment of procurement models requires an understanding of key project features to guide the shortlisting of models and the development of appropriate procurement objectives and evaluation criteria. These features are described in the following sections and include the Project goals and objectives established in earlier studies, and the key considerations and risks relevant to procurement.

3.1 PROJECT GOALS & OBJECTIVES

The goals and objectives for the Project, including the Crossing, were developed from previous studies and incorporate stakeholder and public input to ensure that underlying needs and issues were addressed. These goals and objectives, used to guide the project and procurement selection, are summarized in Table 1.

Table 1 – Project Goals and Objectives

Project Goal	Project Objective
1 - Support sustainability of Fraser River communities	○ Improve safety for all modes of travel; ○ Improve access to designated development centres; ○ Manage congestion on the corridor; ○ Respect the cultural values of communities; ○ Enhance connections between communities; ○ Maintain agricultural productivity; ○ Avoid impacts to agricultural land; ○ Move forward quickly; and ○ Adopt a shared decision-making approach with the Task Force and participating First Nations.
2 - Facilitate increased share of sustainable modes of transport	○ Enhance transit service convenience and facilitate future expansion ○ Provide safe, convenient and comfortable options for pedestrians and cyclists ○ Encourage higher occupancy modes of travel ○ Ensure potential for future rail rapid transit*
3 - Enhance regional goods movement and commerce	○ Improve travel reliability for business and regional goods movements ○ Support the B.C. tourism industry ○ Protect the Fraser River for fishing and transportation ○ Support industrial land productivity ○ Reduce congestion-related delays for priority goods and services trips

Project Goal	Project Objective
4 - Support a healthy environment	○ Avoid loss of habitat for fish, wildlife, birds and marine mammals ○ Improve habitat quality and protect water quality ○ Enhance land- and marine-based recreation ○ Reduce greenhouse gas emissions and other air contaminants

**Further analysis completed with the South Coast British Columbia Transportation Authority (TransLink) concluded that future demand for rail rapid transit is not sufficient to justify the investment required. Rail rapid transit accommodation was subsequently not considered as a project objective.*

3.2 PROCUREMENT OBJECTIVES

The procurement approach should support the effective implementation of the Crossing. The procurement objectives identified by the Project team were developed based on precedent transportation projects in B.C., the Project goals and objectives, and the specific needs of the Project. The procurement objectives for the Crossing are described below:

1. **Timely project delivery:** The shortest overall timeline (planning through to service commencement) for delivery of the Crossing.

2. **Cost-effective implementation (design and construction) & attainable within fiscal constraints:** Provides a cost-effective method to deliver the Crossing and supports achieving the approved budget.

3. **Allocate key risks to the party best able to manage and mitigate them:** Ensure key risks are allocated in the most cost-effective way to the party that is best suited to manage them.

4. **Attractive, marketable transaction:** Ensure a transaction that is fair, transparent, and attracts broad interest from qualified firms with a keen interest to participate and the capability to deliver a project of this size and complexity.

5. **Contributes positively to the environmental and permitting process:** A number of requirements will be determined by the EAC and permitting conditions, which are not yet defined, the procurement should address the need for flexibility to indeterminate requirements.

6. **Ensure strong competition providing innovation and efficient approaches:** The procurement model should consider an approach that optimizes competitive tension, providing innovation, and best value.

4 PROCUREMENT MODEL OPTIONS

4.1 CONSIDERATIONS IN THE SELECTION OF OPTIONS

4.1.1 Schedule

In identifying which procurement models align with the Project goals and procurement objectives for the Crossing, a key consideration was the speed with which the Crossing could be constructed and put in service. A full environmental assessment will be required for the new tunnel crossing. It is anticipated that an environmental assessment certificate (EAC) for the Crossing would not be issued until approximately three and a half years after the Project is approved. The current capacity constraints and congestion at the crossing are impacting economic activity and regional livability. Addressing these challenges is a priority for the Ministry of Transportation and Infrastructure. Therefore, procurement models that aid in accelerating the construction schedule were selected for assessment.

4.1.2 Allocation of Risks

Another key consideration in the identification of procurement options is the complexity and risk profile of the Crossing. An urban setting with an active navigational channel, along with large excavation quantities, high seismicity, liquefiable soils, important environmental considerations, permitting requirements, instream works, and an active Indigenous and commercial fishery present inherent challenges to construction costs and schedule. The attractiveness of the opportunity and ultimate project cost will be affected by the risk allocation and sharing regime. Procurement models that offer flexibility to achieve an optimal risk profile were also selected for assessment.

