

IQALUIT INTERNATIONAL AIRPORT, NUNAVUT

BUILDING AN ICONIC AIRPORT IN CANADA'S NORTH



THE CANADIAN COUNCIL FOR PUBLIC-PRIVATE PARTNERSHIPS
2017 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 2017 National Award Case Studies

Gold Award for Infrastructure:
Iqaluit International Airport
Nunavut

CCPPP Membership

Informed. Connected. Prepared.

We've been around since 1993 – a not-for-profit, non-partisan organization promoting smart, innovative and modern approaches to infrastructure development and services through public-private partnerships. Our 400 members broadly represent the public and private sectors.

Our members will tell you they enjoy superior networking and business development opportunities. They benefit from leading research and have full access to P3 SPECTRUM – the most comprehensive compendium of P3 projects in Canada.

Above all, CCPPP is an internationally respected voice promoting their P3 agenda.

Join Us

Email: partners@pppcouncil.ca

Tel: 416.861.0500

Twitter: @pppcouncil

pppcouncil.ca

Contents

Introduction	01
Quick Facts	04
Overview	06
Description of the Project	09
Innovative Features	13
Procurement Process	16
Overall Structure of the Agreement	19
Financial Arrangements	21
Responsibilities and Risk Allocation	24
Benefits	26
Communications	31
Labour	33
Monitoring	33
Lessons Learned	34
Concluding Comments	35
Testimonials	36
Appendix: CCPPP's National Award Case Studies 1998-2017	38

Introduction

Canada continues to be a world leader in public-private partnerships (P3's), with over 275 projects valued at \$127 billion under construction or in operation. Health and transportation remain the most active P3 sectors, and major public transit projects are at various stages of development across the country. The federal government, as well as provincial and territorial governments, are making historical investments in infrastructure, with most using the P3 approach for some major projects. Municipalities across the country are also using P3's to deliver infrastructure such as roads, water and wastewater treatment plants, transit, recreational facilities and energy solutions. There is also increasing interest from Canada's indigenous communities to use the P3 model to address their infrastructure deficit.

Public-private partnerships have enabled the delivery of much needed infrastructure across the country and have presented the following benefits:

- Attracting private capital investment to accelerate the delivery of public infrastructure
- Fixed price, on-time private sector delivery commitment
- Design benefits from input by construction contractors and operators
- Design and overall project cost reflect whole lifecycle cost of the asset
- Greater innovation in project delivery
- Reforming sectors through a reallocation of roles, incentives, and accountability
- Allocating risks between the public and private sector based on who is better able to manage it
- The public sector is able to enforce achievement of its performance specifications through a pay for performance contract which includes penalties in the event of availability or performance failures¹

Canada's long-standing experience using the P3 approach has created a process of continuous improvement, as each generation of people and projects provide lessons learned to the ones in the pipeline. The market continues to be competitive, with an average of five domestic and international bidders responding to Requests for Qualifications and three being shortlisted for the Request for Proposals stage. This helps ensure that taxpayers are receiving the best value for money and Canada's P3 expertise is being exported to other countries.

The expertise and diversity of Canadian P3s are well represented in the 2017 National Awards for Innovation and Excellence in Public-Private Partnerships. The Canadian Council for Public-Private Partnerships (CCPPP) established the awards in 1998 to honour governments and/or public

institutions and their private sector partners who have demonstrated excellence and innovation in public-private partnerships. Gold, Silver and 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.

2017 Award Winners

Iqaluit International Airport

Gold Award for Infrastructure

The redeveloped Iqaluit International Airport is a key transportation gateway for people and goods in Nunavut and northern Canada, replacing a decades-old facility in need of repair. As the first complete airport infrastructure to be built as a P3 in North America, the facility required innovative design and construction to withstand the arctic environment. The design of the terminal building's igloo-shaped rotunda as well as the artwork and sculpture on display reflect the imagery of Canada's North. The project included several requirements for Inuit labour, services and training to ensure local employment and economic development.

Canada Line

Gold Award for Service Delivery

The 19.5-kilometre Canada Line links Vancouver International Airport with the cities of Vancouver and Richmond, British Columbia, providing a much-improved transportation alternative to the existing road network. Initially delivered ahead of schedule and on budget for the 2010 Olympics, its usage level over the past eight years is far ahead of expectations. The system service delivery performance meets and exceeds requirements, and it has been a major catalyst of economic activity along the corridor. The design-build-finance-operate-maintain contract achieved a savings of 5.5% compared to conventional procurement.

¹ PricewaterhouseCoopers LLP and The Canadian Council for Public-Private Partnerships, *A Process Guide for Public Sponsors*, April 2017.

Calgary Composting Facility**Silver Award for Infrastructure**

The new Calgary Composting Facility, the first P3 composting facility constructed in Canada, will allow the city to divert a minimum of 145,000 tonnes of organics and dewatered biosolids from landfill each year. The three buildings were developed under a unique DBF-OM agreement, which allowed the city to obtain the benefits of fully integrated operations, maintenance and life cycle renewal over 10 years without the cost implications of long-term financing. The project also utilized a P3 performance bond that allowed contractors to overcome the normally onerous capital cost of using traditional securities such as letters of credit to demonstrate liquidity in the event of cost or schedule overruns.

City of Saint John Safe, Clean Drinking Water Project**Silver Award for Project Development**

Saint John's new \$217-million water treatment contract was developed using a unique P3 agreement that combined a design-build-finance-operate-maintain (DBFOM) model for the primary infrastructure (treatment plant and reservoirs) and a design-build-finance (DBF) model for the additional infrastructure dams and distribution system). Service to residents needed to be maintained during the project construction and care was taken to inform customers and stakeholders throughout the process about using the P3 model. The new infrastructure means residents will no longer endure boil water advisories and will be provided with high-quality drinking water for many years to come.

The Centre for Addiction and Mental Health (CAMH)**Silver Award for Project Development**

The CAMH Phase 1C redevelopment project will add two modern new buildings with more than 655,000 square feet to the Queen Street campus, providing inpatient and outpatient services for people with complex mental illness. The P3 project saved \$105 million compared to conventional procurement and excelled in its extensive plans to integrate new buildings with the surrounding community to create a more inclusive environment. In addition, the project required an enhanced contractual and risk allocation structure as a result of directly interfacing with existing CAMH facilities and with a company involved with an earlier phase of development.

Bert Clark**P3 Champion Award**

Bert Clark received the P3 Champion Award for his outstanding contributions to P3 in Canada. He is President and CEO of the Investment Management Corporation of Ontario and was previously President and CEO of Infrastructure Ontario from 2012 to 2016, overseeing the management of the provincial government's real estate portfolio and the delivery of major infrastructure projects using the alternative financing

and procurement (AFP) model. He has been instrumental in developing the AFP approach to deliver major projects on time and on budget. Earlier in his career, he played a lead role in the establishment of Ontario's first long-term infrastructure investment plan. Bert spent four years running the North American infrastructure business for Scotiabank, where he was an effective champion for public-private partnerships, and four years at Osler, Hoskin & Harcourt LLP.

2017 National Award Case Studies

Three projects were selected among this year's five winners to be developed into case studies, with stories detailing their infrastructure and project development. The Iqaluit International Airport will provide an important transportation hub for people and goods, constructed with unique design elements reflecting the Inuit culture and arctic environment. The Calgary Composting Facility will divert compost and biosolids from landfill and provide fully-integrated operations and maintenance without long-term financing costs. Following years of boil water advisories, the new Saint John Safe, Clean Drinking Water Project features a dual P3 model agreement that delivered a new treatment plant, reservoirs and upgraded distribution system to residents.

CCPPP has published 72 case studies of selected Award winners since 1998. Each one details the project's deliverables, its procurement process, contracts, financing and risk allocation, benefits and lessons learned, and testimonials from partners. A complete list of case studies is included in the Appendix, and are available from the CCCPP bookstore: www.pppcouncil.ca/web/bookstore.

Acknowledgements

CCPPP has a team of dedicated Awards selection committee volunteers that 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 that the case studies provide a learning tool for seasoned practitioners as well as those new to the P3 model. The following panelists comprised the 2017 selection committee:

- 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
- Murray Totland, former City Manager, City of Saskatoon

The Awards are made possible by the generous support of the following 2017 sponsors:



Deborah Reid and Margaret Campbell authored the 2017 National Award Case Studies. They interviewed the partners, reviewed all the documentation and conducted additional research. Their thoroughness and insights produced an account of these award-winning projects that is both informative and engaging. CCPPP would also like to thank the project partners, procurement agencies and government representatives, who were invaluable contributors from the applications stage through to the finalization of the case studies.

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. Its mission is to promote smart, innovative and modern approaches to infrastructure development and service delivery through public-private partnerships with all levels of government. 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. The Council organizes an annual conference that is recognized internationally as the premier forum bringing together senior government and business leaders in the P3 community at which the most successful Canadian public-private partnerships are celebrated through CCPPP's National Awards for Innovation and Excellence.

CCPPP conducts research on topical P3 issues and sectors to help further the understanding and best practices of Canada's P3 market. Our reports, case studies, guidance and surveys are available on CCPPP's online bookstore at: www.pppcouncil.ca/web/bookstore.

Quick Facts – Iqaluit International Airport²

Project type

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

Asset/Service

34-year-4-month agreement to design, build, finance, operate and maintain the Iqaluit International Airport, including new terminal building and ancillary buildings, taxiway and runway improvements, and operation and maintenance of the existing airport during construction

Construction period:

- 4 years and 4 months

Operations and maintenance (O&M) period:

- 33 years and 5 months

Status

Fully operational as of December 31, 2017

Partners

Public Sector

- Government of Nunavut (the government)

Private Sector

- Arctic Infrastructure Limited Partnership (AILP), comprising
 - InfraRed Capital Partners Limited;
 - Bouygues Building Canada Inc.;
 - Colas Canada Inc.; and
 - Winnipeg Airports Authority Inc.

Other participants

Public Sector

- Acumen Consulting Limited – Chief Project Officer
- Partnerships BC – Implementation Advisor and Design & Construction Lead
- Bennett Jones LLP – Legal Advisor
- PricewaterhouseCoopers – External Financial Advisor
- WSP (Genivar) – External Technical Advisor and Airport Operations Advisor
- Government of Nunavut and WSP – Technical Compliance Team
- Miller Thomson LLP – Fairness Advisor
- Pacific Meridian Consulting – Facilities Management Advisor
- Jardine Lloyd Thompson Canada Inc. – Insurance Advisor

Private Sector

- Stantec Architecture Ltd. and Stantec Consulting Ltd. – Design
- Bouygues Building Canada – Construction
- Sintra Inc. – Construction
- Kudlik Construction Ltd. – Construction Subcontractor
- Tower Arctic Ltd. – Construction Subcontractor
- Winnipeg Airports Authority Inc. (Nunavut Airport Services Ltd.) – Facilities Management Services
- CIBC World Markets Inc. – Financial Advisor
- Farris, Vaughan, Wills & Murphy LLP – Legal Advisor
- Faithful+Gould – Lenders' Technical Advisor
- Computershare – Trustees
- Willis Group Limited – Insurance Advisor
- Standard & Poor's – Ratings Agency

Independent Certifier

- LeighFisher Canada Inc.

² Background and facts in this case study rely on the information contained in the award application submitted jointly by the project partners in September 2017 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)

- \$418.9 million net present cost (NPC)³

Project financing (nominal dollars)

- Capital costs – \$300 million
 - \$68.7 million – Government of Nunavut
 - \$74.2 million – PPP Canada
 - Remainder (approx. \$157 million) – AILP (debt & equity)

Value for money (present value dollars)

- \$99.8 million (19.2%) NPC

Project highlights and innovative features

- First time in North America that a P3 procurement model was used for an entire airport infrastructure project
- Significant socio-economic benefits:
 - During construction the cumulative Inuit labour requirement was a minimum of 15 per cent, and a minimum \$16,041,825 was to be spent on work, supplies, or services with Inuit businesses.
 - During initial operations Inuit labour is to represent 20 per cent of total labour costs at a minimum and must increase by 6.7 per cent every five years, to reach just over 60 per cent by the end of the contract.
- Innovative design and construction techniques used for the arctic tundra environment and to improve user experience:
 - Thermosyphon technology, a passive refrigeration system, is used to prevent heat from reaching the permafrost, which supports the airport's building foundations.
 - The design of the airport terminal building reflects the arctic landscape and culture and features an innovative roof and wind-scoop design that prevents build-up of snow on the roof and redirects snow away from building entry points.
 - Public passenger-processing functions are kept on a single level, minimizing travel distances and vertical movement of all passengers.

Project website

<https://gov.nu.ca/edt/documents/iqaluit-international-airport-project>

³ The discount rate used for the calculation of value for money (VFM) was 7.83 per cent as at April 1, 2013, which represents the cost of capital over time, taking into account such factors as inflation and interest rates. *Iqaluit International Airport Improvement Project*, Project Report, January 2014, p. 30.



Overview

Located on Baffin Island at the head of Frobisher Bay, the City of Iqaluit and the Iqaluit International Airport (the airport) are the gateway to Nunavut and Canada's north. Nunavut (the territory) is geographically the largest of Canada's provinces and territories⁴ and is home to almost 36,000 residents spread across three time zones, living in 24 hamlets and one city of about 7,000 inhabitants.⁵ No roads or highways connect any two municipalities. Year-round access is limited to air, making airport infrastructure vital.

Replacing the airport became an important project for the territory. The airport was in need of major infrastructure upgrades, not only to accommodate the increasing traffic, but also to improve the functionality of aging buildings and runways. The airport terminal building was more than three decades old and there had been no major investment for over 20 years. Meanwhile, airport traffic had grown at a rate of five per cent annually over the last decade and new security requirements were taking up more and more space.

The Government of Nunavut (the government) worked with commercial and technical advisors to determine the best procurement approach for the project. A design-build-finance-operate-maintain (DBFOM) public-private partnership (P3) model was chosen as it would integrate all aspects of the project, provide optimum risk transfer, encourage innovation and complete construction more quickly than a traditional design-bid-build (DBB) procurement model.

The government selected Arctic Infrastructure Limited Partnership (AILP) to deliver the project through a 34-year-4-month performance-based agreement to design, build, finance, operate and maintain the airport. The project included a new terminal building and ancillary buildings, taxiway and runway improvements, operation and maintenance (O&M) of the existing airport during construction and through a 30-year O&M period. The project cost, \$418.9 million NPC, provided \$99.8 million NPC in savings to the government compared to a traditional DBB procurement.

This project was chosen by the Awards Committee of the Canadian Council for Public-Private Partnerships (CCPPP) to receive the Gold Infrastructure Award for several reasons.

This is the first time in North America that a P3 procurement model was used for an entire airport infrastructure project. The project was ambitious not only because of the old airport's history as a U.S. air force base in the Second World War and its age, but also because of its location—the remote, arctic environment and extreme winter conditions added to the complexities of the project and required innovation in all its aspects, particularly in design and construction scheduling.

The design of the terminal building's rotunda, which is shaped like an igloo, as well as the artwork and sculpture on display, all reflect the imagery of Canada's North. Thermosyphon technology was used to prevent heat from reaching the permafrost⁶ that supports the airport's building foundations. The terminal building was kept primarily single-level to minimize surfaces exposed to winter weather and to keep all public passenger-processing functions on the same level. Upgrades for passengers, such as washrooms past security, were given the same consideration as the complex construction of an international runway in the arctic.

