2003

The Canadian Council for Public-Private Partnerships

2003 National Award Winners

Fredericton-Moncton Highway Project

Business Transformation Project: Transforming the Delivery of Ontario's Social Assistance System

Vancouver Landfill Gas Cogeneration Project

Connecting Small Schools in Newfoundland

The Canadian Council for Public-Private Partnerships

Le Conseil Canadien des Sociétés Publiques-Privées

The Canadian Council for Public-Private Partnerships

2003 National Award Winners

The Canadian Council for Public-Private Partnerships

June 2004

Table of Contents

Introduction

Each year, through its national awards program, The Canadian Council for Public-Private Partnerships recognizes outstanding public-private partnerships across the country. These partnerships have demonstrated innovation and excellence in providing needed public facilities and services. As well as celebrating the achievements of the award-winners, the Council documents their partnership through case studies so that their example may enhance our understanding of the field and help others to develop successful public-private partnerships.

The Council defines a public-private partnership as "a cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards." Awards can be given to projects in three categories: project finance, service delivery and infrastructure.

This is the sixth year of the awards. The Council received 11 nominations, and a national panel of experts selected the winners on the basis of established criteria. The winners were announced at the Council's 11th Annual Conference in November in Toronto.

The Canadian Council for Public-Private Partnerships partners with a number of public and private organizations to host this program. Sponsors for the 2003 National Awards Program include:

- The Government of Ontario
- Deloitte and Touche LLP
- TERANET Inc.
- PricewaterhouseCoopers Securities Inc.
- Power Budd LLP

The case studies are distributed to the Council's more than 240 member organizations from the business community and all levels of government across Canada. In addition, the Council posts summaries of each winning project on its website. Non-members may purchase copies of the full report from the Council, which is a non-profit organization.

Award winners

In 2003, the selection panel chose five award winners: two Gold Awards (one each for infrastructure and service delivery), two Silver Awards (one each for project financing and infrastructure), and one Award of Merit (for service delivery).

Fredericton-Moncton Highway Project

The **Gold Award for Infrastructure** was awarded to the New Brunswick Highway Corporation and Maritime Road Development Corporation (a consortium of Dragados FCC, Janin Atlas and Miller Paving) for the Fredericton-Moncton Highway Project.

The 195-kilometre, world-class four-lane highway was built to rigorous safety, quality and environmental standards for a guaranteed maximum price of $585 million and with the participation of over 30 local firms. The highway was completed in under four years.

Business Transformation Project

The **Gold Award for Service Delivery** was awarded to the Ontario Ministry of Community and Social Services and Accenture for a project that completely redesigned the delivery of Ontario's social assistance programs—the Business Transformation Project.

The partners developed and implemented new streamlined business processes, and built state-of-the-art, made-for-Ontario technology to support those processes. The work was conducted through an innovative partnership between the Ministry of Community and Social Services, and Accenture. This project achieved significant savings and reduced welfare fraud.

Vancouver Landfill Gas Cogeneration Project

The **Silver Award for Project Financing** was awarded to the City of Vancouver and Maxim Power Corp. for the Vancouver Landfill Gas Cogeneration Project.

Maxim has financed, built and is operating a world-class cogeneration facility to convert waste to energy. It raised 83% of the $10.3 million project cost through debt financing arranged by Corpfinance International—principally a 20-year, 7.8% fixed interest rate, non-recourse loan for $7.6 million—and provided equity for the balance. Under matching 20-year agreements, the facility uses landfill gas collected by the City to generate electrical and thermal energy. The electrical energy is sold to BC Hydro under a green purchase agreement, and thermal energy to CanAgro Produce Ltd. to heat its greenhouses.

Connecting Small Schools in Newfoundland

The **Silver Award for Infrastructure** was awarded to the Newfoundland Department of Education, Centre for Distance Learning and Innovation (CDLI), and Aliant Inc. for the Connecting Small Schools project.

A dedicated frame relay network provided by Aliant has significantly increased the bandwidth available in the province's rural and remote schools. This faster, more reliable connectivity allows geographically disadvantaged students to take greater advantage of the innovative distance education courses provided by CDLI.

Federal Health Claims Processing System

The **Award of Merit for Service Delivery** was awarded to Veterans Affairs Canada and Atlantic Blue Cross Care for the Federal Health Claims Processing System.

Building on a successful partnership which was initiated in 1989 and retendered twice, Atlantic Blue Cross Care provides a single health claims processing network for Veterans Affairs Canada as well as for the RCMP and the Canadian Forces. For the government, the contract represents significant infrastructure savings. For the clients, the system allows all claim and accounting information to be handled electronically with no out-of-pocket cost or additional paperwork.

This year the case studies profile the gold and silver award-winning projects. They were written with the help and cooperation of the public and private partners involved. As well as providing us with detailed information, the partners have reviewed a draft of their case study for accuracy. We thank them for sharing their time and expertise with us.

Observations

The case studies provide interesting insights into public-private partnerships in Canada. In previous years, the Council highlighted the capacity of these partnerships to:

- get major projects built faster, sooner and at lower cost to the taxpayer than traditional methods;
- succeed at delivering both large, complex projects and small-scale initiatives;
- create high-quality infrastructure;
- maintain or enhance service delivery;
- gain the support of financial markets and institutions, with and without municipal guarantees;
- combine multiple projects for effective downtown revitalization; and
- create opportunities for exporting Canadian expertise.

This year's case studies demonstrate additional insights into the achievements of public-private partnerships.

Speed of delivery accelerates benefits

Two of this year's awards clearly illustrate that involving the private sector enables public projects to be completed in less time than if government undertook the work alone. Consequently, the resulting benefits are realized sooner.

- The Fredericton-Moncton highway was designed and built in under four years compared to the fifteen years it would typically take under traditional methods. Since the new highway replaced a dangerous section of road, the rapid construction of a safe highway meant that lives were saved more than ten years sooner than would otherwise have been the case.
- In a second example, the Centre for Distance Learning and Innovation in Newfoundland needed to install a frame relay network in over 60 remote schools in time for the start of the next school year, which was only a few months away. Aliant Inc. was able to provide this connection within the short time frame. As a result, those students who had had limited course options were immediately able to access a greater number and richer variety of distance education courses instead of having to wait for another school year.

Communities benefit from local procurement

Major infrastructure projects can provide a significant economic boost to the community, especially when local trades are used.

- An Economic and Industrial Benefits Plan formed part of the contract to design, build, operate, maintain and rehabilitate the Fredericton-Moncton highway in New Brunswick. In this case, over 30 New Brunswick-based engineering, construction and material supply companies worked on the project and, at peak construction, 1,300 of the 1,400 workers were local. Over 92% of the work was sourced locally.

Communications strategy a key to success

It is evident that communications play an important role, especially in large, high-profile projects. Effective projects develop a plan to systematically involve and communicate with the different audiences. They designate a skilled communicator to implement the plan. And they anticipate and prepare a protocol to manage any unexpected issues that may arise.

- The partners in both the Fredericton-Moncton Highway Project and Business Transformation Project included a communications plan in their formal agreement and appointed a lead communicator. One plan focused on the public, the other on the stakeholders and employees involved.
- In the Vancouver Landfill Gas Cogeneration Project, the application to rezone the site to permit cogeneration would probably not have been successful without a significant investment in communications to educate the local councillors and residents about the project.

P3s used in cogeneration projects

Public-private partnerships are involved in the emerging trend to develop cogenerated and distributed power facilities. For municipalities, this can take the form of landfill-gas-to-energy projects. The electrical power generated from landfill gas is typically sold to the provincial utility, whose programs to encourage the generation of "green power" and/or reduce greenhouse gas emissions are an important factor in the viability of these projects.

- The partners in the Vancouver Landfill Gas Cogeneration Project were able to take advantage of the unusual co-location of CanAgro Produce's greenhouses close to the landfill site. The electrical power generated from landfill gas was sold to BC Hydro under a 20-year green electricity purchase agreement and the thermal energy was sold to CanAgro for use in its greenhouses under a 20-year sales agreement.

Acknowledgments

Each year The Canadian Council for Public-Private Partnerships assembles an expert panel from across Canada to judge and select the nominations for the National Awards Program. These awards were introduced in 1998 as a way of not only honouring the excellence achieved in particular P3 projects, but also in acknowledging the professional and dedicated work of the public and private sector partners who brought them to fruition.

The review of the nominations is not an easy one. However, each year our panel dedicates long hours to reading and weighing the merits of the many submissions. We would like to extend our sincere thank you to the 2003 panel of CCPPP directors who so ably fulfilled this task. Those Directors are:

- Cynthia Robertson, Chair. Senior Vice-President, P3PR, Halifax
- D. Robert Beaumont, Partner, Osler, Hoskin & Harcourt LLP, Toronto
- Pierre Le François, President, Society for Partnership and Cooperation, Montreal
- Hon. Allan Maher, Fredericton
- H. William Pearson, President & CEO, Canadian Highways Infrastructure Corp., Toronto
- L.E. (Al) Strang, City Manager, City of Moncton
- Tony Tennessy, President, Pacific Tower Investments Inc., Vancouver

We would also like to extend our appreciation to those who coordinate the program, research the projects to develop the case studies and produce this document. A most deserving thank you to Carla Walmsley, Anne Dudman, Anne Anderson and Jeff Bowden. Your efforts do not go unnoticed and we cannot thank you enough for the long hours that go into this program.

Without the generous support of this year's sponsors, the National Awards Program simply wouldn't be possible. Thank you to: the Government of Ontario, Deloitte and Touche LLP, TERANET Inc., PricewaterhouseCoopers Securities Inc., and Power Budd LLP.

And finally, thanks to all of you who submitted projects to this year's competition. It is very encouraging to see more and more projects developing in this country. Thanks to those governments for "pushing the envelope" in their pursuit of better public services and thanks to the private companies that bring their expertise to these partnerships.

FREDERICTON-MONCTON HIGHWAY PROJECT

2003 Gold Award for Infrastructure

Quick Facts

Project type

Design-Build-Finance-Operate-Maintain

Asset

Fredericton-Moncton Highway—a 195-kilometre, four-lane, controlled access highway

Partners

New Brunswick Highway Corporation

Maritime Road Development Corporation (MRDC) comprising:

- Dragados FFC, a joint venture of Grupo Dragados and FCC of Spain - 50%
- Janin Atlas (GTMI Canada) (now Janin Atlas Inc. and owned by Vinci Group) - 25%
- Miller Paving - 25%

Other participants

Province

Goodmans LLP - legal advisors

KPMG LLP - process advisors

RBC Dominion Securities - financial advisors to the Department of Finance

Delcan Corporation - independent agent

Tardiff, Murray & Associates Inc. - bonding advisors

Lampton/Thompson - insurance advisors

ADI/IBI Group/Wilbur Smith Associates - traffic forecast consultants

MRDC

Marshall Macklin Monaghan - MRDC engineering joint venture

McCormick Rankin Corporation - MRDC engineering joint venture

Meighen Demers LLP (since merged with Ogilvy Renault) - consortium legal advisors

TD Capital - merchant banking support

TD Securities Inc./Toronto Dominion Bank, Mutual Life, Murray and Company - financial structuring and placement

AON Reed Stenhouse - insurance and surety

Vollmer Associates LLP - traffic and revenue forecasting

Financial arrangements

$585 million guaranteed maximum price

Other features

92% of the work was procured locally in New Brunswick

A new world-class four-lane highway between Fredericton and Moncton is saving lives. The 195-kilometre highway was designed and constructed, and is now operated, by the Maritime Road Development Corporation for the provincial New Brunswick Highway Corporation. It was built to rigorous safety, quality and environmental standards for a guaranteed maximum price of $585 million and with the participation of over 30 local firms. The highway was completed in under four years.

Background and rationale

In the mid-1990s, the section of the TransCanada Highway in New Brunswick that stretches between Fredericton and Moncton had the reputation of being one of the most dangerous in Canada. Fatality and accident rates were in excess of the provincial average—between 1991 and 1997, 65 people were killed and 767 injured. It was also expensive to operate.

The New Brunswick Government wanted to replace this dangerous two-lane stretch with a safer, modern four-lane highway with controlled access. It turned to a public-private partnership through the New Brunswick Highway Corporation (NBHC) as an effective way to build a safe highway, to high standards, in as short a time as possible.

Description of the project

In the largest highway construction project in the history of New Brunswick, the Maritime Road Development Corporation (MRDC) built 195 kilometres of four-lane, controlled access highway between Longs Creek near Fredericton and Magnetic Hill near Moncton in less than four years.

The new highway incorporates technologically advanced design features such as rumble strips and weather sensors in the pavement. It required the construction of 20 interchanges, four of which are high-speed interchanges that connect one highway to another, and 89 structures such as bridges, overpasses, underpasses and water crossings. Among these structures are 28 overpasses including two high level bridges, each about one kilometre long, over the Saint John and Jemseg Rivers. Three interrelated quality management systems governed the design, construction and operation of the highway.

The highway traverses 180 watercourses, 30 of which have trout and salmon populations, and passes by large deer yards. A five-kilometre section goes through environmentally sensitive wetlands in which archeological sites of the Wolastoqiyik Nations were found. An environmental management system ensures that the construction and operation of the highway respects these factors.

Both partners placed great emphasis on safety in the design of the highway as well as during construction. An independent safety audit team reviewed the design prior to initiation of design, upon design completion and immediately prior to opening. Workplace safety practices during construction meant there were no deaths and a very low accident rate.

