Alaska Canada Rail Link
Business Case Report

Prepared by:

Ernst and Young Orenda Corporate Finance Inc.

Macquarie North America Limited

Partnerships British Columbia

October 31, 2006

1 **EXECUTIVE SUMMARY** 4

2 **ERNST & YOUNG PUBLIC SECTOR ASSESSMENT** 17

2.1 INTRODUCTION ... 17
2.2 DEFINITIONS ... 19
2.3 INVESTMENT MODEL METHODOLOGY & ASSUMPTIONS ... 20
2.4 LIMITATIONS ... 37
2.5 FINANCIAL RESULTS OF INTEGRATED TRAFFIC FORECAST SCENARIO ... 39
2.6 COMMERCIAL VIABILITY ASSESSMENT OF INTEGRATED TRAFFIC FORECAST SCENARIO ... 46
2.7 YUKON IRON ORE STAND ALONE SCENARIO RESULTS ... 48
2.8 SUMMARY ... 50
2.9 INTEGRATE TRAFFIC FORECAST SCENARIO ... 50
2.10 ECONOMIC IMPACTS ... 51
2.11 ISSUES, CONSIDERATIONS AND NEXT STEPS ... 55

3 **MACQUARIE NORTH AMERICA PRIVATE SECTOR ASSESSMENT** 58

3.1 INTRODUCTION TO FINANCIBILILTY ... 58
3.2 BANKABILITY ... 61
3.3 PRIVATE SECTOR INVESTORS ... 70
3.4 PRIVATE SECTOR PARTICIPATION AND FUNDING GAP ... 73
3.5 PHASED INVESTMENT ANALYSIS ... 77
3.6 INSTITUTIONAL STRUCTURE FOR THE RAILROAD ... 82
3.7 MECHANISMS TO BRIDGE THE FUNDING GAP ... 84

4 **PARTNERSHIPS BC QUALITATIVE ANALYSIS** 90

4.1 INTRODUCTION – GOVERNMENT PERSPECTIVES ... 90
4.2 GOVERNMENT OBJECTIVES ... 91
4.3 QUALITATIVE IMPACTS ... 95
4.4 ROLE OF GOVERNMENT ... 115
4.5 SUMMARY ... 127

5 **RECOMMENDATIONS** 128

APPENDIX A - CASE STUDIES 129

APPENDIX B –TOTAL TRAFFIC FORECAST PER YEAR BY REVENUE TYPE 137

APPENDIX B1 – FULL ROUTE FORECAST PER YEAR BY REVENUE TYPE 138

APPENDIX B2 – PHASED OPTION A (SKAGWAY TO CARMACKS) ROUTE FORECAST PER YEAR BY REVENUE TYPE **139**

APPENDIX B3 – PHASED OPTION B (HAZELTON TO CARMACKS) ROUTE FORECAST PER YEAR BY REVENUE TYPE **140**

APPENDIX C – ADJUSTED FULL ROUTE DENSITY PER YEAR BY SEGMENT **141**

APPENDIX D – TOTAL TON MILES BY ROUTE OPTION **142**

APPENDIX E – TOTAL REVENUES PER YEAR BY ROUTE OPTION **143**

1 EXECUTIVE SUMMARY

In July of 2005, the State of Alaska and Yukon Territory agreed to cooperate on an Alaska Canada Rail Link ("ACRL") initiative to study the feasibility of constructing a rail link between Alaska and Canada. The Premier of the Yukon and the Governor of Alaska agreed to jointly chair a 10 member advisory committee that would oversee the initiative. Funding for the feasibility study was provided by the Yukon and Alaskan governments.

The Stage One of the feasibility study was conducted by a number of technical consultants who performed a variety of market analyses and technical studies. These studies included work to estimate the cost of building and operating the ACRL and the potential traffic volumes that the ACRL could expect to attract. The data collected by the Stage One consultants acted as the basis for the work of the Stage Two consultants; however, the Stage One consultants were independently engaged by the ACRL project office.

This business case report was developed as a result the investment analysis of the Alaska Canada Rail Link ("ACRL") conducted by the Stage Two consultants. The Stage Two consultants include: Partnerships British Columbia ("PBC"), Macquarie North America Limited ("MNAL") and Ernst & Young Orenda Corporate Finance Inc. ("E&Y"). E&Y was assigned the task of building an Investment Model to facilitate the analysis of the financial viability of the ACRL from the perspective of the public sector. This Investment Model was driven by the assumptions and data developed by the Stage One consultants. Building on the output from the Investment Model, MNAL conducted a review to assess the "financeability" and investment potential of the ACRL from the private sector perspective. Finally, PBC examined the qualitative impacts that the project would have on public sector objectives and identified steps that the public sector could take to manage risks associated with the project.

Although the three Stage Two consulting firms worked independently, there was collaboration to develop a coherent investment analysis and business case report. This report describes the findings of the Stage Two consulting firms. The forecasts and analysis discussed in this report are based on the preliminary work and assumptions conducted by the Stage One consultants. The work of these consultants was in no way audited or validated by E&Y, MNAL or PBC. Although E&Y, MNAL and PBC do not doubt the qualifications of the Stage One consultants, any errors or inaccuracies in their work will subsequently lead to inaccuracies in the work discussed in this report. This report was not prepared for investment purposes and actual results will vary from the forecasts and analysis described herein.