A major feature of the project is that the existing airport had to be kept fully operational during construction—air transportation is the critical year-round link for Iqaluit and Nunavut to the south, for provision of perishable food and emergency medical care. Sea access is seasonal and limited to a small number of sailings between July and October.

The new airport offers all Nunavummiut (citizens of Nunavut) and businesses significant economic and social benefits. It will provide ongoing Inuit employment, education and training, improve the safety and services of the airport, improve transportation between northern communities, and facilitate the development of mineral resources in Nunavut to create more business and investment opportunities.

This case study will highlight the factors that made the project an innovative and successful P3 and will share the experiences and lessons learned to benefit future P3 airport improvement projects.

Figure 1 shows the location of the Iqaluit International Airport.

⁴ Nunavut is the largest in area and the second-least populous of Canada's provinces and territories. One of the world's most remote and sparsely settled regions, it has a population of 35,944, mostly Inuit, spread over an area of 1,877,787 km² (725,018 mi²) of land and 160,935 km² (62,137 mi²) of water in Northern Canada. The land area is only slightly smaller than Mexico. Nunavut is also home to the world's northernmost permanently inhabited place, Alert, which, at latitude 82°30'05" north, is just 817 kilometres from the North Pole. (Wikipedia, accessed November 20, 2017.)

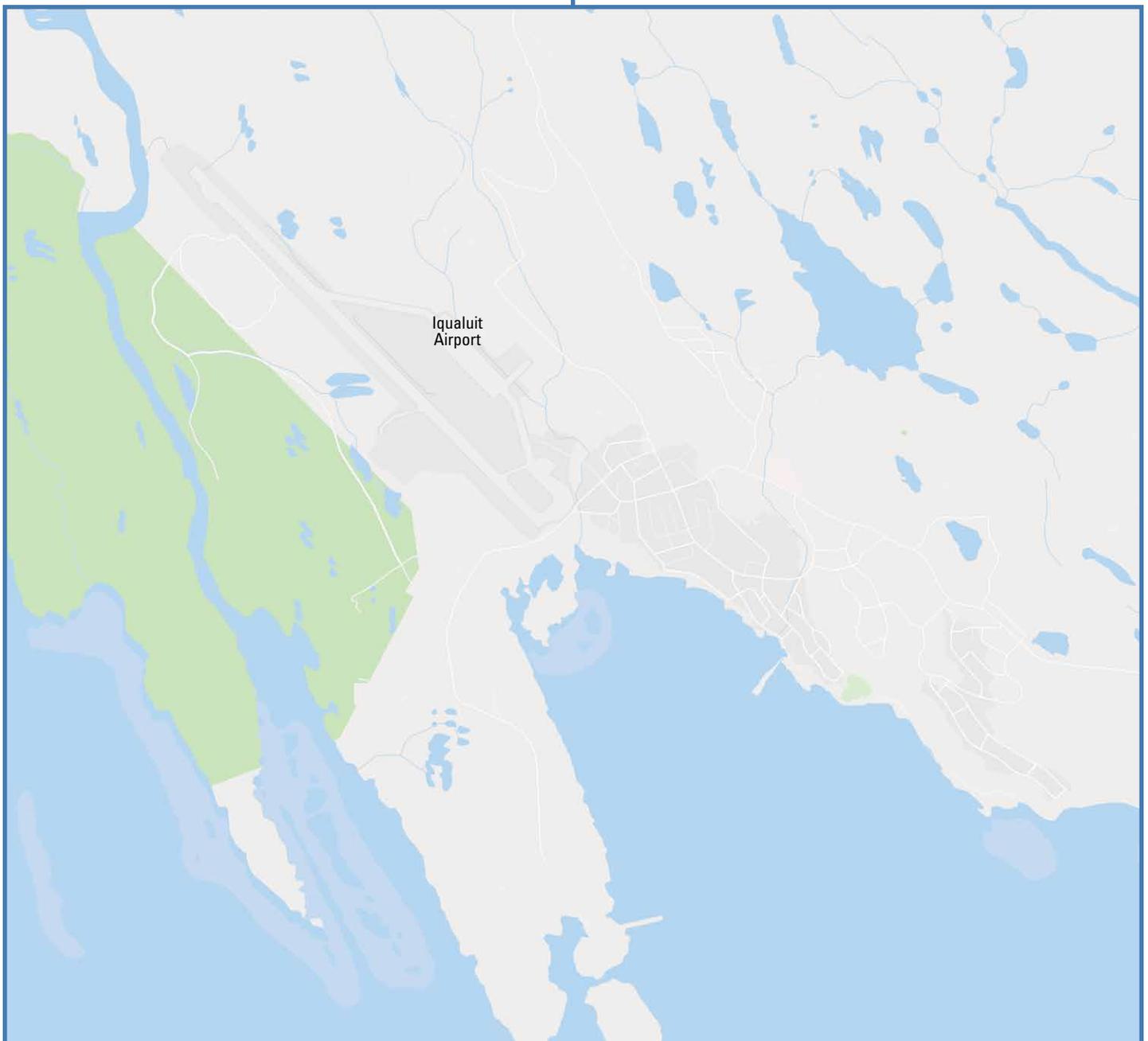
⁵ Statistics Canada, Census Profile, 2016 Census, Iqaluit (population centre), and Nunavut (Territory).

⁶ Permafrost is defined as ground (soil or rock and included ice or organic material) that remains at or below 0°C for at least two consecutive years. (Source: International Permafrost Association, <https://ipa.arcticportal.org/publications/occasional-publications/what-is-permafrost>, accessed April 2, 2018.)

Figure 1: Iqaluit International Airport location



Map data ©2018 Google, INEGI, ORION-ME



Map data ©2018 Google

Background and rationale

Iqaluit, before 1987 known as Frobisher Bay, is located at the head of Frobisher Bay on southern Baffin Island. Settlement was sparse for much of the 19th and 20th centuries. The Sabellum Trading Company of London, England, established several fur trading posts from around 1911 to 1927, and the Hudson's Bay Company opened a small trading post around 1914.

Activity started to increase at the beginning of the Second World War, when Canada and the United States were considering the defence and protection of North America. By 1941 Canada's north was a possible area for invasion—Germany had already established weather stations in Greenland, and by 1942 German submarines (U-boats) were entering North American waters and sinking cargo ships packed with military aircraft. To reach Britain safely American aircraft needed to fly over the Atlantic Ocean.

In 1941, the U.S. War Department had proposed a system of airfields to deliver short-range aircraft to Europe from factories in California and the Midwestern United States by way of northern Canada, Greenland, and Iceland. The U.S. proposal was accepted by the Canadians and construction started in 1942 to quickly establish the airfields.

Codenamed the Crimson Route, it included three Canadian weather stations named Crystal 1, Crystal 2, and Crystal 3. Crystal 2, located in Frobisher Bay, included the Frobisher Bay weather station along with an airfield, and became the Frobisher Bay Air Force Base. By 1943 it was fully operational, but by then it was unneeded, as airfields in Labrador and Greenland were proving more successful. In 1943 Frobisher Bay Air Force Base recorded 323 aircraft arrivals, but few were going onwards to Europe. After the war, the Canadian Government purchased all three Crimson Route airfields from the United States.

Postwar development in the Frobisher Bay community was made possible by air access. Then, as now, air transport was an essential service, and necessities like fresh food for all of the eastern Arctic arrived by air. In 1995, ownership of the airport was officially transferred from the Canadian Government to the Northwest Territories, and then, with the division of the Northwest Territories into two separate territories in 1999, to the Government of Nunavut.

Today, the Iqaluit Airport is an international airport, with the Canada Border Services Agency on duty at all times. Two major flight paths intersect over Iqaluit, flights between Asia and the east coast of North America and flights between Europe and the western half of North America, and a significant number of international flights take advantage of the airport's geographical location to refuel or use as an emergency stop. Every year the airport handles ten to twenty wide-body international airplanes making unscheduled landings due to mechanical or medical emergencies and over 1,500 medevac flights arriving at Iqaluit from other hamlets and leaving for cities in the south (usually Ottawa) that have the capacity to provide complex medical care not available in Iqaluit.

Project rationale

As Nunavut's population grows, the importance of the airport to the economy of Iqaluit and the territory continues to increase. Nunavut has one of Canada's highest rates of natural population growth, plus a fluctuating itinerant population. Several major industrial developments, including an offshore fishery, a diamond mine and an iron mine, are anticipated for the area as well. The existing airport infrastructure would not have been able to accommodate the increase in air traffic without expanded facilities, airside⁷ expansion, and further land development to accommodate new airport-related commercial development.

Safety was another driving factor for the project. The runway had reached the end of its life cycle. Last paved more than 20 years ago, it had a large number of cracks that were causing failures in the surrounding asphalt pavement and could not be easily repaired. Unlike an airport runway in the south, Iqaluit's runway was built on permafrost, which negatively impacted its life cycle and long-term performance—as the upper, active layer of permafrost thawed and froze through the seasons unpredictable cracking resulted, especially when cracks formed on the fault lines of ice-wedge polygons in the permafrost.

Runway lighting and other safety-related systems, over 20 years old or obsolete, were increasingly difficult to maintain and operate as they were starting to fail. The 50-year-old building that housed the fire trucks, emergency response vehicles, snow plows, and other maintenance vehicles was too small to hold the existing equipment, and was located outside the airport's secure perimeter.

The old airport terminal building had fallen into such poor repair—it was in a state ready to be condemned—that the health and safety of passengers was a concern. Inadequate security and screening areas, two very small and crowded boarding gates, and a lack of basic services past security such as washrooms, water fountains, and food kiosks all contributed to a poor user experience.

In addition, when the old terminal building was built passengers had simply walked through a metal detector; there had been no need for security and baggage screening. As air travel regulations changed and modern equipment had to be installed, the terminal building's space became severely cramped and inadequate. But expanding the existing building was not possible as the geographical constraints of the site did not provide a large enough apron.

Replacing the airport terminal building and moving its location was a large cost driver of the project. The airport required significant investment to replace its aging buildings and refurbish the airfield to support Nunavut's growing population and air transportation demands. While short-term

⁷ Airside infrastructure systems comprise aircraft aprons (parking stands), taxiways and taxi-lanes, and apron service roads. (Source: International Air Transport Association (IATA), <https://www.iata.org/whatwedo/ops-infra/air-traffic-management/Documents/airside-infrastructure.pdf>, accessed April 2, 2018.)

fixes had been found to address some of the safety issues, the government required a comprehensive solution before systems and infrastructure failed completely. Adding to its challenges, the government did not have a capital process in place that could facilitate a large-scale investment. The scale of the needs of the project would have been extremely challenging with traditional capital delivery methods.

Government objectives

The government focused on increasing safety, economic growth, and career and business opportunities for Inuit businesses and residents. These three priorities guided the project's objectives, which were developed to be consistent with the *Ingirrasiliqta (Let's Get Moving): Nunavut Transportation Strategy*.⁸ The objectives were used to assist in the service-delivery option decision, measure success during the project's life, and provide consistency in decision-making.

The government objectives were to:⁹

- ensure that all federal regulations and operational requirements were met to maintain the airport's certification with Transport Canada;
- improve the end-user experience by increasing capacity at the airport to achieve an appropriate level of service;
- foster innovation in procurement, design and construction, logistics and sustainability;
- facilitate economic growth both in the community and in Nunavut as a whole;
- maximize the value of both short-term and long-term development opportunities for Inuit businesses and career development;
- deliver the project within the approved budget;
- ensure that maximum value is achieved over the full life cycle of the project;
- deliver performance-based outcomes;
- optimize risk;
- minimize operational impacts throughout the transition to the new facilities; and
- capitalize on potential commercial opportunities at the airport.

Description of the Project

This was an ambitious project, and the age and history of the old airport and the northern environment added to its complexities. Air transportation is the vital link to the south for Iqaluit and Nunavut, so the project also required that the existing airport continue to be fully operational during construction.

In other airports with private-sector involvement, the private sector invests in infrastructure upgrades and seeks a return over a long period of time through a wide variety of revenue sources such as landing fees, retail, and land development. In Iqaluit, none of these opportunities is a significant source of revenue relative to the capital costs for the project.

Also, an airport's infrastructure is more than a main terminal building, so all aspects of the airport's operations needed to be considered. The project included the design, construction, financing, operations and maintenance of the airport, rehabilitation of the existing runway, new and existing taxiways and aprons, an airfield lighting system, a new terminal building and a new combined-services building.

The overall project scope included:

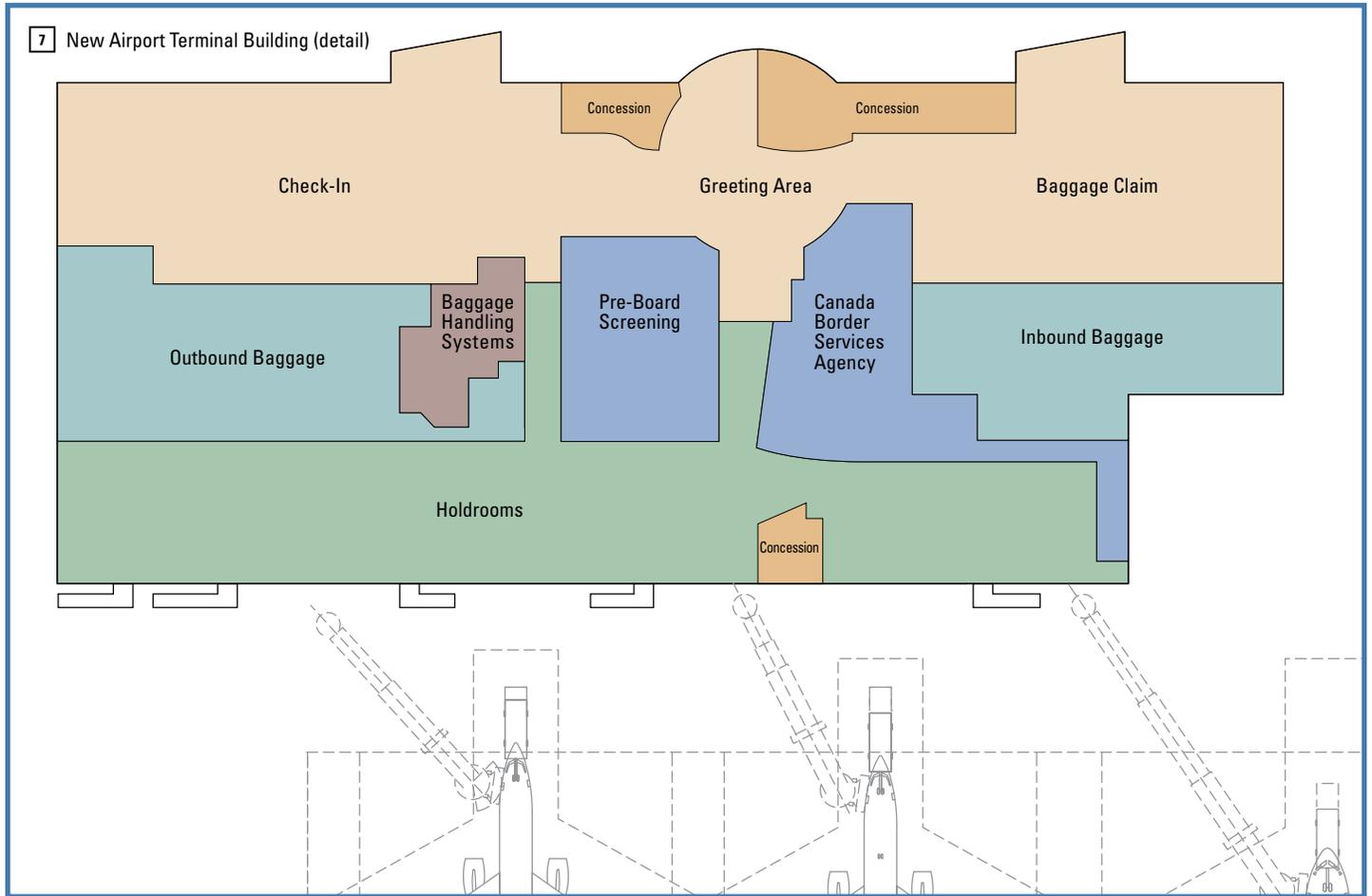
- a new 9,900-square-metre airport terminal building;
- a new 5,200-square-metre combined-services building;
- approximately 450,000 square metres of runway, taxiway, and apron improvements and rehabilitation;
- improvements to airport electrical systems and airfield lighting;
- new taxiways F and G;
- supplying the equipment integrated into the design, such as building security and control systems, elevator, mechanical systems and baggage-handling systems; and
- operations and maintenance of the existing airport during construction of the new facilities and operations and maintenance of the new airport for 30 years after the construction was completed.