4.1.3 Long-Term Partnership Models

Procurement models that include a long-term operation and maintenance component were not assessed for the Crossing.

4.1.4 Inclusion of Private Finance

The benefits of including a portion of private finance in a construction transaction include due diligence by lenders in advance of contract award, due diligence oversight of the contractor by lenders during design and construction, and liquid security for the owner in the event of contractor performance issues. Consequently, the benefits of inclusion of private finance have been considered.

4.2 PROCUREMENT MODELS ASSESSED

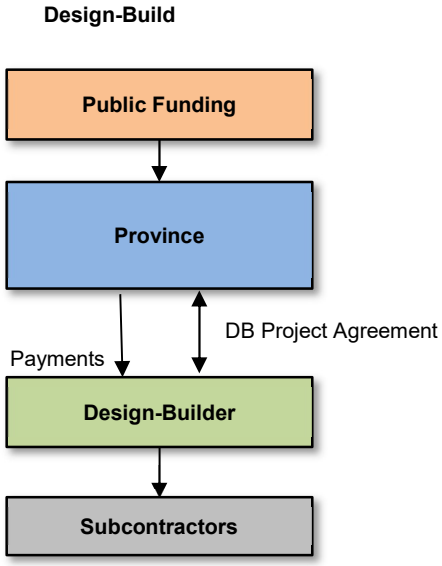
Given the considerations related to schedule, risk, and other factors, both traditional and relatively novel procurement models were examined. Four unique procurement models were examined. Of those, private financing was assessed in relation to two, bringing the total number of procurement models analyzed to six. They are:

4.2.1 Design-Build (DB)

The DB model is widely utilized in BC for procurement of transportation infrastructure. With this model, a short-list of up to three bidders are invited to submit a proposal. The Province enters into a fixed price contract with a contractor with the highest ranked proposal to design and construct the infrastructure. By combining responsibility for design and construction and utilizing a performance-based specification, design and construction-related risks can more readily be transferred to the contractor.

Given that the contract price is fixed at award, the Province receives best value for this model when project risks are well understood and can be efficiently priced during procurement under competitive tension. Consequently, procurement is best timed to coincide with having obtained baseline geotechnical data, signed third party agreements, environmental approvals and/or other risk-defining outcomes.

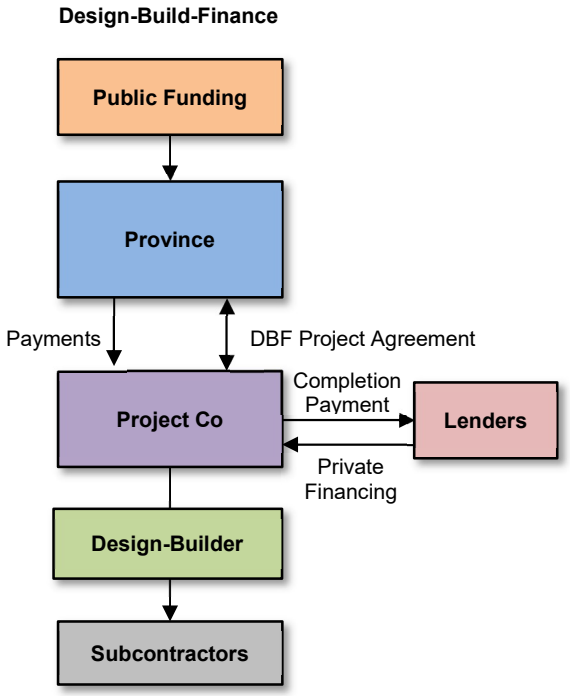
The owner will enter into a DB project agreement directly with the design-builder.



4.2.2 Design-Build-Finance (DBF)

The DBF model mirrors the DB model in terms of inviting a short-list of up to three bidders to submit a proposal, and the Province entering into a fixed price contract with the bidder submitting the highest ranked proposal. This model involves a performance specification and well-understood project risks. The DBF differs from the DB due to the requirement for the contractor to advance a portion of private financing (usually in the range of 20% to 30% of the contract value) during the construction period, to be repaid at completion milestones. Third party lenders are engaged by bidders during the procurement process to provide lending terms and rates under competitive tension. Private financing is advanced during the early stages of design and construction and remains at risk until the contractor achieves one or more completion milestones, at which time the financing is repaid by way of a completion payment(s).

The DBF model typically involves the creation, by the contractor, of a Project Co entity that enters into the project agreement with the owner. Project Co is accountable to the lenders and will enter into a drop-down agreement with the design-builder. The lenders will carry out their due diligence on the contractor, during both procurement and implementation.