The highway opened for public use from end to end on October 24, 2001.

Process leading to the agreement

Preparation

The New Brunswick Department of Transportation established a number of objectives for the project. The optimal mix would be determined in the selection process. These objectives were:

- to ensure the safety of the travelling public;

Features of the Fredericton-Moncton Highway

Construction Facts

- 35 kilometres of wildlife fencing
- Four new small arms ranges – CFB Gagetown
- 19 million cubic metres of earth work
- 300 kilometres of silt fencing
- 1.5 million tonnes of asphalt
- 8.5 million tonnes of aggregate
- 89 structures including two high level river crossings
- 137 kilometres of guide rail
- 458 pieces of heavy equipment
- 300 tandem tractor trailers hauling materials

Technologically Advanced Design

- 380 kilometres of rumble strips
- Energy-absorbing guide-rail end treatments
- Break-away light bases
- Stations with weather sensors in the pavement
- Independent safety audit throughout all phases of development
- ISO 14,000 compatible Environmental Management System (EMS)
- ISO 9,000 compliant Quality Management Plan (QMP)

Engineering Features

- STWAVE numerical model used to analyze the geotechnical conditions in the wetlands.
- The final grade of the wetlands embankment was constructed to one metre above the estimated 100-year flood level.
- Jointless construction was used for bridges of moderate length and skew.
- Standardized precast, prestressed concrete girders were used for most of the bridges.
- Saint John River Bridge (1 km. long) was a 14-span continuous structure with centre span of 120 metres and 24 metre vertical clearance over a navigation channel 60 metres wide.
- Jemseg River Bridge (1 km. long) was designed and constructed so no piers were in the water.

- to ensure that the highway was developed, designed, constructed, operated, managed, maintained and rehabilitated in a manner that meets or exceeds provincial standards;
- to ensure that the highway was developed, designed, constructed, operated, managed, maintained and rehabilitatedin an environmentally responsible manner;
- to share the risks of the project between the private and public sectors;
- to obtain optimal value for money for the New Brunswick Highway Corporation;
- to open the entire highway for safe operation by November 30, 2001 and to fully complete the highway by June 30, 2002;
- to defer payments by the New Brunswick Highway Corporation for the project (other than on account of highway operations and maintenance) until after the opening of the completed highway;
- to maximize the economic and industrial benefits to the citizens and industries of New Brunswick; and
- to provide a high level of service to the highway users at a low cost.

The Department of Finance retained RBC Dominion Securities for advice on how to structure the financial model that would become a public-private partnership. The model was mindful of the government's desire to control the level of provincial debt, balance the budget, and use tolls as a source of funds.

To help find a partner, the Department of Transportation retained KPMG LLP as process advisors and Goodmans LLP as legal advisors.

Selection

The project was announced in June 1996 and a Request For Qualifications (RFQ) issued in December 1996 to establish the financial and technical capability of consortia interested in partnering with the New Brunswick Highway Corporation. Eighteen proponents registered to obtain the RFQ, five of whom submitted a response.

Four teams of government staff and consultants evaluated the RFQ responses in four categories: development, technical, financial, and operations and maintenance. The resulting shortlist was approved first by a Steering Committee (comprising senior officials from the Department of Transportation and representatives from the Department of Finance), second by a Committee of Deputy Ministers, third by the New Brunswick Highway Corporation, and finally by the Executive Council of the Province.

In March 1997, a Request for Proposals (RFP) was issued to the top three proponents. The RFP submissions were to be in three sections: (a) technical, (b) quality management, and (c) financial, legal, and economic and industrial benefits. Each bidder was assigned a letter so its identity was unknown during the approval process through all stages including the Executive Council.

Seventeen teams evaluated the RFP submissions. Team membership included 45 provincial employees, 2 federal employees and 27 consultants. Another 24 individuals were called in as expert resources as needed. Consulting firms involved in the selection process included KPMG (process), RBC Dominion Securities (financial), Delcan Corporation (engineering) and Goodmans (legal). The teams spent more than 18,000 person hours evaluating the RFP submissions in a restricted-access room.

In December 1997 the Cabinet selected the Maritime Road Development Corporation (MRDC) as the Preferred Proponent to begin negotiations. Factors in MRDC's favour were its guaranteed maximum price and strong financial capability, development and operating expertise, and economic and industrial benefits package. Final agreements were concluded in January 1998 and construction began a few months later.

In reviewing how the private partner was selected, KPMG in a written opinion said "the evaluation and selection process was undertaken in a diligent, fair and equitable manner."

Timelines

1996	**June 14**	Project announced
	December 17	RFQ issued
1997	**March 27**	RFP issued to three shortlisted applicants
	November 20	Cabinet selected MRDC as the Preferred Proponent
1998	**January 22**	Final agreements signed
	Spring	Construction began
2001	**October 23**	Official opening of highway
	December	Total completion achieved

The agreement

The contract between the Province and Maritime Road Development Corporation for MRDC to design, build, finance, operate, maintain and rehabilitate the highway was signed in January 1998. At that time the public-private partnership was structured to reflect the Province's financing requirements and to use tolls to help fund the highway.

In 1999 the province's Liberal government was replaced by a Conservative government, which removed the tolls (one of its election promises) and moved the financing of the highway onto the Province's books. To maintain the integrity of the agreement and reassure the lenders, the essential structure of the agreement was not changed with the exception of replacing tolls with traffic volume payments (also known as shadow tolls). The agreements were amended to this effect in March 2000.

The Players

The **New Brunswick Highway Corporation** (NBHC) is a provincial Crown agency, created in 1995 under the *New Brunswick Highway Corporation Act*. It generally deals with lands and highways for which administration and control have been given to it by the Minister of Transportation. On its board are the ministers and deputy ministers of the Departments of Transportation and Finance plus three members appointed by the Lieutenant-Governor in Council. The NBHC is the signatory for the Province in all agreements relating to the Fredericton-Moncton Highway.

The **Maritime Road Development Corporation** (MRDC) is a consortium of private firms that is owned by:

- The Dragados FCC Group, Spain (50%)—a leading builder of toll highways around the world. Dragados FCC Group is the Canadian partnership of Grupo Dragados S.A. and FCC (Fomento de Construccion y Contratas) S.A., each of which owns 25% of MRDC.
- Janin Atlas Incorporated (25%)—a Montreal based company operating across Canada in large infrastructure projects. Janin Atlas is the Canadian subsidiary of Group GTM of France, now Vinci SA, a world leader in construction. Vinci Concessions Canada Incorporated is a subsidiary through which Vinci Group owns its participation in equity of infrastructure projects in Canada.
- Miller Paving, Ontario (25%)—one of Canada's largest highway builders that has operated in New Brunswick for several decades through its subsidiaries.

In addition, the MRDC team included over 30 New Brunswick-based engineering, construction and material supply companies, as well as other firms from the rest of Canada that provided specialized services.

MRDC assigned delivery of the project to MRDC Construction Joint Venture (which has the same owners as MRDC). The MRDC Construction Joint Venture entered a contract with two engineering firms, Marshall Macklin Monaghan and McCormick Rankin Corporation, to form MRDC Engineering Joint Venture.

Similarly, MRDC assigned the operations of the highway to MRDC Operations Corporation (also with the same owners as MRDC).

The **New Brunswick (F-M) Project Company Inc.** (Project Co.) is a not-for-profit corporation that operates at arm's length from the government. Originally part of the structure required for financing, it is responsible for arranging the financing, making payments to lenders and other participants, and leasing the completed highway to the Province.

Project Co. is directed by a five-member board; two members are nominated by the Province, two by MRDC and one selected by the other four members. The fifth member serves as chair under a renewable three-year contract, and may not be an employee of either the Province or MRDC.

Overall Structure

The Province, through the New Brunswick Highway Corporation, retains ownership of the land on which the highway is built at all times. NBHC leases this land to Project Co. (Concession Agreement).

Project Co. is the owner of the highway, and subleases it back to NBHC. It oversaw financing for the highway, issued debt, makes payments, ensures that the terms of agreements are adhered to, and collects tolls (now traffic volume payments) and other highway related revenue.

MRDC was responsible for building the highway in conformance with the technical and other specifications in the agreement (Development and Design-Build Agreement) for a guaranteed maximum price of $585 million, and for operating it for the first 30 years (Operation, Management, Maintenance and Rehabilitation Agreement).

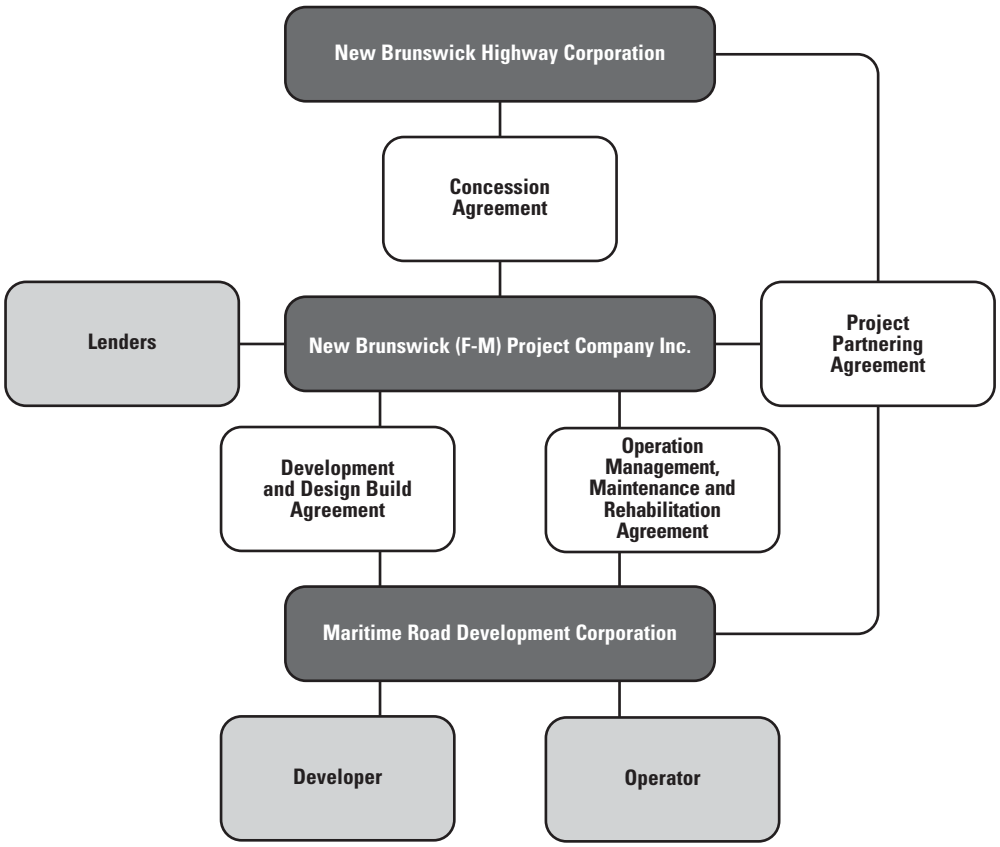
Legal Agreements

Project Partnering Agreement
The Project Partnering Agreement is a high-level agreement that covers the relationships and dealings among the partners. It is signed by the New Brunswick Highway Corporation, Project Co. and MRDC.

Concession Agreement
The Concession Agreement gives Project Co. a concession to develop, design, build, finance, operate, manage, maintain and rehabilitate the specified highway. It is signed by the New Brunswick Highway Corporation and Project Co. and commenced January 22, 1998.
The document includes:

- the terms under which Project Co. is to lease the land corridor from NBHC;
- the transfer from NBHC to Project Co. of highway segments already completed by the Department of Transportation at a capital cost of $130 million, and the transfer pricing to be used for uncompleted Department of Transportation work;
- the establishment of Project Co. as owner of the highway;
- the terms of the sublease under which NBHC leases the highway from Project Co. for use as a public highway; and
- the requirements for NBHC to make monthly payments for highway operation, maintenance and rehabilitation costs during the first 30 years.

Project Structure



Note: NBHC was also a signatory of the DDB and OMM Agreements
Source: Report of the Auditor General – 1998, Chapter 13

This agreement covers a 50 year period. At year 30, and again at year 40, NBHC has the option to cancel the agreement by acquiring the highway from Project Co at fair market value. Fair market value is defined as the present value of Project Co.'s projected net cash flows for the remaining years of the Concession Agreement. If NBHC does not buy the highway after year 30 or year 40, ownership reverts to the Province at year 50.

Development and Design-Build Agreement

The Development and Design-Build Agreement (DDB) is signed by the New Brunswick Highway Corporation, Project Co. and MRDC; the principal companies involved in MRDC are also signatories as guarantors since MRDC has few assets of its own.

This agreement requires the highway to be developed, designed and built by MRDC in accordance with specific guidelines and for a guaranteed maximum price of $585 million. It covers technical specifications, construction standards, environmental matters, audit and inspection, late completion penalties, and other similar matters.

The contract included provisions for MRDC to earn a "quality payment" each month provided a threshold level of quality was attained. These payments were not, in fact, a bonus but part of the guaranteed maximum price. The payments amounted to $24 million over the life of the project, and were distributed according to a payment schedule. In addition, late completion penalties of $150,000 for each 30-day period would be incurred if certain interim and final milestone dates were not achieved.