Figure 2 illustrates the scope of work under the P3 agreement.

⁸ Government of Nunavut, Department of Economic Development and Transportation, *Ingirrasiliqta (Let's Get Moving): Nunavut Transportation Strategy 2008*. https://gov.nu.ca/sites/default/files/ingirrasiliqta_lets_get_moving_nunavut_transportation_strategy.pdf

⁹ Government of Nunavut, *Iqaluit International Airport Improvement Project*, Project Report, January 2014, p. 9.

Figure 2: Site plan depicting scope of work under the P3 agreement

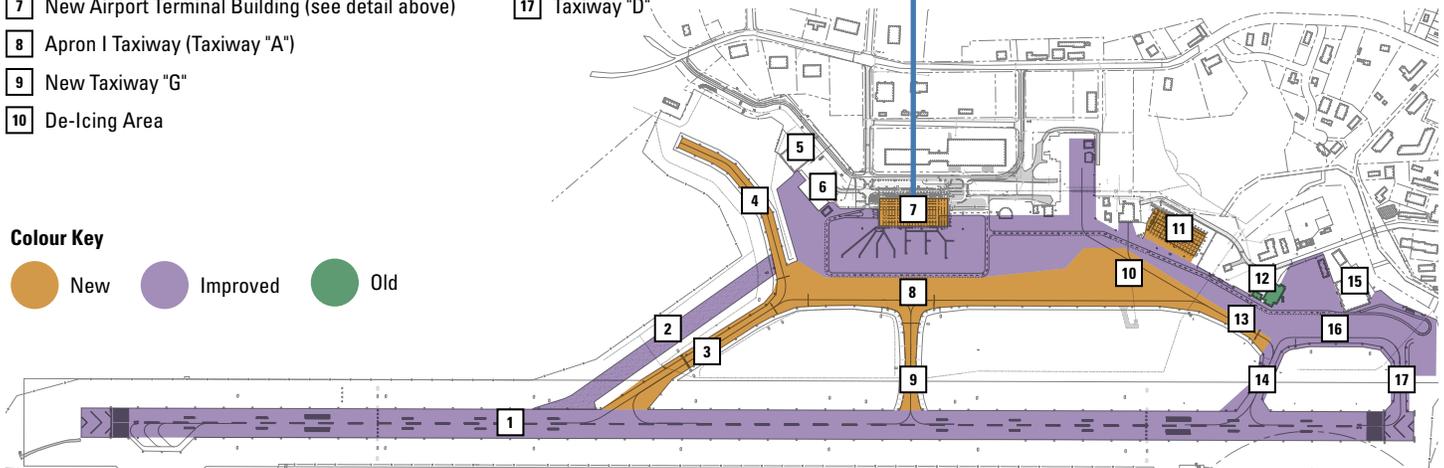


Airport Site Plan Overview

- 1 Runway
- 2 Runway Emergency Access
- 3 New Taxiway "A" Alignment
- 4 New Taxiway "F"
- 5 Keewatin Air Hangar
- 6 Canadian North Hangar
- 7 New Airport Terminal Building (see detail above)
- 8 Apron I Taxiway (Taxiway "A")
- 9 New Taxiway "G"
- 10 De-Icing Area
- 11 New Combined Services Building
- 12 Existing Airport Terminal Building
- 13 Apron II Taxiway (Taxiway "A")
- 14 Taxiway "C"
- 15 First Air Hangar
- 16 Apron III Taxiway (Taxiway "A")
- 17 Taxiway "D"

Colour Key

- New
- Improved
- Old



Design

Improvements for passengers

The airport's design and functionality took the landscape, community needs and modern airport infrastructure all into account. The terminal building, the public face of the airport, includes many modern conveniences that other projects or jurisdictions may already take for granted—for example, instead of busing passengers to and from the aircraft, airplanes can now park in front of the terminal building.

Passenger processing is now very streamlined, especially the baggage-handling system, with the new terminal building dedicating nearly a third of its space for baggage-handling activities. Because the old building had such limited interior space, bags had mostly been handled outside, then brought inside via a short single conveyor belt and simply dropping off the open end, piling up for passengers to sort through and find their own. Now, with the installation of interior bays for outbound and inbound baggage trains, an outbound sorting carousel and two inbound rotary baggage carousels, baggage is all sorted indoors—a welcome improvement given the average winter temperature in Iqaluit is minus 28°C!

Unlike airports in southern Canada, the Iqaluit International Airport regularly receives two types of flights, the small community flights that do not require security screenings for passengers or baggage and the flights connecting directly to major airports in the south, which do require security screenings for passengers and baggage. It is impossible to drive between the hamlets and Iqaluit, so residents regularly use community flights to travel within Nunavut. While the absence of security screenings is convenient for the passengers traveling on those flights, it creates a significant security challenge that must be managed through additional infrastructure in the airport terminal building and procedures to ensure there is no intermingling of screened and unscreened passengers or luggage.

The new airport now includes multiple boarding gates and passenger hold rooms to ensure passengers from secure and non-secure flights do not intermingle. When passengers from non-secure flights reach Iqaluit for onward flights, both they and their baggage need to be screened before boarding a secure flight to any southern or international destination.

For community flights, friends and family can still walk to the gate to see loved ones off instead of leaving them at the pre-board security screening. And unlike at the old airport, all passengers now have access past security to refreshments and washrooms. The airport also has other conveniences that are now taken for granted in other airports, such as free Wi-Fi, electrical plug-ins for charging passengers' electronic items, and water fountains.

Natural light is used extensively throughout the building. A central concourse features several distinct spaces including a rotunda that is used for public gatherings and events, an Elders' Lounge, and spaces for displaying Inuit art. Ample staff and visitor parking is located close to the

terminal building, including convenient drop-off and pick-up areas. The entire building is on one level, providing excellent access for passengers with reduced mobility.

Building improvements

The airport terminal building was designed to accommodate future growth with minimal disruption and reduced costs. The design includes space to increase pre-board security screening lines from two to three, and includes a common-use design for check-in counters and gates to allow multiple airlines to efficiently use the new infrastructure. Subsurface utilities and thermosyphon radiators are located away from building areas that would be expanded, and the foundation slab on the building's southwest corner is extended beyond the current building perimeter, which will minimize any future expense of adding another arrival/departure gate at that end of the building.

The aircraft commonly used between Iqaluit and Ottawa is called a combi aircraft, typically carrying a combination of passengers and cargo. Traditional boarding bridges cannot be used for combi planes since cargo is carried in the front of the aircraft. Instead, passengers must disembark from the rear of the aircraft, using stairs or a ramp to the outdoors. The new terminal building has been designed to allow for easy conversion to the use of traditional connected boarding bridges once the airlines switch to full-passenger-configuration aircraft that board through the front door and combi aircraft are no longer used.

Environmental features

The project also focused on environmental and energy-efficient features. The buildings incorporate combined heat and power units that burn fuel oil to create electricity, with the excess heat from that system captured to serve the heating, ventilation and air conditioning systems, providing substantial energy savings. This makes the airport buildings highly energy-efficient and also ensures that the airport will not be affected during power-grid outages, which regularly occur in Iqaluit. The project agreement requires the terminal building to be LEED-certified,¹⁰ one of the first buildings in Nunavut to have this requirement. While achieving LEED Silver was not a requirement, the terminal building earned sufficient points to reach this level.

Service improvements

The combined-services building is now located within the secure airside perimeter of the airport; previously it was outside the perimeter. This improved proximity reduces response time for emergency services and improves airfield access for maintenance equipment. Further improvements

¹⁰ LEED® (Leadership in Energy and Environmental Design) is a program of the Canada Green Building Council promoting a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water efficiency, energy efficiency, materials selection and indoor environmental quality.

Combi aircraft, with cargo loading at front and passenger boarding at rear



include design features such as drive-through bays, significantly expanded areas for equipment storage and maintenance, and a rapid water and foam refilling station for the fire trucks (which can now refill in five minutes, compared to the previous 45), improving firefighting capability.

Numerous airfield improvements were also included in the project:

- New energy-efficient airfield lighting was installed;
- Two new taxiways (F and G) were constructed;
- Taxiway A was realigned and rebuilt;
- Apron I was significantly extended;
- The runway, existing taxiways and aprons were all repaired and repaved; and
- A new de-icing area with glycol-recovery capability was added.

Taxiway F facilitates future commercial development at the airport and Taxiway G, which connects to the runway directly west of the airport terminal building, improves circulation of aircraft. North Commercial Road, a new service road to access the commercial development adjacent to Taxiway F from groundside, was also included in the project.

Existing Taxiway A, which is the northernmost connection to the runway, was realigned and rebuilt as frost heaves had left the previous connection damaged and repairs were not long-lasting. As a result, the taxiway was often out of service, reducing overall airport efficiency. This

portion of the project was not initially included in the government's plans, but AILP found a sustainable solution to the problem with the assistance of geological models, and included this work in the project.

Development/construction

The northern environment placed many restrictions on the procurement and construction schedules:

- Outdoor construction was primarily limited to May through October, with paving limited to July and August;
- Procurement of construction materials required early booking with shippers to ensure space on a boat since deliveries were limited to four sealifts per year, and only between July and October. Procurement planning started two years before construction began and orders were placed one year in advance of shipping;
- Overall, subcontractors worked hard to limit mistakes in their planning and procurement as missing or extra parts needed before the next sealift could only be delivered by air, costing the entire project time and money.

Old terminal building

It is important to note that although not directly a part of the project, the old terminal building still exists within the secure airport perimeter and continues to be used. The third floor still houses the Iqaluit Flight Service Station (i.e., the air traffic control tower) operated by Nav Canada, and some offices on the second floor continue to be occupied by government staff associated with the airport. The government is planning to renovate and refurbish this building as a separate project in the near future. While the building's overall function will be related to transportation and/or aeronautical uses, the new occupants for the main level have not yet been confirmed.¹¹

Innovative Features

Use of shape, light and colour

The architectural characteristics of the new terminal building reflect the Nunavut landscape and its culture and inspire a sense of place. The dramatic roofline and vivid exterior colour palette are culturally consistent with community practice. The continuous curve of the roof wrapping the

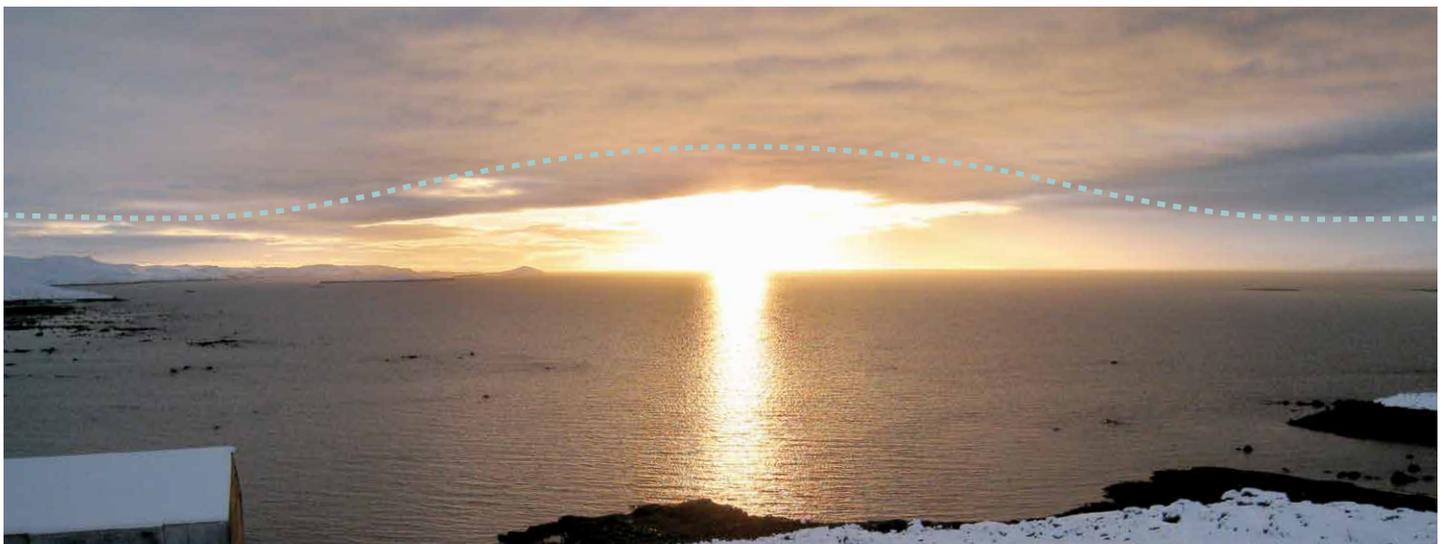
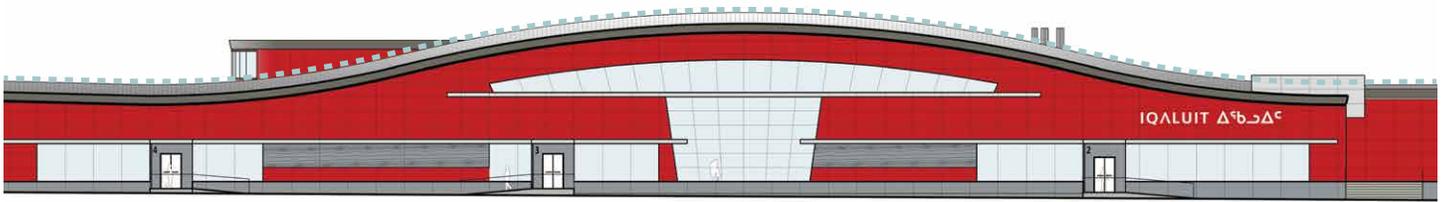
building mirrors the aerofoil shape commonly found on aircraft while also reducing the surface area of the building and limiting snowdrifts.

The use of natural light was important. Inside the building, two-storey windows and a roof lantern provide an abundance of natural light throughout the day and act as a beacon of light to those outside during dark hours. The window layout was inspired by the arctic sun in winter, when it appears as a shallow-curved slit of light barely clearing the horizon (see Figure 3).

The rotunda was designed as the focal space of the new terminal building and serves as a public crossroads and natural meeting space for travellers. Since it can be used as a public assembly space for community events and presentations it also provides a link to the Iqaluit community, and the rotunda's circular shape and high curved walls allude to the igloo form. The terminal building design also prioritizes space throughout for exhibitions of major cultural installations and examples of Inuit artwork.

