NORTH COMMUTER PARKWAY & TRAFFIC BRIDGE REPLACEMENT PROJECT, SASKATOON

SASKATOON'S P3 BRIDGES AND PARKWAY HONOUR ITS PAST

THE CANADIAN COUNCIL FOR PUBLIC-PRIVATE PARTNERSHIPS
2018 NATIONAL AWARD CASE STUDY

The Canadian Council for Public-Private Partnerships

Le Conseil Canadien pour les Partenariats Public-Privé

The Canadian Council for Public-Private Partnerships 2018 National Award Case Studies

Gold Award for Infrastructure: North Commuter Parkway & Traffic Bridge Replacement Project, Saskatoon

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Introduction

For nearly 30 years, The Canadian Council for Public-Private Partnerships and its almost 400 members from both the public and private sectors have played a strong role in refining the P3 model and promoting new approaches to public infrastructure development and service delivery.

Governments across Canada are using the public-partnership (P3) model to build, maintain and operate much-needed infrastructure, from schools and hospitals to bridges and highways — and new projects and new jurisdictions, such as Newfoundland and Labrador, Nova Scotia, Northwest Territories, and several Indigenous communities are becoming involved.

In 2019, there are more than 280 active P3 projects in operation or under construction valued at $136.6 billion.[1] And a majority of Canadians (64 per cent) remain supportive of the P3 model to build much-needed infrastructure.[2]

Along the way, the 'made-in-Canada' P3 model has become globally renowned but, as the winners of the 2018 National Awards for Innovation and Excellence in Public-Private Partnerships demonstrate, it has never stopped evolving.

This year, CCPPP is publishing three case studies on these exemplary projects, joining the more than 70 that have been published to date. Designed to inspire others to consider innovative and efficient models for procuring public infrastructure, the studies highlight many of the lessons learned about P3s. Each case provides a close look at how a successful P3 has worked, including how the partnership was established, its structure and operation and its resulting benefits.

It is important to learn from these complex projects as we move forward. After all, investment in infrastructure is critical for the future of our communities and country because it creates jobs, drives growth, stimulates productivity, and builds a legacy for us to thrive.

For the past decade or so, Canada has been involved in what some have called 'a golden age of infrastructure development,' which the use of P3s and a stable pipeline of projects have helped make possible. But we still have a national infrastructure deficit estimated at anywhere from $50 billion[3] to as high as $1 trillion.[4]

The federal government is working to address this gap with its Investing in Canada plan, which will spend more than $180 billion by 2028 to support infrastructure projects in provinces, territories, municipalities, and Indigenous communities. The plan includes the Canada Infrastructure Bank, which has $35-billion available to partner with private investors and provinces, territories, municipalities and Indigenous communities to build more much-needed infrastructure. Several provinces are also stepping up with record levels of investment, including Ontario, and are once again leading in P3 projects coming to market.

It is important to keep in mind that Canadians want —and expect — critical infrastructure to be built quickly and with the best value for taxpayers. Using public-private partnerships is an advantage given their fixed price, on-time private sector delivery commitment, risk allocation and improved life cycle maintenance and operations.

In 1998, CCPPP established the National Awards for Innovation and Excellence in Public-Private Partnerships to honour governments and/or public institutions and their private sector partners who have demonstrated excellence and innovation in P3s. Gold, silver and bronze Awards of Merit are given in the areas of project development, financing, infrastructure, service delivery or other notable attributes to projects from across the country and at all levels of government.

Winning projects are chosen on the basis of the following criteria:

- Innovative features;
- Relevance or significance as a national and/or international model;
- Economic benefit (job creation, enhanced economic value, export potential, etc.);
- Measurable enhancement of quality and excellence of service or project;
- Appropriate allocation of risks, responsibilities and returns between partners; and
- Effective use of financing and/or use of non-traditional sources of revenue.

[1] P3 SPECTRUM, www.p3spectrum.ca, accessed March 25, 2019.

[2] Nanos research survey, www.pppcouncil.ca/web/pdf/nanos_infrastructure_survey_102018.pdf, p.4.

[3] The Government of Canada, Investing in Canada Plan, (April 2018) http://publications.gc.ca/collections/collection_2018/infc/T94-9-2018-eng.pdf p. 11. Accessed March 26, 2019.

[4] The Globe and Mail (December 13, 2017) www.theglobeandmail.com/report-on-business/time-and-money-lost-to-canadas-infrastructure-gap-a-tremendous-loss/article37302054/

2018 Award Winners

Fort McMurray West 500-kV Transmission Project — Gold Award for Project Financing

This vital power project, stretching 500 kilometres northeast from Edmonton, will increase the capacity and overall reliability of Alberta's transmission system in order to meet booming demand in the Fort McMurray area. This is also the first transmission infrastructure P3 to be procured in Canada.

The awards committee commended the project's use of a "unique funding competition that took place after the route for the transmission line was finalized and regulatory approval had been granted, resulting in significant savings for the public." At the time of award, the cost savings were estimated to be more than $400 million — approximately 25 per cent of total capital costs.

The City of Saskatoon's North Commuter Parkway & Traffic Bridge Project — Gold Award for Infrastructure

When Saskatoon residents and civil and Indigenous leaders came together to celebrate the official opening in the fall of 2018, it was clear this project was about more than improved infrastructure and reduced commutes. It was also building a more inclusive community.

The new six-lane bridge on the Parkway pays tribute to Chief Mistawasis, the Cree Chief who signed Treaty 6, while the modern steel-truss structure of the rebuilt Traffic Bridge uses complex engineering to preserve its historical character while meeting today's safety standards.

The project is the largest infrastructure project ever delivered in the City of Saskatoon and the first bundled transportation P3 in Canada. The project's cost savings by using the P3 delivery model are estimated at $69.4 million, compared to conventional project procurement.

Quad at York University — Silver Award for Service Delivery

Every student knows how important it is to be close to campus to optimize time for classes, research and studying. In August 2017, York University opened the first phase of the Quad, offering much-needed apartment-style accommodations for more than 800 students in Toronto.

The project is among the largest student housing P3 endeavours ever undertaken in Canada and uses a model that freed York from risks associated with capital costs, operations and maintenance, enabling the university to focus its resources on its academic mission.

Milton District Hospital Expansion — Silver Award for Infrastructure

As one of Canada's fastest growing communities, Milton needed to improve and expand its hospital — and fast. Opened in October 2017, the 455,000-sq. foot facility means residents of all ages and abilities can stay close to home and access a wide range of health-care services.

The expansion, designed with community, staff and patient input, was delivered on time and on budget in just 25 months and took place without disrupting essential and lifesaving clinical services at the existing hospital building. The project, which employed 600 workers at its construction peak and created 200 new jobs within the hospital, transferred significant risk to the private sector partner and resulted in projected cost savings of $124.9 million.

Finch West LRT Project — Silver Award for Project Financing

Under construction in northwestern Toronto, the 11-kilometre light-rail system is an Ontario government priority to transform the busy Finch Avenue West corridor. The LRT is expected to open in 2023.

The $1.4-billion Finch West LRT project utilized more than $800 million in private financing consisting of short-term bank financing combined with a cost efficient combination of medium- and long-term bonds. The project reached financial close in an "impressive" 26 days, the awards committee noted. Importantly for an LRT project, the financing structure was also designed to accommodate future system expansion. Overall, the P3 project has an estimated cost savings of $566 million via the alternative financing and procurement model.

Acknowledgements

CCPPP has a team of dedicated Award selection committee volunteers who review the applications, select the winners and provide feedback on the case studies. Using their extensive P3 knowledge and experience, they select the winners from a pool of very qualified applications and then ensure the case studies provide a learning tool for seasoned practitioners, as well as those new to the P3 model. The following panelists comprised the 2018 selection committee:

- Cliff Inskip, Chair of the Awards Selection Committee and President, Polar Star Advisory Services Inc.
- Shariq Alvi, Managing Director, Infrastructure and Project Finance, CIBC
- Rupesh Amin, Managing Partner, Infrastructure & Development, Forum Equity Partners
- Peter Hepburn, Managing Director and Head, Infrastructure and Project Finance, National Bank Financial Markets
- Alain Massicotte, Partner, Blake Cassels and Graydon LLP
- Johanne Mullen, Partner and Leader, Canadian Infrastructure and Project Finance Group, PricewaterhouseCoopers LLP
- Dr. Alan Russell, Professor & Chair, Computer Integrated Design & Construction, Department of Civil Engineering, University of British Columbia
- Godyne Sibay, Partner, Real Property and Planning Group, McCarthy Tétrault LLP
- Lindsay Wright, Manager, Global Infrastructure, KPMG LLP

Deborah Reid authored the 2018 Award Case Studies and we thank her for bringing the essence of these award-winning projects to life. The case studies are developed with significant input and review from the project partners and procurement agencies as well as the diligent work of the researchers. CCPPP would like to thank them for their contributions as well as Infrastructure Canada for its research support for the case studies.

Infrastructure Canada

The Awards are made possible by the generous support of the following 2018 sponsors:

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About CCPPP

Established in 1993, CCPPP is a national not-for-profit non-partisan, member-based organization with broad representation from across the public and private sectors. Our mission is to collaborate with all levels of government and Indigenous communities to enable smart, innovative approaches to public infrastructure development and service delivery that achieve the best outcomes for Canadians. The Council is a proponent of evidence-based public policy in support of P3s, facilitates the adoption of international best practices, and educates stakeholders and the community on the economic and social benefits of public-private partnerships.

Our reports, case studies, guidance and surveys are available on CCPPP's online bookstore at www.pppcouncil.ca/web/bookstore.

Additional resources include: P3 SPECTRUM (www.p3spectrum.ca), Canada's premier source for up-to-date P3 project info.

Quick Facts – North Commuter Parkway & Traffic Bridge Replacement Project[5]

Project type

Design-Build-Finance-Operate-Maintain (DBFOM)

Asset/Service

33-year DBFOM performance and availability agreement comprising two bundled transportation projects:

1. North Commuter Parkway
   - 8.3 kilometres (km) of new arterial roads
   - Chief Mistawasis Bridge (300 metres (m))– a new six-lane river crossing
2. Traffic Bridge (231 m) – replacement of an existing four-span, 294 m, 109-year-old truss bridge.