Operation, Management, Maintenance and Rehabilitation Agreement

The Operation, Management, Maintenance and Rehabilitation Agreement (OMM) is signed by the New Brunswick Highway Corporation, Project Co. and MRDC Operations Corporation together with the principal companies in the MRDC consortium as guarantors.

The operation and maintenance contract covers:

- work to be handled by MRDC in operating and maintaining the highway;
- reporting requirements and rights and duties of NBHC and Project Co.; and
- collection and disbursement of any gross ancillary revenues.

The agreement includes handback standards and provides that NBHC can perform audits to ensure that the highway is operated to the required standards.

The OMM is a 20-year contract, followed by mandatory negotiations to renew it for a further 10 years.

Financial Arrangements

Financing

Project Co. issued debt to cover the long-term financing of project expenditures. Negotiated under the original arrangement, the debt was structured to reflect repayment from two revenue streams—tolls and provincial lease payments.

- Part "A" debt raised by MRDC (originally toll-based):
  - $149.5 million in two tranches issued 22 January 1998 at 6.74% and 7.14%;
  - non-recourse debt;
  - repayable over 29 years;
  - originally to be repaid from gross tolls collected from users and ancillary revenue; as amended, it is repaid by the Province based on traffic volumes (see below).
- Part "B" (lease-based debt):
  - $540 million issued 5 March 1998 at 6.47%;
  - accreting bonds;
  - security comprises a pledge by the Province to make 49 semi-annual lease payments of $30.9 million each, for a total of $1.514 billion, commencing November 2003.

All debt will have been repaid by year 30.

Removing the tolls
A key concept in the original design of the arrangement was to fund a portion of the highway with user fees (tolls). Revenue from the tolls would be used to repay Part "A" debt. When the tolls were removed, they were replaced with traffic volume payments which are paid by the Province.

To measure the traffic volume, a sophisticated traffic-counting structure from IRD Technology in Saskatchewan was installed at selected locations in the highway. Traffic is counted in two classes—simplistically, a car and anything larger than a car. A traffic-volume report is issued to MRDC which advises the New Brunswick Highway Corporation of the counts. On the basis of those counts, NBHC makes payments to Project Co., which in turn makes payments to the lenders of the toll-based debt. Any residual monies are returned to the Province.

Though financing was now on-book and any potential deterrent (tolls) to using the highway removed, the financial impact of the decision to remove tolls included:

- the loss of user fees from through-traffic means the full cost of the highway will be borne by New Brunswick taxpayers (the proportion of the total capital cost to be financed by tolls was 17%); and

- direct costs associated with removing the toll system after the project had begun were $32 million at March 1, 2000.

Operation and maintenance payments
For the first 20 years the New Brunswick Highway Corporation will make payments to Project Co. based on a pre-set schedule attached to the Operation, Management, Maintenance and Rehabilitation Agreement. Payments over the 20 years will total $168 million in 1997 dollars ($168 million plus inflation adjustments).

In years 21-30 the amounts to be paid will either be mutually agreed upon by the parties to the agreement or determined by binding arbitration.

Risk Allocation

The Province transferred significant risk to the private partner. The risk allocations were outlined in the RFP, and are summarized in the following table (risks relating to demand and tolls have been removed).

The New Brunswick Highway Corporation transferred the design and construction risks to MRDC. The guaranteed price meant that any cost overruns were MRDC's responsibility. Project risk was shared amongst MRDC's owners (Dragados, FCC, Janin Atlas and Miller). MRDC Engineering Joint Venture assumed design risk through the member firms' standard errors and omissions insurance.

Construction risk was mitigated with MRDC providing a $250 million performance bond and a $50 million labour and materials bond, as well as extensive insurance coverage on the project.

MRDC also assumed most of the operating risk and some financing risk.

Risk Allocation

	Risks	Primary Responsibility NBHC	MRDC
Development, Design and Construction Risks	Concept approvals – environmental: Provincial EIA	■	■
	Concept approvals – environmental: Federal EARP	■	
	Concept approvals – environmental: Federal CEAA	■	
	Design and construction approvals - environmental:		
	▸ watercourse alteration		■
	▸ archaeological, Jemseg	■	
	▸ archaeological finds, known		■
	▸ archaeological finds, unknown	■	■
	Land acquisition	■	
	Land transfer approvals – CFB Gagetown	■	
	Inability to acquire land causing a route change	■	
	Delays by outside agencies (utilities and permitting)		■
	Delays by the Province	■	
	Insurance and bonding requirements	■	
	Adequacy of insurance and bonding requirements	■	■
	Confirmation of insurance and bonding		■
	Sub-contractor insolvency		■
	Design error		■
	Changes in standards imposed by the Province	■	■
	Changes in standards imposed by others	■	■
	NB DOT supplied data - accuracy		■
	NB DOT supplied data - sufficiency		■
	NB DOT supplied data - interpretation		■
	Patent infringement		■
	Weather, strikes, fire, vandalism, damage to works		■
	Traffic accidents		■
	Damage/injury to third parties		■

continued...

Risk Allocation (continued)

	Risks	Primary Responsibility NBHC	MRDC
Development, Design and Construction Risks (continued)	Damage/loss to utilities		■
	Defective materials		■
	Water/air/soil pollution – pre-existing and unknown	■	
	Water/air/soil pollution – pre-existing and known or arising from work		■
	Quality assurance/quality control		■
	Quality audits	■	
	Public interface		■
	Workplace health and safety		■
	Utilities		■
	Unexploded Ordinance CFB Gagetown	■	
Operations and Maintenance Risks	Changes in standards – imposed by the Province	■	■
	Changes in standards – imposed by others	■	■
	Inflation		■
	Weather		■
	Strikes		■
	Actual maintenance costs higher than anticipated		■
	Damage/injury to third parties		■
	Damages to works		■
	Water/air/soil pollution		■
	Vandalism		■
	Meeting hand back standards		■
Financing Risks	Interest rates	■	■
	Inflation		■

Other arrangements

Safety

Increasing the safety of the highway was a primary objective of this project and, for the first time in Canada, safety audits were designed into the design and construction process. Safety audits are a proactive initiative that can prevent accident blackspots, which are usually only discovered after a highway is opened. Even though technical specifications are followed, it is still possible to find improvements in the field and implement actions, such as flattening a slope, that can further enhance safety.

The safety audits were carried out by an independent third party team together with traffic safety experts at the University of New Brunswick. The safety auditor conducted:

- two audits during the design process (once at mid-point, again at final design); and
- an on-road audit after completion and prior to opening.

MRDC installed a range of safety features including six pavement and atmospheric monitoring stations known as ARMOS (Advanced Road Maintenance and Operations System), energy attenuating guide-rail end treatments, rumble strips and frangible bases for lights and signs.

Quality

A Quality Management Plan (QMP) was a requirement of the RFP.

MRDC submitted and carried out a detailed quality assurance/quality control program for the project. At the proposal stage, MRDC Engineers Joint Venture hired a consultant to oversee the preparation of a model Quality System Manual to support the proposal and be the basis of the project's Quality Management System. The model became the manual for three interrelated quality management systems governing the design, construction and operation of the facility.

The project team adhered to a rigorous set of ISO 9000 standards for quality control. MRDC also supported team members, most of whom were based in New Brunswick, in achieving ISO 9000 equivalency and following rigid quality control and quality assurance procedures.

The project's quality control and environmental programs have received national recognition from several Canadian associations.

Environment

The RFP offered proponents the flexibility to submit an environmental plan, which MRDC did.

The main feature of its Environmental Management System (EMS), which is ISO 14000 compatible, is the continuous monitoring of streams within about half a kilometre of operations over the life of the contract. If suspended solids over 300 parts per million were observed in the streams, financial penalties would be imposed.

Other features of the Environmental Management System:

- wildlife crossings were often combined with stream crossings to achieve a natural result;

- road grading was designed to minimize the amount of tree clearing;
- cuttings of existing rare plants such as the Buttonbush were cultured and replanted; and
- extensive sediment and erosion control fencing was put in place to minimize the impact of fill entering roadways during rain events and spring floods.

MRDC retained the Université de Moncton to conduct post-construction environmental monitoring for the project.

One five-kilometre section of the highway runs through the internationally recognized, environmentally sensitive wetlands at Grand Lake Meadows. A mitigation and compensation fund was established through the New Brunswick Wildlife Trust Fund; MRDC and the Province together contributed $800,000 to the Fund for use in the Grand Lake Meadows area.

In addition to Grand Lake Meadows being environmentally sensitive, MRDC knew that archeological sites were likely to be found in the wetlands. CRM Group was retained by St-Isidore Asphalte, a MRDC member, to monitor construction activity south of Canaan River, due to the presence of known heritage sites and the potential to encounter others during construction. Sites belonging to the Wolastoqiyik Nation were found, including a settlement estimated to be 2,000-3,000 years old and artifacts dating back more than 6,000 years. As a result, MRDC modified the road alignment and rescheduled work to other areas while it consulted with heritage experts.

Benefits and accomplishments

Cost Savings

The Province developed its own reference bid to compare against the private sector submissions. The Department of Transportation estimate was $758 million for construction costs, and $114 million for operating and maintenance costs.

On this basis, the public-private partnership achieved the following savings:

- construction savings of $173 million, given a guaranteed maximum price of $585 million;
- operations and maintenance savings estimated at $13.7 million (net present value) over 20 years; and
- additional value engineering cost savings of $9.3 million.

Other Benefits

Driver Safety

The attention given to designing a highway that would improve driver safety has had impressive results. The highway has seen a 70% reduction in fatalities on the road between Fredericton and Moncton. This is a greater safety improvement than expected from the conventional wisdom that upgrading major arteries from two to four lanes will reduce fatal accidents by one third.

Speed of Delivery
The highway was built in about one-third of the time it would have taken if the government had constructed it. It was completed in under four years compared to the more traditional 15 years and six months ahead of schedule.

Consequently, all the benefits of the new highway (such as safety, travel time saved, environmental benefits, and quality standards) were realized more quickly than through normal project delivery.

Construction Safety
The safety culture extended to the workforce. The workers put in more than 4.6 million hours, yet the overall safety record was one third the provincial average—a project injury frequency rate of 2.1 compared to the provincial rate of 7.0.

Economic and Industrial
The project provided $529.5 million in value-added New Brunswick content.

In its Economic and Industrial Benefits Program that formed part of the contract, MRDC estimated that the project would create about 20,000 jobs over its term:

- approx 8,200 direct jobs during the design and construction phases;
- additional spin-off employment of about 3,000 jobs (11,200 total); and
- about 8,900 jobs through operations and associated spin-offs.

During construction, MRDC sourced most of the jobs and materials from local firms. It employed 30 New Brunswick-based engineering, construction and material supply companies, and 92% of the work was procured locally. At peak construction MRDC had 1,400 employees, and 1,300 of these were from New Brunswick.

For the trucking industry, the new improved highway has shortened the driving time by 30-35 minutes compared to the old route. The truckers report anecdotally that they have seen benefits beyond those they expected.

Skill Enhancement
The opportunity to enhance their existing skills was an additional benefit both for the road builders and for the province as a whole. The size of the project, which was much larger than generally available to contractors within the province, enabled the consortium to place a rigour on the process in terms of quality, safety and protection of the environment. As a result of this experience, the New Brunswick roadbuilders, who were already skilled, have enhanced their capabilities. They have improved their quality assurance process and moved towards ISO procedures.

New Brunswick's academic institutions have similarly benefited. MRDC used local experts to conduct the safety and environmental audits. The safety auditor subsequently developed a safety audit program at the University of New Brunswick while the Université de Moncton, which MRDC retained to conduct the environmental audits, has had the opportunity to develop and apply environmental benchmarks.

MRDC has also contributed $320,000 to the University of New Brunswick and Université de Moncton for research and development, with another $180,000 committed over the following six years.

Communications

By and large, members of the public were supportive of building a new highway as they recognized the hazards of the old road. The major issue was the tolls. An election campaign during the project afforded the opposition the opportunity to press its case. A new government was elected and made good on its promise to remove the tolls. At this point the issue faded from public view.

At the operational level, issues that concerned the public were those associated with any large project—noise, dust, light, blasting.

Both partners agree that having an effective communicator on the project at the beginning is essential, someone who is both skilled at communications and used to working on big projects. This was one of the characteristics of the proponent sought by the Province, and a well-developed communications plan formed part of the agreement between the partners. The plan outlined the approach, activities, stakeholders, issue management and emergency response plan.

MRDC employed a full-time communications manager based in Fredericton during the course of the project. As well as initiating planned communication activities, the communications manager typically dealt with site issues, such as complaints about the effects of continuous quarrying on the residents nearby. On occasion she worked with her counterpart from the Province who would get involved when a knowledge of local issues was needed. They met individually with the residents, held joint meetings in the local Legion, involved the subcontractors, and did whatever they could to keep communications open and accommodate the concerns.

Labour

Early in the process the government's equipment operators had some concerns. The Canadian Union of Public Employees (CUPE) claimed that the project breached the collective agreement. The courts, however, determined that the employer was not in violation.

At least four out of five jobs were sourced from local firms across the province. And, although senior management was mostly from outside the province, Miller Paving had had a presence in New Brunswick for some time through several subsidiaries (Cold Milling, Atlantic Colas and McAsphalt Industries) and New Brunswick-based firms were included on the MRDC team from the outset. Miller's knowledge of the local market facilitated sourcing labour and materials from New Brunswick firms.

