



Project Report: Achieving Value for Money

Port Mann/Highway 1 Improvement Project



March 2011

partnerships
British Columbia

Purpose of this Document

This report describes the need for the Port Mann/Highway 1 Improvement Project, and the rationale, objectives and processes that led to the decision to proceed with the project. The report explains how different procurement delivery models were analyzed and how project benefits and innovations are expected to be achieved in current market conditions. A summary of the key aspects of the final agreement is also provided.

Agencies are publicly accountable for projects through regular budgeting, auditing and reporting processes. In all of its procurement processes, the Province is committed to a high standard of disclosure as part of its accountability for the delivery of public projects.

Partnerships BC, the Ministry of Transportation and Infrastructure and Transportation Investment Corporation are accountable for the contents of this project report, including the reasonableness of assumptions and professional opinions that have been presented.

For more information on the Port Mann/Highway 1 Improvement Project, go to: www.pmh1project.com/

Table of Contents

| | |
|--|----|
| Purpose of this Report..... | i |
| Executive Summary | 1 |
| 1. Project Background, Rationale and Objectives..... | 3 |
| 2. Project Benefits | 7 |
| 3. Project Delivery Options | 9 |
| 4. Competitive Selection Process | 11 |
| 5. Final Design Build Agreement | 14 |
| 6. Final Project Structure | 17 |
| 7. Ongoing Design Build Agreement Monitoring | 19 |

Executive Summary

In 2006, following three years of program definition, research and planning, the Province of British Columbia's Ministry of Transportation and Infrastructure launched the Gateway Program, an important component of British Columbia's Pacific Gateway Strategy. The existing Highway 1 corridor from Vancouver to Langley was one of three priority corridors identified in the Gateway Program. This corridor is the busiest and most economically critical route in Greater Vancouver. Built in the early 1960s when the population of Greater Vancouver was 800,000, it now serves as the only major east-west corridor for Greater Vancouver's 2.5 million inhabitants, with the Port Mann Bridge alone carrying approximately 127,000 vehicles per day. Traffic has increased to the point where the bridge is congested, in both directions, 13 hours on an average weekday.

The Port Mann/Highway 1 Improvement Project (the Project) was initiated as a key element of the Gateway Program to improve mobility for all modes of transportation in the Highway 1 corridor. The goals of the Project include reducing congestion and travel time; improving safety and accessibility; facilitating transit service; and expanding networks and transportation choice for high occupancy vehicles (HOV), cyclists and pedestrians.

Given the cost of the project and other provincial priorities, a key objective was to be self-financing, paid for through user tolls. Following public consultation in 2006, and in accordance with the Provincial Tolling Policy, the province determined to proceed with the project as a tolled facility.

The Project provides significant benefits that include reducing congestion and travel time; improving safety and accessibility; facilitating transit service; and improved transportation choice. Specific user benefits of the Project such as reduced travel times and vehicle operating costs and improved safety were quantified with a present value estimated at more than \$5 billion¹, calculated over a 35-year project operating period. Additional benefits, which were not quantified, include positive effects on regional employment by generating more than 8,000 person years of employment, contributing more than \$800 million to the provincial gross domestic product, improving municipal access, improving the efficiency of regional corridors and reducing congestion-related emissions from idling vehicles.

Key features of the Project include extending the HOV lanes eastward into Langley, construction of transit and commercial vehicle priority access as well as improved and expanded cycling and pedestrian networks. The Project will also allow the reintroduction of public transit to a corridor that has been too congested to support reliable service for the past 20 years.

¹The user benefit analysis employs the discounted cash flow method over a Project life cycle of 35 years using a six per cent discount rate.

Rigorous and Fair Selection Process

A two-stage competitive selection process, comprised of a Request for Qualifications (RFQ) stage and a Request for Proposals (RFP) stage, was used to choose a preferred proponent for the Project. Three of the six teams that responded to the RFQ were invited to participate in the RFP stage of the process. All three teams selected represented a range of British Columbian, Canadian and international experience in design, construction, operations and maintenance, and financing of major transportation projects.

Following a rigorous evaluation process based on a design, build, finance and operate procurement model (DBFO), Connect BC Development Group was selected as the preferred proponent and entered into an agreement-in-principle with the Province of British Columbia (the Province). A Fairness Reviewer was engaged to monitor the competitive selection process and concluded that it was conducted impartially and fairly.

Due to challenging and unprecedented economic conditions and the financial market instability during final negotiations, the Province and Connect BC Development Group were unable to reach a mutually satisfactory agreement, and negotiations were concluded. In accordance with provisions in the RFP, the Province then exercised its option to enter into a fixed-price, design-build agreement (DB) with Connect BC Development Group's design-builder, the Kiewit/Flatiron General Partnership (Kiewit/Flatiron), for design and construction of the new, 10-lane Port Mann Bridge and Highway 1 improvements. On this basis, the Province was able to incorporate many of the benefits that had been realized through the DBFO procurement process.

Design-Build Agreement

Under the DB agreement, Kiewit/Flatiron will design and build the following elements of the Port Mann/Highway 1 Improvement Project:

- Widening of 37 kilometres of Highway 1 from McGill Street in Vancouver to 216th Street in Langley, including 15 kilometres of new HOV lanes;
- Upgrades to interchanges and improving access and safety along the corridor;
- A new, 10-lane Port Mann Bridge across the Fraser River;
- Capability for rapid bus transportation;
- Transit and commercial vehicle priority measures where appropriate;
- Dedicated cycling and pedestrian networks; and
- Removal of the existing Port Mann Bridge.

The new Port Mann Bridge is expected to open with eight lanes of traffic by December 2012, a full year earlier than originally planned. Following removal of a portion of the old bridge, the final two lanes of the new bridge will be open for use. Substantial completion is scheduled for December 2013 and final completion, including removal of the old bridge is scheduled for December 2014. The old bridge will be removed following completion of the improvements. The total design and construction cost associated with the fixed-priced, design-build agreement is \$2.46 billion.