Construction period:

- 3 years

Operations and maintenance (O&M) period:

- 30 years

Status

Operational as of October 2, 2018

Partners

Public Sector

- City of Saskatoon (the City or Saskatoon)

Private Sector

- Graham Commuter Partners General Partnership (GCP)

Other participants

City Participants

- Associated Engineering Group Ltd. – Technical Advisor
- Blake, Cassels & Graydon LLP – Legal Advisor
- BTY Consultancy Group Inc. – Technical Advisor
- CIMA+ Canada Inc. –Technical Advisor
- Collings Johnston Inc. – Technical Advisor
- Golder Associates Ltd. – Geotechnical Lead
- JD Campbell & Associates – Fairness Advisor
- KPMG LLP – Financial and Business Advisor
- MHPM Project Managers Inc. – Technical Advisor
- Northwest Hydraulic Consultants Ltd. – Technical Advisor
- Opus International Consultants (Canada) Limited – Technical Advisor
- Patching Associates Acoustical Engineering Ltd. – Technical Advisor
- Stantec Consulting Ltd. – Technical Advisor
- Zacaruk Consulting Inc. – Technical Advisor

GCP Participants

- Altus Group Limited – Lenders' Technical Advisor
- Applied Research Associates Inc. (ARA) – Asphalt/Pavement Advisor
- ASL Paving Ltd. – O&M Lead
- BDO UK LLP – Financial Model Auditor
- Bilfinger RE Asset Management North America Inc. – OM&R Advisor
- Clifton Associates Ltd. – Geotechnical Design Lead
- COWI Bridge North America – Bridge Design Lead
- DLA Piper – Lenders' Legal Advisor
- Ernst & Young LLP – Tax Advisor
- Graham Infrastructure LP – Design Builder
- Intech Risk Management GmbH – Insurance Advisor
- McMillan LLP – Legal Advisor
- National Bank Financial – Financial Advisor
- Steer Davies Gleave – Traffic Advisor
- Tetra Tech – Roadway Design Lead

[5] Background and facts in this case study rely on the information contained in the award application submitted jointly by the project partners in September 2018 to The Canadian Council for Public-Private Partnerships. Information from the submission has been supplemented and updated with information from the procurement documents, the project agreement, the project report, other sources as noted and personal interviews with project partner representatives.

Project cost, financing and value for money

Total project cost (present value dollars)

- $293.4 million net present value (NPV)[6]

Debt and Equity (nominal dollars)

- $201 million – GCP
  - $13 million equity
  - $91 million short-term bank debt
  - $97 million long-term private placement amortizing bonds

Payments (nominal dollars)

- Substantial completion payment of $108.7 million
- Monthly service payments totaling $258.9 million with deductions for performance and availability failures (includes repayment of Capital and indexed Operating, Maintenance and Rehabilitation)

Government Contributions (nominal dollars)

- $57.675 million – Government of Canada (P3 Canada Fund)
- $50 million – Government of Saskatchewan

Value for money (present value dollars)

- $69.4 million (19.1%) NPV

Project highlights and innovative features

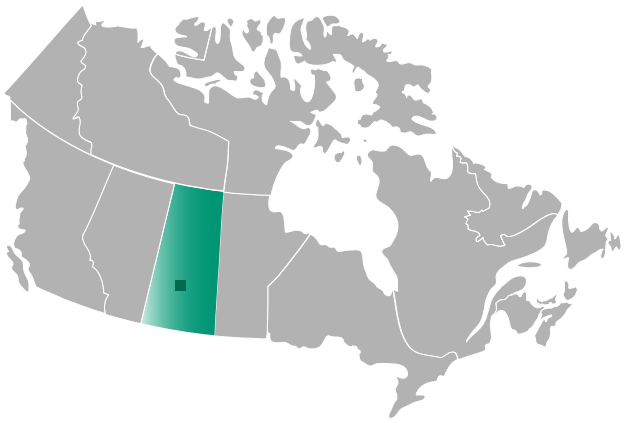
- This is the City's largest ever infrastructure project and its first P3 transportation project; it is also the first P3 transportation contract in Canada with two bundled projects.
- Construction planning was constrained by Saskatoon's cold winters and in-water work windows for the two river crossings across the South Saskatchewan River, which is designated as a navigable waterway.
- Project design incorporated multi-use trails and cycle paths, pedestrian sidewalks, small animal below grade crossings in environmentally sensitive areas and a drainage system to accommodate low-lying areas and ensure no net change in wetlands.
- The North Commuter Parkway road alignment had to avoid a Paleolithic site and had limited access points for construction.
- Naming of the Chief Mistawasis Bridge was a journey for residents toward living up to the calls to action of the Truth and Reconciliation Commission of Canada.
- The design of the Traffic Bridge is unique in this age, as it retains elements of its original century-old design while meeting modern engineering standards.

Project websites

www.saskatoon.ca/business-development/major-projects/current-projects/north-commuter-parkway-traffic-bridge-replacement-project

grahamcommuterpartners.ca

[6] Net present value of contract price to base date of August 20, 2015 using a discount rate of 4.7 per cent.



Overview

Saskatoon, located in the Canadian province of Saskatchewan, is commonly called "the city of bridges" because of its eight bridges that span the South Saskatchewan River. These are a vital part of the fabric of the community, and of the history of Saskatoon.

Three bridges completed in the early 1900s helped make Saskatoon the central economic hub of the province. Two were railway bridges and the third, known as the Traffic Bridge, was for pedestrians and vehicles.

By 2016, Saskatoon's population had grown to 246,376.[7] Saskatoon is reported to be one of the fastest growing cities in Canada and is expected to continue its rapid growth in the future.

On August 24, 2010 the Traffic Bridge, which served the downtown core for over a century, was closed because of advanced deterioration of critical structural elements. Following extensive public consultations and a Needs Assessment and Functional Planning Study[8], city council decided to replace the century-old Traffic Bridge with a modern steel truss bridge to accommodate pedestrians, vehicles and cyclists.

Although the new Traffic Bridge would help relieve the congestion on other bridges leading to the downtown core, city council realized it wouldn't be enough. The northern part of the City was growing rapidly and commuters were demanding congestion relief on other roads and bridges. In response, city council prepared and, in June 2012, adopted an Integrated Growth Plan identifying the need for a new commuter parkway along the east side of the City with a bridge crossing at the northern end.

After assessing procurement options for both projects, city council bundled them into one project that would be procured using a single public-private partnership (P3) contract. City council sought funding from the P3 Canada Fund and the project was approved for a contribution of up to 25 per cent of eligible costs. Funding also came from the Government of Saskatchewan and from the City.

Using a design-build-finance-operate-maintain (DBFOM) procurement process, the P3 contract was awarded to Graham Commuter Partners General Partnership (GCP) in September 2015 at a total project cost of $293.4 million NPV. Both project components opened to traffic on time and on budget on October 2, 2018.

This is the City's largest-ever infrastructure project and its first P3 transportation project. It is also the first P3 transportation contract in Canada with two bundled projects.

The project won gold for infrastructure in the 2018 National Awards for Innovation and Excellence in Public-Private Partnerships, presented by The Canadian Council for Public-Private Partnerships.

This case study will highlight the design and construction features that made the project an innovative and successful P3 and will share the experiences and lessons learned to benefit future P3 municipal transportation projects.

Figure 1 shows the location of the project.

Background and rationale

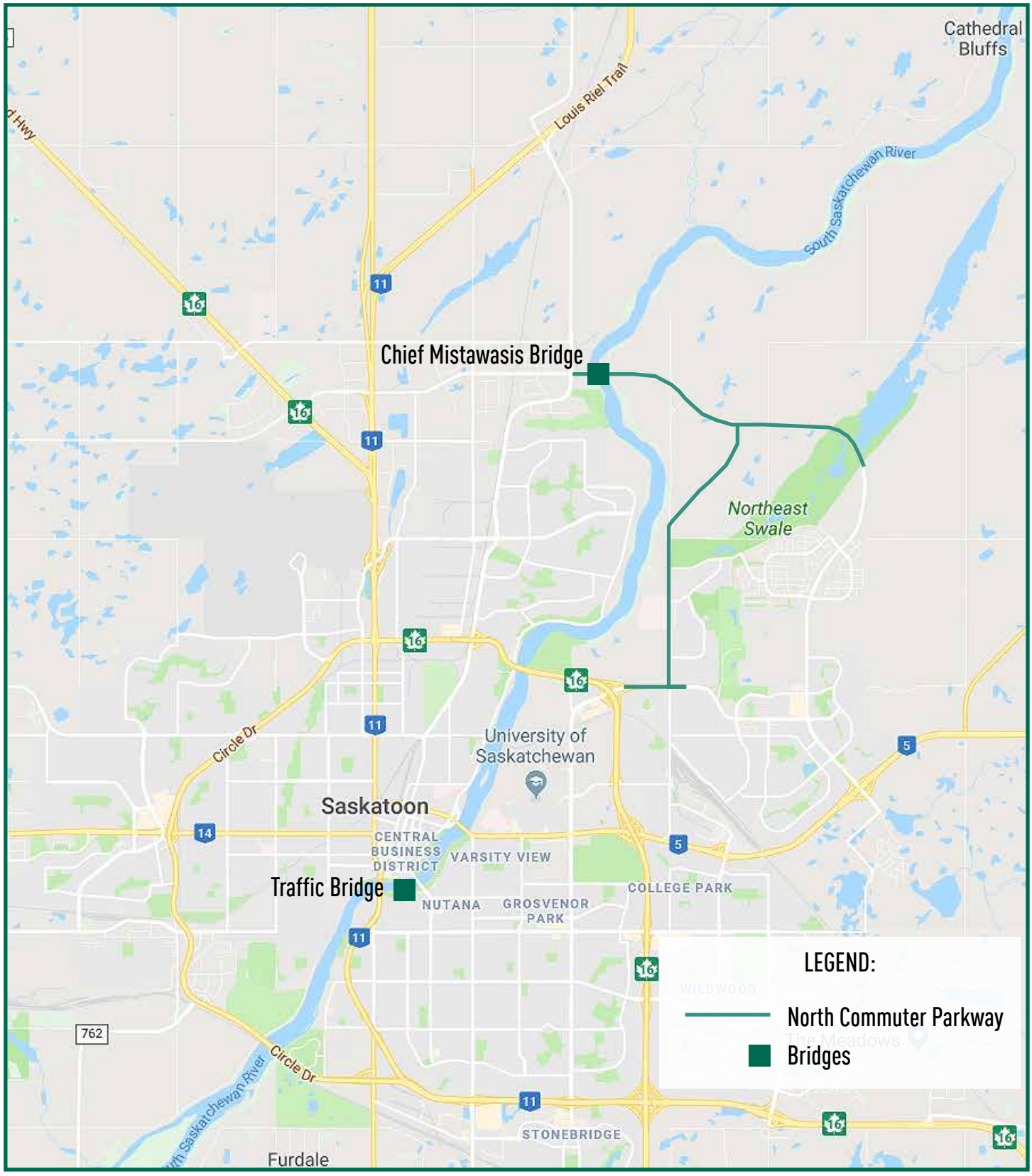
The closure of the Traffic Bridge in August 2010 removed capacity from the City's transportation network and put additional pressure on other river crossings. City council undertook public consultation and a Traffic Bridge Needs Assessment and Functional Planning Study to consider options to replace the century-old bridge. Following the study, city council decided to replace the existing bridge with a modern steel truss bridge with multi-use pathways on either side.

Before moving forward, city council adopted an Integrated Growth Plan in 2012 that identified the need for more spans

[7] Statistics Canada website: http://tinyurl.com/y3wntuza. Accessed January 3, 2019.