Testimonials

Public Sector

"The project was delivered ahead of schedule and has been well received by the residents and commercial interests of New Brunswick. It was built by New Brunswickers for New Brunswickers."

Doug Johnson
Project Manager
Fredericton-Moncton Highway Project
New Brunswick Department of Transportation

Private Sector

"The information provided by the Province at the RFP stage was well done, well documented and questions asked for clarification were received well and answered in a very timely manner. Negotiations (after selection) were very intense with both parties resolving any matters culminating with the signing of agreements to move forward on the project.

PPP projects by their nature have champions but also pockets of resistance, particularly in the bureaucracy. Partnering agreements and principles are essential to be able to deal with these issues. During construction, the Province and the developer worked extremely closely in an effort to meet the completion deadline and resolve concerns in a very timely manner. Senior people in the government and project staff were very accessible, which assisted greatly in completing the project well ahead of schedule. The project went well and both parties achieved their goals."

Leo McArthur
President
Miller Paving

Public Sector Contact

Doug Johnson, P.Eng.
Provincial Project Manager for FMHP July 1996 to April 2002
ADM Policy, Strategic Development & Intergovernmental Relations
New Brunswick Department of Transportation
P.O. Box 6000
Fredericton, NB E3B 5H1
506-453-5818
doug.johnson@gnb.ca

Private Sector Contact

David Garner, P.Eng.
MRDC Project Manager for FMHP from April 1999 to August 2002
V.P. Corporate Development
Miller Paving Limited
505 Miller Avenue
Markham, ON L3R 9R8
905-475-6660
dgarner@millergroup.ca

THE BUSINESS TRANSFORMATION PROJECT:
Transforming the Delivery of Ontario's Social Assistance System

2003 Gold Award for Service Delivery

Quick Facts

Project type
Service Delivery

Asset
Ontario's social assistance delivery system

Partners
Ontario Ministry of Community and Social Services

Accenture

Other participants
HLB Decision Economics Inc.

PricewaterhouseCoopers LLP

Financial arrangements
Each partner invested its own resources, shared risks and rewards, and received benefits proportionate to their investment from any savings achieved.
Results:
- Gross savings of $700 million
- Investment by both partners of $400 million
- Net savings to government of $300 million
- Estimated future annual savings of $200 million

Other features
Five year term

Ontario's Business Transformation Project achieved significant savings and reduced welfare fraud by completely redesigning how the province's social assistance programs were delivered. The project developed and implemented new streamlined business processes, and built state-of-the-art, made-for-Ontario technology to support those processes. The work was conducted through an innovative partnership between the Ministry of Community and Social Services and Accenture.

Background and rationale

In the mid-1990s Ontario's social assistance system was overloaded, inefficient, and prone to errors and fraud. Case loads had almost tripled, and annual costs had risen from $1.3 billion in 1985 to $6.8 billion in 1995.

At the same time, the 30-year old delivery system used antiquated technology and processes that were largely paper-based and labour-intensive. There was no single province-wide system and no on-line capability. The cheque-production system used overnight batch processing.

The system was not centralized. Front-line social assistance services were delivered independently by over 300 municipal and provincial offices and client records were not integrated across jurisdictions. Though there were seven front-end systems in addition to the cheque-production system, these were only partially connected. The lack of coordination facilitated fraudulent claims, resulted in inconsistency across the province, and inconvenienced social assistance recipients (clients).

A new Conservative government in Ontario was elected in 1995, and one of its first steps in addressing these issues was legislative reform. The social assistance programs, which were administered by the Ministry of Community and Social Services, were refocused to form two new programs:

- Ontario Works—for all single parents and individuals; the focus shifted to an employment strategy to help people leave the welfare system.
- Ontario Disability Support—for services to the disabled; similar to a pension program.

The second step, and the rationale for this public-private partnership, incorporated the following key objectives:

- replace an outdated delivery system with one that could support the new social assistance programs;
- modernize/transform the business processes and technology of the delivery system;
- implement the new system across Ontario; and
- provide a platform for strategic change within the Ministry.

Description of the project

Transforming the social assistance delivery system involved an end-to-end redesign. The engine of the redesign was a single, web-based computer system.

This technology supported the revised organizational structures and processes that were needed to implement the reformed policies in an efficient and streamlined way.

Some key features of the new system are:

- Coordinated delivery of Ontario Works by 47 Consolidated Municipal Services Managers.
- Centralized province-wide database of client information.
- Automated eligibility review—a rule-based, automatic decision-making system that uses third party sources to verify eligibility.
- Streamlined application process:
  - Initial telephone screening is done through seven new call centres. Applicants are informed at the time of the call if they are potentially eligible for benefits, and advised on how to appeal if they are not deemed to be eligible.
  - Face-to-face verification interviews are conducted with eligible applicants at their local office soon after the telephone screening. Applicants are advised during the interview of their eligibility and amount of benefits.
- Automated telephone system—an interactive voice response (IVR) system, which is connected to the province-wide database of client information, allows recipients immediate access to information about their case.

The new system standardizes financial eligibility processes and calculations, streamlines case management functions and procedures, provides application support for employment assistance, and enhances program and performance monitoring. It is fast and accurate, provides consistency of application and portability of benefits across the province, and allows front-line staff more time to help recipients find employment.

Since the completion of the project, and following a competitive process, Accenture was awarded a three-year application maintenance services contract from October 2002 to September 2005.

Process leading to the agreement

A complete redesign of the social assistance delivery system was a major undertaking. It would take place in a highly complex and political environment, and affect multiple stakeholders including municipalities. Furthermore, as delivery of benefits could not cease at any time, the changeover from one system to another had to be seamless.

The Ministry did not have the funds or internal capability to undertake such a large and complex project on its own. At the same time, a traditional contract with a fixed price was not feasible since the Ministry did not know at the beginning of the process what the redesigned system would look like.

The project was a pilot for Common Purpose Procurement (CPP) in Ontario. Unlike traditional procurement that selects a proposal on the basis of lowest or evaluated cost, the CPP process selects partners on the basis of proven experience and expertise, project approach and management, financial stability and capacity, as well as the financial and partnership arrangements for sharing the risks, investment and benefits.

Using this procurement process, in 1995 the Ministry issued a Request For Proposals (RFP) to find a partner who would work jointly with it, could complement its skills, and was willing to risk investing its own financial and human resources. Within this project, the basis of the partnership was known as a value-based arrangement. Under this arrangement, the partners would share the risks and rewards of the work by investing their own resources and only recover their investment when benefits were generated from any savings realized from their work.

The contract would be in two parts:

- to assess the existing status and develop a plan; and
- to work with the Ministry to implement the new plan.

Seven proposals were received. Following a review of the submissions, three proponents were invited to make oral presentations. The cross-government evaluation team incorporated representatives from several ministries.

For each submission, the selection criteria included evaluating:

- the financial component, such as how a value-based arrangement would work and the viability of the firm to finance it; and

Timelines

1995	**October**	RFP issued
	December	Seven proposals received; three shortlisted
1996	**January**	Oral presentations by three proponents
	April	Accenture invited to begin negotiations
1997	**January**	Agreement signed
2002	**January**	Contract completed

the capabilities of the firm, such as its experience with similar arrangements, management strength, and suitability and fit with the Ministry.

In April 1996 Accenture, a global management consulting and technology services firm known at that time as Andersen Consulting, was invited to begin negotiations with the Ministry. The partners signed an agreement on January 27, 1997.

The agreement

In 1997 the Ministry signed a four-year agreement with Accenture to jointly develop new technology and business practices related to the delivery of social assistance in Ontario—known as the Business Transformation Project. The agreement included the option to extend the term for an additional year, an option the partners exercised.

Definitive Agreement

Core Agreement	Schedules
The 22 sections include: ► Project Scope ► Deliverables ► Term ► Payment ► Financing ► Party Responsibilities ► Licensing and Title to Deliverables ► Acceptance and Support ► Warranties and Representations ► Indemnification ► Project Management ► Breach and Termination ► Service Level Agreement ► Dispute Resolution ► Publicity and Communications	A Mission and Scope B Financial Arrangement C (intentionally blank) D Project Management E Task Orders F High Level Critical Path G Non Disclosure Agreement for Third Party

Legal Structure

The Business Transformation Project was governed by this agreement (the Definitive Agreement), which was an umbrella agreement that laid out the terms and conditions for the relationship. In general, the partners agreed to work together to transform the social assistance system, and to share the risks, rewards and responsibilities in doing so.

More specifically:

- The Ministry was responsible for developing the legislation, regulations, policy and procedural guidelines, managing the workforce implications of the project, and providing any approvals required.
- Accenture was responsible for working with the Ministry to create both the new business processes and the technology required to support the social assistance reform.

The structure of the project was developed through a master plan and an associated business case. The actual work of the project was conducted through separate task orders. Each task order:

- was agreed to by both parties;
- specified the requirements of the task in question such as the deliverables, resources required, estimated costs and benefits, how the risks would be managed, schedule for completion, accountabilities, and communications plan; and
- was appended to the Definitive Agreement as part of Schedule E.

Some task orders were designated as critical and failure to meet a milestone in a Critical Task Order could be considered a breach of the Definitive Agreement.

Financial Arrangements

The key element of this public-private partnership was the value-based arrangement that formed the basis for financing the project. Under this arrangement both partners invested their own resources and, if needed, arranged their own borrowing. For the public sector, this meant there were no upfront costs to the taxpayers. In return, both partners received benefits and recovered their costs only when savings were achieved. Both understood the risks and consequences of failure and undertook to devote the leadership, experience and resources that would help to mitigate the risks.

More specific details of the financial arrangements in this project include:

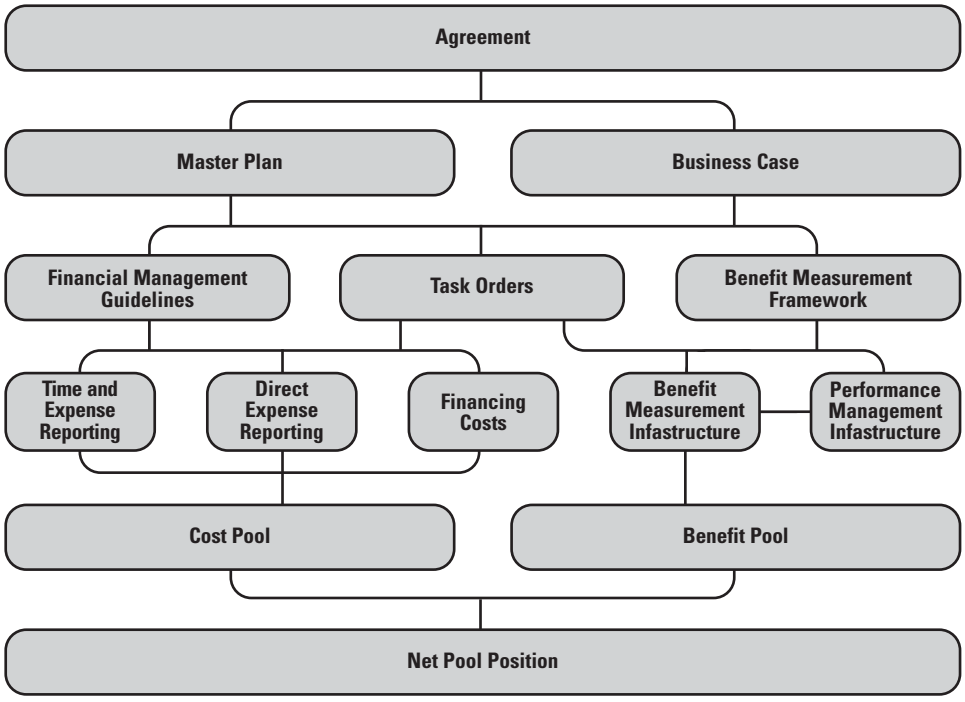
- The Ministry agreed to dedicate the benefit stream to offset project costs.
- The **costs** of each task order were tracked and accumulated monthly into an overall cost pool on a time and material basis. Approved costs included hourly fees, out-of-pocket expenses, hardware, software, office space and equipment, third party service, and interest.

- The **benefits** from each task order were measured and accumulated monthly into an overall benefit pool.
- Funds available in the benefit pool were distributed monthly to the partners in proportion to their contribution to the cost pool.
- The metrics used were approved by both the Ministry and Accenture.
- Not every task order had to show a net benefit (e.g. Project Management Office), as long as the overall benefit pool was positive.

The magnitude of the financial commitment was contained by specifying that:

- Accenture was not committed to incurring costs beyond a reasonably expected benefits total; and
- Payments to Accenture for direct investment and interest charges, excluding the cost of technology hardware, third party software and taxes, would be capped at $180 million for the agreed upon scope of the project.

Structure of the Value-based Arrangement



Source: Partners submission to CCPPP

Risk Transfer

Risk Allocation

Transferring risk from the public sector partner to the private sector partner is a defining characteristic of a public-private partnership. There are at least two reasons to transfer risk: because the payment mechanisms provide an incentive for the private partner to manage and mitigate that risk; and because the private partner can mitigate certain types of risk more efficiently than the public sector. If the right risks are transferred with the right incentives, then the overall risk of the project is diminished.

The widely-held view in the field is that risks should be allocated to the partner best able to manage them. In this case, Accenture had the knowledge and experience of designing and building other large, transformative projects, and so was better positioned to manage that risk. The Ministry took prime responsibility for managing the policy and regulatory factors.