4.2.3 Provisional Design-Build (ProvDB)

The ProvDB, as envisioned here, resembles the DB except that the contract price, fixed at award on the basis of an assumed EAC approval date, is subject to an adjustment based on the timing of the actual EAC approval if it is different. EAC conditions that may impact scope are expected to be well understood by bid time and any subsequent changes would be to the account of the Province, for example in relation to accommodation and habitat offsets. Changes in conditions affecting aspects of design and construction are possible during the permitting process, which is addressed separately in the project agreement.

Like the DB and DBF models, up to three short-listed bidders are invited to submit a proposal. The Province enters into a fixed-price contract with the bidder having the highest-ranked proposal. The provisional price adjustment allows for the contract to be awarded up to one year earlier than the DB models. The price adjustment formula, negotiated and agreed upon during procurement, will be applied when the EAC is issued, based on the difference in timing between the assumed and actual EAC dates. Once calculated, the revised contract price will be fixed for the remainder of the term. If the actual EAC

date is the same as the assumed EAC date, no adjustment is required. This early contract award allows the contractor to advance design, consultation, property acquisition, and other permit preparation activities while the environmental assessment is underway.

Like a DB, the ProvDB involves the owner entering into a project agreement directly with the design-builder. The contract price is fixed once the EAC is issued and the price adjustment formula if needed, is applied.

4.2.4 Provisional Design-Build-Finance (ProvDBF)

The ProvDBF model mirrors the ProvDB model as described above in relation to the DBF. However, the question of how and when lenders are brought onboard will require further analysis and a project-specific strategy. Given the intent to award the contract prior to the EAC and apply a pricing adjustment mechanism at a later date, lenders have indicated they may prefer to join Project Co via a funding competition after both activities have concluded. At that point, both cost and schedule uncertainty will be significantly reduced. However, a procurement approach to private financing will form part of an overall procurement strategy for the Crossing.

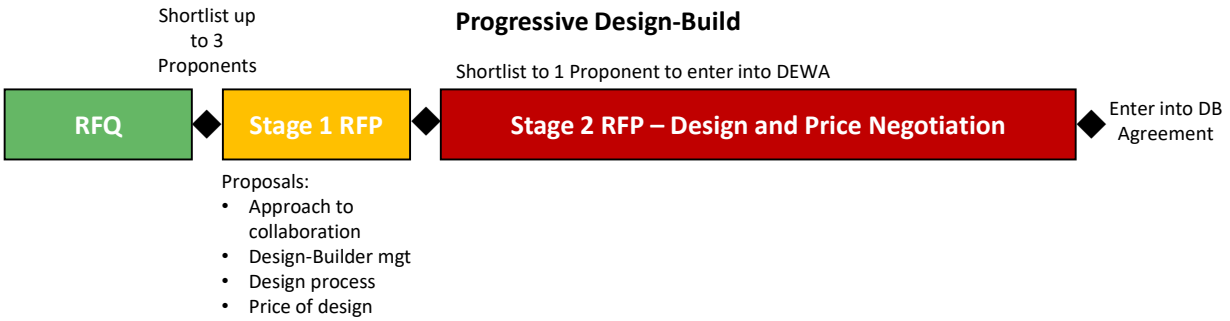
As with a DBF model, the ProvDBF involves the creation of a Project Co entity that enters into the project agreement with the owner.

4.2.5 Progressive Design-Build (PDB)

The Progressive Design-Build model has been used in BC to procure infrastructure when market capacity is constrained and only one market participant has been involved in a pursuit. The PDB model has been effective for achieving a more advanced level of design and collaboration with the owner during procurement than would ordinarily occur for a DB but suffers from less competition.

In a PDB, the competition is structured such that both design and price are progressed through stages during the RFP. Up to three proponents are shortlisted through a request for qualifications (RFQ) phase. The shortlisted proponents then compete during a Stage 1 RFP to continue in the competitive selection process to Stage 2 as the preferred proponent under a design early works agreement (DEWA) with the owner. During the DEWA stage, the preferred proponent will work collaboratively with the owner's team to advance their design and price. Once a price and scope are agreed upon, the contract can be executed.

If the price and scope are accepted, the owner will enter into a DB project agreement directly with the design-builder. The owner is expected to have more reliable pricing information because of the more advanced level of design achieved through procurement.