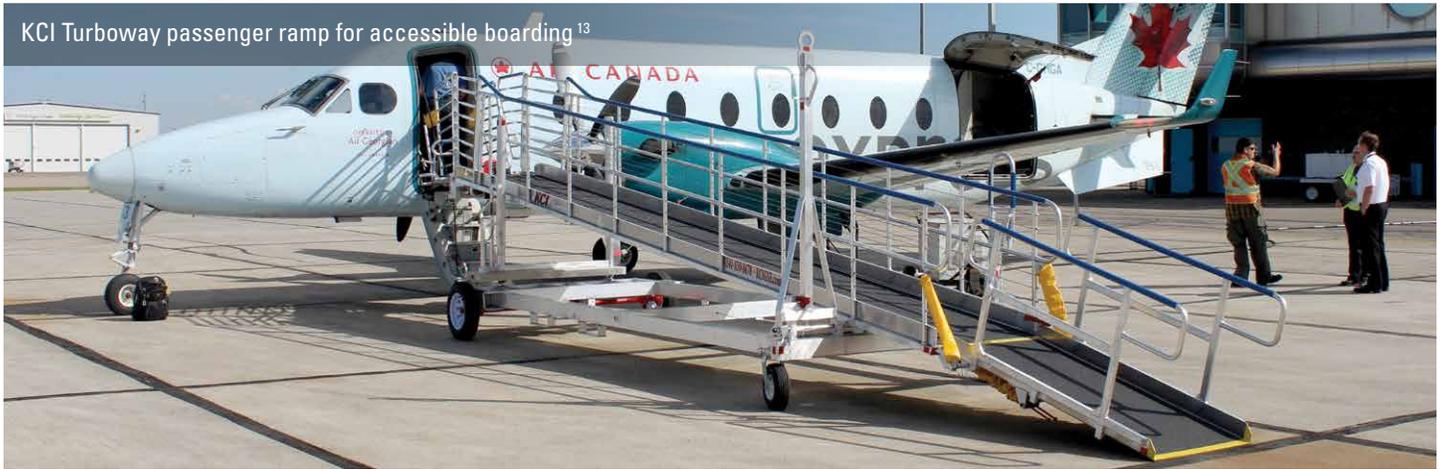
As the airport is located close to the heart of the city and is a key partner in Iqaluit's relationship with Canada's North, bright red¹² was chosen as the colour for most of the exterior cladding to create a dramatic contrast both with the snow and the brief summer season of wildflowers, and also because visibility during whiteout conditions was important.

Figure 3: Terminal building design reflects arctic landscape



¹¹ Chief Project Officer, *Iqaluit International Airport Improvement Project*, Government of Nunavut, email dated January 9, 2018.

¹² Brightly coloured buildings have become a tradition in the North, starting in the 1970s when students at Diamond Jenness Secondary School in Hay River, Northwest Territories, voted to paint their school purple.

KCI Turboway passenger ramp for accessible boarding¹³

Accessibility

Keeping the terminal building primarily to a single level was important for accessibility; aircraft boarding for passengers with reduced mobility has also been improved. Previously, high-back transfer wheelchairs were used to embark and disembark passengers who could not use the stairs, but lifting them up and down the boarding stairs was a concern both for passengers, who considered the process to be undignified, and for airline attendants, who had to physically lift such passengers up the steep boarding stairs, often in extreme weather conditions.

To eliminate the use of these transfer chairs, the government purchased two KCI Turboway Passenger Ramps (see Photo 2), one for smaller turboprop aircraft and one for larger aircraft. These boarding ramps have grades that can accommodate regular wheelchairs and allow easy access for passengers with reduced mobility. The ramps are shared between the two major airlines.

Airport built for growth (40 to 50 years)

The combined prospect of increasing international flights and a growing population called for interior layout innovations that would accommodate more passengers and could process them with different security considerations. As noted previously, flights departing to smaller Arctic settlements do not require passenger or baggage screening, but when passengers from these communities reach Iqaluit for connecting flights outside the territory they need to be screened before they can join passengers who have already gone through the formal domestic and international departure pre-board security checks. Arriving international passengers and their baggage need to be segregated until they have been processed by the Canadian Border Services Agency (CBSA). Lock-off and flexible partitions in both the arrival and departure areas allow for this range of processing as well as for the standard screening processes.

At present all passengers must still go outside to board an aircraft, however, as noted, the new terminal building can be easily converted to the use of traditional boarding bridges when the airlines switch to passenger-only-configuration aircraft in the future.

In addition to designing the airport terminal building for growth, the creation of a new commercial development area to the northeast, serviced by new Taxiway F

from the airfield and by the new North Commercial Road groundside, allows for development of new hangars to accommodate other airlines, businesses or government agencies needing facilities to house and service aircraft related to their work in the North. Approximately 40 per cent of this area has already been leased for facilities to be constructed in the next two to three years.

Permafrost technology

The majority of buildings in Iqaluit are set on pilings that extend deep into the permafrost, both for stability and to allow wind to blow through. This not only prevents snowdrifts, it also prevents the building's heat from melting the permafrost. Permafrost is composed of two layers: the upper, active layer is shallow and thaws and freezes through the seasons; the deeper layer is permanently frozen.

As the bedrock was too deep to be reached for foundation support via pilings, the airport buildings were built on the permafrost. To stop the building from warming the permafrost and to prevent the foundation from cracking, a thick layer of insulation was positioned below the floor slab to reduce heat transmission. Directly below this insulation is a passive refrigeration system that uses "thermosyphons"—tubes that run through the ground beneath the foundation to remove heat before it can reach the permafrost. The system includes a series of sensors that monitor the temperature below the building and confirm that the system is still functioning as designed.

Thermosyphon systems are starting to become common in the North, but this installation is unique, designed to allow more equipment to be added that can transform the system to active refrigeration, cooling the ground beneath the foundation, if global warming continues and temperatures rise beyond the capacity of the passive system. This innovation will ensure a long life for the buildings' foundations. Figure 4 illustrates the features of a thermosyphon system.

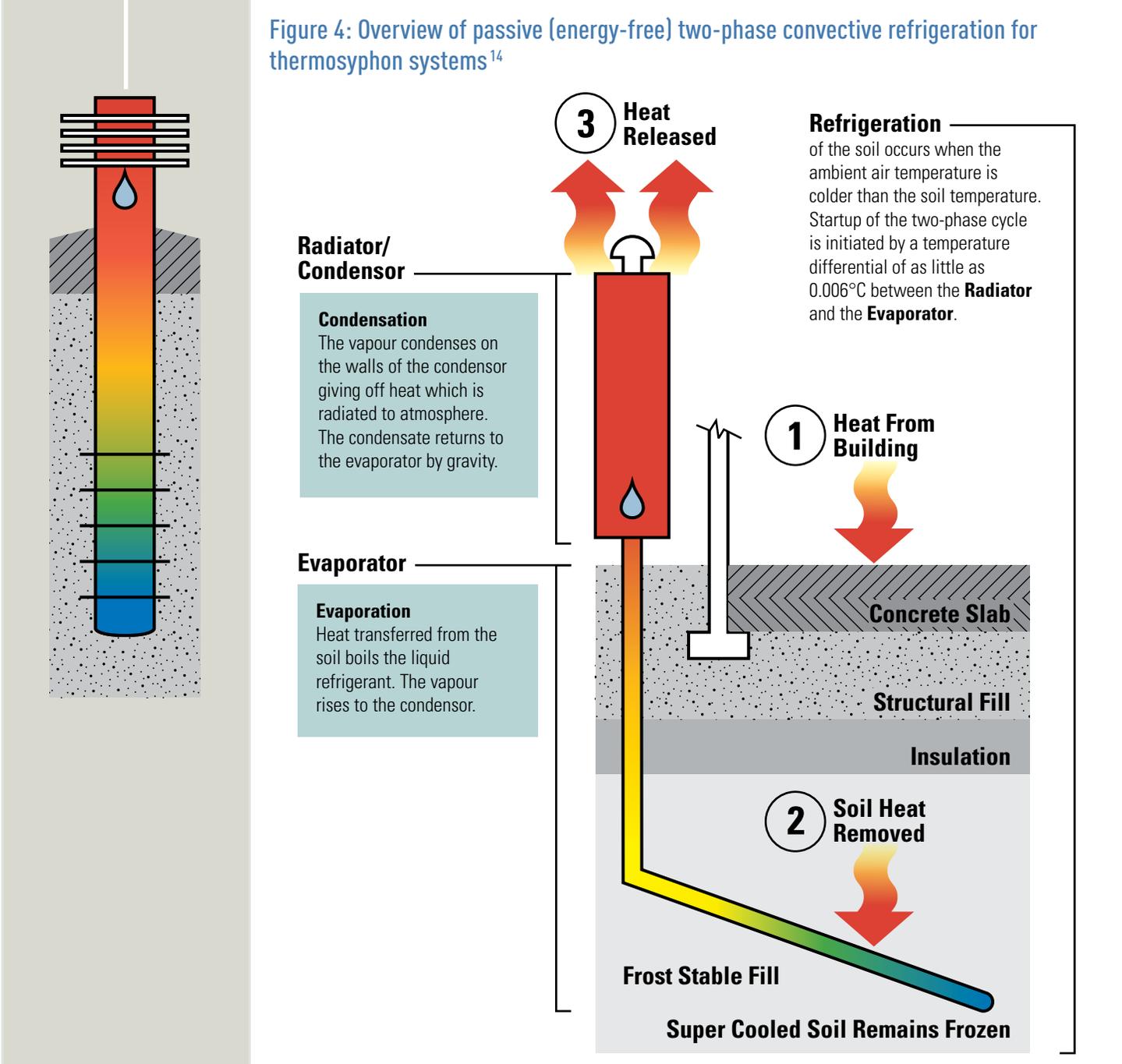
The system's dramatic arrays of vertical tubular radiators stand like sentinels outside the perimeter of the new terminal building (see Photo 3). Care was also taken with the elegant positioning and detailing of the air intake slots, which have been placed along the elevators and away from car and aviation fuel fumes.

¹³ KCI Turboway Passenger Ramp photo credit, <https://www.kcigse.com/wp-content/uploads/2009/12/082.jpg>

Front of airport terminal building, showing vertical tubular radiators of the passive refrigeration system used to prevent permafrost from melting



Figure 4: Overview of passive (energy-free) two-phase convective refrigeration for thermosyphon systems¹⁴



¹⁴ Arctic Foundations of Canada. http://www.northernadaptation.ca/sites/default/files/6_thermosyphons_-_wall.pdf

Delivery of construction materials by sea*



*<https://www.youtube.com/watch?v=nlhFDr4KE6Q>

Short sealift season for delivery of construction materials

Procurement required careful integration of design with construction. Bulky construction materials were shipped from southern centres between July and October, the only ice-free months of the year (see Photo 4). During the summer construction schedules were aided by the long hours of daylight, but harsh weather limited exterior work in the winter, which in Iqaluit typically lasts seven to eight months of the year.

Procurement Process

Selecting the P3 model

The Iqaluit International Airport is the first example in North America of a P3 procurement model being used for an entire airport infrastructure project. The government worked with commercial and technical advisors to determine the best procurement approach. An assessment was developed and each potential delivery option was evaluated against the following qualitative criteria:

- whole-of-life outcomes;
- innovation;
- performance-based outcomes;
- risk optimization;
- schedule certainty;
- airport operations and terminal building flexibility;
- market interest and competition;
- fair, open and transparent process;
- stakeholder considerations;
- procurement complexity and precedents; and
- cost certainty.

Procurement options were analyzed by a project team consisting of representatives from the Government of Nunavut and commercial and technical advisors. The project team concluded that traditional procurement would be a series of DBB and operating contracts. Under this method, the government would have been responsible for retaining, managing, and integrating five discrete projects: the combined services building, the terminal building, landside civil work, airside civil work, and airside electrical work.

In addition to separate architects, engineers, and contractors for each component, the government would have had to provide monthly funding and interface between each of the five projects and the existing operations and maintenance contractor. This method also offered limited risk transfer. Moreover, the five projects could not have been completed concurrently, and each was scheduled to take at least four years to complete.¹⁵

Under a P3 model, a DBFOM delivery method was determined to be the preferred procurement option. Under this model, the government would enter into a single contract with a private partner who would be responsible for:

- arranging partial project financing for facility construction and maintenance over a specified term;
- designing and building the project assets (the same as identified in the DBB);
- operating and maintaining the airport during and after construction; and
- maintaining the asset over the life of the project agreement and handing it back at the end of the contract term in the prescribed condition.

The government moved ahead with the DBFOM procurement model because of its integration, risk transfer, innovation potential and timely delivery.¹⁶

Selecting a partner

Competitive process

Partnerships BC acted as procurement manager for the competitive selection, which was a two-stage process.¹⁷

Request for Qualifications

The Request for Qualifications (RFQ) was issued on June 29, 2012. The project was marketed locally, nationally and internationally. Eight teams responded with their qualifications. From the eight, three teams were shortlisted and invited to participate in the Request for Proposals (RFP) stage. The proponent teams invited to compete are listed in Table 1.

¹⁵ Government of Nunavut, Iqaluit International Airport Improvement Project, Project Report, January 2014, p. 13, and Application Form by Iqaluit International Airport Project to CCPPP 2017 National Awards for Innovation and Excellence in Public-Private Partnerships, September 2017, p. 10.

¹⁶ Ibid.

¹⁷ In addition to services provided within B.C., Partnerships BC offers value-added services to clients outside the province such as the territories of Nunavut and the Yukon and the provinces of Saskatchewan, and Newfoundland and Labrador. Partnerships BC also pursues advisory and procurement opportunities with jurisdictions outside of B.C., including the West Coast Infrastructure Exchange in the United States. (Partnerships British Columbia Inc. 2017/18–2019/20 Service Plan, September 2017, p. 6.)

Table 1: Qualified teams

Proponent	Equity Investors	Design Lead	Construction Lead	Service Provider Lead
Arctic Infrastructure Limited Partnership	<ul style="list-style-type: none"> ■ InfraRed Capital Partners Ltd. ■ Bouygues Building Canada Inc. ■ Colas Canada Inc. ■ Winnipeg Airports Authority Inc. 	<ul style="list-style-type: none"> ■ Stantec Architecture Ltd. ■ Stantec Consulting Inc. 	<ul style="list-style-type: none"> ■ Bouygues Building Canada Inc. ■ Sintra Inc. ■ Kudlik Construction Ltd. ■ Tower Arctic Ltd. 	<ul style="list-style-type: none"> ■ Winnipeg Airports Authority Inc.
Mittarvik Development Partners	<ul style="list-style-type: none"> ■ Bilfinger Berger PI International Holding GmbH ■ Kiewit Canada Development Corp. ■ Bird Capital Ltd. 	<ul style="list-style-type: none"> ■ Associated Engineering ■ NORR Ltd. 	<ul style="list-style-type: none"> ■ Peter Kiewit Infrastructure Co. ■ Bird Design-Build Construction Ltd. ■ Black & McDonald Ltd. 	<ul style="list-style-type: none"> ■ Canadian Base Operators ■ Halifax International Airport Authority
Plenary Group and Edmonton Airports	<ul style="list-style-type: none"> ■ Plenary Group (Canada) Ltd. 	<ul style="list-style-type: none"> ■ MMM Design Group 	<ul style="list-style-type: none"> ■ PCL Constructors Northern Inc. ■ Dexter Construction Company Ltd. 	<ul style="list-style-type: none"> ■ Honeywell Ltd./Canada ■ Edmonton Airports Authority

Request for Proposals

During the RFP stage, each team had the opportunity to discuss issues or concerns on matters related to commercial, legal, design and construction, and facilities management during collaborative and topic-specific meetings.

