8 FINANCING CONSIDERATIONS & FINANCIAL ANALYSIS

8.1 Financing Considerations

Governments have traditionally invested directly in roads and transit systems, and operated them as part of government. However, since the early 1990's, many governments have adopted models where the private sector funds, designs, builds, and operates roadways and transit systems. This practice is widespread in England, Australia, New Zealand, and Asia, and is becoming more common in North America. The Government of Canada has also demonstrated a growing interest in shared financing over the last decade.

Public Infrastructure Financing Alternatives

Public Private Partnerships (PPP's) permit Governments to finance development of public infrastructure and provision of public services through access to private capital markets. With the application of PPP's increasing over the last decade, they are now widely acknowledged by both the private and public sectors as a way of drawing on the expertise of both groups to provide a long-term mutual benefit.

Governments have implemented PPP's throughout the world under a variety of different models with a variety of different names. A recurring theme in these initiatives is to avoid having to increase the level of public sector debt.

The rationale for a public-private partnership usually results from:

- a shortage of government funds
- a desire to obtain the benefits of private sector project management;
- transfer of risks to private companies; and
- greater flexibility in management and efficiency in operations enjoyed by the private sector.
- Increase level of 'user pays' in the community

International experience has proven that the involvement of the private sector in the delivery of public infrastructure can deliver value for money through the transfer of risk, particularly the risk associated with ridership levels, innovation, and project delivery responsibility.
Other benefits of the PPP include:

- Commercialisation of revenues: the private sector often focuses on developing commercial opportunities associated with the project.
- Access to capital: Government funds are usually limited. PPP's provide an alternative funding source.
- Accountability and on-time delivery: PPP's allow the Government to penalize the private sector when they do not meet the contracted timeline or budget.
- Cost of funds: the cost of the private sector funds reflect the full risk associated with the project.

There are many models which may be adopted for the implementation of a PPP. At one end, the private sector may provide all or most of the funding, and absorb major risks associated with the project – construction costs, delays, lower than projected revenue, higher than expected operating costs. At the other, the private sector's role may be limited to designing and building a facility within broadly specified

parameters and operating for a fixed income. In the middle, a private contractor may take the risks of design, construction, and schedule, but be guaranteed revenues sufficient to cover the bid cost of the project and subsequent operations.

In determining the appropriate scope and structure of the PPP for the particular project Government's must consider:

- What is the preferred delivery option, i.e. the bundling of different elements of project delivery into a single contract.
- What physical and functional components of the project are to be under private sector ownership and control, i.e. stations; infrastructure; rolling stock; and
- What network components are included in the PPP, i.e. the airport and commuter elements of the project and the existing system.

Table 8.1 summarizes a number of examples of transportation infrastructure finance through public private partnerships.