Transportation Investment Corporation

In June 2008, the Transportation Investment Corporation (TI Corp) was established under the Transportation Investment Act. TI Corp is a commercial, self-sustaining Crown corporation wholly-owned by the Province. While maintaining government oversight, TI Corp's mandate is to manage all components of project delivery, including design, construction, financing and operations. Originally, TI Corp was created to act as the authority overseeing the concessionaire for the Project, however under the current delivery model TI Corp acts as the authority and concessionaire overseeing the implementation of the Project.

1. Project Background, Rationale and Objectives

The Problem: Current Congestion

Significant population and economic growth combined with changing regional travel patterns and expanding trade have placed considerable strain on British Columbia's (B.C.) transportation system. Congestion on regional roads and highways is increasing with growing impacts to residents, communities, the environment and the economy.

Over the next 25 years, Greater Vancouver's population is expected to grow by about 900,000 residents. Without action, congestion would get worse, quality of life would suffer and economic opportunities would be foregone. Investment in transportation is required to improve the region's liveability and its competitiveness as a trading centre and a place to do business.

Dispersed employment growth, changing social trends and increasing trade have caused Metro Vancouver's growth to evolve differently than anticipated by previous regional planning documents such as the Liveable Region Strategic Plan. As a result, the region's transportation network has been showing increasing strain from significant changes in travel patterns, rising traffic volumes and congestion on major roads and bridges.

The increase in traffic volumes has been seen on almost all of the region's major roads, but most notably at water crossings. The existing Port Mann Bridge has the highest daily traffic volumes per lane among all major water crossings in Greater Vancouver and is congested 13 hours a day. Built as a four-lane bridge in 1964 (now modified to five lanes incorporating an eastbound HOV lane) when the population of Greater Vancouver was 800,000, the Port Mann Bridge carries approximately 127,000 vehicles per day—a 65 per cent increase since 1985 when daily traffic numbered 77,000 vehicles. Despite having fewer lanes, daily traffic on the Port Mann Bridge is 20 per cent higher than on San Francisco's Golden Gate Bridge.

The average morning peak period queue to access the Port Mann Bridge westbound is approximately eight kilometres long, typically extending as far as 192nd Street. Analysis indicates the average queue could extend 17 kilometres to 216th Street by 2021 if improvements are not made to this corridor.

This loss of mobility compromises the region's ability to take advantage of significant economic development opportunities, negatively impacts the region's competitiveness and reduces safety. Regional and inter-regional traffic would continue to spill onto local streets, adding to congested conditions already resulting in collision rates at least double that of free-flowing conditions, and congestion-related idling that contributes significantly to the region's greenhouse gas emissions.

Project Rationale: Responding to the Problem

Coordinated transportation infrastructure and service improvements are necessary throughout the region to address current and future transportation needs and to realize potential economic development opportunities from increasing trade.

In 2006, following three years of program definition, research and planning, the Ministry of Transportation and Infrastructure launched the Gateway Program, an important component of British Columbia's Pacific Gateway Strategy. The Port Mann/Highway 1 Improvement Project is a key element of the Gateway Program focusing on Highway 1 between Vancouver and Langley.

Measures to restore mobility to the Highway 1 corridor were determined to be necessary as the corridor is the most significant commuter and goods movement route in the Lower Mainland. This route suffers from the worst congestion of all major roads and is experiencing the most rapid growth in traffic.

Objectives: Port Mann/Highway 1 Corridor Pre-Design Concept

Studies were conducted using widely recognized tools and planning models along with the goals and analytical parameters established for the Gateway Program to develop a pre-design concept for the Highway 1 corridor. This concept represented a conceptual point of reference for the physical scope of the Project. Various components of the Highway 1 corridor were studied, with each study indicating the need to provide significant

improvements to accommodate forecasted traffic levels. These studies also strongly recommended addressing safety issues along the highway which included insufficient merge lengths, extensive off-ramp queues that back up onto the highway and undesirable lane changing at on- and off-ramps.

Project Goals

As a result of these studies, the following goals were established for the Port Mann/Highway 1 Improvement Project:

- Reduce travel times for trips along the corridor and increase travel time predictability;
- Reduce congestion at entry and exit points to Highway 1;
- Reduce travel times for trips across the corridor and improve connections within and between communities;
- Improve access to and egress from the corridor for goods movement;
- Facilitate the introduction of transit service along the corridor and the improvement of transit service across the corridor;
- Expand HOV, cycling and pedestrian networks along or in the vicinity of the corridor; and
- Improve safety for vehicle operators and passengers, cyclists and pedestrians.

The pre-design concept for the Port Mann/Highway 1 Improvement Project included the following features:

- Added capacity to the Highway 1 corridor;
- Extending the westbound and eastbound HOV lanes on Highway 1;
- Transit priority measures, including the introduction of bus service through transit queue-jumpers and extended HOV lanes;
- Significant cycling and pedestrian infrastructure improvements; and
- Ability to accommodate future light rail rapid transit expansion across a new Port Mann Bridge.

Physical Characteristics of the Project

In addressing these goals, the Ministry of Transportation and Infrastructure developed a pre-design concept for the Port Mann/Highway 1 Improvement Project which included widening the

highway, twinning the Port Mann Bridge, upgrading interchanges and improving access and safety on Highway 1 from the McGill Street interchange in Vancouver to 216th Street in Langley, a distance of approximately 37 kilometres.