A final draft of the project agreement was issued before the closing date, serving as the common basis for all proposals. The three technical proposals were then evaluated on the following requirements:

- substantially satisfy the requirements of the RFP and the final draft project agreement (contract);
- demonstrate to the satisfaction of the government that the proponent would be capable of performing the obligations and responsibilities of the private partner and delivering the project in accordance with the project agreement; and
- demonstrate a good understanding of the project and the required scope of work.

One technical submission did not substantially satisfy the requirements and that proponent was not invited to make a financial submission. The two proponents that met the technical requirements were invited to make a financial submission.

These two financial proposals were evaluated on five criteria:

- The proponent had arranged sufficient financing for the project in accordance with the requirements of the RFP and the final draft project agreement;

- The proponent's financing plan, including security, bonding, guarantees and insurance elements, was robust and deliverable;
- The proponent's financing plan could be executed expediently if the proponent was selected as preferred proponent;
- Each of the proponent's equity providers continued to have the ability to raise sufficient capital to meet the equity requirements; and
- The proponent was financially viable.

An evaluation committee was appointed to carry out this step and select the preferred proponent.

Affordability requirements, scope ladder and optional valued items

A key objective of the competitive selection process was to maximize the project scope while meeting the project's affordability requirements.

There were two affordability requirements:

- a mandatory affordability ceiling of \$465.94 million net present cost (NPC) calculated as at April 1, 2013, using a discount rate of 7.83 per cent; and
- a mandatory capital cost ceiling of \$295.77 million in nominal dollars.¹⁸

¹⁸ Government of Nunavut, *Request for Proposals, Iqaluit International Airport Improvement Project*, May 24, 2013, p. 20.

The government developed an affordability model for the proponents to use to determine their NPC and the total capital cost of their proposals to test against the affordability and capital cost ceilings.

A scope ladder was introduced to provide ways for proponents to meet the affordability requirements by reducing the scope of their proposals; a proponent could propose to reduce the scope of the project by choosing not to provide one or more of the scope-ladder items on an approved list, but only in the order established by the scope ladder.¹⁹

Evaluation

Once it had been determined that proposals satisfied the mandatory requirements of the RFP, they were evaluated and ranked in two steps. The first was according to the proponent’s use of scope-ladder items: the proponent using the fewest scope-ladder items would be ranked the highest, and the one using the most would be ranked the lowest. Since neither of the proponents used the scope ladder items, the ranking process proceeded to the second step.

The second step was to rank the proposals according to their respective NPC. The proposal that offered the lowest NPC would receive the highest ranking and designated the highest-ranked proposal.

Name of private partner

The proponent that met all the RFP requirements and offered the lowest price was Arctic Infrastructure Limited Partnership (AILP).

Commercial and financial close

The entire procurement process was completed in less than 15 months. Commercial and financial close took place on September 10, 2013. Table 2 shows the project timeline.

Table 2: Project timeline



cont.

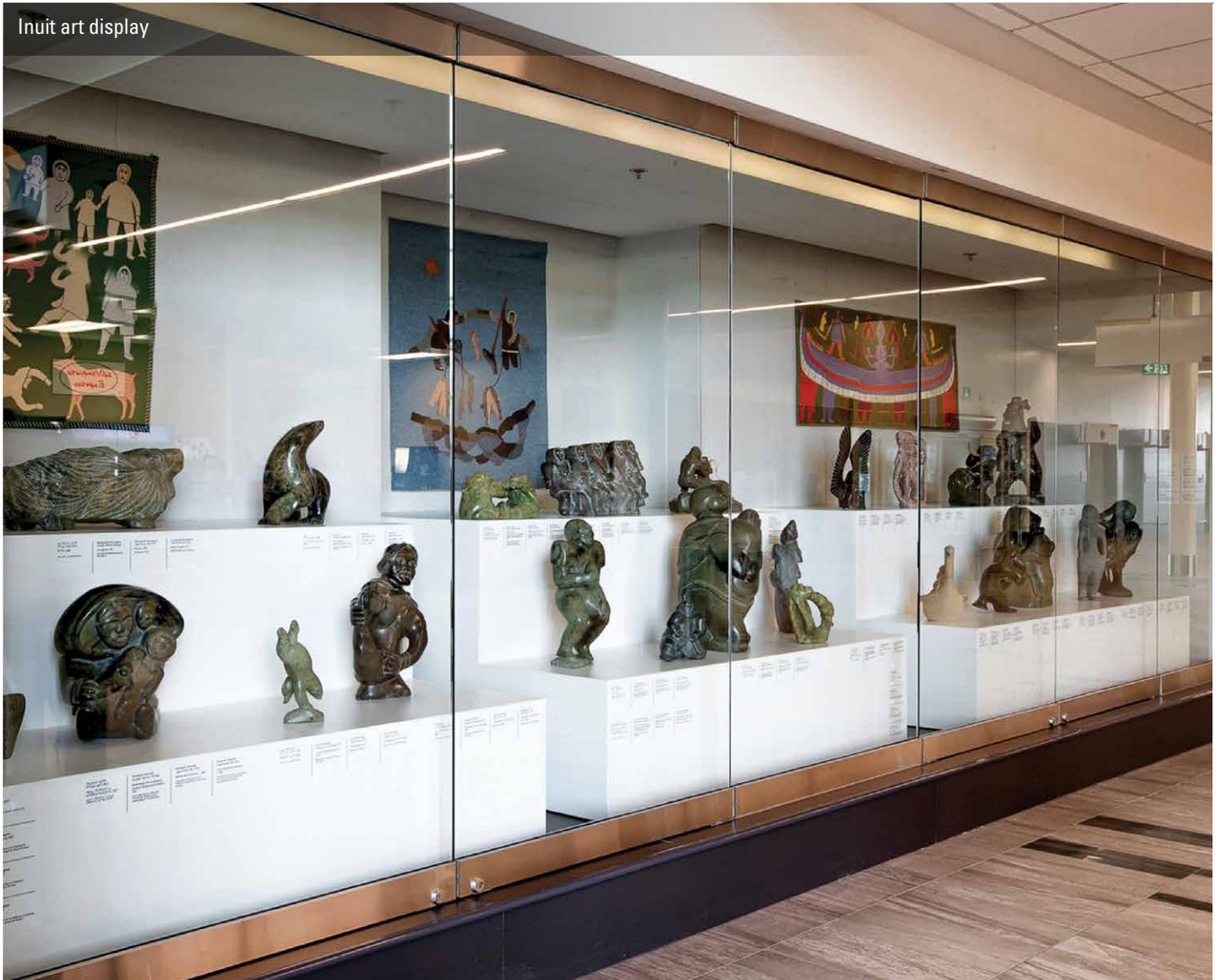


Fairness of the process

A fairness advisor, Jane Shackell, Q.C., of Miller Thomson LLP, monitored the competitive selection process and offered an assessment of the procedures and whether or not the selection process was carried out fairly and reasonably. The fairness advisor was given access to all documents, meetings, and information related to the evaluation process during both the RFQ and RFP stages. Reports were issued for both processes. The RFP report concluded “the procurement process as described in the RFP was fair, reasonable and appropriate, and that the project team reasonably implemented and complied with that process.”²⁰

¹⁹ Ibid., p. 21.

²⁰ *Iqaluit International Airport Improvement Project, Final Report of the Fairness Advisor: RFP*, July 8, 2013, p. 5.



Overall Structure of the Agreement

The private sector team consists of four parts: equity providers, design, construction, and facility management services.

Equity providers

InfraRed Capital Partners Limited, Bouygues Building Canada Inc., Colas Canada Inc. and a subsidiary of Winnipeg Airports Authority together provided 100 per cent of the equity.

Design

Stantec Architecture Ltd. and Stantec Consulting Ltd. were responsible for the design of the new airport.

Construction

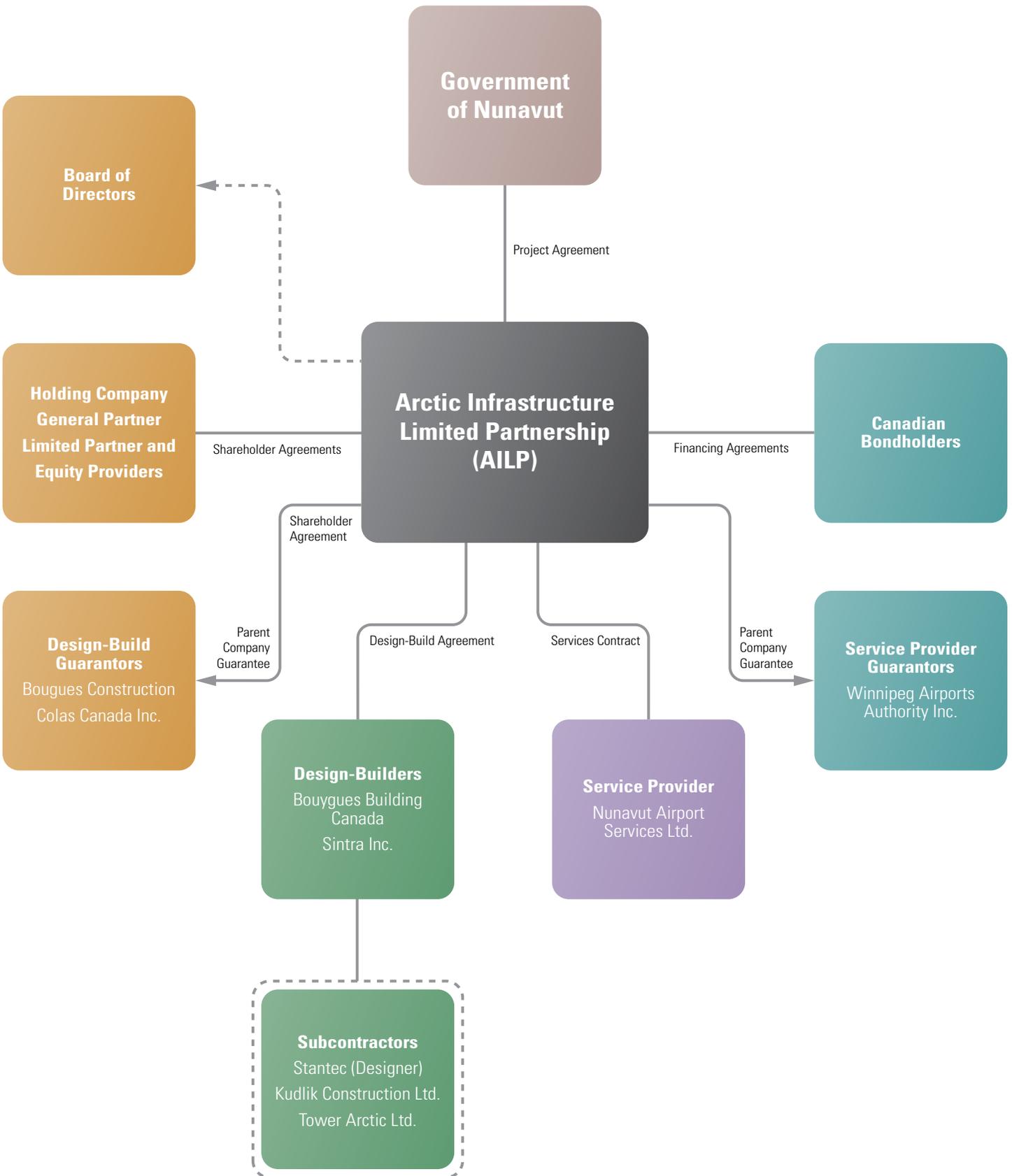
Bouygues Building Canada Inc. and Sintra Inc. took primary responsibility for the project's design-build requirements and used a number of subcontractors, including local Iqaluit firms Kudlik Construction Ltd. and Tower Arctic Ltd., to perform some design-build activities.

Facility management services

A subsidiary of Winnipeg Airports Authority (Nunavut Airport Services Ltd.) has primary responsibility for airport operations, including facilities maintenance services and life cycle deliverables.

The partnership structure is illustrated in Figure 5.

Figure 5: Partnership structure



Financial Arrangements

Capital costs

The capital cost for the new airport is \$300 million. This includes the capital cost for new construction, equipment, insurance, goods and services tax, the procurement process, and implementation. Capital costs were funded by

- the Government of Nunavut, which contributed \$68.7 million during construction;
- the Government of Canada, which through the P3 Canada Fund contributed \$74.2 million (based on 25 per cent of eligible costs up to a maximum of \$77.3 million) in two installments paid directly to the Government of Nunavut:
 - \$63 million at interim service commencement, achieved in August 2017;
 - the balance at full service commencement, achieved December 2017; and
- AILP, which contributed the remainder through debt and equity in the project.

The government's contributions to the project during construction were provided through ongoing progress payments and two lump-sum payments. Equity investors explored various debt financing markets and structures and determined that the optimal financial structure in the context of the government contribution profile consisted of a single tranche of long-term amortizing debt.

To achieve the most efficient pricing and terms for long-term debt, equity investors held a competition between private placement investors and bond underwriters with strong track records in the Canadian P3 market. Ultimately, the lowest proposed NPC was a long-term-rated amortizing bond by CIBC. The \$142.0 million bond offering was completed in September 2013 with an A- rating from S&P. A credit spread of 185 basis points was achieved, which matched the lowest on a Canadian P3 project since 2008.

The contribution from AILP is fully recognized in the liabilities of the government. Most notably, the borrowing limit for the territory was increased to accommodate not only the government's direct contribution but also AILP's contribution. This capital contribution will be repaid as part of the availability payments from the government to the proponent over the life of the contract.