[8] Stantec Consulting Ltd. in association with Fast Consulting, *Traffic Bridge Needs Assessment and Functional Planning Study Final Report*, Prepared for City of Saskatoon Infrastructure Services Department, January 2011 File: 6332-24 City 1131-54409.

Figure 1: Location of the project



across the river, including a new commuter parkway and bridge crossing in the northern part of the City. This came to be known as the North Commuter Parkway and bridge project.

Traffic projections showed both projects would significantly improve commuter travel times for trips between key employment centres and rapidly growing residential areas on the east side of the river.

At its meeting on May 21, 2013, city council combined the two projects into one — the North Commuter Parkway and Traffic Bridge Replacement Project (the project) and made it part of its *Bridging to Tomorrow* initiative that had several aims, among them:

- making strategic investments in public infrastructure;
- having effective and efficient infrastructure;
- providing critical commuter connections in key areas of the City, addressing traffic congestion, reducing intersection delays, shortening travel times, and reducing greenhouse gas emissions; and
- achieving the planning goals for the City's *Growing Forward!* plan to grow to a population of 500,000.

Project rationale

As noted earlier, additional river crossings were necessary as the City continued to grow. The North Commuter Parkway and Bridge would provide a critical commuter connection across the South Saskatchewan River, linking the Marquis Industrial Area with Saskatoon's northeast residential developments. The new Traffic Bridge would reinstate an important link for commuters, pedestrians and cyclists crossing the river in the central business district.

Both bridges would significantly reduce commuter traffic on the City's other bridges, resulting in reduced trip times for all users crossing the river. Other benefits included reduced fuel consumption for commuter and public transit vehicles, which would in turn reduce greenhouse gas emissions, improve business productivity and enhance the quality of life for residents.

City objectives

The City's P3 project goals were founded on meeting:

- the affordability threshold (a committed fixed budget for the capital cost);
- a prescribed schedule end date;
- the federal funding requirements; and
- the long-term asset performance requirements.

Description of the Project

The project has two distinct parts, both including a three-year construction period and a 30-year O&M period:

1. North Commuter Parkway and bridge; and
2. Traffic Bridge replacement.

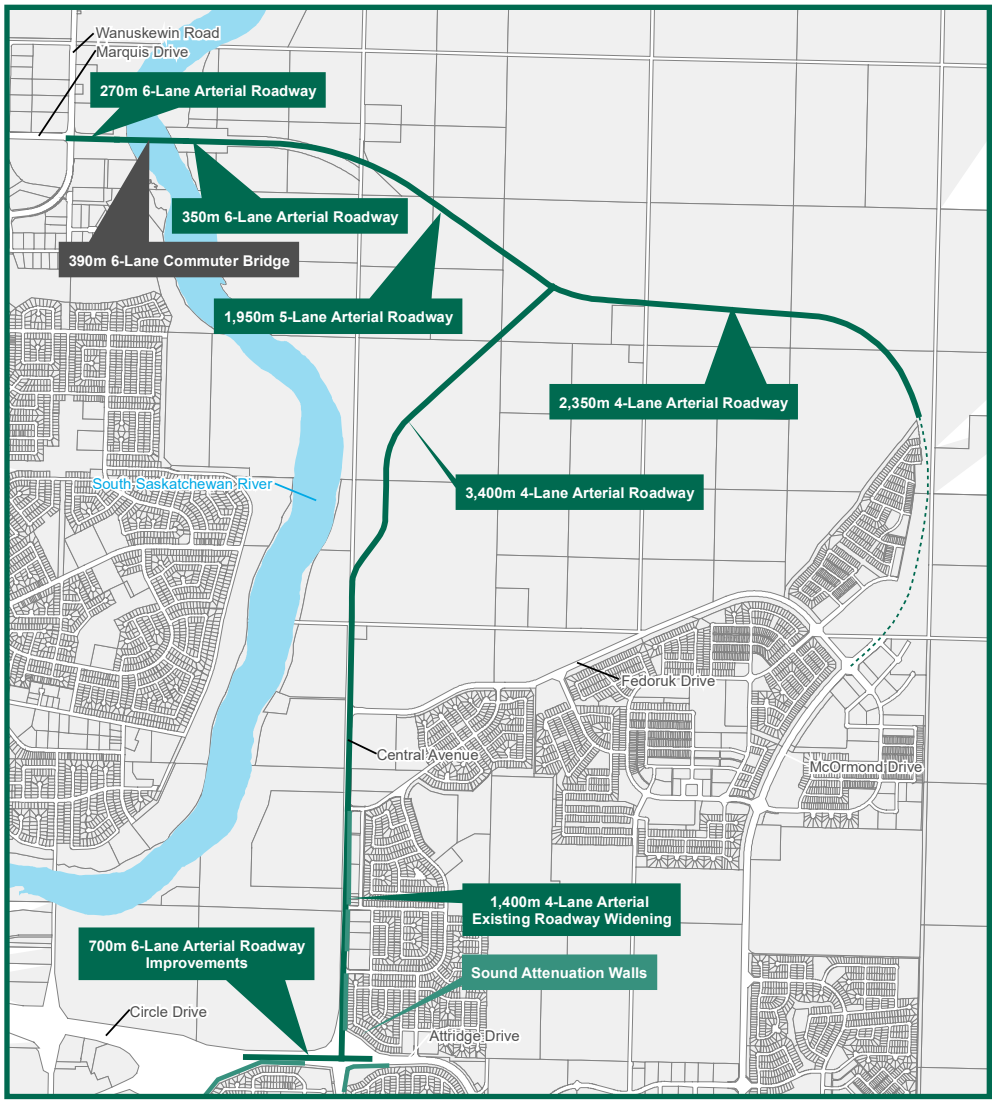
North Commuter Parkway and bridge

The North Commuter Parkway and bridge portion of the project includes:

- approximately 8.3 km of new four- and six-lane arterial roadways;
- improvement/expansion of approximately 2.1 km of existing arterial roadways;
- a new six-lane, 300 m bridge (now called the Chief Mistawasis Bridge) across the South Saskatchewan River with:
  - 2-m-wide bikeway on the north side at the same elevation as the driving surface;
  - 3.5-m-wide multi-use pathway on the south side, at the same elevation as the driving surface;
  - a capacity to accommodate 80,000 to 100,000 vehicles per day; and
- a swale crossing comprising six culverts with the bottom portion covered in earth, to allow small amphibians to cross under the roadway.

Ancillary infrastructure includes multi-use trails, drainage facilities, existing intersection improvements, street lighting and new traffic intersections to accommodate future development in northeast Saskatoon. Figure 2 shows the components of the North Commuter Parkway and Chief Mistawasis Bridge works.

Figure 2: North Commuter Parkway and Chief Mistawasis Bridge



Traffic Bridge replacement

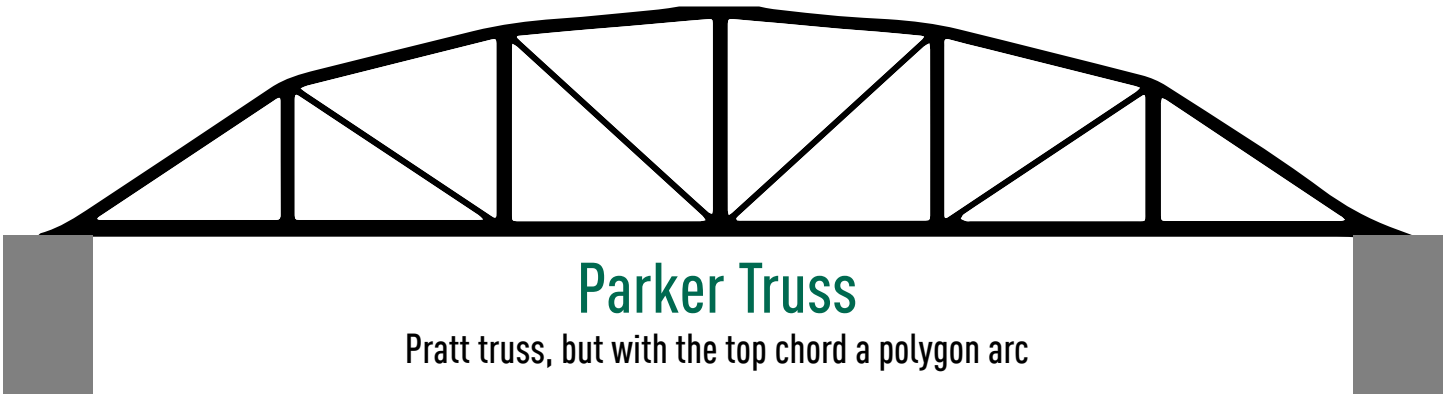
The Traffic Bridge replacement works included the demolition and replacement of a steel-truss bridge originally constructed in the early 1900s as the City's first vehicular bridge. The new bridge is a modern steel-truss bridge with:

- two 3.7-m-wide traffic lanes;
- two 3-m-wide multi-use pathways—one on either side of the bridge; and
- a capacity to accommodate more than 20,000 vehicles per day.

The Traffic Bridge design maintains the character and elements of the original 294-m truss bridge while meeting modern bridge engineering standards.

It has four spans, with new reinforced concrete piers constructed around the existing piers within the river. The bridge geometry is similar to the old bridge, but is slightly wider and taller to accommodate wider traffic lanes and pathways, as well as overhead clearance for emergency vehicles.

Figure 3: Parker style truss bridge[9]



Innovative Features

Design

Heritage design with modern engineering

The new Traffic Bridge is a modern version of its predecessor and mimics the Parker style[10] of the original truss bridge built in the early 1900s. Figure 3 shows an illustration of the Parker style. Photos 1 and 2 show the old and new versions of the Traffic Bridge.

The design of the new Traffic Bridge includes bolted connections mimicking the old truss rivet connections and pedestrian and cyclist pathways mimicking the look of the old wooden sidewalks. This latter feature was accomplished with the use of precast stamped concrete. The precast panels were manufactured with pigmentation and a stamped wood grain finish that met both the aesthetic requirement to honour the original heritage bridge and the durability and life cycle requirement to enable the use of mechanized snow-clearing equipment without degrading the longevity of the structure.

Photo 3 shows the concrete sidewalks stamped with a woodgrain finish on the new Traffic Bridge.

Conventional weathering steel with a protective coating within the splash zone was used for the truss elements of the new Traffic Bridge. This results in a two-tone colour between the lower and upper portions of the bridge until the patina can form on the exposed portions of the weathering steel. The process will eventually turn the entire bridge into a uniform shade of brown similar to the look of the old Traffic Bridge.

The design also anticipated use of the bridge for community festivals and events. Removable barriers create accessible entrances from the roadways to the exterior sidewalks, increasing the functionality during these modern-day special events. Photo 4 shows how a community event can make use of the new Traffic Bridge.

Innovative reuse of existing piers

Components of the existing substructure of the old Traffic Bridge were integrated into the design of the replacement bridge. Through field inspection and load testing the existing piers were deemed to retain some foundational capacity that could be complemented with the new substructure elements. The existing concrete pier footing was used as base material for the new pier spread footing. Also the existing pier shaft was groomed to plumb and wrapped with new concrete, encasing the old concrete, and effectively recycling and repurposing the old structure. Photo 5 shows this work in progress.