Specific physical scope elements of the pre-design concept included:

- **McGill Street to Grandview Highway (Vancouver):** Two new lanes (one in each direction) and improvements to the following interchanges: McGill Street, Hastings Street, First Avenue, Boundary Road and Grandview Highway.
- **Grandview Highway to Douglas Street Overpass (Burnaby):** Improvements at the Willingdon interchange and a new overpass across Highway 1 at Wayburne Drive, as well as improved traffic flow via a new auxiliary lane system.
- **Douglas Street Overpass to North Road (Burnaby):** Two additional lanes (one in each direction) and improvements to: the Sprott Street and Kensington Avenue interchanges, the Gaglardi Way interchange and the Cariboo Road overpass.
- **North Road to Cape Horn (Coquitlam):** Two new lanes (one in each direction) and improvements to the Brunette Avenue interchange, an improved highway crossing at King Edward Street and improvements to the Cape Horn interchange.
- **The Port Mann Bridge (Coquitlam–Surrey):** A new four-lane bridge for eastbound traffic with capacity to accommodate an additional lane in the future.
- **152nd Street to 200th Street (Surrey/Langley):** Four new lanes (two in each direction), extension of HOV lanes and improvements to the following interchanges: 152nd Street, 160th Street, 176th Street and 192nd Street.
- **200th Street to 216th Street (Langley):** Transition to six lanes at 200th Street, then back to four lanes (two in each direction) at a new 216th Street interchange.
- **Intelligent Transportation Systems:** Including dynamic message signs, closed-circuit cameras and vehicle detectors to provide for early detection of traffic incidents, effective emergency response and efficient removal of vehicles and debris.

Tolling

Another important element of the Project pre-design concept was the consideration of tolling as a potential option to reduce congestion, limit growth in traffic demand and generate revenue to pay for the improvements.

Analysis showed that tolling, as part of a suite of congestion reduction measures, would help manage traffic growth over time, and ensure the long term effectiveness of the highway improvements.

An extensive public consultation process was undertaken regarding the proposed improvements and the bridge toll. A majority of consultation participants supported the \$2.50 (2005\$) toll each way for private vehicles. With consumer price index increases, the toll rate for cars will be in the \$3.00 range when the Port Mann Bridge opens in 2012. In June 2006, following the extensive public consultation process, it was announced that tolls would be applied to the new Port Mann Bridge.

In keeping with current tolling methodology around the world and considering the project's primary objective to address congestion as well as the geographic constraints of the Highway 1 corridor, a fully electronic, open road tolling system was adopted as the tolling methodology. This ensures no toll booths, no stopping and no unnecessary travel time delays for users. A wide range of convenient payment methods was also determined to be necessary to ensure that the system is simple, easy and effective to use.

Open road tolling systems generally require users to possess an electronic tolling device, such as a transponder, linked to a credit card allowing tolls to be automatically charged when the user travels. Traditionally, users without an electronic tolling device are required to pay a higher rate, or not use the system at all. However, key to the Port Mann/ Highway 1 Improvement Project was ensuring all users would qualify to pay the lowest possible rate. This necessitated creating options for vehicles without a transponder to pay the minimum toll rate. These options include permitting these users to pay in advance of travel or to pay in a timely fashion following use.



Artists rendering of the new 10-lane Port Mann Bridge. The new bridge will accommodate new Highway 1 RapidBus service, providing service between Langley and Burnaby in 25 minutes or less. The bridge will also be built to accommodate future light rail rapid transit.



Construction of westbound HOV ramp to Grandview Highway. This upgraded connection will provide significant benefits to users such as improving safety and accessibility.

Other elements of the proposed tolling structure include:

- Registered HOV vehicles using the HOV lanes will pay a reduced toll rate during peak hours;
- Motorcycles will pay a reduced toll rate;
- Commercial vehicles will pay a toll rate higher than passenger vehicles, but this rate will be reduced at night;
- Registered vehicles for persons with disabilities as defined under the Persons With Disabilities Act, will travel for free; and
- Other potential toll discount options to be determined.

Environmental Assessment

The Port Mann/Highway 1 Improvement Project was subject to a harmonized federal/provincial environmental review process. An environmental assessment for the Project was prepared and submitted to the B.C. Environmental Assessment Office for review. Potential environmental and socio-community impacts were identified, along with proposed mitigation and compensation measures, to ensure that the Project could proceed with no significant environmental impacts.

An Environmental Assessment Certificate under the B.C. Environmental Assessment Act (BCEAA) was received on June 12, 2008 and the federal screening decision under the Canadian Environmental Assessment Act (CEAA) was received in July 2008. This constituted approval under the harmonized BCEAA/CEAA environmental review process and identified the commitments that the proponent must implement throughout the various stages of the Project.

Public Consultation

Extensive public consultations on the Port Mann/Highway 1 Improvement Project began in 2006, occurring at key design stages including pre-design (2006-2007) and preliminary/detailed design as the contractor completes design work (late 2009-early 2011). Consultation has involved small group meetings with a broad cross-section of stakeholders, open houses, local area community meetings and web-based consultation.

For more information about the Project, including community and stakeholder input received during each phase of consultation, visit: www.pmh1project.com/

2. Project Benefits

User Benefits

The new Port Mann Bridge will replace the existing 45-year old bridge and provide the capacity needed to meet current and future traffic demand. The Project will also provide the first bus service across the Port Mann Bridge in more than 20 years, including a new RapidBus service—a joint initiative of the Province and TransLink—that will allow commuters to travel from Langley to the SkyTrain in Burnaby in less than 25 minutes. In addition to RapidBus service, the new bridge will be built to accommodate potential light rail rapid transit at a future date.

Improving capacity and transit will provide significant road and bridge user benefits, primarily through:

- Travel time savings (avoiding delays);
- Reducing vehicle operating costs; and
- Improving safety.