Table 8.1 - Example Transportation Infrastructure PPP Projects

Project	Comments
Confederation Bridge (Prince Edward Island/ New Brunswick) (1987)	• New 12.9 km fixed link bridge over Northumberland Straight between PEI and New Brunswick - $1 billion in direct construction costs • In response to three unsolicited bids for bridge-tunnel solution in 1985- 1986, Federal Government issued a Request for Expressions of Interest in 1987 seeking innovative designs that would provide long-term fixed link • 35-year agreement for the design, build, financing and maintenance of the Confederation Bridge awarded in 1993. At end of contract, bridge transferred to Government for $1. Construction completed in 1997 • Government pays annual lease payment of $41.9M (1992 dollars) escalated at 75% of CPI – equal to previous ferry subsidy. Operators able to collect tolls. Lease payments securitised for $660 million and toll revenues for $328 million
Charleswood Bridge (Manitoba) 1994	• New 152 metre bridge over Winnipeg's Assiniboine River (and associated roadworks) – $15M in capital costs • Bridge awarded on a design, build, finance, own, maintain, transfer basis – City of Winnipeg to make annual ascending lease payments under a 30-year lease
Highway 104 (Nova Scotia) (1997)	• Province needed to build a safe 45-km by-pass on the TransCanada Highway (the Cobequid Pass) faster than would be possible with public sector delivery. • Design, build operate (toll system) awarded – project built for $113M • Off-balance-sheet financing of not-for-profit entity responsible for collecting tolls, operations and maintenance. Federal/Provincial Governments each contributed $27.5M and $5.5M of subordinated debt was provided by the Sydney Steel Corporation pension fund
Highway 407 (Ontario) (1993 and 1999)	• In 1993 the Province issued an RFP seeking mechanisms to build the 69- km highway more quickly, cheaply and with lower risk to the taxpayer. • Highway 407 Central was to be designed, built, financed by toll revenues, operated and maintained by the successful bidder over a 35 year concession period. Province later modified the franchise to a design, build, operate and transfer scheme with the financing responsibility retained by the government. This meant that the financing, traffic and revenue risks remained with the government. • In 1999, the Province sold a 99-year concession for Highway 407 central, together with the right/obligation to make 39-km of extensions for $3.1B.
The Channel Tunnel (France and England) (1987)	• The Channel Tunnel is a unique case and in many respects not typical of private project finance. The operator was at arm's length from the construction companies which wanted to build the tunnel and the banks who wanted to finance it. • Due to the complexity of the project, Eurotunnel let a design and build contract to the original construction companies operating as a joint venture. • The original estimated total cost was of the order of €7.5 billion in 1987 prices, with almost half of this sum to be provided by equity capital and the rest by loans. The total cost increased progressively during construction to over €16 billion. • Most of the additional cost was covered by additional loans, although some dilution of the equity has taken place through rights issues and some debt for equity swaps as the company struggled to meet its debt charges. The governments agreed to successive increases in the length of the concession, from an initial 55 years to an eventual 99 years.
Other examples of infrastructures financed through PPP / and Potential new projects	• New Brunswick toll highway • French, Spanish, Australian toll-ways • RailTrack in UK • Winnipeg Red River diversion canal • Lower Mainland port/rail infrastructure improvements / expansion. Gateway Transportation strategy and RAV line (potential projects) • Detroit - Windsor tunnel • Peace Bridge expansion (Fort Erie-Buffalo)

Private Finance and Risk Transference

Privately financed infrastructure faces three main types of risk: construction risk, revenue and maintenance risk and planning and political risk. Construction risks arise because of the individuality of large infrastructure projects and their long gestation periods, both of which make costs difficult to estimate accurately.

Once infrastructure is completed, infrastructure providers also face operational risks. Where usage is below that expected there may be revenue risks. Finally, and most difficult to assess, are the policy and planning risks which any infrastructure provider has to take into account. The long gestation periods and the longevity of payback periods for major projects makes them vulnerable to changes of policy. Table 8.2 summarizes risk types and risk allocation.

As a consequence of the inherited risks of building and managing new infrastructure, private finance usually demands an equity return calculated by determining an appropriate risk premium above a forecast risk-free rate. Risk premiums are generally set by regulator entities. In Canada this risk premium has historically ranged between 3% and 5%.

Table 8.2 - Risk Type and Possible Risk Allocation [2]

	Public Sector	Builder	Operator	Private Lender	Private Owner
Approval Process	X				
Development		X			X
Design		X		O	
Construction		X		O	X
Operation			X	O	X
Maintenance			X		X
Demand			X	O	X
Revenue			O	O	X
Interest Rate				O	X
Exchange Rate				O	X
Inflation				O	X
Taxation					X
Environmental	X	O			O
Regulatory / Political	X			O	X
Injury / Damage	O	X	X		X
Residual Value				O	X
Obsolescence			O		X
Legacy Defects	X	O	O	O	O
(i.e. Polluted Site)	X: Principal risk taker		O: Secondary risk taker		

[2] *British Columbia Investing Management Corporation, Infrastructure Investing, Nov 2003.*

All of these factors are present in the present situation.

Capital Markets – Expectations

Canadian investment managers expect equity markets to stay the course in 2004 and expect equities to outperform bonds according to Mercer Investment Consulting 2004 Canadian Fearless Forecast.

For 2004, the investment managers forecast equity returns to be in the range of 8% to 12%, with Canadian small capital and emerging markets cited as the most favourable markets. For bond and cash markets, the managers expect more modest returns ranging from 2.8% to 4.5%. For the Canadian equity market, the managers predict the material, energy, and financial sectors to be the top performers.