[9] Illustration from Wikipedia: https://en.wikipedia.org/wiki/Truss_bridge.

[10] A Parker truss bridge is a Pratt truss design with a polygonal upper chord. A Pratt truss includes vertical members and diagonals that slope down towards the center. https://en.wikipedia.org/wiki/Truss_bridge.

Photo 1: Original Traffic Bridge built in the early 1900s as seen from the west bank of the South Saskatchewan River[11]

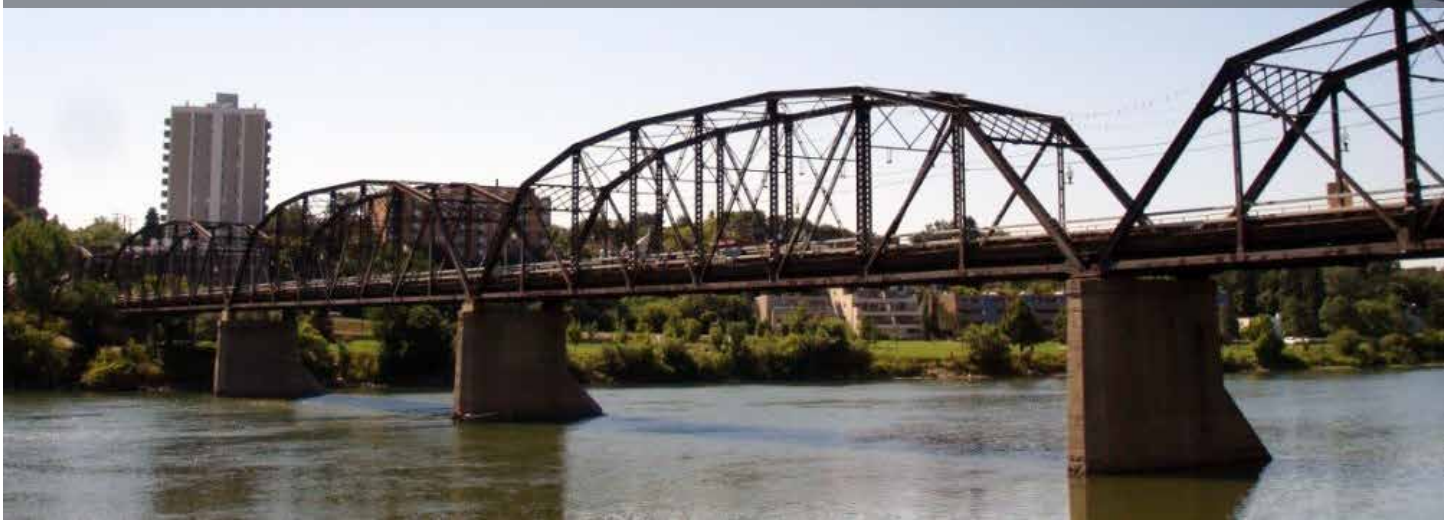


Photo 2: New Traffic Bridge completed in 2018 as seen from the west bank of the South Saskatchewan River in November 2018[12]

Area beneath former landlocked span converted to a public park

The original Traffic Bridge consisted of five spans to cross the river. In the early 1960s beneath the southern-most span of the bridge, the river was infilled with soil to create new roadways and park space. This resulted in one of the five spans becoming landlocked. This landlocked span was removed for the construction of the new Traffic Bridge and the space was converted into a public park with accessible pathways, attractive vegetation, and lookout areas. Photo 6 shows the newly landscaped area.

[11] Photo courtesy of: By Drm310 at English Wikipedia, CC BY 2.5, https://commons.wikimedia.org/w/index.php?curid=15751812.

[12] Photo courtesy of: By Drm310 - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=74778554.

Photo 3: Stamped concrete sidewalks on the new Traffic Bridge

Photo 4: Traffic Bridge opening day community party

Photo 5: Existing piers repurposed for new Traffic Bridge

Photo 6: Landscaped area replacing former fifth span of Traffic Bridge

Removal of the requirement to fabricate cut-outs

A costly feature of the original Traffic Bridge was the lattice-style members.[13] In the distant past, material cost was a higher proportion of bridge construction, and design efforts were made to minimize the amount of steel used in the structure. Conversely, today's cost constraints are geared towards minimizing both labour and materials. To balance the heritage aesthetics and functional design of the new Traffic Bridge, the requirement to fabricate cut-outs (meant to mimic the lattice appearance of the original heritage bridge) in the steel truss superstructure was removed. The lattice structure was determined to provide minimal impact when viewed at a distance. Retaining the overall truss geometry preserved the heritage component of the old bridge while keeping the same aesthetic. Photo 7 shows the lattice-style members of the old bridge.

Integrated pavement maintenance and rehabilitation approach

GCP used an integrated pavement maintenance and rehabilitation approach that supported a maximum deferred roadway pavement design. Asphalt pavement life optimization was completed via a financing and engineering design life review. Installation of the final layer of asphalt is scheduled beyond October 1, 2018 for three or four years. This approach reduces costs and keeps the ride surface in a better condition for a longer period of time. It also maintains the performance of the road structure against the original service life replacement. Figure 4 shows a cross-sectional view of the depth of the stage two surface on the newly constructed roads.

[13] Member – An individual angle, beam plate or built piece intended to become an integral part of an assembled frame or structure. Source: Glossary of Bridge Terms, www.dot.state.oh.us/DIVISIONS/COMMUNICATIONS/BRIDGINGTHEGAP/Pages/BridgeTermDefinitions.asp.

Photo 7: Old Traffic Bridge showing lattice-style members

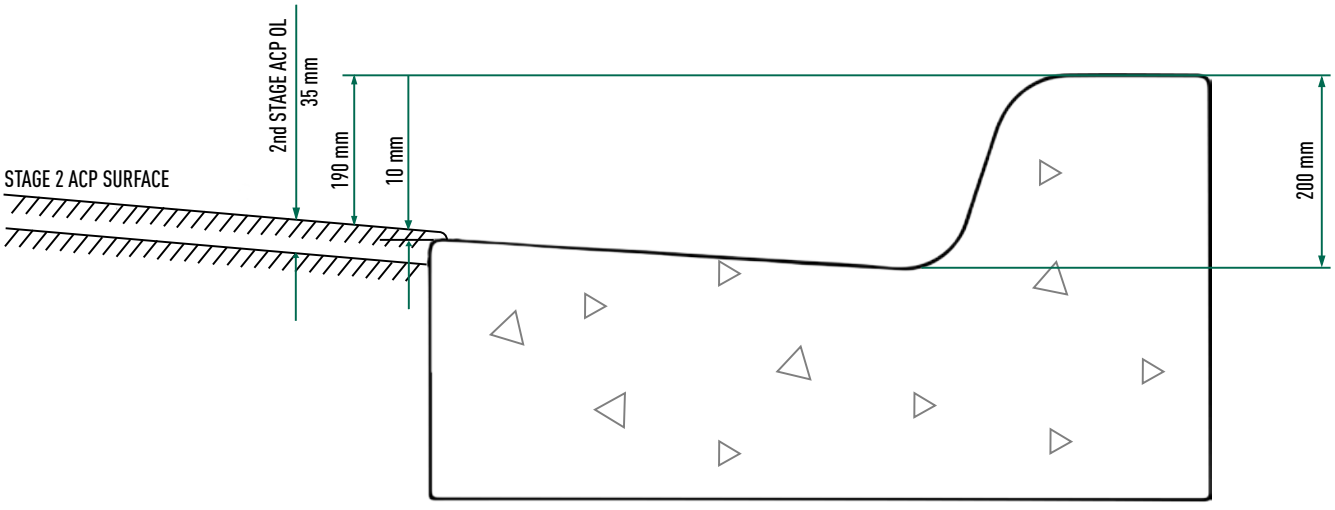
Multi-use pathways

Multi-use pathways are provided at both bridge sites and have been connected with shoreline pathways at the ends of each bridge to ensure maximum pedestrian safety, convenience and accessibility. In total, there are 12 km of multi-use trails and bike paths and 6.5 km of concrete sidewalks. The project agreement requires GCP through its O&M subcontractor, ASL Paving Ltd. (ASL), to maintain these and all project pathways so they are safe and available to the public year-round.

Shortened bridge structures

During the commercially confidential meetings in the procurement process, GCP made a proposal to shorten both bridge structures by using the shortest distance across the river at each site. This would reduce capital costs in the short term and O&M costs in the long term. The option to shorten the bridge structures was not originally allowed in the technical requirements; however, given that it was a technically sound proposal, the City amended the technical requirements in the RFP to allow all bidders to consider the option.

Figure 4: Cross section of stage 2 road surface



STAGE 2 ACP SURFACE
W/35 mm STAGE 2 OVERLAY

Development/construction

Coordination with local agencies

The schedule required permits for all work be efficiently obtained to meet specific milestones. Collaboration among GCP and local agencies allowed construction to mobilize in one month and all critical path permits to be obtained within five months of the contract award.

Construction planning

Scheduling construction activities was constrained by Saskatoon's cold winters and in-water work windows for the two river crossings.

The South Saskatchewan River is designated as a navigable waterway meaning that both commercial and private waterway traffic needs to be permitted during the fair weather navigable season. Impacts to fish and spawning seasons must also be avoided to prevent any damage to the river ecology. In-stream works were not to occur during four of six seasonably warm months of the year.

The in-stream temporary construction works were planned and scheduled to occur primarily during winter months and permanent works were scheduled primarily in the summer months when in-stream works were halted. Benefits included increased confidence in water flow rates, the absence of waterway traffic and complete mitigation of risk to fish spawning activities.

To arrive at an optimum construction schedule GCP prepared detailed staging and sequencing plans during the proposal planning stage and worked closely with the engineering team to analyze the river hydrology during different seasons and conditions to determine what part of the river channel could be occupied in each season. GCP also had to consider fish windows and navigational constraints that would dictate when berms could be constructed or removed. Berms were needed to provide construction access to each pier location and for the erection of the superstructure.

Once the optimum berm sequencing plan was developed, the team analyzed the access requirements for the delivery of construction materials. The solution was to use a 45-m portable temporary bridge to provide year-round construction access for regular construction loads (i.e. concrete trucks, rebar and equipment). This allowed the team to schedule completion of the erection of the superstructure a full eight months earlier than would have otherwise been possible.

Photo 8: Traffic Bridge construction during winter months

Photo 8 shows construction activity at the Traffic Bridge site during winter months.

Environmentally sensitive areas

The North Commuter Parkway goes through two environmentally sensitive wetlands. GCP studied the wildlife in the area and developed a plan to protect the existing biodiversity. Multiple mitigation strategies were employed to ensure the area was returned as closely as possible to its original vegetative condition. This included:

- developing construction access plans;
- establishing access and construction of portions of road subgrade in the winter and shoulder months;
- removal, temporary storage and replacement of the same topsoil that existed in the area;
- using environmental protective measures including sedimentation fencing and turbidity curtains;
- monitoring and inspection programs;
- revegetation with matching seeding; and
- consultation with the Meewasin Valley Authority responsible for preservation of the swales.