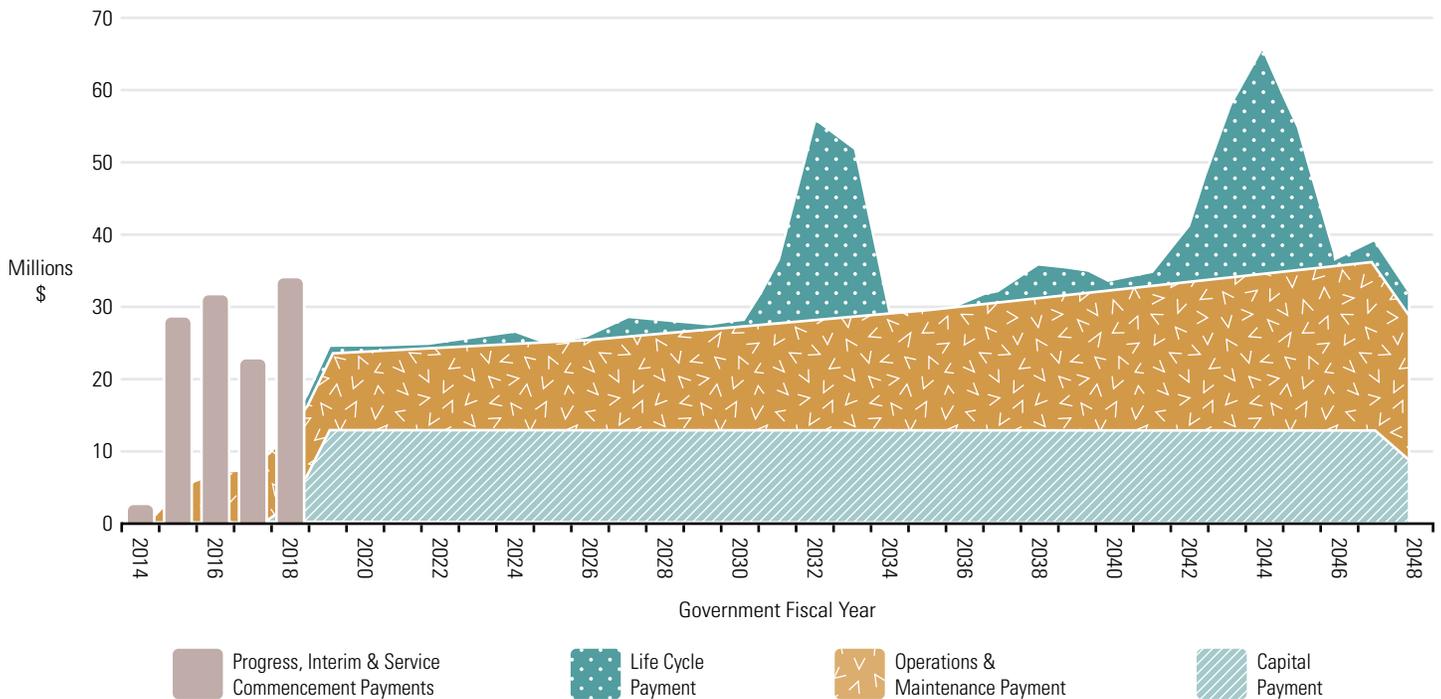
Federal government support was critical for the project's success. The territory receives a significant portion of its revenue from the Government of Canada under the Territorial Formula Financing model. In turn, this funding represents a key element of the territory's credit profile and its Aa1 credit rating from Moody's Investors Service. This, coupled with the federal government's lack of explicit guarantee of the Government of Nunavut's financial obligations under the project agreement, presented a challenge to funders when evaluating credit. During evaluation, equity investors performed extensive due diligence regarding the federal government's commitment to the territory and the project. Federal support was demonstrated through:

- the strategic importance of the airport to Canada;
- the allocation of funding for the project's capital costs from the P3 Canada Fund;²¹ and
- the federal government's historic commitment to the territories and the consistency of their financial support.

See Figure 6 for an illustration of overall project financing and Figure 7 for an illustration of life cycle payments.

²¹ Government of Canada and Government of Nunavut, *Governments of Canada and Nunavut Demonstrate How Commitment to Public-Private Partnerships Benefits the Territory*. News release, September 20, 2012.

Figure 6: Project financing



Payments

During the construction period there were two types of payments made to AILP:

1. Construction-related payments: These were capped by fiscal year to manage the Government of Nunavut’s annual capital plan. These payments were made monthly as construction progressed and were capped at \$86.5 million. There were also two substantial completion payments, one of \$18.3 million at interim service commencement in August 2017, and the other of \$16 million at full service commencement in December 2017.
2. Operations and maintenance payments: These payments started after AILP assumed operations and maintenance activities at the existing airport in July 2014. AILP is paid through a payment mechanism based on performance, facility availability, and service quality. Performance is constantly monitored, tracking the achievement of key performance indicators and availability of the infrastructure.

Performance-based payment principles

The project is the first P3 for an entire airport based on an availability model, as is common in most Canadian P3 projects. In this project, AILP has an incentive to perform through a payment mechanism that is based on the principles of performance, facility availability and service quality.

Monthly availability payments began when AILP assumed operations of the airport. These payments are based on responsibilities as the project progressed throughout construction to operations and maintenance. Table 3 outlines the milestones for these payments.

Table 3: Availability payment milestones

Project milestone	Availability payment
Assumption of operations	Based on existing airport operations
Interim service commencement	Based on facility maintenance and operations
Service commencement	Based on capital repayment, facility maintenance, life cycle and operations

Throughout the operating period, AILP's performance is being constantly monitored based on the availability of the infrastructure and achievement of key performance indicators. The government is entitled to make deductions from its monthly payments if AILP does not meet the standards specified in the project agreement. For example, if a runway is not available and the situation is not resolved within 15 minutes, the payment to AILP can be reduced by up to \$4,500 for each 15-minute interval depending on the time of day.²²

Life cycle profile

The project's life cycle expenditure profile included a number of major runway rehabilitations requiring significant expenditure over a short period of time. Operating resiliencies were constrained during these periods,

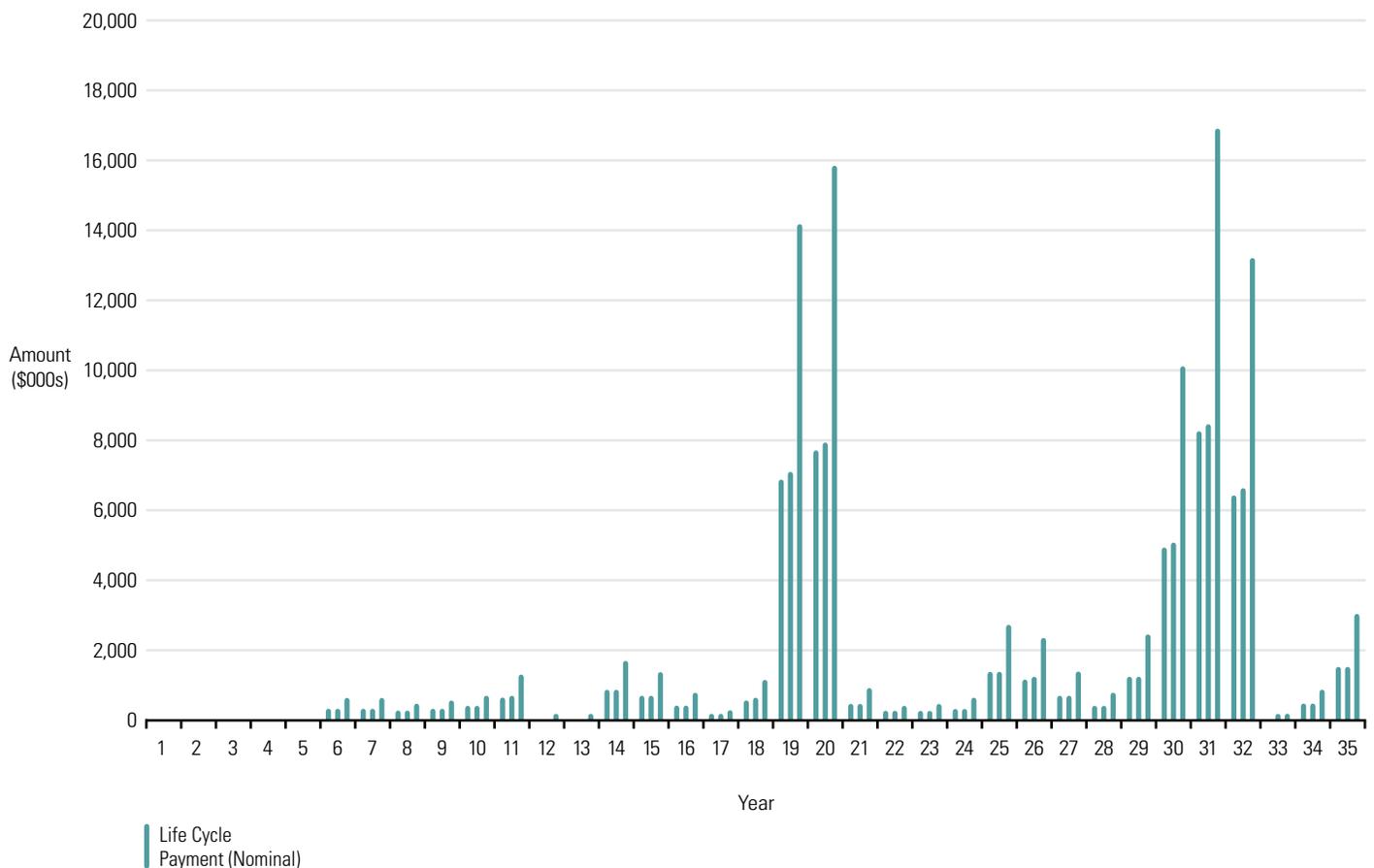
creating a significant credit challenge given the emphasis placed on resiliencies as a key credit metric for funders and rating agencies.

The solution was to have equity investors manage operating leverage by incorporating discrete contingency amounts into its life cycle budget during peak expenditure periods. Lender protections were added to the financing documents as well, which restricted the permitted use of the contingency amounts and introduced cash-reserving mechanisms. As a result, operating resiliencies improved to a level consistent with an "A" category credit rating.

Figure 7 shows life cycle payments over the duration of the project agreement.

Figure 7: Life cycle payments over time

Life Cycle Profile – Quarterly



²² Government of Nunavut, *Iqaluit International Airport Improvement Project*, Project Report, January 2014, p. 24.

Aircraft at boarding gate



Handback requirements

Because of the challenges of construction in Nunavut, handback requirements were given special consideration. One major potential issue is the runway, which will be due for re-pavement as the 30-year contract ends. The government wanted to guarantee AILP honoured the runway handback requirement, which stipulated that it be in a good state of repair at the end of the contract. Runway paving is a major cost and the government wanted to ensure that the life cycle payments it made to AILP in the last years of the contract went to repaving and not to enhancing AILP financial returns.

The contract includes an innovative feature specifically for the runway handback: six years before the contract ends an independent handback certifier will review AILP's handback plans on a yearly basis, including a report on whether AILP has the funds available that will be needed to complete the planned work as forecast. For the last five years of the contract, AILP will also provide the government with security on their plans (e.g., a letter of credit). If they fail to do so, the remaining life cycle payments will be retained. The independent certifier can also determine how much of the life cycle payments to withhold based on the runway's progress or failure to meet final state-of-repair requirements.

Revenue sharing

The only revenue earned by AILP comes from the airport restaurant and gift shop. Compared to large airports in southern Canada, revenues from the airport restaurant and gift shop are expected to be very small given the relatively small number of annual passengers.

Landing fees and rents for office space within the airport are determined by the Government of Nunavut. All revenue associated from these two sources is for the Government of Nunavut's account.

Responsibilities and Risk Allocation

Under the terms of the project agreement, AILP was and is responsible for the following:

- obtaining and maintaining an Airport Operating License from Transport Canada and operating the Iqaluit International Airport to the standard described in the project agreement;
- delivering the design and construction in accordance with the project's specifications;
- obtaining all permits, provisions of utilities and other site services, construction work and commissioning, and substantial completion of the project by the stipulated milestones leading to interim service commencement and full service commencement;
- procurement, supply, and installation of all equipment;
- providing partial financing for the design and construction of the new buildings and for the rehabilitation of specified components of the existing buildings and current infrastructure;
- operation of the airport and the life cycle maintenance of the new and existing buildings, maintenance and support services, the development of a quality management plan, site security and grounds maintenance;

- training and hiring of Inuit businesses and workers through the term of the project agreement;
- environmental management and sustainability; and
- returning the infrastructure assets to the government in the specified condition at the end of the term.

The government of Nunavut is responsible for:

- setting and collecting all aeronautical fees and related charges;
- tenant management on airport property outside of retail spaces within the new airport terminal building;

- economic development; and
- pre-existing environmental issues.

Federal agencies (NAV Canada, Canadian Air Transport Safety Authority, and Canadian Border Services Agency) continued to operate on-site during construction and carried out their respective responsibilities.

Table 4 shows a summary of the allocation of risks among the government, AILP and third parties.

Table 4: Summary of risk allocation

Risk	AILP	Gov't of Nunavut	Third Party
Financing	■		
Design	■		
Construction of new infrastructure	■		
Airport operations	■		
Security screening of passengers and baggage (CATSA)			■
Processing of international travellers (CBSA)			■
Fueling airplanes and ground-handling services (Uqsuq Corporation)			■
Facility maintenance of airfield and new infrastructure, including buildings	■		
Aircraft rescue and firefighting	■		
Setting aeronautical fees		■	
Supervening events	■	■	
Pre-existing environmental contamination		■	■
Unit price of asphalt, fuel, energy, shipping and labour throughout term of project agreement		■	
LEED certification	■		
Ownership		■	
Scope changes		■	
Pavement settlement risk	■		
Change in aerodrome standards by Transport Canada and other adverse airport regulatory changes		■	
Energy consumption	■	■	

Benefits

Cost savings/value for money

The net present cost (NPC) of the project agreement was estimated to be \$418.9 million. The NPC of delivering the same project using a traditional DBB rather than a P3 approach was estimated to be \$518.7 million. The government achieved an estimated value-for-money savings of taxpayers' dollars of \$99.8 million by procuring the project as a P3.²³

Major factors that contributed to the cost savings included efficiencies from competitive construction pricing, significantly reduced delivery time of project components, integration of the design, build, operation, rehabilitation and finance components, and an efficient allocation of risk. The NPC was developed with a discount rate of 7.83 per cent as at April 1, 2013,²⁴ representing the cost of capital over time, accounting for inflation and interest rates.

The cost comparison of the VFM assessment is illustrated in Figure 8 and the component elements are listed in Table 5.

Figure 8: Value-for-money cost comparison



²³ Government of Nunavut, *Iqaluit International Airport Improvement Project*, Project Report, January 2014, p. 3.

²⁴ *Ibid.*, p. 30.

Table 5: Value-for-money components

	DBB \$ Millions NPC	DBFOM \$ Millions NPC
Total costs	\$359.5	
Annual service payment to AILP		\$278.0
Risk adjustment	\$86.9	\$6.4
Competitive neutrality adjustment	\$8.1	
Progress payments		\$73.8
Interim service commencement		\$13.2
Service commencement payment		\$11.2
Project management costs, including procurement and implementation	\$64.3	\$36.4
Total*	\$518.7	\$418.9
Value for money		\$99.8
VFM % of DBB		19.2%

*Values do not add up due to rounding

Community socio-economic benefits

The Iqaluit International Airport is an essential service for life in Nunavut and for the territory's success. Beyond the improved infrastructure of the airport and runways, the project offers all Nunavummiut and businesses significant socio-economic benefits.

The Nunavut Tunngavik Incorporated (NTI) is an organizational body that ensures that the promises of the Nunavut Land Claims Agreement are carried out. The project agreement includes a requirement that AILP hire Nunavut land claims beneficiaries during both its construction and ongoing operations. Under Article 24 of the Nunavut Land Claims Agreement, the government must train Inuit firms to win contracts and set up programs to increase Inuit job and business skills. Significant time and attention was therefore given to Inuit labour, services, and training requirements as stipulated in Schedule 24 of the project agreement.

These requirements included:

- Inuit labour during the construction period: a minimum of 15 per cent of total labour costs (based on salary), including a minimum 10 per cent requirement per contract year;
- engaging with Inuit businesses during the construction period: a minimum of \$16,041,825 to be spent on work, supplies, or services with Inuit businesses;
- engaging with Inuit business during the operations period: a minimum of 10 per cent of all invoices paid for work, supplies, or services have to be with Inuit businesses (measured every five years);
- Inuit labour during the operating period: to start, a minimum of 20 per cent of total labour costs (based on salary) and, following the start of operations, 6.7 per cent added to the base requirement in every five-year period for the duration of the 30-year contract; and
- Inuit training requirements: achieving a total of 100 points based on the requirements in Table 6.