Looking further down the road, the Canadian investment managers forecast 5-year median equity returns to be in the range of 8% per annum to 10% per annum, while bond and cash markets are forecast to be in a more modest range of 3.4% per annum to 5.5% per annum.

Government of Canada Bonds offer attractive returns and are fully guaranteed by the federal government. They are available for terms of one to 30 years and like T-Bills, are essentially risk-free if held to maturity. Currently 5 to 10 year Government of Canada Marketable Bonds average yield is around 4.80%, the yield for more than 10 years bonds is around 5.41%[3]. Standard and Poor's, Moody's and DBRS rate AAA Stable Canada's long-Term Domestic and Foreign Debt[4].

Canada's Provincial Governments bonds offer high quality and better rates than similar Government of Canada bonds. They pay a guaranteed, fixed level of interest income and are also available for terms from one to 30 years. Provincial Bonds issues are typically expressed as a spread over the Government of Canada bond yields. Some five-year provincial bonds yield 4.17%, nine-year 4.97%, eleven-year 5.11% and 25-year 5.51%[5]. In 1999, Standard and Poor's upgraded Newfoundland and Labrador's long term issuer credit rating to A minus from triple B plus.

The Standard and Poor's also upgraded its long-term senior debt ratings on the Province and on Newfoundland and Labrador Hydro (NLH) to A minus. NLH has consistently issued bonds in the last decades. NLH's bonds issued between 1989 to 1992 yield 10.25%, and bonds issued after 1992 yield between 5.05% and 8.40% depending on their year of maturity.

Newfoundland and Labrador's GDP growth was taken into consideration for the rating upgrade established by Standard and Poor's. In the next couple of years, Newfoundland and Labrador's GDP is expected to continue growing at a slower pace[6]. This upgrade enhances the ability of the province, and its Crown corporations, to access the financial markets on more favourable terms and at lower interest rates. Among other indicators Newfoundland inflation is expected to increase at some 1.9% annually until year 2007[7].

[3] *Bank of Canada*
[4] *Department of Finance Canada*
[5] *Edward Jones Investments: http://www.edwardjones.com*
[6] *Newfoundland and Labrador Department of Finance*
[7] *Newfoundland and Labrador Department of Finance*

8.2 Financial Analysis

Selection of Key Target Parameters

Based on the preceding discussion, the following key parameters are selected for use in the financial analysis.

The long-term inflation rate of 2.5%, and nominal and real social discount rates of 10% and 7.5% respectively have been introduced previously and employed in the economic analysis reported previously.

For purposes of examining debt financing, the rate employed for the base case is 8% real (10.5% nominal), to be applied in amortization calculations over the operating life of 30 years, and including a risk premium because of the nature of the project. Short-term debt to finance construction work is estimated on the basis of 5%.

From the discussion above, if the project were to involve equity participation, then an acceptable long-term equity return would be 22.5% pre-tax. This is based on after-tax return on equity of 13.5% (high end, with risk premium), assuming an effective corporate tax rate of 40%. If a project were to be financed 25% with equity, then the blended target rate of return would be 13.5%. If the debt rate were to be reduced by 2%, then the blended target rate of return would drop to 12%.

At this pre-feasibility stage of the project, it is considered that these parameters are more or less in line with the risk and reward expectations of prospective investors. In other words, internal rates of return below 12% are not likely to attract private capital without significant external favourable considerations.

It is clear that the project in its entirety is incapable of even approaching this target. However this is useful to keep in mind in respect of a strategy that would segment the costs and risks to privatize a portion of the project. For example, if the project were to be built with public financing, then the operation could be submitted to tender or some other competitive process to franchise it for pecuniary considerations. The pricing for this would be influenced by the target returns from operations.

Financial Analysis Results

The first order of business is to translate the constant dollar estimates for project costs and revenues into nominal values. In carrying out this conversion, the cost of financing during construction is also determined by calculating interest on: current year costs plus previous year payments plus interest accumulated in prior years. The project costs translated into current dollars, representing the total cost of the project are shown in Table 8.3 for both the longer and a quicker construction periods.