Both the Ministry and Accenture accepted significant risk with this project. Though overall project risks were shared, the financial risks for Accenture were high. If no savings were realized, it would neither recover its investment nor make any return; also, it had to have sufficient financial resources to withstand the lag between ongoing investment and subsequent return. For the Ministry, there was high operational and political risk in the case of failure.

Risk Management

The partners developed a risk management strategy, drawing on multi-disciplinary expertise from a range of sectors. Developing the strategy included:

- identifying engagement risks and mitigation strategies;
- analyzing and assessing risk impact, assigning probabilities;
- identifying all the actions the project needed to take to mitigate the risks, influence the possibility of the risk occurring and the actions that would be taken if the risk did occur;
- monitoring high impact risk items;
- ensuring the necessary infrastructure and support for the risk management function; and
- developing, tracking and controlling risk reduction measures and monitoring those measures for their effectiveness.

The project comprised a series of building blocks, each of which moved the project closer to the new system of social assistance service delivery. The fundamental principle of the risk management strategy was to understand and manage each of the building blocks in a way that reduced the risk of subsequent steps of the project. For example, the partners:

- implemented the call centres and the interactive voice recognition system early in the project, so clients could start getting used to the changes; and

- undertook the new eligibility review process[1] early in the project, so that the savings that accrued from it over the initial phases could help fund other parts of the project.

Each task order outlined how to manage the risk of that task order.

Benefit Measurement

Since payment to both partners depended on the relative sizes of the cost and benefit pools, the methods by which costs and benefits were measured and allocated were critically important. The measurement process, which would determine the actual level of benefits, had to balance mitigation of the partners' financial risk with administrative simplicity and public defensibility. It had to demonstrate that the savings were the result of the project, not of the new policy or other external changes such as municipal amalgamation.

An additional factor in mitigating financial risk was performance management. Establishing performance targets and monitoring key indicators helped to realize and accelerate the benefits found.

Through the Project Management Office, the partners established a specialized metrics team to develop and maintain the metrics for operational performance measures. This team, which was managed jointly by the Ministry and Accenture, managed the monthly measurement process and maintained consolidation benefit forecasts.

A third party econometrics firm hired by the Ministry, HLB Decision Economics Inc., reviewed and validated the business case, methodology and metrics calculations and forecasts. Such an independent review provided important credibility of the project's arrangements.

Ownership

The ownership arrangement is specified in the Definitive Agreement. The partners jointly own the original materials developed for the project including the system technology. As "tenants in common", any application of the system outside Ontario would require joint approval. However, the Province has full discretion to update, change, use or give it to another government entity within Ontario without any approval from Accenture.

[1] The Consolidated Verification Process, described more fully under "Project Phases".

Managing the project

Governance

"The most important thing we had to get right was governance of the project," said Alden Cuddihey, senior partner at Accenture. As joint investors both parties wanted to be involved in governance whilst recognizing the government's exclusive role in policy. The partners invested significant time in developing a charter that articulated common objectives, scheduling activities and developing the decision-making structure. Ultimately, the project was governed by a Governance Committee, Executive Team, Project Management Office and two project directors.

The Governance Committee was a cross-government body of government representatives and chaired by the Ministry's Deputy Minister. It ensured the project was coordinated within the overall priorities of government and dealt with technology, procurement, financial and political issues.

An Executive Team was established with senior executives from each partner. Including the private partner at the most senior level demonstrated the shared nature of the partnership. The Executive Team comprised the Ministry's Deputy Minister and three Assistant Deputy Ministers, and three of Accenture's most senior partners in Canada. Bonnie Ewart, the Assistant Deputy Minister responsible for the project, was chair.

The Executive Team met every other week for the purpose of high level decision-making. Issues considered were those that would delay the project if a decision was not made, such as changes in finances, scope or time lines. Decisions were made by consensus.

Below the Executive Team was the Project Management Office, which comprised Bonnie Ewart and her Accenture counterpart, and a small group of support and communications staff from each partner. The Project Management Office, where it was within its scope, made decisions on issues brought to them by the project directors; high-level issues it took to the Executive Team for decision.

The project director for the Ministry (a professional project manager hired by the Ministry for the project) and the project director for Accenture ran the operational, day-to-day aspects of the project. They held team meetings almost every day and met with the senior executives in the Project Management Office at least once a week.

Each task order designated the primary responsibility for that task order to one of the partners, and that partner's project director was responsible for the management of the related task order teams.

The rigorous project management infrastructure was a critical element in moving the project forward expeditiously. This structure and the working relationships that developed meant that things got done; issues, when they developed, were dealt with quickly and not allowed to fester or delay the project.

Project Phases

The project was organized into three major components: developing the overall design or blueprint; initiating some early opportunities for strategic portions of the redesign; and implementing the full service delivery model.

- Social Assistance Blueprint: The blueprint, which took about one year to develop, determined the high level design of the organization, business processes and technology of the new social assistance service delivery model. Developing the blueprint was an iterative process that involved stakeholders within the Ministry and the municipalities.

- Early Opportunities: To generate momentum and demonstrate action to people in the field, early in the process the partners began to design and implement three initiatives: Monthly Reporting and the Consolidated Verification Processes for Ontario Works and for Ontario Disability Support. The Consolidated Verification Process (described below) was chosen deliberately (a) to generate money to fund the third phase (Service Delivery Model Implementation), and (b) to give people in the field an opportunity to experiment with change.

- Service Delivery Model Implementation, which occurred in two phases.
  - The first phase included the automated eligibility review, seven call centres to screen applicants, and the automated telephone system for client enquiries.

  - The second phase involved implementing the remaining components through a single web-based system and province-wide database; it included calculation of eligibility, cheque production and payment, and tracking and reporting mechanisms.

The pilot system of the full model went live in May 2001 (some portions had been implemented earlier in Early Opportunities phase), followed by broader implementation in three waves commencing in September 2001. Implementation was complete in January 2002.

Consolidated Verification Process

The Consolidated Verification Process (CVP) is intended to reduce fraud. The process verifies that an applicant is eligible for social assistance and validates the accuracy of the entitlement. CVP uses external sources, such as credit bureaus or Canada Revenue Agency, to carry out the verification checks.

Benefits and accomplishments

Cost Savings

The project has been a financial success.

By December 2000 both partners had recovered their investment, mostly as a result of early implementation of the Consolidated Verification Process. As of March 31, 2002, when the project's books closed, the overall financial results were:

- gross savings of over $700 million;
- investments by both partners of around $400 million; and
- net savings to the government/taxpayer of $300 million.

In addition, a third-party econometrics firm forecasts ongoing savings of about $200 million annually.

Savings arose from two benefit streams:

- Program expenditure savings, which resulted from:
  - caseload reductions due to improved eligibility determination; and
  - average cost/case reductions due to improved entitlement determination.
- Administrative savings, which were reinvested in programs, resulted from
  - caseload reductions; and
  - casework productivity improvements.

Most of the savings were realized from the Consolidated Verification Process. By 2003 the new system had identified and eliminated payments to 46,000 people deemed to be ineligible and 23,000 cases of overpayments. It had also provided timely and accurate information that assisted in the prosecution and conviction of 1,870 cases of fraud. Since the Consolidated Verification Process was intended to ensure people received accurate benefits, it also identified some underpayments which were corrected.

Other Benefits

As well as cost savings for the government, the project brought about significant improvements in both client service and program integrity. The new system identified and rectified instances where eligible recipients were not receiving the benefits to which they were entitled. In addition:

- Client service was improved through, for example, reduced wait times, a simplified process, quick information about the status of their case, and more time for assistance from staff.
- The automatic and consistent application of policy reduced the risk of fraud and increased program integrity.
- The streamlined efficiencies of the new system minimized the cost of delivering such a large, complex system through improved worker productivity, reduced system enhancement costs, and easier capture and application of financial policy.

Benefit Summary

Improved Client Service	Increased Program Integrity	Reduced Delivery Cost
► Seven call centres allow a client to apply by phone. ► Reduced wait times: Calls to the call centre answered in 60 seconds, 80% of the time. ► Simplified process: Telephone screening simplifies the application process. ► Self-sufficiency: Staff can focus on employment planning in office visits. ► Currency: Interactive voice response and automated decisions allow clients to get up-to-date information and feedback on demand. ► Fair and consistent application: Automation of eligibility rules. ► Portability: Clients can move between municipalities without having to re-apply.	► Automatic application of government policy – both eligibility and benefits. ► Rigour and third party information applied to the case review process. ► Consistent application of policy across the province through automation. ► Overpayments collected across jurisdictions. ► A single, province-wide system has reduced the risk of fraud.	► A full suite of case management tools improves worker productivity. ► A single, modern, flexible web-based application replaces seven disparate applications and reduces system enhancement costs. ► A single platform with a rule-based engine facilitates the capture and application of financial policy.

Communications

Large projects such as the Business Transformation Project involve change, and change is frequently seen as uncomfortable and threatening. With hundreds of municipal and provincial delivery sites involved plus the Ministry's policy and program delivery branches, change management was one of the project's biggest challenges.

Communication and stakeholder involvement are key tools in managing change successfully. With at least three audiences (the public, stakeholders and employees) and two points of view (public and private sectors), the communications role in public-private partnerships typically requires multifaceted skills and a well-developed communications strategy. An effective strategy not only plans proactively to communicate with the various audiences but also establishes a protocol ahead of time for how to jointly manage unexpected issues.

The partners incorporated a communications strategy into the Definitive Agreement. The communications protocol was maintained at the Project Management Office, and a communications plan formed a component of each task order. While communications were led by the Ministry, they were always conducted with the full knowledge of Accenture. Communications were mainly internal to the government and focused on involving stakeholders such as the municipalities and ministry employees. But one public incident did arise that had an impact on the project.

Public

A 1998 report on the project by the Provincial Auditor received significant media attention. Some issues raised in the report were taken up in the Legislative Assembly and by the Public Accounts Committee which conducted public hearings.

This was a difficult time. The private partner's reputation was at stake and it became caught up in a policy/political debate regarding welfare reform in general, to which it could not respond; at the same time the public partner was under significant political pressure. The Ministry communications team responded to the concerns raised by the Provincial Auditor through the lead communicator; the communications focus was more on internal than public defence. A priority was the need to convince the Minister's office that the project should continue—which eventually happened.

As a result of the public attention and because the Minister's office wanted to be kept fully informed, Bonnie Ewart and her counterpart at Accenture reported to the Minister's office weekly in writing and in face-to-face meetings for over two years. This time commitment was highly unusual. Ultimately, the Minister became a champion for the project and, by reinforcing the planned completion date, helped ensure its timely resolution.

Stakeholders

Communications with stakeholders and employees were proactive and responsive to feedback. There were multiple stakeholders in the municipalities and the Ministry. It was essential to involve them in a meaningful way, and more than 1,000 people were invited to participate in this process.

Early on the partners established consultative groups within the Ministry and municipalities. For example, a group of senior decision-makers from the municipalities formed a Municipal Reference Group that met every 4-8 weeks and was part of the design and decision-making forum. In addition, senior executives from both partners visited the 47 Consolidated Municipal Service Managers on several occasions to discuss the issues and to personalize the project. Some municipalities were very supportive, and the partners enlisted them to champion the project with other municipalities.

In the last six months of the implementation phase, there was extensive email communication and feedback between all participants.

The partners invested considerable time in tracking all the comments and feedback received from municipalities, and responding to the feedback The municipal participants later assessed the partners very highly for their responsiveness. In other words, the partners were seen to be listening to the stakeholders.

Employees

"The labour strategy was all about communication, communication, communication," Bonnie Ewart said.

An important element in the strategy was removing the fear that some employees would lose their jobs as a result of the change. The Ministry decided not to downsize while trying to introduce the new system. As a result, while the effects of the reform redefined and eliminated jobs, there was no requirement to lay off any employees—instead attrition could take its course.

Secondly, the Ministry involved its unions throughout the transformation (the municipalities managed their own unions). The engagement of unions in early discussions and communications was a key success factor. The Ministry met regularly with the Ontario Public Service Employees Union (OPSEU) through its usual channels, while Ms. Ewart as lead communicator met with the Canadian Union of Public Employees (CUPE) every three to six months.

The 6,000 employees affected by the changes were represented by three different unions:

- CUPE (4,000 employees of the 47 Consolidated Municipal Service Managers charged with delivering Ontario Works)
- OPSEU (1,700 employees of the province responsible for front-line delivery of Ontario Disability Support Program)
- AMAPCEO (300 managers and supervisors in the Ontario Disability Support Program)

The main source of labour transitions came from establishing the seven new call centres. A recruitment strategy was developed to hire the 20-80 staff required in each call centre and classification, compensation and labour relation strategies were developed to integrate these new positions within each municipality.

Other issues

Applicability to Other Projects

The Business Transformation Project was an innovative and successful public-private partnership that has applicability outside Ontario. The delivery system developed through the project can be applied to other jurisdictions that provide social assistance programs. Similarly, the value-based arrangement is a model for other organizations in the public sector that do not have the funds to undertake a large project.

Many jurisdictions have shown interest, including:

- State of California (ISAWS project)
- State of Texas (Health and Human Services)
- Hong Kong (Social Welfare Department)
- Australia (Family and Community Services)
- Malaysia (Social Security)
- Belgium (Knowledge Centre for Public Private Partnerships)
- Province of British Columbia (Ministry of Human Resources)

Reflections

After completing such a massive, ground-breaking project, there is the opportunity to reflect on any advice or lessons learned.