Table 6: Inuit training requirements²⁵ (Achieving a total of 100 points based on the requirements below)

Pre-apprenticeship programs		
	<p>1.5 POINTS for each student who passes</p>	<div style="display: flex; align-items: center;"> <div style="border: 2px solid teal; padding: 5px; margin-right: 10px;"> POINT REQUIREMENTS OUT OF TOTAL OF 100 </div> <div style="display: flex; gap: 20px;"> <div style="text-align: center;"> <p>MINIMUM</p> <div style="border: 2px solid teal; border-radius: 50%; padding: 10px; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;"> <p>NO</p> <p>MINIMUM</p> </div> </div> <div style="text-align: center;"> <p>MAXIMUM</p> <div style="border: 2px solid teal; border-radius: 50%; padding: 10px; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;"> <p>25</p> <p>POINTS</p> </div> </div> </div> <div style="margin-left: 20px;"> <p>Only 15 points can be applied to Inuit beneficiary students who do not continue into an apprenticeship program with ongoing work associated with the project.</p> </div> </div> <p>Comments:</p> <p>Pre-apprenticeship programs are offered by Nunavut Arctic College. Programs from other institutions must be approved by the Government of Nunavut.</p> <p>Inuit beneficiary students must complete coursework and pass.</p> <p>There is no minimum grade above a passing grade (which is 70%).</p> <p>There are Government of Nunavut programs to assist with the cost of courses and living expenses.</p> <p>To qualify for points in this category, AILP must notify the Government of Nunavut of Inuit beneficiary students enrolled in the pre-apprenticeship program before the course starts.</p>
Apprenticeship programs		
	<p>Completion of Year 1</p> <p>1.5 POINTS for new hire</p> <p>2.25 POINTS for continuing hire</p> <hr/> <p>Completion of Year 2</p> <p>2.25 POINTS for new hire</p> <p>3 POINTS for continuing hire</p> <hr/> <p>Completion of Year 3</p> <p>3 POINTS for new hire</p> <p>3.75 POINTS for continuing hire</p> <hr/> <p>Completion of Year 4</p> <p>3.75 POINTS for new hire</p> <p>4.7 POINTS for continuing hire</p> <hr/> <p>Achievement of journeyman (final exam)</p> <p>2.25 POINTS</p>	<div style="display: flex; align-items: center;"> <div style="border: 2px solid teal; padding: 5px; margin-right: 10px;"> POINT REQUIREMENTS OUT OF TOTAL OF 100 </div> <div style="display: flex; gap: 20px;"> <div style="text-align: center;"> <p>MINIMUM</p> <div style="border: 2px solid teal; border-radius: 50%; padding: 10px; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;"> <p>40</p> <p>POINTS</p> </div> </div> <div style="text-align: center;"> <p>MAXIMUM</p> <div style="border: 2px solid teal; border-radius: 50%; padding: 10px; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;"> <p>NO</p> <p>MAXIMUM</p> </div> </div> </div> </div> <p>Comments:</p> <p>For each Inuit beneficiary points are given for each year completed.</p> <p>A year's completion required the minimum required hours of work experience and successful completion of the school component.</p> <p>At least 50% of the required work hours for each year must be associated with the project for the period from the effective date until 1 year before the target service commencement date.</p> <p>After that at least 25% of the required work hours for each year must be associated with the project.</p> <p>In all cases this can include the use of apprentices from other projects.</p> <p>The balance can be from work on other projects in Nunavut or the rest of Canada.</p>

²⁵ Government of Nunavut and Arctic Infrastructure Limited Partnership, *Project Agreement for the Iqaluit International Airport Improvement Project*, September 10, 2013, Schedule 24, *Inuit Content*, pp. 9–12.

Relevant college and other certification programs



4 POINTS for each program or certification completed

POINT REQUIREMENTS OUT OF TOTAL OF 100

MINIMUM

NO
MINIMUM

MAXIMUM

12
POINTS

Comments:

Relevance of program must be demonstrated by AILP and approved by Government of Nunavut. Examples: University of Guelph airport management program, International Association of Airport Executives program, IATA Aviation management professional certification, IATA airport diploma, Canadian Construction Association gold seal.

On-the-job training



1 POINT for every 24 hours of training

POINT REQUIREMENTS OUT OF TOTAL OF 100

MINIMUM

NO
MINIMUM

MAXIMUM

20
POINTS

Comments:

Points are tied to attainment of professional designations, not registration in a program. Examples: chartered accountant, engineer, professional engineer, power engineer (any class), etc. Inuit beneficiary must be employed for at least one year by a company working on the project. AILP must notify the Government of Nunavut of Inuit beneficiaries within this category within 60 days of the beneficiary commencing their program and/or job with the company working on the project.

Professional designations



5 POINTS for each designation

POINT REQUIREMENTS OUT OF TOTAL OF 100

MINIMUM

NO
MINIMUM

MAXIMUM

10
POINTS

Comments:

Points awarded on successful completion of certification. AILP must demonstrate that the Inuit beneficiary did not have qualifications before attaining certification.

Technical skills: Major (i.e., firefighter and heavy equipment operator)



3 POINTS for National Fire Protection Association (NFPA) firefighter 10-01 level 1 or level 2

4 POINTS for NFPA firefighter 10-03 level 1, level 2 or aircraft fire & rescue ARFF

2.5 POINTS for fire officer level 1

5 POINTS for fire officer level 2

3 POINTS for heavy equipment operator certification (for those *without* previous class 3 license)

1.5 POINTS heavy equipment operation certification (for those *with* previous class 3 license)

POINT REQUIREMENTS OUT OF TOTAL OF 100

MINIMUM

NO
MINIMUM

MAXIMUM

60
POINTS

for the category, with sub-limits of 40 for firefighter, 40 for heavy equipment operator

Air Terminal Building from airside with City of Iqaluit Plateau subdivision in background



The project agreement also established the Schedule 24 Advisory Panel to guide AILP in meeting the Inuit labour, business, and training requirements. Representatives from the Nunavummi Nangminiqagtunik Ikajuuti Secretariat for economic development in Nunavut, Government of Nunavut Department of Family Services, and Service Canada are members of the Advisory Panel.

The Schedule 24 Advisory Panel meets annually with the government and AILP to ensure all requirements are being met and to review the AILP's demonstrated effort in achieving the requirements.

AILP was responsible for creating and submitting an Inuit Engagement Plan to the government and the advisory panel. The plan was divided in two sections, one for the construction period and another for the operating period. Overall, the plan had to address:

- how Inuit employment would be managed including the annual cycle of work in Nunavut (including weather-related winter closures) and the cultural cycle of Inuit life;
- anticipated levels of absenteeism and turnover;
- details of work to be carried out by Inuit beneficiaries;
- recruitment strategies;
- retention and promotion strategies;

- career progression through promotions and advancements;
- cultural awareness training for non-Inuit staff; and
- monitoring, monthly reporting, and annual presentations to the Schedule 24 Advisory Panel.

AILP has done well in meeting the challenging Schedule 24 Inuit labour and business requirements in the project agreement, and progress has been made:

- As of October 2017, AILP had spent over \$54 million with Inuit businesses, well in excess of the construction-period target of \$16,041,825;
- Nunavut Airport Services Ltd., the service provider, has achieved an Inuit labour ratio often in excess of 50 per cent, well above the 20 per cent target for operations in the first five years;
- An Inuit liaison director was appointed to assist in the development of training programs and ways to recruit, train, and retrain local employees;
- A high level of retention has been achieved with Inuit land claims beneficiaries in senior roles;

- Engagement with educational organizations like the Nunavut Arctic College in Rankin Inlet has encouraged students to submit résumés to the project; and
- Job postings were shared with the Kakivak Association and Service Canada and announced in English and Inuktitut on CBC Radio.

During the construction period it was challenging to find and retain Inuit labour, due to the fragmented construction schedule dictated by the arctic environment. An outdoor construction schedule limited to four months of the year and an indoor schedule limited to 10 months of the year meant multi-month layoffs. Workers would find other jobs in Iqaluit or other communities, reducing the pool of Inuit labour available for the project when it restarted.

Despite this challenge, the labour progress achieved to date has been positive. AILP is required to increase Inuit employment by 6.7 per cent every five years after assuming operation of the airport, which will amount to over 60 per cent Inuit employment by the end of the agreement.²⁶

User satisfaction

End-users have embraced the space, especially the airlines. All check-in counters and boarding gates are shared common-use infrastructure, allowing room for new airlines in the future.

The increased space and new café are proving particularly popular with both travellers and local residents. Travellers are pleased with such new amenities as the baggage carousels, the availability of food and washrooms past security. Local residents use the café even if they are not travelling. And, since Iqaluit is not a walkable city, locals also use the new airport for “mall-walking,” to get their exercise. Described as “stunning” and “world-class” by some, the new airport has made a world of difference for travellers and residents alike, and has given the community a new sense of pride.

Communications

Between the partners

Overall, communication between the partners was a positive experience. Due to the isolated location and small city size, on-site communication and in-person meetings were generally easy to schedule; however, when not on-site, project team members were based in many geographic places. When project team members were not in Iqaluit, connecting through Internet-based meeting tools was a viable alternative, and this method of communication was used extensively during the design phase. Traditional video conferencing was not an option—all Internet access in Iqaluit is via satellite links with insufficient bandwidth to support it, and not all parties have access to it. Internet-based meeting tools were introduced as a cost-saving alternative when meeting in person was not financially responsible.

With the public

From the beginning, AILP recognized the significant impact the project would have on Iqaluit. Unlike other airport projects, where a small portion of a region’s population might use such a facility, in Iqaluit, many residents of both the city and the territory are potential users. The Iqaluit airport is the main way in and out of the city and is the major transportation hub for the eastern arctic.

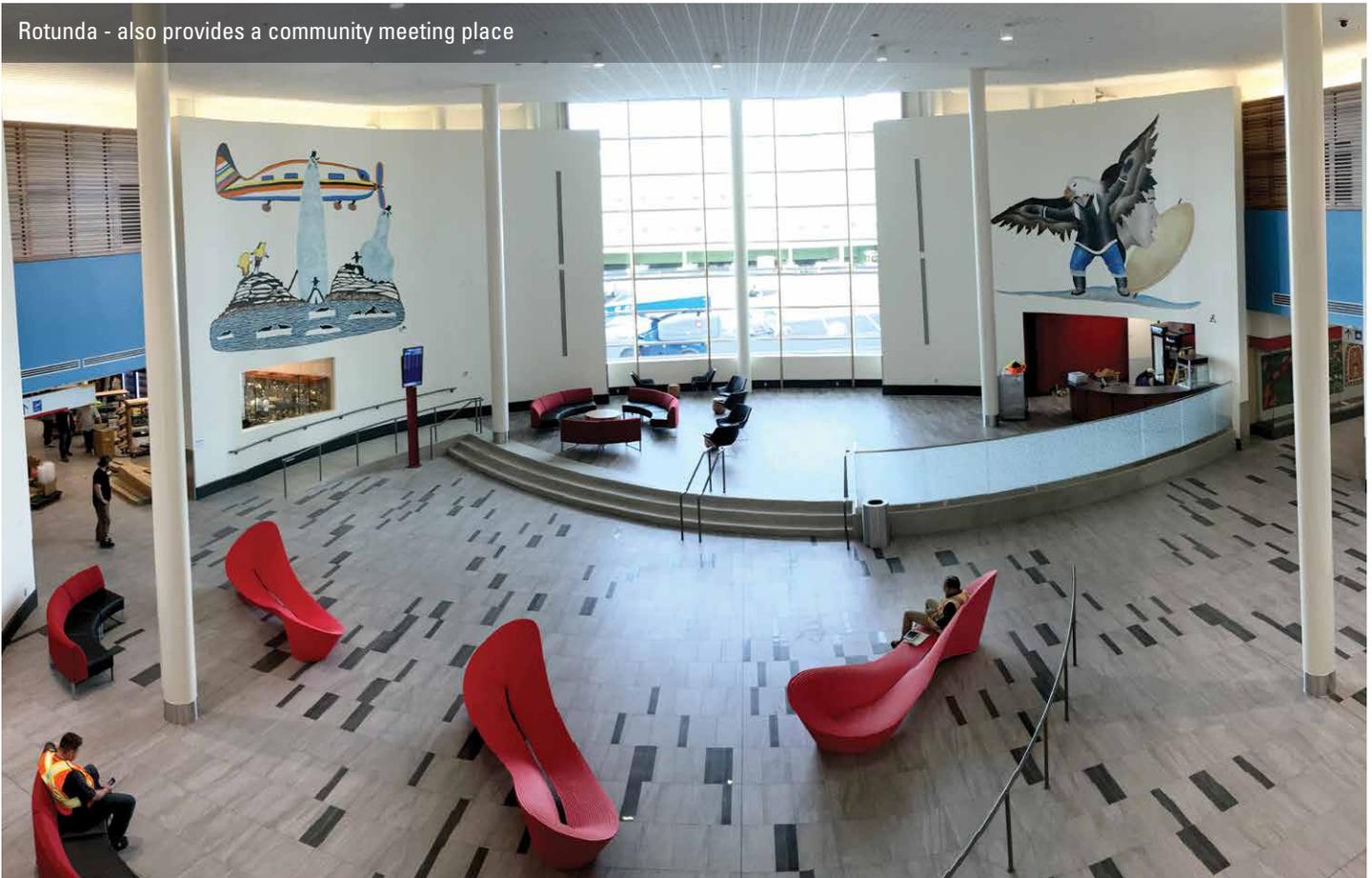
For this reason, in September 2013 a public consultation was held, six months prior to the start of construction. While public support for the project was generally strong, participants raised concerns in several areas, including concerns related to the anticipated level of local economic benefit and Inuit employment, the design of the airport terminal building for passengers with reduced mobility and the fact that the project did not immediately include connected passenger-boarding bridges. And finally, given the magnitude of the project, there were concerns about the financial impact on and possible delays of other badly needed infrastructure in Iqaluit and other communities.

AILP also joined the Baffin Regional Chamber of Commerce and the Workers’ Safety and Compensation Commission. The Chamber assisted in supporting the local supply chain and became community advocates for the project.

AILP sponsored every trade show for the project and was respectful of community time in Iqaluit, such as Nunavut Day, celebrated annually on July 9th to commemorate the passage of the *Nunavut Act* establishing the territory of Nunavut. Facebook was used to post job opportunities.

²⁶ Interview with local resident and traveller, February 13, 2018.

Rotunda - also provides a community meeting place



Rotunda featuring a reproduction of Kenojuak Ashevak's "The Enchanted Owl"



Dispute resolution mechanism

The project agreement includes a dispute resolution procedure (DRP) that is outlined in detail in Schedule 20. It begins with a notice period followed by a period in which best efforts are made to resolve the dispute through without-prejudice negotiations.

If resolution cannot be achieved this way, the procedure follows an issues-resolution ladder that includes nominated expert subject-matter referees to seek resolution at the lowest level possible before escalating the dispute to arbitration or litigation. Since signing the project agreement, the government and AILP have used the DRP six times.

The first of these disputes was initiated by the government and was related to interpretation of performance measures and reporting of non-performance events by AILP. The other five disputes were initiated by AILP: two were related to financial claims for site work impacted by environmental issues; two were related to nighttime work between scheduled flights; and one related to general construction activity.

In the first two instances a referee settled the matter, with both parties paying equal costs for the referee's time as per the DRP. The remaining disputes were initiated after construction was complete and are still unresolved as of the date of this document.