Table 8.3 Project Capital Cost Summary

	BASE CASE	HVDC
	$ Millions	$ Millions
Total Cost - Constant $2004	$1,184	$1261
Total Cost - Current $	$1,450	$1550
Interest During Construction	$257	$263
Total to Finance	$1,708	$1813

The first conclusion that becomes evident is the total project costs are approximately 50% higher on account of inflation and interest expense -- $1.7 billion versus $1.2 billion. The advantage of a quicker construction phase is also now apparent, because a slight cost disadvantage in constant dollar terms becomes an advantage in real world conditions. The swing overall is worth $100 million. This is the reason for preferring the Two TBM process.

The total amount to finance is $1,708 million. Incorporating the post operation cash flows, the Internal Rate Of Return is –9.3%. This remains consistent with the conclusion of the economic analysis, that the project is not bankable on its own merits. There is no point in proceeding without access to free capital that might be made available to suit some higher purpose. Debt financing of this amount would create a situation in which losses perpetually accumulate and compound.

With a view to identifying a set of financial conditions under which the project could proceed, various scenarios involving grants or contributions were considered. The main finding is that a total contribution in the order of $1.4 billion, or more, would be required for the project to be self sufficient.

To illustrate the impact of this point, a grant of $1.395 billion could be dispersed over nine years to cover planning, design and most of the construction. This has been calculated at about $60 million in total over the initial 5-year stage for planning, approval and design, and between $250 and $300 million per year over each of the next four years during construction. While this money is being dispersed as needed to cover current costs, interest expense is avoided. The amount to be financed as a result of this would be about $50 million, including interest. This contribution level, was determined such that the project cash flows could provide a return around 8%. This is still below the private finance threshold considered applicable at this time, except perhaps for long-term debt, but it is close enough to illustrate the level of public support that is a prerequisite for advancing the project.

Once the appropriate level of support is decided, then the models developed for this project could be employed to explore more variations and to examine revenue and cost relationships. Without any public support, there is not sufficient justification to advance from here. The issue of public sector involvement is thus identified as a fundamental condition to resolve for advancing beyond the present pre-feasibility stage.

The larger scope issues include significant benefits that extend beyond the terms of reference, resources or time available for this project. Nevertheless, these were mentioned as important issues during consultations with outside interested parties. They include:

- Benefits to travellers and freight shippers not measured by toll revenues
- Energy price and supply impacts of HVDC e.g. industrial growth opportunities;
- Social factors attributable to a permanent fixed link between Newfoundland Island and Labrador;
- Hwy 138 in Quebec extension to the tunnel.

High prices for electrical energy in Newfoundland have been cited as a deterrent to industrial growth and a major potential benefit of a fixed link. While transportation benefits of the fixed link are anticipated by users to be significant, the primary motivation for increasing business opportunities and employment in the resource and small manufacturing sectors of the Great Northern Peninsula and Labrador is to bring power across from Labrador hydro developments and thus ensure long-term stability in the supply and price of

electrical energy. This, of course, is a positive feature that is intimately connected to justification of the tunnel.
The benefits from such new developments would not necessarily be internalized in the tunnel projections, because the fixed link across the Strait of Belle Isle is just a small part of the total transmission system that would be built to support such developments. Analyzing this potential is a major undertaking on its own. Proponents of the fixed link make a case for these advantages. Considering current trends in prices for fossil fuels and the prospect of crude oil above $50/barrel continuing, there appears to be merit for these arguments at face value, and the beneficiaries would be the population at large.

Social factors attributable to a permanent fixed link are important considerations more closely linked to the visionary goals and objectives of the population as interpreted by the Government. They are beyond the scope of a quantitative analysis such as this project.

Finally, all of the projections contained in this study are founded on the assumption that there would be a continuous road link from Québec City to the tunnel portal along the North Shore of the Gulf of St. Lawrence. Such a project has been under consideration and preliminary estimates are reported elsewhere in this document. It is unlikely that there would be a significant growth in long-distance travel to the crossing if this route were not completed. The Trans-Labrador highway, once completed, is such a long detour that it would discourage most prospective drivers. It would thus be prudent to ensure that Highway 138 in Quebec will be built before finalizing any financial or economic justification of a transportation fixed link between the Island of Newfoundland and Labrador.