For the public sector, it's important to understand the magnitude of the effort, and what its impact will be on those involved. "It's not a normal project with a beginning, middle and end," said Bonnie Ewart. "We shook up the whole social assistance delivery system as well as the Ministry."

She advises others to start the internal transition work as early as possible, to envision the Ministry structure and training that will be required when the project ends. At the end of this project, the Ministry found it had to create a new branch in order to assume its new functions. She also recommends a phase-down period that provides support to Ministry employees who are involved in the transition after the official end of the project.

"Leadership and commitment from the most senior levels are essential," said Alden Cuddihey. Extensive senior management attention by the most senior levels of both organizations ensures the project has the right skills at the right time to do what is necessary. The right governance structure and a rigorous project management infrastructure enable the team to get the work done.

Above all, they advise, nurture the relationship. Take the time to really know, understand and trust your partner. Develop a combined culture—a successful initiative such as the Business Transformation Project is the result of the joint relationship, not of two individually successful partners.

Testimonials

Public Sector

"Workers already spend less time on administration and more on helping clients. The Business Transformation Project's success to date is attributable to its partnership with Accenture and critical alliances with the Ministry's corporate and field staff and municipalities. Accenture's knowledge of technology and experience in large-scale business redesign helped the Ministry and municipalities envision a new, effective way to deliver programs. That vision was the Service Delivery Model. Clearly, this award demonstrates that the Business Transformation Project is changing the way business is done with partners in the private sector."

Deputy Minister
Responsible for the Business
Transformation Project
Ministry of Community and Social Services

Private Sector

"This contract represents an excellent business arrangement for Ontario and is a good example of how government and the private sector can work together effectively. Accenture is paid out of savings generated by the project, which means that if no savings were achieved, Accenture would not have been paid a dime.

Ontario taxpayers saved money with this contract … The old system was incapable of detecting fraud, underpayments and overpayments, and failed to provide a foundation for future changes and enhancements. The 30 year old system was lacking in sound technology or any form of information sharing, which left the door open to error and fraud. …

The new technology allows for the consistent application of the Ministry's eligibility rules across the province and the new system has the flexibility to meet the evolving needs of the province's social assistance programs. The new automated telephone system allows recipients to access up-to-date, personal information about their case through a touch-tone service seven days a week. Millions of callers have used this feature to date and caseworkers now spend less time on routine inquiries and more time working with recipients to help them achieve self-sufficiency."

Alden Cuddihey
Partner
Accenture

Public Sector Contact

Bonnie Ewart
[Then] ADM, Business Transformation Project
Ministry of Community and Social Services
880 Bay Street, 6th Floor
Toronto, Ontario M7A 2B6
416-327-9460
Bonnie.ewart@css.gov.in.ca

Private Sector Contact

Alden Cuddihey
Partner
Accenture
16 ElginStreet, Suite 2100
Ottawa, Ontario K2P 2C4
613-750-5263
alden.cuddihey@accenture.com

VANCOUVER LANDFILL GAS COGENERATION PROJECT

2003 Silver Award for Project Financing

Quick Facts

Project type
Design-Build-Finance-Own-Operate

Asset
Landfill gas cogeneration plant

Partners
City of Vancouver

Maxim Power Corp.

Other participants
BC Hydro

CanAgro Produce Ltd.

Finning International

Corpfinance International Inc.

Financial arrangements
$10.3 million, with 83% debt financing raised by Maxim

Maxim has 20 year purchase agreements with BC Hydro (electrical energy) and CanAgro Produce Ltd. (thermal energy), matching a 20 year gas supply agreement with the City.

The City receives royalties of 10% of revenues, about $400,000 per year.

Other features
The cogeneration facility was designed, built and is operated by Finning International, Maxim's strategic partner.

Maxim formed a limited liability project company for this project: Maxim Power (BC) Inc.

For the City of Vancouver, Maxim Power Corp. has built and is operating a world-class cogeneration facility to convert waste to energy. The facility uses landfill gas collected by the City to generate electrical and thermal energy. Electricity is sold to BC Hydro under a green purchase agreement, and thermal energy is sold to CanAgro Produce Ltd. to heat its greenhouses.

Background and rationale

The City of Vancouver in British Columbia owns and operates one of the largest landfill sites in Canada. Located at Burns Bog in the neighbouring municipality of Delta, the landfill serves approximately 900,000 residents and receives approximately 400,000 tonnes of municipal solid waste each year. The site has been operating since 1966 and has sufficient capacity to operate for another 40 years though future operations are restricted to the existing landfill footprint.

The decomposition of waste in landfill sites produces landfill gas (LFG), primarily methane which is a greenhouse gas that contributes to climate change. Canada has committed to reduce greenhouse gas emissions under the Kyoto Protocol.

To prevent odours and reduce these greenhouse gas emissions, the City has had an active landfill gas collection and flare system in place since 1991. The collection system was expanded in 2000, and it now collects approximately 2,000 standard cubic feet per minute (scfm) of landfill gas. Traditionally, the odours and greenhouse gas emissions have been controlled by burning, or flaring, the gas. This burning creates heat energy.

To meet its environmental obligations and to take advantage of the energy available, the City initiated a search for a private partner who would make beneficial use of the landfill gas. The search resulted in a public-private partnership with Maxim Power Corp. (Maxim).

Maxim is an independent power producer, based in Calgary, that develops, owns and operates distributed power projects. It specializes in developing small-scale cost-effective generating capacity and has installed distributed energy systems in Canada and overseas.

Description of the project

Maxim installed a cogeneration facility that is fuelled by landfill gas from the landfill site. The facility is located at CanAgro Produce Ltd.'s greenhouses in Delta, close to the landfill site. The facility produces electrical power, which is sold to BC Hydro under a 20-year green power purchase agreement, and recovers waste heat in the form of hot water which is delivered to CanAgro for use in its greenhouses under a 20-year thermal sales agreement.

CanAgro[2] is a large and sophisticated grower of hothouse vegetables. At its Delta site, it produces tomatoes in three state-of-the-art greenhouses that cover a total of 57 acres under glass. The greenhouses were built in three phases (with a fourth expansion planned) and the cogeneration project is associated with phase three, which is a very large 32-acre greenhouse. CanAgro operates the greenhouses under highly controlled conditions and is a leading, high-volume producer of tomatoes with annual production at the Delta site of 32.4 million pounds.

[2]CanAgro Produce Ltd. and Century Pacific combined in 2003 to form Hot House Growers Inc. In 2002 the two companies produced 32% of greenhouse tomatoes grown in British Columbia.

The cogeneration project had three components:

- A gas conditioning system at the landfill site to remove water from the gas and compress the gas.
- A 2.9 km. pipeline to take the gas from the landfill site to the cogeneration facility at CanAgro's greenhouses in Delta.
- A powerhouse comprising three reciprocating engines (with a fourth due to be installed in September 2004) located close to CanAgro's boiler house. Each Caterpillar 3532 engine produces 1.85 megawatts of electrical energy and approximately 2 megawatts of thermal energy.

The electrical energy available from the project is equal to approximately 500,000 gigajoules per year, or the energy requirements of 4,000 to 5,000 households. Cogeneration has resulted in a net reduction in greenhouse gas emissions of 30,000 tonnes per year, equivalent to removing 6,000 vehicles from the road.

Process leading to the agreement

In January 2001 the City issued a Request for Proposals (RFP) to find a partner that would finance, design, build, own and operate a beneficial use facility. Though it considered building a power plant itself, it wanted to solicit a broader range of projects so that it could optimize the economic, environmental and community benefits to the City.

The City received five submissions, each proposing to use the landfill gas in a different way. The proposals were evaluated on the basis of each proposal's quality, technical and economic feasibility, and potential benefit to the City.

Maxim with its cogeneration proposal involving CanAgro's greenhouses was ranked as the top proponent and City staff began negotiations with the company in August 2001. Terms for the sale of landfill gas were negotiated by December 2001, and the contract formally approved by Council in February 2002.

Timelines

2001	**January**	City issued RFP
	April	Five proposals received
	August	Negotiations began with Maxim
2002	**February**	Formal approval of contract
2003	**January**	Design and tendering of plant Financial commitment from Corpfinance International
2003	**September**	Construction completed

Work on design and tendering of the plant began in January 2003 at the same time that Maxim received a financing commitment of $7.6 million from Corpfinance International Inc. Construction was completed and operations began nine months later, in September 2003.

The agreement

Overall Structure

Maxim Power Corp. formed a wholly-owned subsidiary, Maxim Power (BC) Inc., as a stand-alone project company.

Key elements of the partnership are:

- The design, finance, construction and operation of a cogeneration facility by Maxim.
- A 20-year landfill gas supply agreement between the City and Maxim.
- A 20-year green electricity purchase agreement between Maxim and BC Hydro.
- A 20-year thermal energy sales agreement between Maxim and CanAgro.
- Payment of royalties to the City by Maxim of approximately 10% of gross revenues from Maxim's sale of electrical and thermal energy from this project.

Cogeneration Facility

To develop the cogeneration facility, Maxim signed two contracts with Finning International Inc., its strategic partner in distributed power. Under these contracts Finning would:

- Design and build the $6.3 million powerhouse as a turnkey project; and
- Operate the facility under a 20-year equipment operating and maintenance contract.

To build the other components, Maxim contracted with Sandwell Engineering of Vancouver. Sandwell, in turn, hired subcontractors to construct the gas conditioning unit at the landfill site and the pipeline that would bring landfill gas to the powerhouse.

Maxim financed and will own the cogeneration facility, both during and after the 20-year agreements.

Maxim must ensure the facility operates 70-75% of the time, an operational level it needs to attain in order to meet its debt repayment obligations. In fact, it expects to use over 95% of the landfill gas available and that overall system energy efficiency will reach 85%. Any prolonged downtime allows the City to terminate the landfill gas supply agreement and find a new fuel purchaser.

Landfill Gas Supply Agreement

Key terms of the gas supply agreement included:

- The City will supply landfill gas to Maxim for 20 years.
- The City will supply Maxim with a small amount of land for infrastructure under an easement.
- The City will continue to construct and operate the landfill gas gathering and collection systems.
- Maxim will have first right to use all landfill gas over the 20-year contract term up to 3,000 scfm, which provides it with future opportunities for expansion as landfill gas volumes are expected to increase.

Energy Sales Agreements

Maxim won a 20-year fixed-price green power purchase agreement from BC Hydro under its Green Energy Program for the electricity generated from the Vancouver landfill facility. In 2001 BC Hydro introduced the Green Energy Program to promote renewable and green energy throughout the province; it aims to meet 10% of new demand to 2010 by purchasing green energy, at premium prices, from independent power producers such as Maxim. This new policy was an important factor in the project.

Maxim's original contract, executed January 4, 2002, was for 5.6 megawatts of electricity. Maxim has subsequently won a second contract to sell an additional 1.8 megawatts of green power when a fourth engine is installed at the site in the fall of 2004.

Thermal energy, in the form of hot water, is sold to CanAgro under a 20-year thermal sales agreement. The thermal energy contract price is set at fixed rates varying with the annual amount of energy utilization, subject to an annual adjustment for changes in CPI until 2013 (*Prospectus* for Hot House Growers Inc., CanAgro's successor).

Financing

Maxim arranged debt financing amounting to 83% of the total cost of the project through Corpfinance International (CFI), which specializes in medium and long term project financing. The project is financed principally with a 20-year, 7.8% fixed interest rate, non-recourse loan for $7.6 million. A subsidiary of CFI, CFI Capital, raised an additional $900,000 of subordinated debt from VanCity Capital and the Green Municipal Investment Fund (GMIF).

The GMIF is a $200 million permanent revolving fund, endowed by the Government of Canada and administered by the Federation of Canadian Municipalities, which helps municipalities implement highly innovative environmental projects. One of the GMIF's priorities are projects that have high potential to reduce greenhouse gas emissions. Through GMIF a municipal government and its private sector partners can borrow at the preferred interest rate of 1.5% below the Government of Canada bond rate. GMIF will finance up to 15% of the capital costs of a qualifying project. The City was a co-signatory on the GMIF application but the loan was to Maxim.

Maxim provided equity for the balance of the financing required for the $10.3 million project.

Financing

Type	Amount	Provided by
Senior debt	$7.6 million	Corpfinance International Ltd.; 20-year, non-recourse loan with 7.8% fixed rate
Subordinated debt	$0.9 million	Arranged through Corpfinance International Capital: ▸ VanCity Capital ▸ Green Municipal Investment Fund
Equity	$1.8 million	Maxim
Total	**$10.3 million**	

Risk and Return

Many of the risks of building, financing and operating the cogeneration facility have been transferred to the private partner who, as a result, receives most of the financial return. Being able to transfer construction risk to the private partner and having a partner who had extensive prior knowledge and experience were critical factors for the City.

The City retains the risk of ensuring sufficient supply of landfill gas over the 20-year term. It manages this risk by retaining responsibility for the day-to-day operations of the gas collection system. It shares with Maxim any political risk associated with either closing the landfill or not expanding the landfill gas collection system.

In return, the City is entitled to 10% of the gross revenues from the sale of both electricity and thermal energy, amounting to around $400,000 annually.