A permanent drainage system and six below-grade swale-crossing culverts, with bottoms covered in earth, were installed to accommodate low-lying areas, allow small amphibians and other animals to cross under the roadway and ensure no net change in the wetlands. Coordination efforts were completed

Photo 9: Wetlands

Photo 10: One of six swale-crossing culverts

with the local Swale Watcher's group. Photos 9 and 10 show the wetlands and the swale crossing culverts.

Safety

Work at the Chief Mistawasis Bridge was done at extreme heights. The team prefabricated bridge deck panels on the ground and hoisted them up by crane one at a time, eliminating the time working at heights. This allowed pieces to be made in advance and under controlled conditions so they were ready for installation. This improved work flow, and resulted in an improvement to the overall schedule by two weeks. Photo 11 shows prefabricated deck panels being hoisted onto the bridge.

Contaminated soil remediation

Beneath the new roadways approaching the new Chief Mistawasis Bridge were the remnants of a tallow pit where fat produced from rendering was disposed of and buried. Remediation of 32,000 tonnes of contaminated soil was required. The process included excavation of the contaminated soils, transportation for proper disposal, inspection to confirm cleanup and replacement with new clean fill. The contaminated material was considerably odorous so cleanup was completed in winter months to minimize disruption to adjacent neighbourhoods.

This was a known issue. The risk was that the contaminated soils extended further or deeper than reported in the environmental assessment and tests. However, the reports adequately described the site conditions and quantities and remediation was completed without delay or issue.[14]

Photo 11: Hoisting prefabricated deck panels

Archeological finds

Two significant archeological sites were in the direct path of the project: a ship wreck buried under the river bed at the Traffic Bridge and Paleolithic fossils at the site of the Chief Mistawasis Bridge.

Ship wreck artifacts

In 1908, a steam-powered sternwheeler called the City of Medicine Hat collided with the southernmost pier of the Traffic Bridge. The wreckage remained buried under the river bed. Placement of the final abutment for the Traffic Bridge had to take this into account to assist in heritage conservation efforts. During installation of the drilled abutment piles, an Archeologist was on site monitoring the works and the material removed was screened.

Although this was a known issue, it was not certain that remnants of the ship still existed and if so, where they were located. The RFP merely identified an area of concern. A delay

[14] E-mail correspondence with GCP, March 21, 2019.

was possible, however quick engagement with the provincial Heritage Conservation Branch during the detailed design phase defined the parameters for an acceptable level of recovery of the artifacts if ship remnants were found.

Another possible delay was the time frame needed for sampling, sequestering, and screening the soils of the pile drilling process. GCP mitigated this by developing a process to bag and tag the soils for transportation to a location off site for screening and recovery of artifacts. GCP designed and supplied custom industrial-sized screens and other equipment to increase the production rate of the archeological screening process and handle the volume of materials produced. GCP also provided the necessary labour.[15]

Photo 12: Sinking of the steam-powered sternwheeler City of Medicine Hat

More than 50 items from the wreckage were recovered and sent to the Royal Saskatchewan Museum for further analysis and display. To commemorate this historical location, GCP worked with the Meewasin Valley Authority and the Heritage Conservation Branch to place an interpretive panel on the south abutment of the new Traffic Bridge. Photo 12 shows the site of the sunken ship.

Paleolithic fossils

Ancient bison skulls from the Paleolithic period were discovered during the excavation of the west embankment for the Chief Mistawasis Bridge. GCP actively supported the City in its involvement of the Wanuskewin Heritage Park to properly manage the find. Work on the project was stopped while 15 fossils were excavated, recorded and extensively examined before being donated to the Royal Saskatchewan Museum in Regina.

The most important part of managing this find was the environmental and awareness training provided to the workforce. The equipment operator was able to identify the bones during the course of the work and more importantly raise the concern to the project supervisor to act upon the find. Archeologists who were already working on recovery of the sunken ship artifacts were able to quickly mobilize to this site to recover the findings.

Additional resources were brought in to ensure coverage on both work sites and to ensure the full-time presence of an archeologist throughout the remainder of excavations in this area. While work was stopped for the collection and logging of the skulls and bones, the excavating work was deployed elsewhere on site to remain productive. No extension of time was requested or needed to manage this find.[16]

Procurement Process

Selecting the P3 model

The City chose to use the P3 funding model for the project as it proved to be the most fiscally responsible and efficient way to achieve its goals of planning for future growth and enhancing the quality of life for its residents.

A number of delivery models had been considered, including the design-bid-build (DBB) model traditionally used by the City. The suitability of a P3 model was initially assessed by Brookfield Financial, in its report of April 2013. Brookfield explored the viability of a DBFOM delivery model for the project, performed an initial market sounding exercise, analyzed project costs and provided an overview of regulatory requirements and project governance options. The report concluded that:

> "…the DBFOM model allows the City to partner with private sector participants and pursue a 'win-win' solution that best leverages the skills and resources of each party, encourages innovation, and ultimately delivers the highest tangible value to the City."[17]

[15] E-mail correspondence with GCP, March 21, 2019.

[16] E-mail correspondence with GCP, March 21, 2019.

[17] Brookfield Financial, *Roads and Bridges DBFOM Initiative, Analysis of Structural Considerations and Cost Impact*, April 2013.

Table 1: Qualified teams[18]

Bridge City Infrastructure Group	Bridge City Partners	Graham Commuter Partners
CH2M Hill Canada Ltd.	Acciona Concessions Canada	Gracorp Capital Partners LP
Hatch Mott MacDonald Ltd.	AECOM	Graham Infrastructure
P. Machibroda Engineering Ltd.	Pacer Projects Corp	Buckland & Taylor
Flatiron Constructors Canada Limited	Mainroad Holdings Ltd.	Tetra Tech
Aecon Concessions	Natixis	Clifton
Volker Stevin Highways Ltd.	DIF Infra 3 Canada	ASL Paving Ltd.
Hochtief PPP Solutions North America Inc.		BBGI
Bank of Nova Scotia		National Bank Financial

This conclusion was validated through a high-level P3 screening assessment and another market sounding exercise prepared by KPMG as part of the development of the business case for the project submitted to P3 Canada. The high-level screening assessment determined the project satisfied a number of criteria supporting a P3 delivery, while the market sounding consultations indicated significant private sector interest towards the size and scope of the project as a DBFOM.[19]

The business case also determined using a P3 approach would deliver significant savings for taxpayers and value for money. The DBFOM model used by the City offered several advantages, in particular on-time, on-budget delivery, fixed payments over the life of the agreement that make it easier for the City to plan and budget accurately, and the ability to transfer much of the financial risk associated with building and maintaining the project away from the taxpayer.

The P3 model was also chosen for its ability to finance needed facilities that the City could not afford to deliver on its own. Use of the P3 model meant state-of-the-art facilities could come on stream faster, address resident needs sooner and minimize the impact on resident taxes. It also meant any resulting savings could be used to fund other core services or offset other costs.[20]

Selecting a partner

Competitive process

The City conducted a two-stage procurement process: a Request for Qualifications (RFQ) leading to a short list of three proponents; followed by a Request for Proposals (RFP). Short-listing was used to allow each proponent team a reasonable chance of success in the procurement while ensuring there was sufficient competition to generate the best value for the City.

Request for Qualifications

The RFQ was issued on July 21, 2014. During this stage the City facilitated a question and answer process. The three short-listed proponents were announced on October 3, 2014. Table 1 lists the short-listed proponents.

Request for Proposals

The RFP was issued on December 16, 2014. During this stage, the City had three rounds of commercially confidential meetings with each proponent. The intention was to provide early feedback to proponents to minimize the possibility of unacceptable technical proposals and optimize the effort expended by the proponents.

[18] City of Saskatoon, December 16, 2014, *Request for Proposals to Design, Build, Finance, Operate and Maintain North Commuter Parkway and Traffic Bridge Project*, RFP Version 1.0, Schedule 1 – RFP Data Sheet, p. 2.

[19] KPMG, *City of Saskatoon Value for Money Analysis, North Commuter Parkway Project and Traffic Bridge Project*, November 3, 2015, p. 6.

[20] City of Saskatoon website: www.saskatoon.ca/business-development/major-projects/public-private-partnerships

Technical and financial proposals were submitted approximately one month apart. The technical proposals were evaluated on a pass/fail basis prior to the City evaluating the financial proposals. Among the acceptable technical proposals, the financial proposal with the lowest net present value was selected as the preferred proponent.

Affordability requirements

Financial proposals were evaluated against an affordability threshold of $165 million (expressed in NPV terms as at the financial submission deadline of August 20, 2015). The affordability threshold was communicated to the proponents during the RFP period and bidders were encouraged to submit financial offers containing a price below the affordability threshold.

The affordability threshold was calculated based on the City's available budget for the operating period payments for the project (i.e., the sum of the capital payments, operations and maintenance payments and major maintenance and rehabilitation payments), but excluded the substantial completion payment.

Commercial and financial close

On September 8, 2015, city council approved Graham Commuter Partners as the preferred proponent. Commercial and financial close took place on October 21, 2015. The entire procurement process was completed in 15 months. Table 2 shows the project timeline.

Table 2: Project timeline

2013 May 21

City council made decision to bundle Traffic Bridge Replacement project with North Commuter Parkway project

2014 March 31

City council approved the bundled project to be procured through P3 delivery model – DBFOM

2014 July 21

RFQ issued

2014 December 15

Short-list of three teams announced

2014 December 16

RFP issued

2015 September 8

City council approved GCP as preferred proponent

2015 October 21

Commercial and financial close

2018 October 1

Scheduled substantial completion date

2018 October 2

North Commuter Parkway, Chief Mistawasis Bridge & Traffic Bridge opened to traffic

October 2048

Contract end date

Fairness of the process

The City widely published the RFQ in the local newspaper and on provincial and federal public tendering websites, Sasktenders and MERX respectively, so that all qualified firms had equal opportunity to access and respond. All potential and actual bidders received access to the same type and level of information throughout the entire procurement process.

A comprehensive process framework was included in the procurement process for both the RFQ and RFP stages to ensure a rigorous and unbiased evaluation process. The evaluation framework provided guidelines for the conduct of the procurement process, detailed the evaluation criteria and identified roles, responsibilities and codes of conduct for each participant in the evaluation process. This approach ensured the evaluation process yielded a result that was fair and defensible, and that clearly identified the preferred private-sector partner to take on the project.

During the evaluation of responses to the RFQ and RFP, the City established a single point of contact to receive and respond to questions from respondents/proponents. All the questions and answers were posted to all respondents/proponents, all the communications were documented and all the transaction documents, including the final project agreement, were disclosed to the public.