These improvements will help travelers realize time savings of up to 30 per cent due to reduced congestion. The value of the anticipated travel time and operating cost savings is estimated to have a present value of more than \$5 billion over a 35 year operating period.²

Safety Benefits

The Project will also provide significant safety improvements along this major transportation corridor, including:

- Reducing congestion on Highway 1, particularly during peak periods, through widening the highway; extending HOV lanes; providing transit and commercial vehicle priority access measures; and a new, wider Port Mann Bridge;
- Providing safer, more efficient highway on- and off-ramps, improving connections and improving cross-highway movement; and
- Improving access for all modes of transportation, including public transit, and non-vehicle traffic by enhancing and adding cycling and pedestrian facilities.

Economic Benefits

The Project is expected to generate more than 8,000 person years of employment and contribute more than \$800 million to the provincial gross domestic product.

Throughout construction, the Kiewit/Flatiron General Partnership (Kiewit/Flatiron) will hire hundreds of workers. At the peak of construction, Kiewit/Flatiron expects to have up to 1,200 staff and trade workers of which the vast majority will be from British Columbia.

As of July 2010, Kiewit/Flatiron has tendered and awarded more than \$500 million in subcontracts for the Project to approximately 100 companies, most of which are based in British Columbia. This represents about 20 per cent of the total design-build agreement value and additional subcontracts will be initiated as construction progresses.

The Project will also provide long-term economic benefits by:

- Improving the competitiveness of B.C. and Canadian businesses moving goods to market through and within the region;
- Reducing transportation costs of goods and services for consumers; and
- Increasing the productivity of workers by reducing the travel times of service providers in the region and the number and extent of delays.

Additional Benefits

Additional benefits of the Project relate to anticipated long-term socio-community improvements, including:

- Improving intra-municipal access by reducing highway queuing that currently spills onto municipal streets;
- Providing improved cross-highway connectivity within municipalities that span both sides of Highway 1;
- Maintaining local streets for local use by improving the efficiency of regional corridors; and

²The user benefit analysis employs the discounted cash flow method over a Project life cycle of 35 years using a six per cent discount rate.

- Improving air quality by reducing congestion-related idling vehicle emissions and providing reliable alternatives to the single occupant vehicle.

In addition, the design and construction partner, in response to the competitive selection process, proposed a number of value-added improvements beyond the Ministry of Transportation and Infrastructure's requirements. These improvements will result in better safety, improved traffic flow and reduced operations and maintenance costs over time. These improvements and associated benefits include:

- A new 10-lane bridge that will result in improved safety and traffic flow. The new bridge will include dedicated lanes that separate highway through-traffic from the more than 30 per cent of bridge traffic that exits in Surrey or Coquitlam, immediately after the crossing;
- Significant environmental improvements as a result of having fewer piers in the river.
- Increased capacity for transit across the Fraser River through improved access to bridge on-ramps;
- Earlier bridge opening; and
- Removal of the existing bridge—once the new bridge is complete—which will save expenditures in maintenance, rehabilitation and seismic upgrades that would have been required on the old bridge.



Construction of the north tower. This is one of the two towers, rising 158 metres from the water that will be supporting the cable-stayed main bridge.

3. Project Delivery Options

The B.C. Ministry of Finance has mandated through its Capital Asset Management Framework (CAMF) that the following principles guide all public sector capital procurement:

- Fairness, openness and transparency;
- Allocation and management of risk;
- Value for money and protecting the public interest; and
- Competition.

In addition, in 2008 the Province revised the capital standard requiring, for all capital projects in which the provincial government contribution exceeds \$50 million, that a public private partnership (PPP) be considered for procurement unless there is a compelling reason to do otherwise (e.g. a different procurement model will generate better value for money). Further, projects where the provincial government contribution is between \$20 million and \$50 million will be screened to determine whether a more comprehensive assessment of the project as a PPP is warranted.

Project Procurement Objectives

In support of the Province's Capital Asset Management Framework, procurement was carefully considered through the development of procurement objectives based on the Project goals. These procurement objectives were then used to help in identifying and assessing a range of procurement options for delivering the Project. The procurement objectives included:

- Achieving value for taxpayers' dollars;
- Meeting the Province's financial goals and constraints;
- Developing an attractive and marketable transaction;
- Achieving a fair and transparent procurement process;
- Ensuring public and stakeholder input throughout the delivery of the program;
- Achieving timely delivery and efficient Project sequencing;
- Ensuring effective asset performance throughout the Project term;

- Minimizing traffic impacts during construction; and
- Fulfilling all environmental obligations.

Procurement Options Analyzed

The Ministry of Transportation and Infrastructure and Partnerships BC considered a range of procurement options as described below.

Design Bid Build (DBB)

This is a traditional project delivery model where the Province develops a detailed design for the construction requirements of the project. Once the design and specifications are complete, a tender call is issued. The lowest qualified price is selected and a construction contract is awarded. The construction contractor takes responsibility for performing the construction work based on the specifications and detailed drawings. Under DBB procurement the contractor usually receives monthly progress payments. The management of the interface between major project elements is the responsibility of the Province. When construction is complete, the asset is handed over to the Province who would then contract separately for the operation and maintenance of the project. Rehabilitation is designed and funded by the Province and contracted when the work is required.

In this model, separate parties are responsible for design, construction and maintenance at different times in the project's life cycle and therefore opportunities for innovation in these areas are potentially not optimized.

Design Build (DB)

In this project delivery model the Province enters into a DB agreement with a lead contractor who has the responsibility of both preparing the detailed design of the project and undertaking the construction. Combining the design and build aspects of construction focuses responsibility for the construction risks on a single entity. The lead contractor is paid based on certain construction milestones being achieved. However, the Province retains the responsibility and risk associated with the performance of the asset during the operations phase. The management of the interface between major project elements is the responsibility of the Province. When the DB agreement is complete, the asset is handed over to the Province who would then contract with an operations and maintenance contractor to perform those functions for the project. Rehabilitation is designed and funded by the Province and contracted when the work is required.