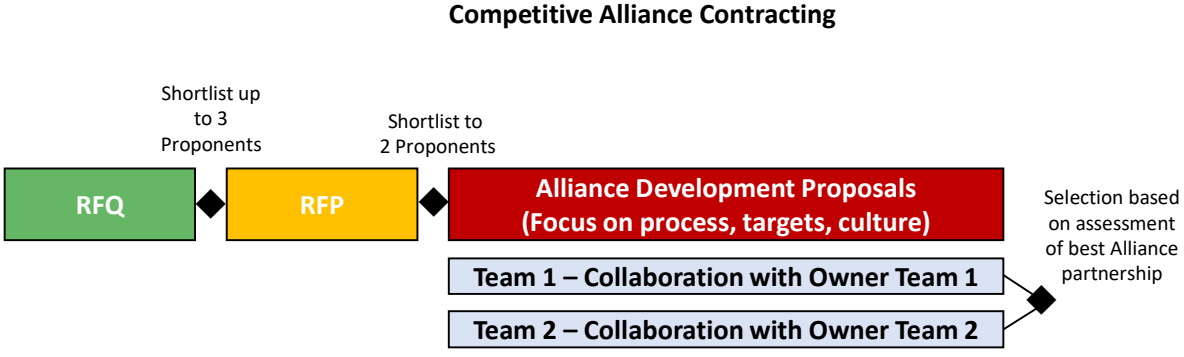


4.2.6 Competitive Alliance Contracting (CAC)

Alliance contracting has been utilized in several jurisdictions internationally to procure large infrastructure projects. The competition is structured such that up to three proponents are shortlisted through a request for qualifications (RFQ) phase. The shortlisted proponents then compete during an RFP phase to be one of two bidders to enter into an alliance development contract with the owner. The preferred proponent is then selected based on an approximately equal weighting of people, price, and technical solution criteria.

Rather than fixing price and risk allocation as with a DB contract, an alliance contract involves costs and risks being shared amongst the owner, the contractor, and its subcontractors within an overall target budget.

The owner will enter into a project alliance agreement with the preferred team.



5 ASSESSMENT OF OPTIONS AND RESULTS

5.1 ASSESSMENT

The procurement options described in Section 5.4 were assessed using the procurement objectives described in Section 4.

5.1.1 Assessment Scale

An assessment scale was applied to represent the extent to which each procurement model option addresses each procurement objective or criterion. The following scoring framework provided the basis for the qualitative assessment:

x	Ineffective in satisfying the criteria.
✓	Partially effective in satisfying the criteria.
✓✓	Substantially effective in satisfying the criteria.
✓✓✓	Fully effective in satisfying the criteria.

5.2 SUMMARY OF RESULTS

The results of the procurement options assessment are detailed in Appendix A and summarised in Table 2 below.

Table 2 - Summary of Assessment Results

Assessment Criteria	DB	DBF	ProvDB	ProvDBF	PDB	CAC
Timely project delivery	✓½	✓✓	✓✓½	✓✓✓	✓✓	✓✓½
Cost effective implementation (design and construction) & attainable within fiscal constraints	✓✓	✓✓	✓✓½	✓✓½	✓½	✓✓
Allocate key risks to the party best able to manage and mitigate them	✓✓	✓✓	✓✓	✓✓	✓✓½	✓✓½
Attractive, marketable transaction	✓✓✓	✓✓½	✓✓	✓½	✓✓	✓½
Contributes positively to the environmental and permitting process	✓	✓	✓½	✓½	✓½	✓½

Assessment Criteria	DB	DBF	ProvDB	ProvDBF	PDB	CAC
Ensure strong competition providing innovation and efficient approaches	✓✓½	✓✓½	✓✓½	✓✓½	✓✓	✓✓

5.2.1 Timely Project Delivery

The ProvDB and CAC models provide opportunity for contractor involvement in advance of the issuance of the EAC. Therefore, these models are expected to result in earlier start and finish dates for construction. The PDB model, which advances design early through a DEWA, was assessed to involve sufficient risk of uncertainty related to reaching agreement on a fixed price with only a single proponent that an accelerated schedule is less assured. The inclusion of private finance further benefits the ProvDBF.

5.2.2 Cost-effective Implementation

The DB, DBF, ProvDB and ProvDBF models were assessed to provide the most competitive pricing with up to three proponents participating in the procurement through to final award. The ProvDB and ProvDBF models, by moving up the construction period by approximately one year, are expected to have a lower overall cost and less contingency associated with permitting risks and timing.

5.2.3 Risk Allocation, Management and Mitigation

The PDB and CAC models were assessed to offer the best opportunities to efficiently allocate, manage and mitigate risks on the project. The PDB model, during which a negotiated price is based on a more advanced level of design, enables the proponent to price risks with more fulsome information. Similarly, the CAC model does not require the contractor to carry risk contingency since all risks are shared with the owner.