Maxim, as owner of the facility, has assumed the financing risks. It has managed the supply and demand risks with matching 20-year agreements with the City (as supplier) and the two customers (BC Hydro and CanAgro). Some fuel supply risk remains, however, since landfills can be subject to political pressure—and the business case relies on some additional landfill utilization over time.

Maxim also bears some risk associated with utilizing the gas since there is little storage capacity on site.

In return, Maxim receives all the revenues from the sale of electrical and thermal energy, net of the City's royalties. Its revenues derive from its 20-year power purchase agreements with BC Hydro and CanAgro.

Benefits and accomplishments

Cost Savings

The City will receive royalties of about $400,000 per year for the next 20 years. These royalties will be used to help offset the overall cost of operating the landfill gas collection system, which is estimated at $250,000 per year.

Environmental Benefits

Aside from the financial benefits to the City, the cogeneration project has significant environmental benefits.

- Using landfill gas as fuel reduces consumption of traditional hydrocarbon fuels. The cogeneration facility provides enough electrical energy to light and give power to 4,000 to 5,000 B.C. homes annually, and enough thermal energy to meet almost one-third of CanAgro's energy requirements for its phase three greenhouse, or 20% of its total requirements at the site.

- Using landfill gas as fuel rather than flaring it reduces emissions of greenhouse gases. The cogeneration project results in a net reduction in greenhouse gas emissions of 30,000 tonnes per year, equivalent to removing 6,000 vehicles from the road.

Other Benefits

The Corporation of Delta also benefits from the project. First, it receives tax revenues from the new infrastructure in its jurisdiction. Second, under its economic partnership with the City of Vancouver, it receives some net revenues from the landfill site. With reduced operating costs, these revenues to Delta are slightly increased. And finally, the long-term low-cost energy supply helps solidify CanAgro's operation in the community, with concomitant job security for its employees.

Communications

Most of the communications involved in the project concerned the community of Delta, and were the responsibility of CanAgro, on whose land the facility would be sited, and Maxim.

The consideration of a cogeneration facility at the CanAgro site began around 1998 and encountered local resistance. Residents were concerned about the effects of intensive farming (such as greenhouses), increased noise, increased pollution, and loss of habitat. The site of the facility is zoned A-1 Agriculture, and a 2001 amendment to Delta's bylaws required anyone wishing to build a cogeneration plant to apply to rezone the land to include cogeneration as a permitted use.

Some fears were based on the misunderstanding that permitting one cogeneration facility would open the doors to many such arrangements. In fact, the location of a greenhouse so close to a landfill site was unique in the area. Project participants spent significant time informing and educating the residents and Council members.

To effect the rezoning and receive approval for the pipeline to go under the highway that ran between the landfill site and greenhouses was a major task. The application had to be approved by three committees, and the proponents were required to hold an open house and participate in a public hearing. Due to the large amount of education that was provided to all of the committees and council members, there was minimal opposition at the public hearing. The whole rezoning process took about nine months.

Ultimately, the project became a source of pride, winning awards such as the Federation of Canadian Municipalities' Sustainable Community Award.

Other issues

Facility Expansion

Soon after it commenced operations, Maxim announced that a fourth engine would be installed, adding 1.8 megawatts and raising total plant capacity to 7.4 megawatts (the existing powerhouse had been designed to accept a fourth cogeneration unit). In September 2003 Maxim received another 20-year green power purchase agreement from BC Hydro to sell the additional electricity generated. At the same time it secured additional volumes of landfill gas from the City under the existing supply agreement. The expansion is expected to be complete in the fall of 2004.

Applicability to Other Jurisdictions

The cogeneration project at the Vancouver Landfill site is unusual. It is the proximity of CanAgro's greenhouses so close to the landfill site that enables Maxim to make use of the thermal energy as well as electrical energy generated. In British Columbia most of the cogeneration projects are being developed within the forest industry, using wood waste as a fuel.

A number of landfill gas to energy projects were initiated in Canada in the 1990s (see the Appendix to this chapter for a summary of successful projects described by Environment Canada). The majority of these projects are in Ontario and Quebec, and most sold the energy generated to the provincial power utility. Recognizing the potential of these types of projects, the Green Municipal Funds have developed a landfill gas strategy to advance utilization in the 27 large landfill sites that represent the best opportunities to reduce greenhouse gas emissions.

While the co-location of landfill site and greenhouses is relatively rare, the concept of a distributed energy system is gaining popularity as major power producers seek supplementary sources of energy. Distributed energy resources are small-scale power generation technologies, using sources such as wind, run-of-the-river or cogeneration, that are located close to where the electricity is used; it provides an alternative to or an enhancement of the traditional electric power system.

The partnership between the City and Maxim has created a project that takes advantage of Maxim's expertise in distributed energy systems. The partners have built a state-of-the-art facility for converting landfill gas to energy that may be a showcase for potential landfill gas projects around the world.

Testimonials

Public Sector

"The City of Vancouver owns and operates the Vancouver Landfill in Delta. The landfill serves approximately 900,000 people or 40% of the Greater Vancouver Regional District. The City has collected landfill gas since 1991 to prevent odours and minimize greenhouse emissions from the landfill. Entering into an agreement with Maxim Power Corp. to beneficially use the landfill gas provides a number of benefits that could not easily have been achieved without a public-private partnership.

The primary benefit is that in addition to generating electricity the project provides energy to a neighbouring greenhouse. The benefit of working with the greenhouse is that in addition to direct financial benefits to Maxim and the City the project supports existing local industry and jobs maximizing community benefit. In addition, a private-public partnership allows the private sector to participate in the risk associated with the project, minimizing the risk to the City's taxpayers. Finally, entering into a private-public partnership has ensured that the project is constructed using optimum technology because of Maxim's experience with similar projects around the world. In summary, for the City of Vancouver, this project provides significant benefits, that at least in part, could not have been realized without our partnership with Maxim Power Corp."

J. Paul Henderson, M.A.Sc., P.Eng.
Manager of Transfer and Landfill Operations
City of Vancouver Engineering Services

Private Sector

"The Vancouver Landfill Gas Cogeneration Project is a showcase for Canada and British Columbia in respect to the economic and environmental benefits of distributive generation and cogeneration for society as a whole. The project is a very unique combination of public and private sector commitment to a common objective to realize a commercially viable project while enhancing overall societal benefits through reduced emission reductions, and contribution to local government coffers while reducing global GHG emissions.

The Project will utilize otherwise flared landfill gas to provide 5.5 megawatts of certified green power to BC Hydro under a long term 20 year power purchase agreement and displace over 120,000 gigajoules of natural gas consumption at the CanAgro Greenhouses, which will together provide over 30,000 tonnes of greenhouse gas emission reduction per year over the 20 year contract term.

The City of Vancouver owns and operates the Vancouver Landfill, which services the waste disposal requirements of the City of Vancouver, Richmond and Corporation of Delta, B.C. It has an operating permit until 2040 and will initially provide enough landfill gas to fuel Maxim Power's landfill gas generation project for 20 years providing enough power to light up and power over 5,500 homes annually. The project also expects to expand its generation and heat recovery capacity as the landfill gas volumes at the City of Vancouver landfill grow over the next 20 years.

In summary, the project is a very unique example of a win-win proposition between private sector companies (Maxim Power Corp. and CanAgro Greenhouses) and public sector entities (City of Vancouver and Corporation of Delta) to realize a project that is both commercially viable and enhancing public good via increased employment, enhancement of tax base and revenues to the public sector entities while simultaneously contributing to a significant reduction in greenhouse gas emissions in the local air shed. This is a triple bottom line sustainability project.

The project is a showcase for Canada given its commitments to the Kyoto Protocol and its objectives for climate change initiatives."

Rick Hopp
Senior Vice President, Business Development
Maxim Power Corp.

Public Sector Contact:

Paul Henderson
Manager, Transfer and Landfill Operations
City of Vancouver Engineering Services
453 West 12th Avenue
Vancouver, BC V5V 1V4
604-940-3201
paul_henderson@city.vancouver.bc.

Private Sector Contact:

Richard Hopp
Senior Vice President, Business Development
Maxim Power Corp.
Suite 1210 715 – 5th Avenue S.W.
Calgary, AB T2P 2X6
604-943-7435
rhopp@maximpowercorp.com

Appendix: Landfill Gas to Energy Projects in Canada

Landfill Location	Landfill Site Owner	Plant Owner and/or Operator	Energy Used for/Sold to	Energy Generation Begins
Beare Road Landfill, Rouge Park, Ontario (closed site)	City of Toronto	E.S. Fox Ltd. (originally by Enercogen)	Ontario Power Generation	1996
Brock West Landfill, Pickering, Ontario (closed site)	City of Toronto	Eastern Power Developers	Ontario Power Generation	1991
Cambridge, Ontario	Regional Municipality of Waterloo	Gerdau Courtice Steel (GCS)	For use in GCS's steel recycling plant	1999
Clover Bar Landfill, Edmonton, Alberta	City of Edmonton	EPCOR (originally by Environmental Technologies Inc.)	Supplementary fuel at Clover Bar Generating Station	1992
Coquitlam, British Columbia (closed site)	Greater Vancouver Regional District	Coquitlam Landfill Gas Co. Ltd (developer); E.H. Hanson Engineering (operator)	For use by Newstech Recycling Ltd.	1994
Jackman, British Columbia (closed site)	Township of Langley, British Columbia	JV with Norseman Engineering; Topgro contributed capital	For use in Topgro Greenhouses	1995
Keele Valley Landfill, Vaughn, Ontario	City of Toronto	Eastern Power Developers	Ontario Power Generation	1995
Kirkland, Quebec (closed site)	Compagnie Meloche Inc.	Optigaz Inc. (originally by Highland Energy)	Hydro-Quebec; emission reduction credits sold to Ontario Power Generation	1998
Lachenaie Landfill, City of Terrebonne, Quebec	BFI Canada Inc	BFI Canada Inc.	Hydro-Quebec	1996

continued...

Appendix: Landfill Gas to Energy Projects in Canada (continued)

Landfill Location	Landfill Site Owner	Plant Owner and/or Operator	Energy Used for/Sold to	Energy Generation Begins
Magog, Quebec	Intersan, a division of Canadian Waste Services Inc.	Intersan	Used to heat the landfill's vehicle service garage	n.a.
Niagara Falls, Ontario	Niagara Waste Systems Ltd.	Integrated Gas Recovery Services (consortium of Integrated Municipal Services and Comcor Environmental Ltd.)	Used in Abitibi-Consolidated's newspaper recycling plant, Thorold	2002
Port Mann, British Columbia (closed site)	City of Surrey, British Columbia	JV with Norseman Engineering	For use in Georgia-Pacific's wallboard plant	1993
St. Michel, Quebec (closed site)	City of Montreal	Societé en Commandite Gazmont (consortium including Biothermica Energy and SNC Lavalin)	Hydro-Quebec	1995
Ste. Cecilie-de-Milton, Quebec	Roland Thibault Ltd.	Roland Thibault Ltd.	Used to heat nearby greenhouses	early 1980s
Vancouver Landfill, Delta, British Columbia	City of Vancouver Regional	Maxim Power Corp.	BC Hydro; and to CanAgro for use in its greenhouses	2003
Waterloo, Ontario	Municipality of Waterloo	Toromont Energy	Ontario Power Generation (OPG); emission reduction credits sold to OPG and Entergy Corp.	1999

Compiled from Environment Canada, National Office of Pollution Prevention, Technical Bulletins
Accessed February 2004 from http://www.ec.gc.ca/nopp/lfg/en/list.cfm

CONNECTING SMALL SCHOOLS IN NEWFOUNDLAND

2003 Silver Award for Infrastructure

Quick Facts

Project type

Service Delivery

Asset

Dedicated frame relay network that provides increased bandwidth in rural and remote schools, enabling an advanced model of distance education.

Partners

Newfoundland and Labrador Department of Education, Centre for Distance Learning and Innovation

Aliant Inc.

Financial characteristics

Aliant invested $1 million to provide a dedicated frame relay network to over 80 sites, and received a two-year commitment from the Centre for Distance Learning and Innovation.

Geographically disadvantaged students in remote communities across Newfoundland and Labrador now have access to a wider range of advanced and enriched courses. A dedicated frame relay network, developed through a public-private partnership between the Department of Education's Centre for Distance Learning and Innovation (CDLI) and Aliant Inc., has significantly increased the bandwidth available in the province's rural and remote schools. This faster, more reliable connectivity allows these students to take greater advantage of the innovative distance education courses provided by CDLI.

Background and rationale

School enrolment in Newfoundland and Labrador has declined by almost 50% over 30 years, from 163,000 in 1971 to 84,000 in 2002, and the decline is projected to continue. In addition, most students live in rural and remote communities—Newfoundland has 800 towns and communities distributed along 10,000 km. of coastline.

As a result of this small, dispersed school population, class sizes are small and course options for high school students were extremely limited. The Department of Education was concerned that, unlike their urban counterparts, rural students did not have access to high school courses beyond the core programming recommended by the Province. One of its challenges was to offer advanced level programs in, for example, chemistry or physics, in areas where the student population could not support a range of specialist teachers.