As separate parties are responsible for the construction and the ongoing maintenance of the project, life cycle innovation is potentially not optimized nor is any long-term risk of the design and construction quality transferred.

Design Build Finance Operate (DBFO)

In a DBFO agreement, the private partner accepts responsibility for arranging design, project financing and for carrying the costs of construction, operations and maintenance during the term of the agreement. The contractor typically receives compensation through a performance-based payment mechanism which may involve payments for road availability, safety, congestion management and other independent measures. The payment mechanism allows the application of penalties for non-performance during both the construction and operations phases. The penalties vary in severity depending on the type of non-performance.

In the case of the Port Mann/Highway 1 Improvement Project, the risk associated with the revenue stream from the collection of a toll led to the consideration of a variation of the DBFO arrangement. Like other DBFO arrangements, the private partner would be required to design, build, finance, operate, maintain and rehabilitate the corridor over the life of the agreement. However, once the Project had been substantially completed, instead of receiving compensation through a performance-based payment mechanism, the private partner would receive compensation through levying government regulated tolls on road users and would therefore assume the risk associated with this revenue stream. Thus, the private partner would bear the full cost of the Project regardless of whether or not the forecasted traffic volumes materialized. This approach would still include the ability to impose penalties for non-performance.

Recommended Procurement Model

The procurement options analysis identified the variation of the DBFO as the preferred procurement delivery model. This variation included the requirement that the private partner only apply tolls within the tolling framework set and regulated by the Province.

In addition, if actual revenue from the tolls exceeded expectations, a revenue sharing mechanism would have been applied to protect the public interest and allow for a reasonable rate of return for the private partner. Performance incentives were also included to ensure the private partner effectively managed the entire corridor.

At the time of approval, the DBFO model was considered to be the most effective procurement model to achieve the procurement objectives and the Port Mann/Highway 1 Improvement Project goals, while delivering strong value for taxpayers' dollars by transferring risks ranging from construction to traffic volumes.

4. Competitive Selection Process

Once the preferred procurement model was determined, a competitive selection process for the Project was designed that would be transparent, fair, encourage competition, and allow the selection of an industry partner that would best support the Province's objectives and achieve value for taxpayers.

The Ministry of Transportation and Infrastructure engaged Partnerships BC to manage the competitive selection process. The competitive selection process included two stages based on a Request for Qualifications (RFQ) and a Request for Proposals (RFP). The Project RFQ was marketed provincially, nationally and internationally resulting in submissions from six respondents. From the respondents, the three most qualified teams that had demonstrated their capability to successfully design, build, finance, operate and maintain the Port Mann/Highway 1 improvements, were invited to submit proposals for delivery of the Project. The three proponents announced in August 2007 included:

- Connect BC Development Group:
 - The Macquarie Group (Macquarie Bank Limited, Macquarie Infrastructure Group and Macquarie Infrastructure Partners)
 - Transtoll Inc.
- Gateway Mobility Partners:
 - Cintra (Concesiones de Infraestructuras de Transporte) S.A.
 - Skanska Infrastructure Development, AB
- Highway 1 Transportation Group:
 - Bilfinger Berger Group
 - Transurban Group

The RFP encouraged the proponents to innovate and provide their own design solutions as long as the performance standards set for the Project could be met or exceeded. For example, proponents had the opportunity to determine whether to retain the existing bridge and provide a second bridge to meet capacity requirements, or to provide a new bridge that would carry all of the traffic.

The RFP was based on an interactive approach that included extensive technical and commercial in-confidence workshops and topic meetings. These sessions were intended to address and work through any project-specific issues identified.

Evaluation of the RFP submittals was undertaken by an evaluation team comprised of leading experts in key areas, including:

- Highway safety;
- Construction traffic management;
- Highway design and construction;
- Finance;
- Environmental management; and
- Engineering.

The responses to the RFP were received in two submissions. A technical submittal, which was evaluated to ensure that the design, construction, maintenance and operations proposed by each proponent would meet the requirements of the RFP. Subsequently the final submittal, which addressed pricing and financing requirements, was provided a short time following the completion of the evaluation of the technical submittal. After completion of the evaluation, and according to the criteria and procedures as set out in the RFP, the Connect BC Development Group was selected as the preferred proponent in August 2008. An agreement-in-principle was then reached in January 2009.

The table below summarizes the competitive selection process timeline.

| PROCUREMENT STAGE | TIMING | OUTCOME: |
|----------------------------------|---|--|
| Request for Qualifications | May 22, 2007 to June 15, 2007 | The project was marketed locally, provincially and nationally. Submissions from six respondents were evaluated and a shortlist of three teams was announced August 7, 2007 <ul style="list-style-type: none"> • Connect BC Development Group • Gateway Mobility Partners • Highway 1 Transportation Group |
| Request for Proposals | Issued August 7, 2007 <ul style="list-style-type: none"> • Technical Submittals – February 29, 2008 • Final Submittals – May 30, 2008 | The three shortlisted teams submitted proposals. This stage included extensive workshops and topic meetings. |
| Selection of Preferred Proponent | August 19, 2008 | After evaluation of the proposals, Connect BC Development Group was selected as the preferred proponent. |
| Agreement-in-Principle | January 28, 2009 | The parties agree to work to finalize terms of the agreement. |
| Negotiations impasse | February 27, 2009 | An agreement could not be reached, and the Province announces plans to proceed with the project using traditional financing. |
| Design-Build Agreement | March 17, 2009 | The Province enters a fixed-price, design-build agreement with Kiewit/Flatiron General Partnership to design and build the Project. |

Fairness Reviewer

A Fairness Reviewer, Jane S. Shackell, QC, monitored the competitive selection process and completed four fairness reports at key points during the procurement process.