To ensure compliance with best practices, a due diligence committee was established. It was comprised of City staff not engaged in the project. The committee provided an opinion as to any apparent conflict of interest brought forward during the RFQ and RFP periods. In addition, the findings of the due diligence committee were vetted by an independent fairness advisor, JD Campbell & Associates, retained by the City that reported directly to the project steering committee. Finally, the fairness advisor provided an opinion stating that the entire process was carried out with openness, transparency and integrity.

Overall Structure of the Agreement

Graham Commuter Partners General Partnership (GCP) was formed as a special purpose vehicle to deliver the project. GCP's shareholders are:

- Graham Capital Partners LP (Graham Capital) (50 per cent); and
- BBGI SICAV S.A. (BBGI) (50 per cent).

GCP negotiated a drop-down construction contract with Graham Infrastructure LP to be the sole design-builder, and a short-term contract with ASL Paving Ltd. (ASL), to provide operations and maintenance (O&M) services.

The short-term O&M contract reflected the risk appetite of ASL. GCP worked with lenders to evaluate renewal risk and agree upon reasonable terms in the financing term sheet. This enabled GCP to successfully draw ASL, a local and inexperienced P3 partner into the project, and build experience and capacity in the local market.

GCP retains long-term operations, maintenance and rehabilitation risks and has the direct responsibility for supervising Graham Infrastructure LP and ASL to ensure the performance outcomes of the project are satisfied. GCP is the primary contact with the City and is responsible for all financial services (including managing the independent certifier and lenders' technical advisor and reporting and liaising with lenders).

As the sole design-builder, Graham Infrastructure LP has the ultimate responsibility for the design and construction of the project to meet the project agreement specifications.

ASL has two roles. During the construction period, ASL was the paving subcontractor to the design-builder and during the operating period, ASL is the O&M subcontractor to GCP with a seven-year renewable contract. This dual role provided ASL the incentive to ensure excellent performance in both the construction and operations phases of the project as it is ultimately responsible for maintaining the roadway infrastructure, and is subject to the full deduction regime for non-performance. The partnership structure is illustrated in Figure 5.

Financial Arrangements

The City received funding from the Government of Canada through the P3 Canada fund. The funding agreement amount is equal to 25 per cent of the eligible capital costs, up to a maximum contribution of $57.675 million.

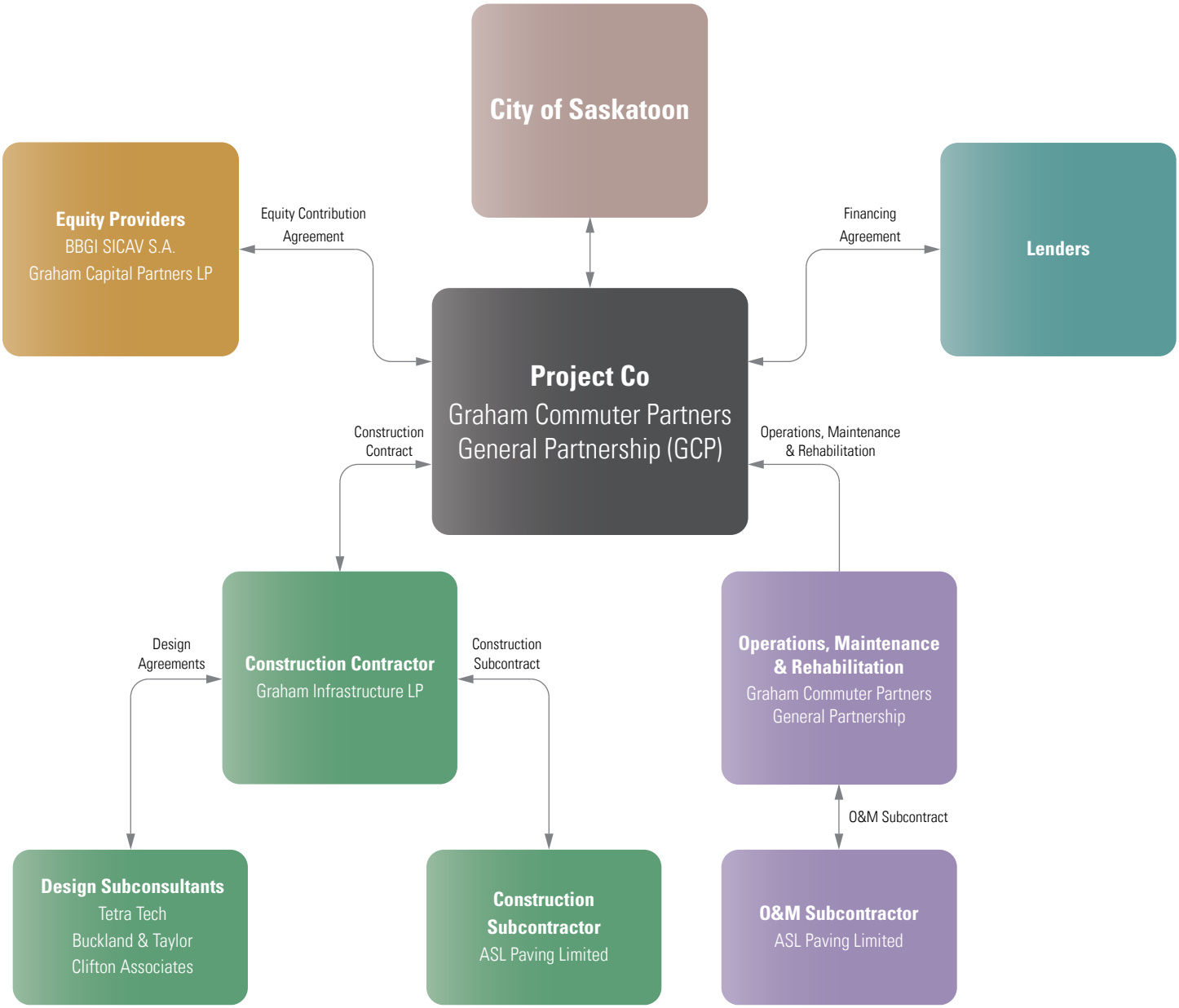
The Government of Saskatchewan contributed $50 million to the North Commuter Parkway and Chief Mistawasis Bridge portion of the project with the remaining funding provided by the City.

Capital costs

The project's capital costs were financed through a combination of public and private-sector financing:

- GCP – $201 million through a combination of debt and equity:
  - $13 million equity;
  - $91 million short-term bank debt; and
  - $97 million long-term private placement amortizing bonds.
- City – $108.7 million substantial completion payment (paid with a combination of funds from P3 Canada, the Government of Saskatchewan and the City) and the remaining life cycle capital to be repaid monthly during the 30-year operating period.

Figure 5: Partnership structure



Operating & maintenance payments

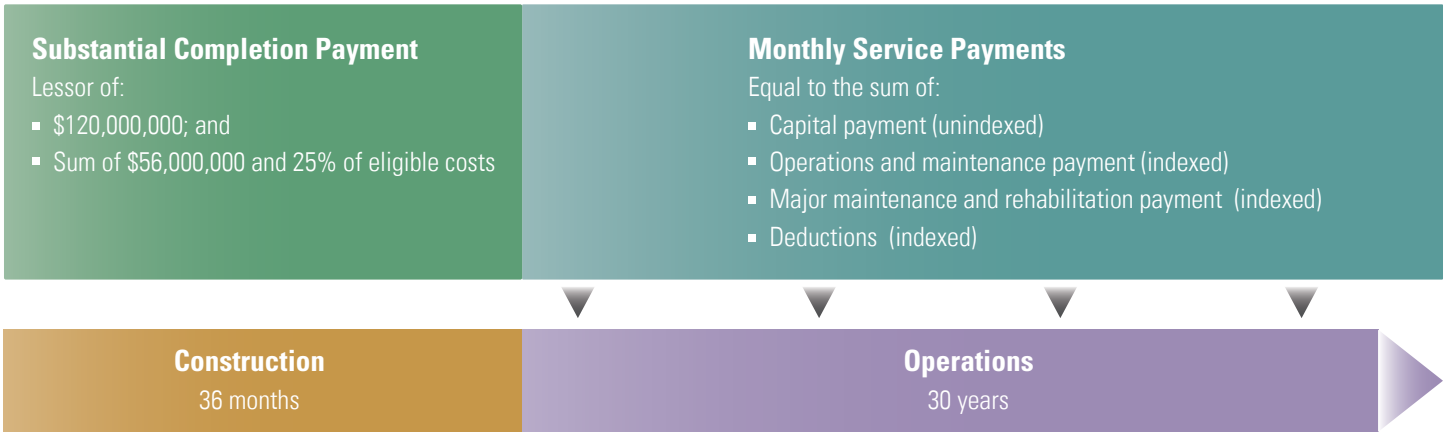
The City will make monthly availability based payments during the 30-year operating period, with deductions for service, quality and/or availability failure events.

Figure 6 illustrates the content and duration of these two types of payments.

Deal flexibility

The bank bond financing structure contributed over $1 million in savings to the estimated $69.4 million in total NPV savings. It is comprised of unrated, privately placed, long-term bonds underwritten by one of the largest infrastructure investors in Canada, coupled with shorter-term bank debt with cash flows tailored to correspond with the timing of the substantial completion payment. Working with one long-term lender allowed

Figure 6: Payment structure



the GCP team to structure a finance agreement that balanced the team members' strengths and the financial markets' long-term investment needs.

In addition, the financing agreement includes flexible terms around the renewal of ASL's seven-year O&M subcontract. This will allow GCP to subcontract with a new partner if ASL chooses not to renew the subcontract as long as the terms of the new subcontract are materially equivalent to the subcontract with ASL.

Responsibilities and Risk Allocation

The City worked collaboratively with proponents to formulate a risk allocation regime for the project agreement that was fair and effective. The approach taken was to allocate risk to the party best able to mitigate and manage it. This approach allowed GCP to price the risks passed down by the City efficiently and produce a strong value-for-money (VFM) solution.

GCP assembled a consortium with the technical expertise necessary to perform the project agreement obligations. All consortium participants had the past experience and capability to understand, assume responsibility for and mitigate the required risks flowed through to them from the project agreement, and had the technical and financial capacity to absorb any unexpected technical risks that may materialize.

The following examples highlight a few of the shared risks:

- Graham Infrastructure, the design-build contractor, agreed to address any settlement issues identified within the first two years of operations at the bridge approaches;
- ASL, the operating subcontractor, agreed to a seven-year O&M contract, with an option to renew for an additional seven-year term; and
- GCP agreed to retain rehabilitation risk and certain O&M scope not within ASL's area of expertise (such as line painting) and accepted the long-term pricing risk following the initial seven-year term of ASL's contract.

Tables 3 and 4 summarize the allocation of key risks for each phase of the project.