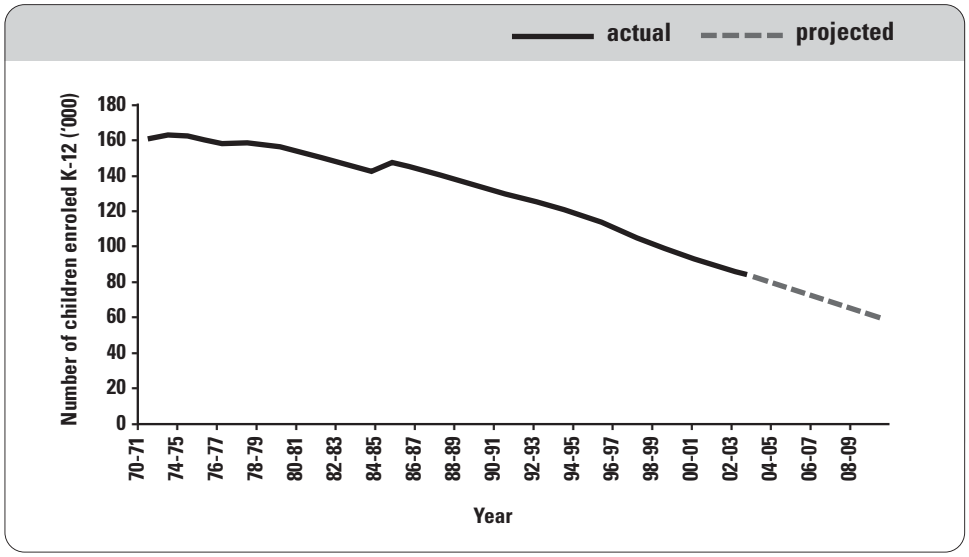
In 2000 the Ministerial Panel on Educational Delivery in the Classroom delivered its report, Supporting Learning, that addressed these and other concerns. Among its recommendations were measures to strengthen distance learning.

The Department sought to enhance the interactivity of distance education courses and to expand the accessibility of these courses to remote areas of the province. The Centre for Distance Learning and Innovation (CDLI) was established in 2000 as a division of the Department of Education, with the aim of providing "all learners with equitable access to educational opportunities in a manner that renders distance transparent." Its mandate focuses on communications and information technology, specifically:

- the development and delivery of online courses, programs and services for (a) senior high school students, and (b) professional development programs for teachers; and
- the integration of information and communications technology in classrooms from kindergarten to grade 12.

The Province's old distance education model used specially-developed student resources, and communication between teacher and students was based on telephone audioconferencing. All the resources were print-based so updates were slow and costly. Furthermore, the telecommunications system was saturated and adding additional students was expensive.

School Enrolment, Newfoundland and Labrador, 1970-71 to 2002-03 (actual) and 2009-10 (projected)



Source, Newfoundland and Labrador, Department of Education, Education Statistics – Elementary-Secondary, 2002,03, Table 8.

CDLI's new distance education model required it to:

- build digital content;
- equip a large number of small schools with the necessary hardware and software; and
- ensure adequate bandwidth to carry digitized content (text, audio and video) at reasonable speeds.

It is this last component—the need for adequate and reliable bandwidth—that was the impetus for this public-private partnership with Aliant Inc.

Description of the project

Aliant Inc. built a frame relay based network which connects over 80 of Newfoundland and Labrador's most remote schools. Frame relay technology is a method of connecting schools in a wide area network using the existing telephone circuit technology, which was available in all 11 school districts. As a result of this installation, the majority of schools involved in distance education have broadband access to the Internet and are connected via a virtual private network. The network was built within a short time frame: 62 schools connected in the first year and 18 schools in the second year. Other schools have subsequently been added.

This connectivity enables CDLI to deliver a unique model of distance learning and e-learning which combines the best of real-time (synchronous) instruction and delayed time (asynchronous) instruction. Instruction using the Internet includes not only web-based lessons but a real-time audio-graphic instructional package, and a database-driven tools package that provides online learning activities and allows students to be evaluated online and to track their own progress. Real-time instruction incorporates collaborative features such as messaging and a white board as well as the ability to identify which students are on line or to use an electronic 'raised hand' to signal a desire to communicate with others in the virtual class.

Through this model of distance education, smaller remote schools share a trained e-teacher who can teach from anywhere in the province and deliver the course simultaneously to one or many remote locations. This model allows CDLI's resources to be focused on enriching course content and expanding the number of courses offered.

In less than two years, CDLI in partnership with Aliant has replaced an outdated distance education model with one which offers the flexibility to accommodate significantly greater numbers of students and course options.

Process leading to the agreement

After the Ministerial Panel report, the government moved to implement its recommendations as soon as possible, directing that pilot initiatives were to be in place for the school year starting September 2001.

The pilot project confirmed that CDLI needed high speed connectivity for schools in remote parts of the province if the new model was to work. Over recent years the government had considered many approaches to developing a province-wide network. The geology of the province—primarily solid rock—has challenged the widespread installation of telecommunication capability in remote areas.

Timelines

2000	**March**	Release of *Supporting Learning: Report of the Ministerial Panel on Educational Delivery in the Classroom*
	December	CDLI established
2002	**June**	Negotiations between CDLI and Aliant completed
	September	62 schools connected
2003	**September**	Additional 18 schools connected, for a total of 80 schools

Given the urgency of developing a new internet-based model of distance education in less than one year, it was evident to CDLI that a private sector partner was needed to build the required infrastructure in the time-frame desired. At this time CDLI looked for a land line solution as a transitional measure before moving towards a more fully-developed high speed network.

CDLI approached the major communications carriers in the province that it felt may have the necessary capacity to provide this infrastructure. A list of target communities was made available to each with a request to indicate its ability and desire to partner. All but Aliant indicated they would be unable to deliver.

Meanwhile Aliant was enthusiastic about working with CDLI, to find a way to support distance education around the province and to lay the platform for a future high speed broadband network. CDLI and Aliant began discussing the Province's requirements and the level of commitment that each partner could make, with Alfred Whiffen of Aliant and Wade Sheppard of CDLI championing the project. After six to eight months of negotiations, the senior officials from the two organizations found a way to make the project work and came to an agreement in June 2002.

The agreement

The agreement between CDLI and Aliant had the following components:

- Aliant would invest $1 million to install frame relay systems that would connect the province's distance education schools; this level of investment would provide entry-level broadband connectivity to most (but not all) of the province's distance education schools.
- CDLI committed to purchase broadband services from Aliant for these schools for two years.
- The network for 62 sites had to be installed by the start of the school year in September 2002, and the remainder (18 sites) by September 2003.
- The network would consistently provide service of a minimum of 512 kilobytes per second.
- Connections were to be reliable, specifically that 99% of the sites should be able to access the Internet 99% of the time.

A key provision in the agreement allowed for any advances in technology. Though frame relay gave CDLI the connectivity it wanted in the short term, the agreement contained the proviso that, if during the two-year period any solution came in that surpassed frame relay capacity, CDLI could migrate to it without any penalty (this did not happen).

The agreement was managed by a consortium of senior executives and managers from the two organizations. Day-to-day management was conducted through daily contact at the director/manager level of both organizations and a project management team, with regularly scheduled partnership meetings involving senior players. The partners worked closely together during each stage of the project, from conception to planning, design and implementation.

Financial Arrangements

To justify the extensive infrastructure investment required to deliver frame relay services to the remote schools (about $1 million), CDLI gave Aliant a two-year commitment for the purchase of broadband services. This commitment provided enough of a business case to support the financial investment.

Aliant delivered frame-relay services to CDLI at deeply discounted rates. It also used its buying power to negotiate other purchases at discounted rates.

CDLI's financial resources were provided through the government's usual budgeting process.

Risk Allocation

CDLI transferred to Aliant the financial risk surrounding the investment as well as the risks that Aliant's frame relay solution could handle the required capacity and that it could ramp up in time for the September school opening.

Aliant's risk surrounding the infrastructure build, which could have resulted in stranded investment, was mitigated by the Province's commitment for service delivery over a period of time. As an organization, it is also committed to contributing to local communities and believes this commitment is worth some economic risk.

Benefits and accomplisments

The key benefit from this project is that broadband connectivity allows CDLI to offer courses to students who are geographically disadvantaged. Frame relay services have replaced basic dial-up Internet connections, which enables students to access interactive, graphically rich courses, and the smaller remote schools share an e-trained teacher from the larger centres. Thus students in the smallest schools in the province can access programs and resources normally only available in larger schools.

Enabling government staff to focus on developing the educational content for the network rather than owning and operating the infrastructure has resulted in:

- course enrichment and basic course delivery without adding teaching staff; and
- expansion of available courses beyond core subjects.

Other, co-curricular programs sponsored by private companies and other government departments and agencies are also now available to rural schools.

By 2003 CDLI had converted 27 senior high school courses to online media rich format, hired 23.5 e-teachers, and developed and implemented various support mechanisms at the school level. The September 2003 student enrolment doubled the previous years' registration numbers.

Distance Education Expansion

	School Year			
	2000/01 Telephone Conference Model	2001/02 Hybrid Program	2002/03 E-Learning Model	2003/04 E-Learning Model
Number of schools offering program	75	75	75	95
Student enrolment	485	362	635	1,100
Course registrations	734	628	958	1,724
Courses offered	10	10	18	27

The advantages of the new distance education model with enhanced connectivity include:

- the classes are immediate and interactive, and not as restricted to a prescribed schedule of communication times;
- the content is easy to update and enhance; and
- the digital content and communications allow a more seamless blending of traditional and newer learning experiences.

Local businesses and other organizations in the communities where the network has been installed now also have the opportunity to access broadband connectivity. For example, organizations such as the Canadian Coastguard, Nav Canada and the Royal Canadian Mounted Police (RCMP) are taking advantage of the service that is now available, which is a benefit to both the Province and Aliant.

Labour

CDLI kept the Newfoundland and Labrador Teachers Association (NLTA) apprised of its progress and intentions. Initial concerns that CDLI's activities would lead to teacher cuts were allayed and NLTA have become supportive of CDLI's mandate to provide enhanced programming to rural students . The executive director of NLTA sits on the advisory board of CDLI and was kept well informed as the project developed.

In addition, CDLI made frame relay connections to its sites available free of charge to NTLA for its Virtual Teacher Centre for professional development programs.

Other issues

Applicability to Other Jurisdictions

As a result of this project, CDLI has become a Canadian leader in the development and delivery of high school learnware and is attracting interest from other sources.

- The Canadian Armed Forces School of Engineering has provided CDLI with a letter of intent to purchase some of its online programs.
- The Department of Education is about to sign an agreement with the South Oceans Educational Development Group to provide curriculum and evaluation services to nine schools in China. There is the potential to deliver some of these programs from Newfoundland and Labrador via e-learning.

Next Steps

The frame relay network was intended to be transitional. The province is proceeding with the next stage in improving connectivity. In 2003-04, in partnership with the federal government, it will issue an RFP to seek a private partner for high speed connectivity—to build the infrastructure in rural parts of the province that will replace many of the sites on frame relay with more widely available, high speed connections. This additional connectivity will further enhance the Province's ability to ensure that all its students have equal access to educational opportunities.

Testimonials

Public Sector

"Our partnership with Aliant has really been the cement that held together all the other components of our e-learning program. Their frame relay solution provided the required high speed connectivity to bring a broad suite of advanced and specialty courses to high school students throughout the entire province, within a very reasonable cost to the taxpayer. They took a risk – we took a risk – and now we have the infrastructure to bring state of the art programs to students in some of the most rural and remote communities in the province, all taught by some of our best specialist teachers.

Our school principals, school board staff and e-teachers can't say enough about the new approach. We now have high speed connectivity areas where, ostensibly, there was no business case for it. The reliability and stability of the service is outstanding; and students, under the new model, are learning. Performance on provincially-administered high school examinations shows students who study through the Centre for Distance Learning and Innovation meet or exceed the performance levels of students who receive regular classroom instruction.

The bonus for schools is that they have this high speed access not only for their e-courses but also for student research, teacher on-line professional development, administration and web-based communication. The older slow dial-up service is gone and there is no going back!"

Gerald Galway
Assistant Deputy Minister
Newfoundland and Labrador Department of Education

Private Sector

"It is with great pride that Aliant enters into this partnership with CDLI. We believe in helping to provide a bright future for our province's youth that includes accessible education and training right here, right now. Too often our geographically challenged sons and daughters are forced to make difficult choices that, in many cases, results in them leaving their communities to see higher learning. Here in Newfoundland and Labrador, Aliant has partnered with public educational institutions and school boards. For example, our Aliant Pioneers have embodied this spirit through the "Computers for Schools" program: helping our children fulfill their educational aspirations here in the province regardless of their socio-economic background.

This new technology-based true information highway provided by Aliant is the latest example of our quest to be the 'number one company with the strongest connection to the hearts and minds of Atlantic Canadians.' We tip our hat to the CDLI team for their foresight, initiative and drive to make this happen. We are thankful to have been asked to be part of it."

Jim Organ
[Then] VP Sales, Newfoundland and Labrador
Aliant Inc.

Public Sector Contact

Gerald Galway
Assistant Deputy Minister
Department of Education
P.O. Box 8700
St. John's
Newfoundland and Labrador A1B 4J6
709-729-5397
geraldgalway@gov.nl.ca

Private Sector Contact

Alfred Whiffen
Regional VP Sales,
Newfoundland and Labrador
Aliant Inc.
P.O. Box 2110
St. John's
Newfoundland and Labrador A1C 5H6
709-739-3012
alfred.whiffen@aliant.ca

Design: ARTiculation Group, Toronto Printed in Canada