5.2.4 Attractive, marketable transaction

The DB and DBF models were assessed to offer the market familiar procurement approaches, contract terms and contractor obligations. The less familiar models, ProvDB, ProvDBF, PDB and CAC, involve unique features that may be perceived to introduce procurement risks that reduce bidders' interest.

5.2.5 Positive Contribution to Environmental and Permitting Process

There was little to differentiate amongst the procurement models on this criterion. A slight advantage was assessed for each of the ProvDB, ProvDBF, PDB and CAC models, due to the opportunity each provides for proponents to better understand the risks to cost and schedule prior to final pricing.

5.2.6 Strong Competition Providing Innovation and Efficiency

Opportunities for innovation and efficiency were assessed to be inherent in all five procurement models. However, as assessed in relation to the cost-effective implementation criteria, the DB, DBF, ProvDB and

ProvDBF models provide the most competitive pricing with up to three proponents participating in the procurement through to final award.

5.2.7 Summary

On balance, the Progressive DB and Competitive Alliance models scored lowest amongst the options assessed. Scores overall reflect considerable uncertainty in terms of how well the processes and contracts would perform, despite their anticipated benefits, given there is less of a competitive element.

The DB, DBF, ProvDB and ProvDBF are recommended for further analysis in the business case. In most respects, the ProvDB and ProvDBF provide the same benefits as the DB and DBF models. The procurements each result in a fixed price, performance-based contract, and could be modeled from similar approaches undertaken in other jurisdictions. The schedule benefits, if realized, may be such that the cost uncertainty that the provisional price formula represents may be sufficient to recommend these approaches. A financial value for money analysis will be carried out for all four options.

6 NEXT STEPS

The four preferred procurement options identified in this report are analyzed in detail through risk quantification, financial modeling and other procurement options assessment activities described in the Business Case. This detailed analysis provides a substantive basis for recommending the model most appropriate for the procurement of the Crossing.

APPENDIX A – DETAILED PROCUREMENT OPTIONS ASSESSMENT

Project Assumptions: single contractor, new eight-lane tunnel and removal of the existing four-lane tunnel.

Criteria	Design-Build	Design-Build Finance	Provisional Design-Build	Provisional Design-Build-Finance	Progressive Design-Build	Competitive Alliance
Timely project delivery: *The shortest overall timeline (planning through to service commencement) for delivery of the Project.*	**✓1/2** • Requires a well-defined set of performance requirements, that need to be developed independently in advance of starting procurement, which does not promote an early start compared to other options, primarily due to reliance on environmental requirements being confirmed during EA process to inform requirements. • Has a track record of providing shorter overall project deliveries by achieving a fixed price and schedule that incentives proponents to optimize their designs with a focus on schedule, and by starting construction before final design. • Risk transfer of design and constructability, combined with a performance regime support schedule performance.	**✓✓** • Requires a well-defined set of performance requirements, that need to be developed independently in advance of starting procurement which does not promote an early start compared to other options, primarily due to reliance on environmental requirements being confirmed during EA process to inform requirements. • Has a track record of providing shorter overall project deliveries by achieving a fixed price and schedule that incentives proponents to optimize their designs with a focus on schedule, and by starting construction before final design. • Risk transfer of design and constructability, combined with a performance regime support schedule performance. • Inclusion of at-risk private finance and associated lenders' due diligence further strengthens scheduled performance.	**✓✓ 1/2** • Requires well-defined performance requirements for the fixed price portion of the project, which need to be developed independently in advance of starting procurement, that does not promote an early start to procurement. • However, the model is anticipated to start earlier than a typical DB as key risks relating to the EA process are addressed separately and potentially priced provisionally, allowing procurement to proceed concurrently with finalizing the environmental approval. Design changes resulting from environmental and permitting requirements would be finalized during implementation. • Approach is anticipated to be the modification of existing DB, where the contractor is responsible for design and constructability, with a performance regime (potentially including private finance would further enhance schedule performance). • Pricing the provisional work during implementation may be challenging due to unknown environmental, permitting, and other factors	**✓✓✓** • Requires well-defined performance requirements for the fixed price portion of the project, which need to be developed independently in advance of starting procurement, that does not promote an early start to procurement. • However, the model is anticipated to start earlier than a typical DB as key risks relating to the EA process are addressed separately and potentially priced provisionally, allowing procurement to proceed concurrently with finalizing the environmental approval. Design changes resulting from environmental and permitting requirements would be finalized during implementation. • Approach is anticipated to be modification of existing DB, where the contractor is responsible for design and constructability, with a performance regime (potentially including private finance would further enhance schedule performance). • Pricing the provisional work during implementation may be challenging due to unknown environmental, permitting, and other	**✓✓** • Design requirements start with higher-level performance requirements and design is developed through the progressive DB procurement process under competitive tension to a specified point. • Selected proponent continues with their design to provide a fixed price and schedule for the project in collaboration with the owner to address project requirements including environmental and permitting as the design is being developed. • Design may take longer for proponent to commit to price and schedule certainty for the whole project, which may delay the start of construction. • May be greater schedule uncertainty in arriving at a fixed price proposal due to lack of competitive tension working with a single proponent. • Once agreed contractor is responsible for constructability with a performance regime (potentially including private finance would further enhance schedule performance).	**✓✓ 1/2** • Promotes an early procurement and aligns contractor's and owner's interest to meet targets, including schedule. • Design is developed in collaboration with the owner to address project requirements including environmental and permitting issues. This model is developed to provide shorter project deliveries and achieve target timelines. • Less incentive for schedule and price performance with pain share gain share payment mechanism. • No dispute resolution process may delay resolution if disputes happen. • Lack of experience of owner and contractor may add time to the procurement process.