Table 3: Allocation of key construction period risks

Key Risk	City of Saskatoon	GCP	Graham Infrastructure LP
Weather	■		■
Geotechnical site conditions			■
Unknown contamination	■		
Utility relocation	■		■
Change in law & insurance	■	■	■
Scope changes by public sector	■		
Financing		■	
Replacement of contractor		■	
Schedule & cost overrun			■
Permits & approvals	■		■
Land acquisition	■		
Environmental issues	■		■
Design			■
Structural defects			■
Insurance and deductibles		■	■

Table 4: Allocation of key operating period risks

Key Risk	City of Saskatoon	GCP	ASL Paving
Change in Law	■		■
Insurance and deductibles		■	■
Cost inflation	■		■
Rehabilitation and handback		■	
Scope changes by public sector	■		
O&M performance (Years 1 to 7)			■
O&M Performance (Years 7 to 30)		■	

Benefits

Cost savings

Bundling two separate projects into a single P3 contract was one of the project's main cost-saving benefits. Doing so resulted in overall lower procurement and operational costs. The savings during the procurement resulted in lower bid costs, legal fees and due diligence costs. During the construction phase, bundling allowed for greater purchasing power for the private partner as economies of scale were achieved in material purchases, such as concrete and steel.

Operational cost savings were also realized in lower overhead costs from requiring one rather than two project management teams, safety plans and quality management plans for the two components. There are also reduced monitoring costs. The overall result was better value for the City.

Value for money

The City anticipated a robust competition among private sector contractors, financiers and maintenance providers to generate value for money for its residents. It also believed the competitive bidding process would facilitate innovation among the bidders, to the benefit of the City, in the form of improved designs or processes not specified in the project requirements and create further efficiencies and long-term cost savings.

The City worked with KPMG to quantitatively assess the DBFOM delivery model against the public-sector comparator model. The initial analysis estimated that use of a DBFOM model would save $26.6 million. This amounted to 7.5 per cent less than the costs to deliver the project using a traditional public-sector procurement approach.

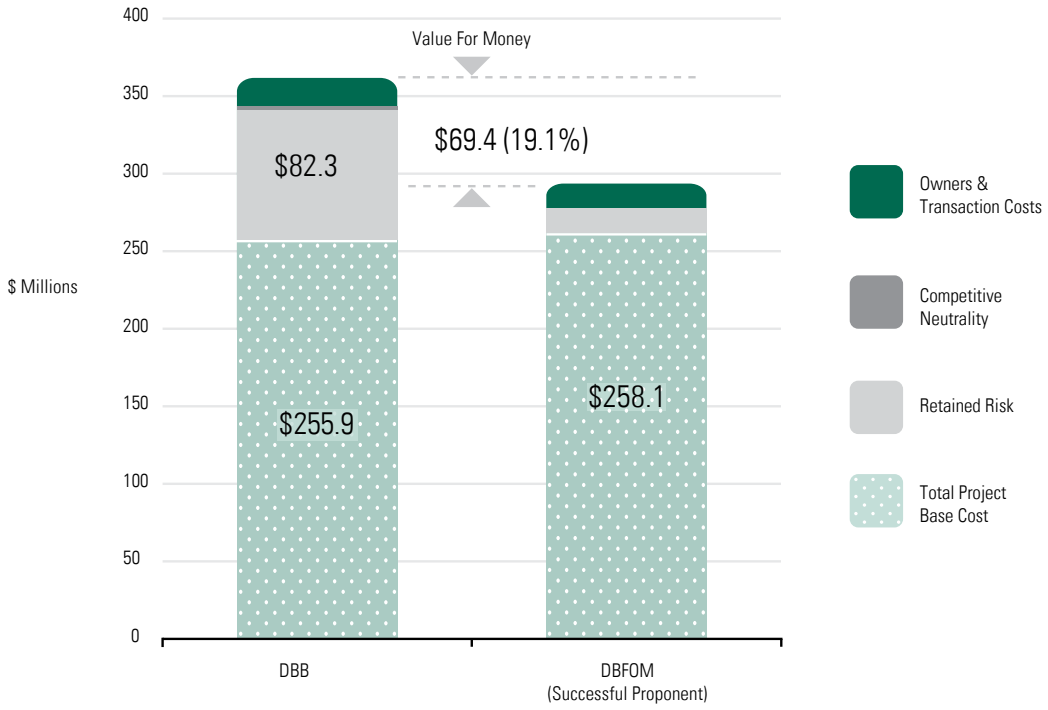
The VFM analysis was refreshed in October 2015 following financial close and showed the actual savings achieved with the bid by GCP were $69.4 million or 19.1 per cent less than the estimated traditional procurement method costs. The greater savings were gained through various innovations included in GCP's design, construction, operations, maintenance, rehabilitation and financing plans. In addition, the structure of the financing plan, with half underwritten and half direct private placement, contributed to the achievement of greater value for money.

Table 5 and Figure 7 show a summary of the cost components of each procurement model in the updated VFM assessment.

Table 5: Value-for-money cost comparison[21]

$ Million **NPV to August 20, 2015 with rate of 4.7%**	**DBB** **(Public-sector comparator)**	**DBFOM** **(GCP)**
Total project base cost	$255.9	$258.1
Retained risk	$82.3	$18.1
Transferred risk	Included in base cost	Included in base cost
Owners and transaction costs	$19.1	$17.2
Competitive neutrality	$5.5	n/a
Total risk-adjusted project cost	**$362.8**	**$293.4**
Project VFM ($)	-	$69.4
Project VFM (%)	-	19.1%

Figure 7: Value-for-money cost comparison[22]



[21] KPMG, *City of Saskatoon Value for Money Analysis, North Commuter Parkway Project and Traffic Bridge Project*, November 3, 2015, p. 12.

[22] Ibid.

Community socio-economic benefits

An improvement in travel times is one the major socio-economic benefits provided by the project. Other system-wide transportation benefits include reduced intersection delays, less congestion on corridors throughout the City and reduced traffic over all other river-crossing bridges in the City. Indirect benefits include lower greenhouse gas emissions from lower fuel consumption and improved business productivity. Overall, the quality of life for the City's residents has been enhanced.

Communications

Between the partners

Frequent and regular meetings and discussions supported the daily interaction between the partners throughout the construction period. This contributed to an open and collaborative approach to construction completion.

A design and construction committee, established at the outset, was chaired by the City's representative and included a GCP representative and the construction project director. Meetings of this group were held regularly and allowed GCP and the City to discuss contract issues and project progress.

A technical work group was also established with key representatives from the design and construction team and the O&M team. Meetings of this group were chaired by the construction project director and were a regular forum for addressing work progress and the movement of technical issues toward mutually agreeable resolutions.

With the public

During the procurement phase of the project, City webpages were developed and updated with milestones and key decisions as they were made. Several community events were held to engage, educate and receive feedback from the public about the project.

During the construction phase, regular updates were provided through the media, dedicated City webpages and a project-specific website managed by the construction team. The project agreement was specific as to what this website should include, for example:

- final design plans/renderings for each construction project;
- live webcams for the two bridge sites;
- monthly or bimonthly project updates;
- photo galleries updated monthly or bimonthly showing progress;
- quarterly videos and aerial photographs showing progress; and
- in the final month of construction, a summary highlights video for each project.[23, 24]

Community engagement – naming the Chief Mistawasis Bridge

The City held a naming competition for the North Commuter Parkway Bridge. The naming outreach plan was launched as a response to the Truth and Reconciliation Commission Call to Action #79 to commemorate Aboriginal peoples' history and contributions to Canada.[25] Together, the City and GCP facilitated a site tour and made the North Commuter Parkway Bridge site available for a traditional tobacco offering ceremony.

The competition began in August 2017 and involved the establishment of a community-led steering committee facilitated by the City and included representatives from the Office of the Treaty Commissioner, Central Urban Métis Federation Inc., Saskatoon Tribal Council and the Federation of Sovereign Indigenous Nations.

Naming the bridge provided an opportunity to unite the community and Province in an act of reconciliation and educate the community on Aboriginal history and culture, particularly in

[23] Project Agreement (RFP Version 1.0) City Of Saskatoon, North Commuter Parkway and Traffic Bridge Project, Schedule 21 – Project Communications.

[24] The final project documentary can be viewed here: www.youtube.com/watch?v=uf7BH55ZrT0&feature=youtu.be

[25] Truth and Reconciliation Commission of Canada: Calls to Action, 2015, "Commemoration – 79. We call upon the federal government, in collaboration with Survivors, Aboriginal organizations, and the arts community, to develop a reconciliation framework for Canadian heritage and commemoration. This would include, but not be limited to: … iii. Developing and implementing a national heritage plan and strategy for commemorating residential school sites, the history and legacy of residential schools, and the contributions of Aboriginal peoples to Canada's history." http://nctr.ca/assets/reports/Calls_to_Action_English2.pdf.

and around Saskatoon. Throughout the journey, it was important Métis and First Nation Elders guided the cultural protocol for the naming project in all aspects, including the blessing of the land in May 2017. Names were gathered from the community, both Aboriginal and non-Aboriginal residents, through an open call for nominations.

Nominations had to meet one of the following guidelines:

- a historical name acknowledging an Aboriginal historical event or figure; or
- a word or concept embodying the spirit of community, coming together or connection.

Elders and Residential School Survivors reflected and deliberated on the list of names in order to assist the Naming Steering Committee in the selection of a short list of four names from the 461 submissions received. The four short-listed names selected in November 2017 were:

- Louis Riel;
- Chief Mistawasis;
- Wîcîhitowin; and
- Waniskâ.

The naming process focused on engaging with youth and having them actively involved in learning about the past and how it relates to their community today. GCP sponsored the development of a number of learning resources for the four short-listed names. Four educational vignettes, school lesson plans and tool kits were created with the participation of the school divisions.[26]

The four vignettes were also used to provide more information to members of the wider community about the significance of the short-listed names and invite them to provide input online or in person. The Bridge Naming Steering Committee made its final recommendation to city council in June 2018. The name chosen for the North Commuter Parkway Bridge through this process was the Chief Mistawasis Bridge.

As a result of the naming process, a number of names have been referred to the Saskatoon Naming Advisory Committee to be considered as additions to the City's master names list for future civic infrastructure.

[26] Links to the educational vignettes are available here: www.saskatoon.ca/engage/name-north-commuter-parkway

Dispute resolution mechanism

By retaining direct responsibility for the design-build and O&M teams, GCP has an incentive to ensure the early identification of issues and their prompt resolution. If an issue occurs, an escalation ladder is in place to allow the project to progress despite the occurrence of a dispute.

Resolution would first be sought between the key individuals involved at the operational level. If the issue is not resolved it would then be escalated to senior project representatives. If the team still fails to come to a resolution, the issue would be raised to the senior management of the parties. In the event that this approach fails to satisfactorily resolve the issue, the disputing parties would move to the use of the formal dispute resolution procedure set out in Schedule 7 of the project agreement.

The project agreement establishes a formal process to resolve the dispute starting with a settlement meeting, followed by a recommendation of the independent certifier and ending with arbitration if necessary.[27] As of March 2019, the formal dispute resolution mechanism has not been used.

Performance Monitoring

GCP has an incentive to perform through a payment mechanism based on service, quality and availability. GCP's performance is constantly monitored based on the availability of the infrastructure and the achievement of key performance indicators. The City is entitled to make deductions from its monthly payments if GCP does not meet the standards specified in the project agreement.