The Fairness Reviewer concluded that the evaluation and selection process was implemented impartially, fairly and without bias or discrimination.

Agreement-in-Principle

On January 28, 2009, the Province entered into an agreement-in-principle with Connect BC Development Group. The agreement specified broad terms of a DBFO agreement to guide further negotiations. Due to the international economic crisis, the agreement-in-principle also specified the Province's commitment to provide about one-third of the financing required for the Project, standing behind a significant equity investment from the private sector partner, and on the same terms and conditions as the banks providing debt financing.

Decision to Proceed Using a Design-Build Agreement

Following the agreement-in-principle, several weeks of comprehensive negotiations took place. However, the Province and the preferred proponent were unable to reach a mutually satisfactory agreement and on February 24, 2009, negotiations were concluded. The inability of the parties to reach an agreement reflected the challenging and unprecedented economic and financial market environment at the time. Despite the significant commitments of debt and equity capital to the Project, and the strength of the consortium partners, Partnerships BC ultimately recommended that the Province not proceed. The Province and Connect BC Development Group mutually agreed to end the DBFO procurement process.

The competitive selection process was designed to allow for an agreement with individual proponent team member(s) in the event an agreement could not be reached with a proponent. The Province

determined that the DB agreement proposed by Kiewit/Flatiron in the Connect BC Development Group proposal provided the best value. On February 27, 2009, the Province announced it would enter into a fixed-price contract with Kiewit/Flatiron General Partnership, to design and build the new, 10-lane Port Mann Bridge and Highway 1 improvements.

On this basis, the Province was able to incorporate many of the benefits of the DBFO procurement process that had been realized to date, including the innovation of the single bridge, and transferring the risk of cost overruns and schedule delays to the contractor.



Completed sections of the new bridge deck and the gantry crane. The new Port Mann Bridge will be operational by December 2012.

5. Final Design Build Agreement

On March 17, 2009, the Province entered into a fixed-price, design-build agreement with Kiewit/Flatiron General Partnership. The Kiewit/Flatiron proposal went through a rigorous, competitive process as part of the original RFP for the Port Mann/Highway 1 Improvement Project, where it formed the design-build portion of the bid submitted by the Connect BC Development Group.

Innovations/Benefits Gained from the DBFO Process

Significant innovative approaches to the final DB agreement and associated benefits were achieved as a result of undertaking a DBFO competitive selection process. These include:

- **Competition and innovation:** The competitive nature of the bidding process encouraged the proponent teams to develop innovative solutions in all aspects of the Project from design, construction and through to operations. In this case, the Connect BC Development Group proposed an innovative single-bridge design which included the demolition of the existing bridge. The single-bridge design was based on their assessment that over the term of the agreement, this approach would be the most cost-effective. This formed a key component of the final DB agreement with Kiewit/Flatiron.
- **Schedule and cost certainty:** The risks of cost and schedule overruns are transferred to the DB contractor, thereby providing a financial incentive to complete the Project on time and on budget.
- **Integration:** One of the benefits of the DBFO delivery model is the integration of design, construction, long-term maintenance and rehabilitation of the Project into one agreement, with a single point of accountability and responsibility for those functions transferred to the private partner. Although the DBFO agreement was not concluded, the final DB agreement with Kiewit/Flatiron incorporates this whole Project life cycle approach taken by the Connect BC Development Group, and includes optimized design and traffic management solutions that may not have otherwise been considered.

Profile of the DB Partner

Kiewit/Flatiron General Partnership is a joint venture between Peter Kiewit Sons Co. and Flatiron Constructors Canada Limited.

Members of the Kiewit/Flatiron General Partnership are:

- **Peter Kiewit Sons Co.:** Since establishing its presence in British Columbia in the early 1940s, Peter Kiewit Sons Co. has been a leading heavy construction contractor, earning the reputation for successfully delivering some of the largest and most challenging projects in the province on time and within budget. The Kiewit group of companies is among North America's largest and most successful contractors.
- **Flatiron:** Flatiron, established in 1947, is a subsidiary of Hochtief Aktiengesellschaft, a leading provider of international construction related services, and is consistently ranked among the continent's top builders, providing quality and ingenuity in transportation and civil construction.
- **H5M:** A design joint venture between Hatch Mott Macdonald Ltd. and MMM Group Ltd., will lead the on-shore design services for the Project.
- **TY Lin International:** With extensive experience in cable-stayed bridge design, TY Lin International will lead the design team for the new Port Mann Bridge crossing.

Key Terms of the DB Agreement

Final Design-Build Costs

The total design and construction cost associated with the fixed-price, design-build agreement with Kiewit/Flatiron General Partnership to design and build the new, 10-lane Port Mann Bridge and Highway 1 improvements is \$2.46 billion.

Scope of the DB Agreement: Design and Key Features

Kiewit/Flatiron is responsible for the following aspects of the design and construction of the Port Mann/Highway 1 Improvement Project:

- **Widening of Highway 1:** Widening of 37 kilometres of Highway 1 from the McGill Street Interchange in Vancouver to 216th Street in Langley.
 - West of the Port Mann Bridge – one additional general purpose lane will be added in each direction (total of three general purpose and 1 HOV lane in each direction to Grandview Highway and two general purpose and one HOV lane in each direction to McGill Street when completed).
 - East of the Port Mann Bridge – two additional lanes in each direction will be built to 200th Street, providing one new HOV lane in each direction (total of four lanes in each direction). Between 200th Street and 216th Street, one additional general purpose lane is planned in each direction (total of three lanes in each direction).
- **Upgrading interchanges and improving access and safety, including transit and commercial vehicle priority access:**
 - Sixteen new structures will be constructed or rebuilt at the Cape Horn interchange;
 - Seven Highway 1 overpasses are being widened (First Avenue, Lougheed Highway, BNSF Railway near Boundary Road and BNSF Railway near Cariboo Road, Boundary Road, Brunette River and North Road);
 - Nine Highway 1 interchanges are being replaced (Willingdon Avenue, Sprott Street, Kensington Avenue, Gaglardi Way, Cariboo Road, King Edward Street, 152nd Street, 160th Street and 176th Street); and
- New special purpose ramps at four locations:
 - HOV ramps at Grandview Highway (Vancouver);
 - Transit-only ramps at Government Street to connect to the Lougheed Town Centre Station (Burnaby);
 - Truck-only ramps to United Boulevard/Pacific Reach (Coquitlam); and
 - Transit/HOV ramps at 156th Street (Surrey)
- **New Port Mann Bridge:** A new, 10-lane bridge with a capacity of five tolled lanes of traffic in each direction and the ability to accommodate light rail rapid transit in the future. The new crossing will be 2.03 kilometres long, 50 metres wide (roadway only) and will have a minimum of 40 metres of clearance above the high water level. The new bridge will have three components:
 - A cable-stayed main bridge across the Fraser River (850 metres);
 - South approach, Surrey (360 metres); and
 - North approach, Coquitlam (820 metres).
- **Cycling and pedestrian access:** Cycling and pedestrian measures will be incorporated into all new structures where they connect to existing or planned infrastructure.

WHY A NEW, SINGLE BRIDGE DESIGN?

- Significant rehabilitation required for the old bridge
- Overall lower life cycle cost
- Greater efficiency and traffic safety through the use of through-lanes and local-connection lanes between Surrey and Coquitlam

Performance-based Principles

The DB agreement entered into with Kiewit/Flatiron protects the public interest by specifying performance standards, and providing completion incentives and penalties based on performance.

Key terms of the agreement include:

- Significant liquidated damages for late completion;
- Penalties to be applied for:
 - Non-adherence to the traffic management plan set out in the agreement;
 - Non-compliance measured against delivery of all contractual requirements; and
 - Unsatisfactory quality management performance.
- Requirement to participate in an interface agreement between the DB contractor, the tolling contractor and operations and maintenance contractor. This agreement requires the direct cooperation between all parties to jointly manage the construction interfaces with the Province providing oversight associated with these interfaces.

Risk Allocation Summary

Throughout the competitive selection process, the Province allocated risks according to which party would be best able to effectively manage those risks. For example, the DB partner is responsible for risks associated with design and construction, utilities, traffic management, environmental management and quality assurance. The Province is responsible for risks related to property acquisition and some off-corridor environmental work. There are also risks that are shared between the two parties, including events such as earthquakes and floods.

Due to increased economic and financial market instability after procurement commenced, the Province made the decision to cease negotiations and proceed with the DB agreement. As a result of proceeding with a DB agreement rather than a DBFO, some risks that were originally transferred to the private partner were retained by the Province. These include: risks related to tolling revenue, toll collection and the tolling system. The Province also retained responsibility for operations, maintenance and rehabilitation for the Project.

However, the risk transfer associated with the DB agreement for the Project is an enhancement to the historic approach to DB agreements because it transfers risks in a manner consistent with typical DBFO agreements. For example, the majority of the construction schedule and construction cost risk remained the responsibility of the DB partner.

The DB agreement has been structured to pay the DB partner through construction milestones based on progress of the work, and the Province has capped its annual expenditure exposure by having maximum annual payment amounts.

Construction Schedule

Kiewit/Flatiron is responsible for meeting the following construction schedule:

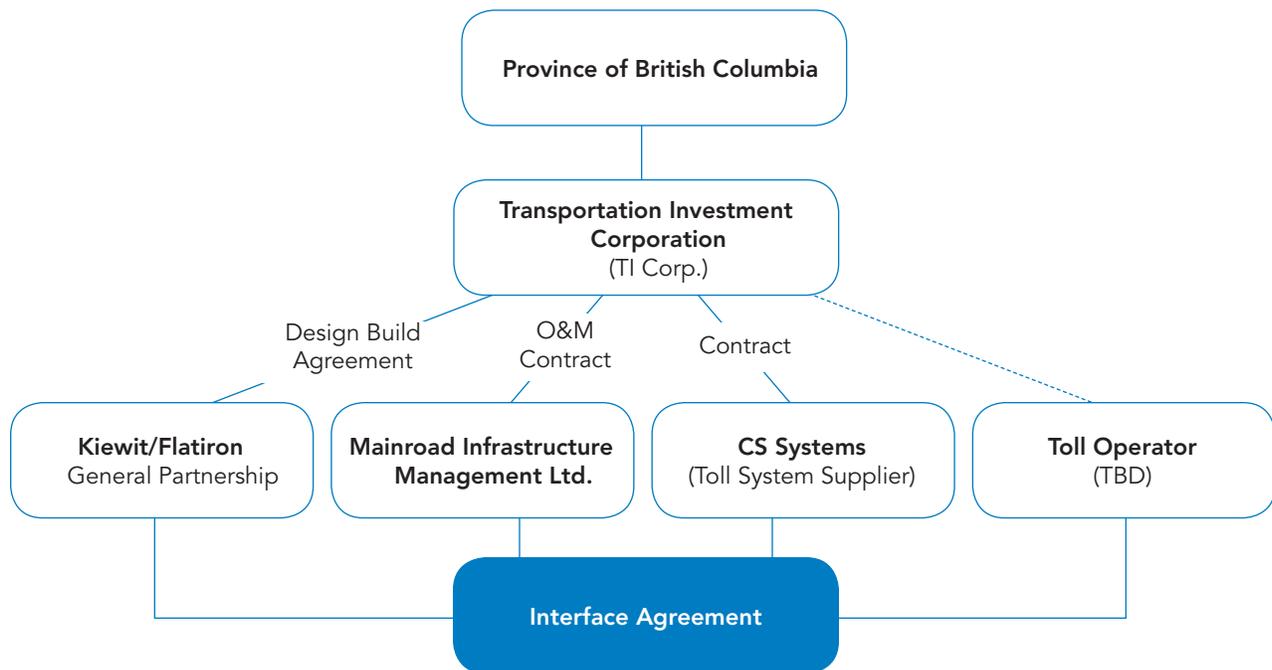
| MILESTONES | DATE |
|---|---------------|
| Construction start | March 2009 |
| New Port Mann crossing opens with eight lanes and tolling begins (will provide all movements to and from the bridge that are currently available) | December 2012 |
| Substantial completion | December 2013 |
| Final completion including removal of existing bridge | December 2014 |