Criteria	Design-Build	Design-Build Finance	Provisional Design-Build	Provisional Design-Build-Finance	Progressive Design-Build	Competitive Alliance
			that may lead to disputes and possible delays. • New approach on provisional elements that may take additional time to develop and to agree with proponents.	factors that may lead to disputes and possible delays. • New approach on provisional elements that may take additional time to develop and to agree with proponents. • Inclusion of at-risk private finance and associated lenders' due diligence further strengthens scheduled performance.		
Cost-effective implementation (design and construction) & attainable within fiscal constraints: *Provides a cost-effective method to deliver the project, and supports achieving the approved budget.*	**✓✓** • Promotes competition and design innovation with a fixed price through the competitive selection process if three bidders participate. • Later procurement start due to EA process incurs estimated escalation, time related costs within the contract of ~$150M. • Seeking to transfer risk under competitive tension can result in higher contingencies compared to more progressive model.	**✓✓** • Promotes competition and design innovation with a fixed price through the competitive selection process if three bidders participate. • Later procurement start due to EA process incurs estimated escalation, financing and time related costs within the contract of ~$150M. • Benefit of private finance providing independent review of constructability and schedule during procurement and construction in support of cost and schedule certainty. • Market may be less interested in projects requiring private finance. • Seeking to transfer risk under competitive tension can result in higher contingencies compared to more progressive model.	**✓✓ 1/2** • Promotes competition and design innovation with a fixed price on majority of contract, through the competitive selection process if three bidders participate. • Earlier procurement avoids escalation, financing and time related costs penalty of approximately ~$150M on the fixed portion of the project. • Negotiated provisional price component can encourage more competitive bidding and reduced contingencies that can drive better pricing. • May put owner at disadvantage negotiating provisional elements during procurement and implementation that may add cost. • Seeking to transfer risk under competitive tension can result in higher contingencies compared to more progressive model.	**✓✓ 1/2** • Promotes competition and design innovation with a fixed price on majority of contract, through the competitive selection process if three bidders participate. • Earlier procurement avoids escalation, financing and time related costs penalty of approximately ~$150M on the fixed portion of the project. • Negotiated provisional price component can encourage more competitive bidding and reduced contingencies that can drive better pricing. • May put owner at disadvantage negotiating provisional elements during procurement and implementation that may add cost. • Seeking to transfer risk under competitive tension can result in higher contingencies compared to more progressive model.	**✓ 1/2** • Promotes establishing a fixed price and design innovation through the collaborative design development. • Can improve earlier cost certainty by having a pricing point corresponding to known technical requirements (similar to provisional DB approach), with subsequent pricing of EA and permitting related requirements once known. • Allows for early procurement start before EA and permitting requirements are fully defined which can help proponents identify and resolve environmental and permitting issues as the design is developed, including working with the EA and permitting authorities. • Can be less effective at arriving at competitive fixed price proposal due to lack of competitive tension working with a single proponent and less certain timeline.	**✓✓** • Has been demonstrated to be cost effective in other jurisdictions. • Promotes competition and design innovation through the competitive selection process to develop a conceptual design and 'target cost.' • Allows for early procurement start before EA and permitting is defined which can help the Alliance team to identify and resolve environmental and permitting issues as the design is developed, including working with the EA and permitting authorities. • Less competitive tension driving cost reduction than other options. • Does not benefit from private finance oversight. • Pain/gain share mechanism provides less support for achieving target pricing compared to fixed price under models with a DB component.