While the partners have generally been able to maintain a good working relationship through the DRP, the process for complex issues requires a significant investment of time from both partners, which diverts attention from other project priorities and results in additional hidden costs for both partners.²⁷

Labour

Special consideration was given to existing labour contracts that would still be active on the assumption of operations date (July 21, 2014) for AILP. The government had an existing airport security contract with a security contractor and an existing airport operations and maintenance contract with an O&M contractor, both of which expired on September 30, 2014.

AILP assumed the security contract. The government terminated the O&M contract and gave AILP the option to hire these employees. The project bid price was affected by this decision, taking into account the assumption-of-operations date and the cost to the government for terminating early. Nunavut Airport Services Ltd. made offers to all existing O&M employees; of the 17 offers made 13 were accepted. No government employees lost their jobs as a result of the decision to pursue the project as a public-private partnership.

Monitoring

Performance monitoring spans every phase of the project, starting at financial close through design, construction, operations, and maintenance.

During the design and construction phase, both the government and AILP appointed representatives who reviewed, approved, accepted or confirmed whether AILP's activities were in accordance with the project agreement. The government representative was supported by a compliance team of design and construction professionals, who all had access to the construction site, drawings, and specifications. They reported observations to the government on a regular basis.

In addition, a construction-period joint committee (CPJC) was formed at the commencement of construction. The committee formalized communications between the government and AILP, providing a forum for the parties to consult and cooperate on all matters related to the project's construction. The CPJC was a requirement of the project agreement and was active until service commencement.

To support both partners, an independent certifier (IC) was also appointed. The IC monitored and reported on construction progress and certified that the conditions for interim service commencement and service commencement were achieved.

During the operations and maintenance phase, the project agreement requires both the government and AILP to appoint a representative to serve on the operating-period joint committee (OPJC) for the duration of the operating term. This committee serves as a forum for all parties to consult and cooperate on facility and airport operational matters.

In addition, AILP must provide the government with the following plans for review and approval during the operations phase:

- annual and five-year plans for facilities maintenance and life cycle;
- annual plans for Inuit engagement;
- facility condition reports every five years; and
- annual service plans for operations.

Quality management continues to be a key part of the project agreement. Financial penalties are in place if AILP fails to ensure delivery, performance, and high standards of quality.

AILP is required to have a performance-monitoring program in place during the operating period, tracking the delivery of services. Monitoring reports are readily available to government at any time, including monthly reports that contain a variety of information, including:

- a summary of calls made to the help desk and the resolution of those calls;

²⁷ Chief Project Officer, *Iqaluit International Airport Improvement Project*, Government of Nunavut. Letter dated January 9, 2018.

- a summary of preventive and demand maintenance activities performed;
- a summary of unavailability events and service failures;
- reporting of environmental issues;
- reporting and analysis of energy consumption;
- a calculation of monthly payments owed to AILP; and
- a summary of all life-safety actions and statutory testing.

The reports provide key information to ensure the airport terminal building, runway and other project components are being properly maintained in accordance to the standards set out in the project agreement.

Lessons Learned

Partnership advantages

From the government's perspective, a key advantage of using the P3 process was that it enabled the government to focus on life cycle performance and make life cycle investments in the project as a whole rather than if it had been undertaken as five individual sequential projects using traditional procurement models, which would have had five different start and end dates.

The P3 delivery model brought budgeting certainty to the project, and certainty of payment of operation and maintenance costs over the 34-year-four-month project lifetime. This was especially important in that the agreement also included the requirement that AILP would take over operations of the old airport during construction. The government also noted that the advantages of the partnership became clear after experiencing the complexities associated with construction in an operational airport and when employing the performance mechanisms during construction.

Early focus on service

During pre-procurement, the importance of an experienced service provider was identified as key to achieving project success during construction, especially because the existing airport needed to remain operational throughout construction and conflicts between construction priorities and operational priorities and flight schedules were to be expected. For this reason, the procurement documents were developed with a focus on finding a service provider that would meet the expectations of the government. This focus on service at such an early stage continues to contribute to the project's success.

Knowledge transfer

The government noted that for a public agency using the P3 model for the first time, achieving broad knowledge transfer within the organization requires a specific plan and appropriate resources. It is important that this plan be developed early on in the project's life or the opportunity to transfer

knowledge to staff and stakeholders will be missed. Maintaining continuity of staff who have a deep understanding of a complex project agreement over the 30-year operating period will be an ongoing challenge for the government, and is a key risk area when achieving the full benefits from the P3 model.

Stronger service-provider involvement in design and construction phase

The government was anticipating that the service provider would have a level of interest similar to that of the government in evaluating the life cycle and operational impacts of equipment and materials used in construction, and in managing conflicts that resulted from construction work conflicting with operational priorities, but there were no specific performance mechanisms included to ensure that this would be the case. Future projects would benefit from stronger service-provider involvement in the design and construction phase of the project.

Oversight of subcontractors

The government did not anticipate the impact on day-to-day management that resulted from the private partner's approach of subcontracting it to other parties, which negated some of the perceived benefit of a single contract, and there was no clear mechanism for the government to influence this. From the government's perspective, the P3 agreement needs to include a mechanism to ensure that the private partner retains a level of oversight and responsibility even for risks and accountabilities that are 100 per cent subcontracted to other parties.

Allowance for quality-assurance reviews

There should be increased allowance for requirements and resources for the owner to perform quality-assurance reviews, as the private partner has no incentive to self-report performance failures unless there is regular and consistent oversight.

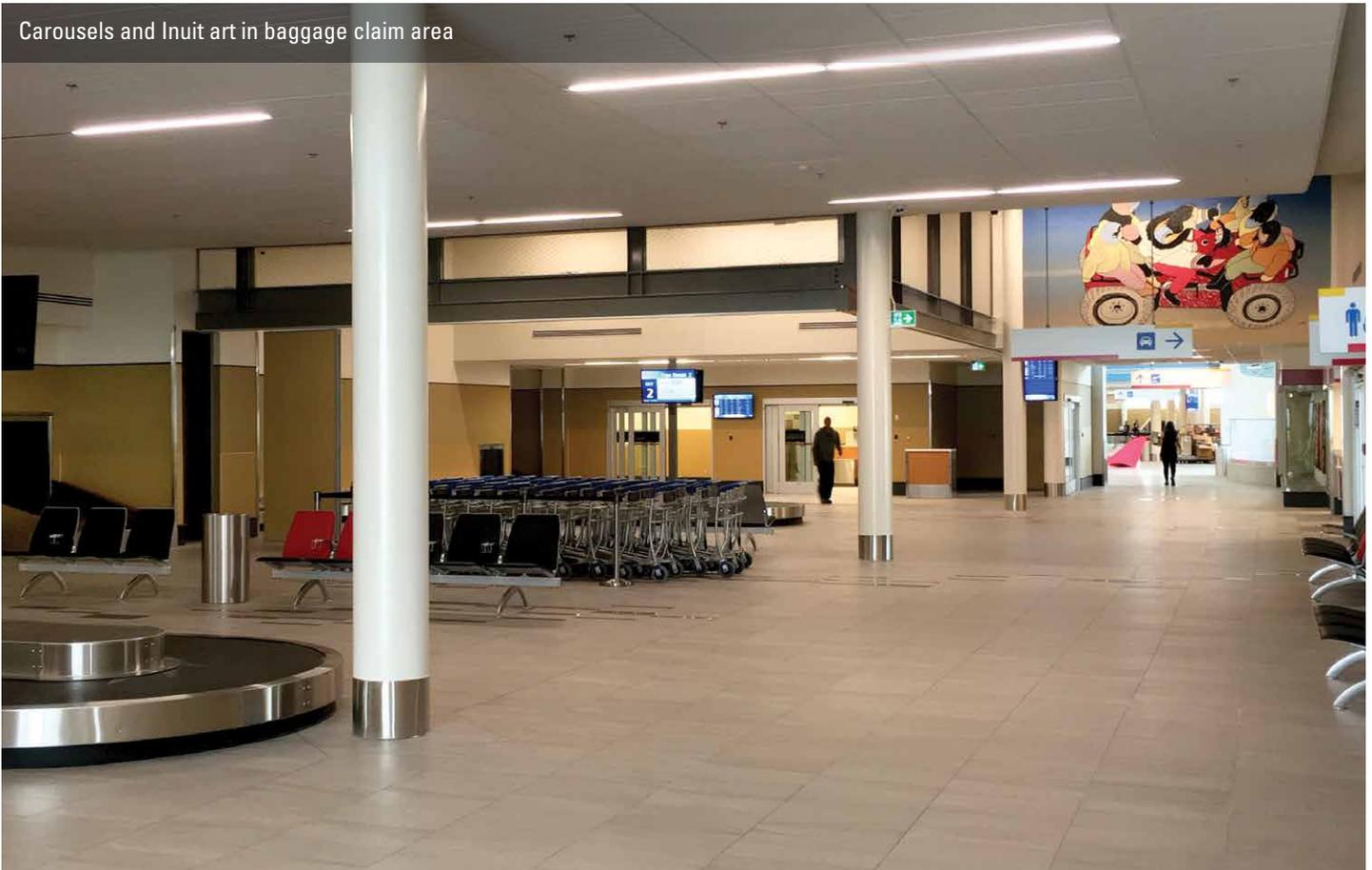
Importance of life cycle payments to government

The government recognizes the importance of the annual life cycle payments. The long-term contractual nature of the P3 agreement requires the government to provide funding to AILP to perform required life cycle upgrades over the duration of the contract. Under a traditional delivery model, the airport would need to compete with many other infrastructure needs in the territory. In the past, such competition for funds has meant that the airport did not receive all the required life cycle upgrades.

Applicability to other jurisdictions

The government has expressed interest in additional P3 projects as the infrastructure needs of the territory grow. Schedule 24 of the agreement proves that labour transition and local labour sources can be an area of strength for a project if sufficient time, resources and private-partner financial incentives are dedicated to its success.

Carousels and Inuit art in baggage claim area



Concluding Comments

The Iqaluit International Airport project achieved substantial completion August 2017 and is now fully operational, achieving service commencement on December 31, 2017. Ask local travellers passing through the airport what they think about the new facility and typically they'll mention the addition of washrooms past security as the improvement they most appreciate, closely followed by the new revolving baggage carousels, extra seating space and the high overall level of comfort. Travellers from outside of Iqaluit have readily expressed their enthusiasm, extolling the beauty of the overall design and the impressive displays of Inuit art. Significant upgrades and a distinctive design combined with the complex infrastructure innovations implemented in the airport's foundation and airfield are what make the airport a unique P3 project.

The history and beauty of Canada's north is reflected throughout the terminal building. Artistic production is an integral part of Inuit culture, and Inuit sculpture, tapestries, and two-dimensional artwork are given pride of place at strategic locations throughout the terminal building. The rotunda, with its shape evoking the form of an igloo, features reproductions of Kenojuak Ashevak's iconic print, "The Enchanted Owl," and work by other notable Inuit artists. These reflections of Nunavut society and its economy greet every traveller.

Airport infrastructure is vital to life in Nunavut, and the government believed a public-private partnership would help it achieve a successful project and meet requirements for airport operations over the long term. Given the age and history of the airport and the critical link air transportation provides for Iqaluit and all of Nunavut, the Iqaluit International Airport was an ambitious project even before factoring in construction in such a remote northern environment.

Financing, design and construction scheduling all required innovation, and the focus on integrating local Inuit labour with the advisory panel's continued support foster the territory's economic and social development. The government is pleased with the outcomes achieved so far and will consider this model again the future.

The Iqaluit International Airport embodies many aspects of innovation in infrastructure delivery. As the first P3 in Nunavut and the first entire airport-infrastructure P3 project in North America, challenges were always expected. Delivered on time and on budget, and delivering \$99.8 million (NPC) in savings to the territory, the project is a testament to the power of public-private partnerships.

Testimonials

Public sector

It's clear the Iqaluit International Airport Project is not just a piece of infrastructure, but a gateway for all Nunavummiut to Canada and beyond. Unlike other airports in Canada, the Iqaluit International Airport is an essential service for our territory. We depend on supplies flown from the south.

As the largest infrastructure project in Nunavut's history, and given the challenges of constructing anything in the territory, it is quite remarkable that the project was completed on time and on budget. Nunavut has a large infrastructure gap, and while the airport is important, we have many more projects that need to be delivered. The airport has proven that the P3 approach works and we will consider this model for future projects.

Throughout construction and operations, the Inuit have been an important contributor to the success of the project and a strong foundation has been laid for continued growth of Inuit skills and training. The economic and social benefits for our people and communities are yet another success of the P3 model.

The Government of Nunavut would like to acknowledge Arctic Infrastructure Limited Partnership for its spirit of cooperation and willingness to try new things in our northern environment. We look forward to a long-term, positive relationship during the operations phase.

The support from PPP Canada and their funding was essential to making the Iqaluit International Airport project a reality. We look forward to advancing funding partnerships with the federal government as Nunavut embarks on its next infrastructure projects.

Peter Taptuna

Premier of Nunavut

Private sector

The Iqaluit International Airport Project fostered an ethos of partnership since the project's inception. The strong relationship between Arctic Infrastructure Limited Partnership and the Government of Nunavut allowed us to create and maintain value through procurement, construction, and now operations. The long-term relationships established over the course of the project have facilitated transparent problem solving, which proved essential to maintaining a difficult project schedule in a rural, northern environment.

The unique challenges of building an international airport in the remote tundra required careful coordination and planning, including effective utilization of a short sealift season to deliver all construction materials to the site. By leveraging the existing relationships the Government of Nunavut had with local sealift partners, the project benefited from the timely delivery of all materials required for construction.

The partnership between Arctic Infrastructure Limited Partnership and the Government of Nunavut was especially important during service operations in the existing airport terminal building. As the old airport had to remain operational throughout the project, the terminal was maintained for three years during construction. The government's generous knowledge transfer during this period ensured the terminal remained open for every scheduled flight.

As the private sector partners, we recognized that strong stakeholder relationships would propel the project's success. Working with the government, we engaged facility users and the wider Iqaluit community. As the airport is essential to life in Nunavut, engaging the entire community remains the priority. Arctic Infrastructure Limited Partnership has already participated in over 25 community events, including the sponsorship of the region's largest Inuit festival, Toonik Tyme.

The Iqaluit International Airport Project has excelled due to the hard work and dedication of the project team. The partnership between ourselves and the Government of Nunavut has enabled us to deliver this complicated infrastructure project on time and on budget. The first flight took off from the new airport terminal building at 7:30 a.m. on August 9, 2017, with the project team waving the first passengers off—an emotional and proud moment. We look forward to strengthening our partnership with the Government of Nunavut even more over the next 30 years.

John Wood

CEO

Arctic Infrastructure Limited Partnership

Back of terminal building facing the runway



Public Sector Contact

Barry Reimer

Chief Project Officer

Iqaluit International Airport Improvement Project

Government of Nunavut

PO Box 1000, Stn 620

Iqaluit, Nunavut X0A 0H0

Canada

1-604-818-4346

barry@acumen.co

Private Sector Contact

John Wood

Chief Project Officer

Arctic Infrastructure Limited Partnership

100 King Street W., Suite 5600

Toronto, Ontario M5X 1C9

Canada

1-647-227-8730

John.wood@aip-iaip.com

Appendix: CCPPP's National Award Case Studies 1998 - 2017

Defence

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

Education

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

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

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

The Canadian Council for
Public-Private Partnerships



Le Conseil Canadien pour
les Partenariats Public-Privé

www.pppcouncil.ca

 @pppcouncil