For example, deductions can be made if minimum availability is not met, or if a traffic lane is not available at a certain time of day, or in a certain section of roadway. Deductions can also be made for service failures such as failure to monitor and report in accordance with environmental regulatory requirements, or for quality failures such as receipt of a stop work order issued by a regulatory body related to safety or environmental issues.

[27] Project Agreement (RFP Version 1.0) City Of Saskatoon, North Commuter Parkway and Traffic Bridge Project, Schedule 7 – Dispute Resolution Procedure, p. 1.

Calculation of failure points and their impact on the monthly payment are set out in Schedule 14 of the project agreement.[28]

GCP is required to produce a monthly performance monitoring report to list the occurrence of all service, quality and availability failures including the calculation of the resulting deductions. GCP is also required to report the aggregate deductions so they can be measured against the overall deduction thresholds established in the project agreement.[29]

Lessons Learned

Collaboration

GCP maximized the integration of team members using collaborative project governance and management measures. Building a "one project: one-team" culture began at the start of project planning. Early in the project planning stage, GCP completed a "green sheet" estimate of the reference concept using the City's affordability threshold. This base estimate was then used to iteratively evaluate design, innovation and construction approaches to confirm their added value.

The affordability constraint placed an increased importance on the full alignment of the project implementation teams and ensured all teams were aware of the challenges being managed by their counterparts to achieve this primary project goal.

As a GCP-led team, each member of the team, regardless of their employer, was treated as a trusted member. This allowed the process to be open, inclusive and transparent. GCP also treated the City as a partner in its team throughout the project planning and delivery stages. During regular collaborative meetings with the City, GCP provided real-time, open and transparent updates on its status and challenges as it progressed through the project planning stage.

Through its open dialogue in these meetings, GCP collaborated with the City to communicate and evaluate value-add concepts. The open and inclusive communication resulted in integrated discussions around design optimizations and risk allocation that allowed the team to provide significant VFM, while meeting all other project goals.

Financing with multiple lenders

Through past experiences GCP learned that, when structuring a transaction with multiple lenders, inter-creditor issues must be managed early on. Superior team organization coupled with open lines of communication between equity providers, lenders and their respective advisors resolved issues promptly, allowing the project to reach financial close within the City's timeline. GCP has also learned that partnering with a bank to act as underwriter, regardless of whether it is rated or unrated, can provide additional benefit — if the bank is prepared to adopt a true underwrite rather than a back-to-back with an identified private placement investor during the bid phase.

Partnership advantages

A key element in the project's success was the open, regular and frequent communication between the GCP team and the City's team. The development of relationships and trust that occurred during the design and construction phase of the project provided opportunities to accelerate approvals and facilitate the presentation of information for complex design decisions. The exchange of ideas and shared opportunities allowed both teams to efficiently navigate the sometimes time-sensitive processes to the benefit of the project, while ensuring the specific considerations of each group were respected.

Graham Group Ltd. has extensive project history and experience operating in the City. Partnering with ASL for both construction and operations allowed GCP to align processes and communication protocols with existing City methods. This willingness to adapt to City protocols was made easier due to past experience, especially with respect to the operating period responsibilities.

GCP's design team included three carefully selected firms with the technical expertise needed to develop and deliver a quality design. These firms were led by GCP's dedicated design manager responsible for integration of the design disciplines and resulting design quality. GCP initiated weekly technical work group meetings where all disciplines were included for a full day of design briefing and brainstorming. This included the equity investors, the design-builder, the design team, the O&M team

[28] Project Agreement (RFP Version 1.0) City Of Saskatoon, North Commuter Parkway and Traffic Bridge Project, Schedule 14 – Payment Mechanisms.

[29] Ibid.

and advisors. Several design quality innovations evolving from these sessions were implemented as part of the project.

Design review improvements

While the GCP team had few, if any, major issues with the P3 process, an area suggested for improvement is the design review from an O&M perspective. According to GCP, a standard feature of a design-build project on the design development side is that an independent design reviewer is brought into the team to review the design throughout the initial stage to ensure the design intent and requirements of the technical specifications are met.

However, now in the O&M stage, GCP and the City have compiled a list of questions regarding maintenance of the structure. Had these questions been asked at an earlier date the parties may have changed a few minor design details. For instance snow removal and snow storage near or on the bridges. GCP recommends the O&M team introduce a third-party independent design reviewer during the design development phase for the purpose of meeting O&M requirements through the design.

Concluding Comments

The City of Saskatoon had two critical infrastructure projects it needed to build to bring commuters into the downtown core more efficiently, provide a river crossing to a growing area of the City and reduce overall traffic congestion. However, it lacked the financial resources to accomplish its goals. Bundling the two projects into one and using a P3 procurement model allowed the City to leverage funding from the federal and provincial governments with private-sector investment.

The P3 model was the best fit to achieve the City's objectives as it gave cost certainty, provided significant value-for-money and ensured the project will meet high operations, maintenance and rehabilitation standards for the next 30 years.

The replacement of a century-old bridge means today's commuter transportation requirements are met and enhanced. And the North Commuter Parkway and Chief Mistawasis Bridge will improve quality of life and business productivity by connecting growing residential areas with business areas.

Saskatoon partnered with Graham Commuter Partners General Partnership (GCP) to deliver the $293.4 million NPV project that resulted in a value-for-money savings of $69.4 million NPV or 19.1 per cent compared to the cost of delivering the project using traditional public-sector procurement methods.

GCP subcontracted with ASL Paving Ltd., a local paving company that had no P3 experience, but had first-hand familiarity with the City's specifications. ASL was not comfortable with a 30-year O&M commitment, but the finance partners collaborated to monetize and carry the renewal risk, securing a seven-year commitment from ASL. This accommodation of a shorter than typical O&M contract with an option for renewal will help to build local experience and capability in P3 project development, execution and O&M.

The project finished on-time and on-budget which, according to both partners, is a major accomplishment compared to similar municipal projects in recent years.

By undertaking this project using a DBFOM P3 procurement model, the City of Saskatoon was able to build a new river crossing in a growing area and replace an iconic landmark in much less time and at much less cost than had it undertaken the project using a traditional public-sector procurement approach.

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Appendix: CCPPP's National Award Case Studies 1998 - 2018

Defence
Communications Security Establishment Canada Long-Term Accommodation Project (2011)

Education
Quad at York University, Ontario (2018)
Saskatchewan Joint Use School Projects (2015)
Alberta School Alternative Procurement – Phase 1 (ASAP I), Alberta (2010)
O'Connell Drive Elementary School, Nova Scotia (1998)

Energy
Fort McMurray West 500-kV Transmission Project, Alberta (2018)
John Hart Generating Station Replacement Project, B.C. (2014)
Britannia Landfill Gas to Electricity Project, Ontario (2005)
Vancouver Landfill Gas Cogeneration Project, B.C. (2003)
Bruce Nuclear Power Facility, Ontario (2000)
Waterloo Landfill Gas Power Project, Ontario (2000)

Government Services
Archives of Ontario – Offsite Archival Storage (2006)
Cook Chill Food Production Centre, Ontario (2005)
DriveTest: Ontario Driver Examination Services (2004)
Transforming the Delivery of Ontario's Social Assistance System (2003)
Emergency Service Mobile Communications in Ontario (2000)
Electronic Child Health Network, Toronto, Ontario (1999)
Teranet, Ontario (1998)

Health
New Oakville Trafalgar Memorial Hospital, Ontario (2016)
Humber River Hospital, Ontario (2015)
BC Cancer Agency Centre for the North and Fort St. John Hospital & Residential Care Project, B.C. (2012)
Centre Hospitalier de l'Université de Montréal Project (2012)
Glen Campus – McGill University Health Centre, Quebec (2010)
Women's College Hospital Redevelopment Project, Ontario (2010)
Royal Jubilee Hospital Patient Care Centre, B.C. (2009)
VIHA Residential Care and Assisted Living Capacity Initiative, B.C. (2007)
Abbotsford Regional Hospital and Cancer Centre, B.C. (2008, 2005)
Facility Management for the Royal Ottawa Health Care Group, Ontario (2000)
Devonshire Care Centre, Alberta (2000)
Shaikh Khalifa Medical Centre, United Arab Emirates (2000)

IT Infrastructure
Connecting Small Schools in Newfoundland (2003)

Justice & Corrections
Forensic Services and Coroner's Complex, Ontario (2016)
Okanagan Correctional Centre, British Columbia (2015)
Elgin County Courthouse, Ontario (2014)
Ontario Provincial Police Modernization Project (2013)
Surrey Pretrial Services Centre Expansion, B.C. (2011)
Durham Consolidated Courthouse, Ontario (2007)
Central North Correctional Centre, Ontario (2002)
Five Corners Project, B.C. (2002)

Real Estate
Aurora College Family Student Housing, Northwest Territories (1999)
Legislative Chamber, Offices and Housing, Nunavut (1999)

Recreation & Culture
L'Adresse symphonique, Quebec (2011)
SHOAL Centre: Seniors Recreation Centre, B.C. (2004)
John Labatt Centre, London, Ontario (2002)
Skyreach Place, B.C. (2000)

Social Housing
Single Room Occupancy Renewal Initiative Project, B.C. (2013)

Transportation
North Commuter Parkway & Traffic Bridge Replacement, Saskatchewan (2018)
Iqaluit International Airport, Nunavut (2017)
Southwest Calgary Ring Road, Alberta (2016)
Disraeli Freeway and Bridges Project, Winnipeg, Manitoba (2012)
Canada Line, B.C. (2009)
Confederation Bridge, PEI (2009)
Highway 407 ETR, Ontario (2008 & 1999)
Autoroute 30, Montreal, Quebec (2008)
Northwest Anthony Henday Drive, Alberta (2008)
William R. Bennett Bridge, B.C. (2008)
Autoroute 25, Montreal, Quebec (2007)
Kicking Horse Canyon Project –Phase 2, B.C. (2007)
Golden Ears Bridge, B.C. (2006)
Anthony Henday Drive Southeast Leg Ring Road, Alberta (2005)
Sea-to-Sky Highway Improvement Project, B.C. (2005)
Sierra Yoyo Desan Resource Road , B.C. (2004)
Fredericton-Moncton Highway Project, New Brunswick (2003)
Belledune Port Authority, New Brunswick (2000)
Retendering Alberta's Highway Maintenance Contracts (2000)
Cobequid Pass Toll Highway, Nova Scotia (1998)

Water, Wastewater & Biosolids
Calgary Composting Facility, Alberta (2017)
City of Saint John Safe Clean Drinking Water Project, New Brunswick (2017)
Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan (2014)
Biosolids Management Facility, Sudbury, Ontario (2013)
Britannia Mine Water Treatment Plant, B.C. (2006)
Goderich Water and Sewer Services, Ontario (2000)
Port Hardy Treatment Project, B.C. (2000)

These case studies can be obtained through CCPPP's online bookstore at: www.pppcouncil.ca/web/bookstore

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