Criteria	Design-Build	Design-Build Finance	Provisional Design-Build	Provisional Design-Build-Finance	Progressive Design-Build	Competitive Alliance
				• Market may be less interested in projects requiring private finance. • Benefit of private finance providing independent review of constructability and schedule during procurement and construction in support of cost and schedule certainty.		
Allocate key risks to the party best able to manage and mitigate them: *Ensure key project risks are allocated in the most cost-effective way to the party that is best suited to manage them.*	✓✓ • Allows for defined risk allocation, risk allocated to industry partners is typically higher than most models. • Typical allocation of risks associated with EA and other permitting requirements are likely inefficient for this project given the anticipated lengthy time frames for these approvals. • Owner retains long term risk associated with operations, maintenance, and rehabilitation.	✓✓ • Allows for defined risk allocation, risk allocated to industry partners is typically higher than most models. • Will likely involve holdback provisions through private financing to secure performance of risk allocation. • Typical allocation of risks associated with EA and other permitting requirements are likely inefficient for this project given the anticipated lengthy time frames for these approvals. • Owner retains long term risk associated with operations, maintenance, and rehabilitation.	✓✓ • Allows for defined risk allocation, risk allocated to industry partners is typically higher than most models. • Environmental schedule risk is retained/shared risk to enhance ability for proponent to price and manage. • Contracts will likely involve holdback provisions to secure performance of risk allocation. • Owner retains long term risk associated with operations, maintenance, and rehabilitation.	✓✓ • Allows for defined risk allocation, risk allocated to industry partners is typically higher than most models. • Environmental schedule risk is retained/shared risk to enhance ability for proponent to price and manage. • Contracts will likely involve holdback provisions that may include private financing to secure performance of risk allocation. • Owner retains long term risk associated with operations, maintenance, and rehabilitation.	**✓✓ 1/2** • Allows for defined risk allocation, risk allocated to industry partners is higher than most models (similar to DBF). • Contracts will likely involve holdback provisions that may include private financing to secure performance of risk allocation. • Typical allocation of risks associated with EA and other permitting requirements may be inefficient on this project given the anticipated lengthy time frames for these approvals. • Owner retains long term risk associated with operations, maintenance, and rehabilitation.	**✓✓ 1/2** • Promotes a shared risk model, risk allocated to the Alliance, no blame model. • No private financing to secure performance which is based on pain/gain share on target outcomes. • Major risks are mitigated by the Alliance, and not priced upfront as in other models. • An inexperienced owner team can result in ineffective risk sharing. • Owner retains long term risk associated with operations, maintenance, and rehabilitation.

Criteria	Design-Build	Design-Build Finance	Provisional Design-Build	Provisional Design-Build-Finance	Progressive Design-Build	Competitive Alliance
Attractive, marketable transaction: *Ensure a transaction that is fair, transparent and attracts broad interest from qualified firms with a keen interest to participate and the capability to deliver a project of this size and complexity.*	✓✓✓ • Market is familiar and comfortable with the model and commercial terms based on precedent projects.	✓✓1/2 • Market is familiar and comfortable with the model and commercial terms based on precedent projects. • Market may be less interested in projects requiring private finance.	✓✓ • Market is familiar and comfortable with the DB model but less familiar with including a price adjustment mechanism and uncertain as to how well it will work.	✓1/2 • Market is familiar and comfortable with the DB model but less familiar with including a price adjustment mechanism and uncertain as to how well it will work. • Market may be less interested in projects requiring private finance	✓✓ • Market is generally supportive of the model and interested in participating. • Market is less familiar with the model and has some concern over the owner's lack of familiarity	✓1/2 • Viewed as an attractive model by some in the market • Market is concerned with adopting this model given its novel nature in BC. • Market is uncertain as to how well it will work given the owner's lack of familiarity.
Contributes positively to the environmental and permitting process: *A number of requirements will be determined by the EAC and permitting conditions, which are not yet defined, the procurement should address the need for flexibility to indeterminate requirements.*	✓ • Allows proponents to engage in limited collaborative discussions about the EA and permitting requirements during the competitive selection process and to give limited feedback on the finalization of the commitments.	✓ • Allows proponents to engage in limited collaborative discussions about the EA and permitting requirements during the competitive selection process and to give limited feedback on the finalization of the commitments.	✓1/2 • Allows the industry to be engaged earlier in the process. • Provides limited opportunity to engage in collaborative discussions about the EA and permitting requirements. • Developing provisional elements and mechanisms may provide opportunity to better understand impacts of environmental and permitting requirements and timelines. • May have challenges with stakeholders if project advances with a committed technical design prior to finalization of the environmental consultation process.	✓1/2 • Allows the industry to be engaged earlier in the process. • Provides limited opportunity to engage in collaborative discussions about the EA and permitting requirements. • Developing provisional elements and mechanisms may provide opportunity to better understand impacts of environmental and permitting requirements and timelines. • May have challenges with stakeholders if project advances with a committed technical design prior to finalization of the environmental consultation process.	✓1/2 • The model allows the proponent to have insight into the EA and permitting process during the competitive selection process and to give feedback on the finalization of the commitments. • The model allows the environmental and permitting requirements to be understood concurrently with a price proposal. • Can have a pricing point corresponding to known technical requirements, with subsequent pricing to EA and permitting related requirements once known.	✓1/2 • Allows the industry to be engaged earlier in the process, and to work collaboratively with the owner on the EA and permitting packages, including consultation. • Delivery on those requirements are more likely to be optimized toward the target cost, which benefits both the owner and industry partners in the Alliance through pain/gain share around target outcomes. • Final design could incorporate input from the EA and Permitting consultation processes. • Less competitive tension driving value than other options.