6. Final Project Structure

While maintaining government oversight, the Transportation Investment Corporation (TI Corp) will manage all components of project delivery, including design, construction, financing and operations. TI Corp will act as the authority and concessionaire for the Project and will be in charge of overseeing the implementation of the Project. The final DB agreement is a contractual arrangement between Kiewit/Flatiron General Partnership and TI Corp that spans from March 2009 (when the agreement was signed) to December 2014 when final construction is completed and the old bridge is removed. Kiewit/Flatiron is responsible for the design and construction of the Port Mann/Highway 1 Improvement Project as outlined in the DB agreement. In addition to the scope provided under the DB agreement with Kiewit/Flatiron, TI Corp is also responsible for the provision and consideration of additional improvements throughout the Project's corridor to be completed when warranted by traffic volumes.

TI Corp will be responsible for operations, maintenance and the tolling infrastructure related to the Project through separate agreements.

The organization chart below depicts the overall project structure, including the relationship between the signatories to the final DB agreement.



Project Financing

TI Corp will finance the Project by borrowing money from the Province using fiscal agency loans. The interest rate to be paid by TI Corp on the fiscal agency loans is a flow-through of the Province's cost of funding.

Tolling, Operations and Maintenance

TI Corp will be responsible for procuring and managing the following contracts:

- **Routine operations and maintenance during construction:** Routine operations and maintenance during the construction period are performed by Mainroad Infrastructure Maintenance Ltd.
- **Routine operations and maintenance after construction:** The operator will manage the operations and maintenance of the Port Mann/Highway 1 Improvement Project once construction is complete. The operator will be determined by TI Corp in the future through a competitive procurement process.
- **Tolling contractor:** The tolling contractor will collect tolls and manage tolling operations on the new Port Mann Bridge. The tolling contractor will be determined by TI Corp in the future. This approach ensures that the readiness date for tolling implementation remains on schedule while providing time to confirm and finalize tolling system and business rules. TI Corp intends to proceed with a competitive selection process in 2011.

Additional Design and Construction Scope

The agreement between the Province and TI Corp includes consideration of additional design and construction scope not included in the DB agreement with Kiewit/Flatiron. This contemplated scope will be considered further as traffic demand increases and the additional capital expenditures are warranted. The additional scope includes:

- Construction of auxiliary lanes between Grandview Highway and Douglas Street as traffic warrants;
- Further reconstruction of the Brunette Avenue interchange above the interim safety and efficiency improvements that are included in the DB agreement. The scope of the reconstruction will be influenced by future transportation plans currently under consideration by others;
- 192nd Street interchange improvements; and
- Construction of the 216th Street interchange once agreements are reached with the local municipality.

Accounting Treatment

B.C.'s Office of the Comptroller General, responsible for the overall quality and integrity of the government's financial management and control systems, has established accounting guidelines for major capital projects. The total cost of the Project including design and construction of the full project scope, operations, maintenance and interest during construction, for accounting purposes is \$3.3 billion.

7. Ongoing Design Build Agreement Monitoring

Under the DB agreement, Kiewit/Flatiron is required to register for, and maintain the standards of, the ISO 9001:2000 program, a program that focuses on maintaining established quality management standards.

The DB agreement also includes checks and public interest safeguards to ensure project delivery, performance and high quality standards. Close monitoring spans the design and construction phases of the Project and includes, but is not limited to, the elements described below.

Self-Monitoring

Kiewit/Flatiron is required to prepare monthly quality management reports, undertake internal and external audits, and host bi-annual quality management committee meetings throughout the term of the agreement.

TI Corp will also be provided with open access to the following:

- Bi-annual Quality Management Committee Meetings,
- Regular Quality Task Force Meetings,
- Work plans, and
- Project Quality Manager's Monthly Quality Report.

Monitoring by TI Corp

During the construction phase, TI Corp will provide oversight and management of Kiewit/Flatiron activities throughout the term of the agreement.

Elements of this function will include:

- Process monitoring and quality surveillance;
- Independent structural engineering review of the new Port Mann Bridge design and construction;
- Independent structural engineering review of the on-shore structures; and
- Review of the monthly progress reports submitted by Kiewit/Flatiron to ensure they accurately reflect the work completed.

An independent certifier will monitor and report on the construction progress to ensure that Kiewit/Flatiron has met the obligations as set out in the DB agreement to reach both substantial completion and final completion.

SCOPE OF WORK SUMMARY

On-shore

- Highway 1 Widening – 37 kilometers
- Earthworks – 3.1 million m³
- Structures – 30 new, 6 rehabilitated
- Retaining walls – 100 m²

New Port Mann Bridge

- New 10 lane, 850 m cable-stayed bridge crossing the Fraser River
 - Structural Steel – 12,000 tonnes
 - Concrete – 157,000 m³
- Approaches – 1170 m
- 288 cables, 251 piles, 108 caissons
- 2 pylon towers, each 158 m high
- Dedicated pedestrian and cycling facilities



partnerships
British Columbia
www.partnershipsbc.ca