Criteria	Design-Build	Design-Build Finance	Provisional Design-Build	Provisional Design-Build-Finance	Progressive Design-Build	Competitive Alliance
Ensure strong competition providing innovation and efficient approaches: *The procurement model should consider an approach that optimizes competitive tension between multiple parties, providing innovation and best value.*	**✓✓1/2** • Promotes design and build integration and incentivizes innovation to develop the most efficient approach to meet project requirements. • Having three proponents in the competitive selection process would support a competitive design competition. • Market may find project complexity with undefined environmental and permitting requirements overly challenging. • May require significant stipend value to address requirements in design to address complexities, duration and structure of procurement to ensure three proponents stay engaged throughout.	**✓✓1/2** • Promotes design and build integration and incentivizes innovation to develop the most efficient approach to meet project requirements. • Having three proponents in the competitive selection process would support a competitive design competition. • Market may find project complexity with uncertain environmental and permitting schedule overly challenging. • May require significant stipend value to address requirements in design to address complexities, duration and structure of procurement to ensure three proponents stay engaged throughout. • Market may be less interested in projects requiring private finance.	**✓✓1/2** • Promotes design and build integration and incentivizes innovation to develop the most efficient approach to meet project requirements. • Having three proponents in the competitive selection process would support a competitive design competition. • Provisional sum approach intended to address complexity of undefined environmental and permitting requirements. • Proponents anticipated to provided competitive fixed price and schedule for majority of the project scope. • May require significant stipend value to address requirements in design to address complexities, duration and structure of procurement to ensure three proponents stay engaged throughout.	**✓✓1/2** • Promotes design and build integration and incentivizes innovation to develop the most efficient approach to meet project requirements. • Having three proponents in the competitive selection process would support a competitive design competition. • Provisional sum approach intended to address complexity of undefined environmental and permitting requirements. • Proponents anticipated to provided competitive fixed price and schedule for majority of the project scope. • May require significant stipend value to address requirements in design to address complexities, duration and structure of procurement to ensure three proponents stay engaged throughout. • Market may be less interested in projects requiring private finance.	**✓✓** • Promotes design and build integration and incentivizes innovation to develop an efficient approach to meet project requirements. • Having two proponents in the competitive selection process would support a competitive early stage design competition. • Project complexity with undefined environmental and permitting requirements, would be addressed through this more open and collaborative approach. • Approaches requires higher compensation to reimburse for design costs under the more open and collaborative approach. • Working with one proponent in contractor/owner relationship towards final price reduces competitive tension that would otherwise drive optimization.	**✓1/2** • Promotes design and build integration and incentivizes innovation to develop the most efficient approach by the members of the Alliance based on pain/gain share on target outcomes. • Having two proponents in the competitive portion of the procurement supports innovation in early stage design approach. • Project complexity with undefined environmental and permitting requirements, would be addressed through the open and collaborative Alliance approach. Approaches requires higher compensation to reimburse for design costs within the Alliance team. • Working as integrated Alliance team (rather than contractor/owner models) supports seeking innovative approaches to optimize schedule and value. • Owner's lack of familiarity with approach may limit owner's ability to leverage innovation.