The results discussed in this report can be divided into sections that were the responsibility of the individual consulting firms:

- E&Y was responsible for the Public Sector Assessment described in Section 2.
- MNAL was responsible for the Private Sector Assessment described in Section 3
- PBC was responsible for the Qualitative Assessment of the ACRL from a government perspective described in Section 4

Ernst and Young Public Sector Assessment

The Investment Model developed by E&Y is a consolidation model with extracted data such as traffic volume estimates, construction cost estimates and operations cost estimates from models created by the Stage One consultants. Some of the key assumptions included:

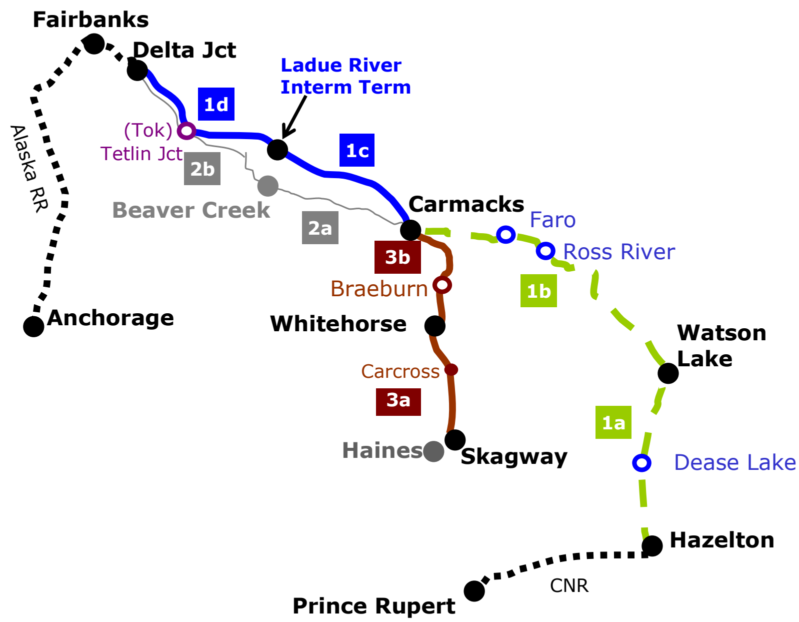
- 2 year construction period
- Annual capacity of 20 million gross tons per year
- 50 year operating period
- Nominal cost of capital of 5%
- Annualized inflation of 2% on free cash flows
- 50% of current intermodal traffic (as estimated by Stage One consultants) converts to rail
- 5 million tons of import intermodal container traffic flowing to North America through an Alaskan port
- Adjacent transportation infrastructure capable of handling the ACRL traffic (i.e. ports and connecting railways)
- Outbound mineral concentrate and inbound mine construction and operations traffic as predicted by Stage One consultant work
- Alaskan and Mackenzie gas pipelines constructed after the ACRL with associated traffic volumes as estimated by Stage One consultants

The model analyzed a number of different options including:

- A full route option connecting the Alaska Railroad in Delta Junction with the Canadian National Railroad in Hazelton including a connection between Carmacks and Skagway.
- A phased option of a route between Carmacks and Skagway.
- A phased option of a route between Carmacks and Delta Junction.
- A phased option of a route between Carmacks and Hazelton.

The traffic volumes for each of the options were largely dependent on the capacity of the railroad and the origination and destination of the traffic. For the full route option the traffic included a mix of pipeline, mineral and intermodal traffic but was dominated by intermodal traffic for regional re-supply and container traffic flowing to North America via an Alaskan port. Both the Skagway and Hazelton phased options captured some mineral and pipeline volumes. The Delta Junction option only captured pipeline traffic volumes.

Figure 1: Map of Full Route



The results of this analysis are summarized in Table 1 below. Positive net discounted cash flows would be an indicator commercial viability. For all four options analyzed the net discounted cash flow is negative for both a discount rate of 5% and 10%. Although 5% may be close to the cost of government debt it is well below the likely cost of capital for this type of project. However, should government choose to invest in the railway, analysis using this rate gives government an indication of the gap between costs and revenues including the cost of government debt.

Table 1 – Investment Model results

Operating Statistics of Route Options over the Operating Period				
($'s per ton mile)	Full Route	Phased Option Skagway	Phased Option New Hazelton	Phased Option Delta Junction
Revenue per Ton Mile	0.053	0.089	0.059	0.024
Operating Cost per Ton Mile	0.014	0.064	0.022	6.531
Operating Ratio	26.8%	72.0%	37.4%	N/A
Route Option Net Cash Flows Discounted at 5%				
$ millions	Full Route	Phased Option Skagway	Phased Option New Hazelton	Phased Option Delta Junction
Initial Capex	10,537	652	6,946	2,938
Net Discounted Cash Flows	(2,743)	(459)	(4,972)	(3,053)
Recovery %	74%	30%	28%	-4%
Route Option Net Cash Flows Discounted at 10%				
$ millions	Full Route	Phased Option Skagway	Phased Option New Hazelton	Phased Option Delta Junction
Initial Capex	9,847	623	6,482	2,742
Net Discounted Cash Flows	(6,421)	(555)	(5,490)	(2,804)
Recovery %	35%	11%	15%	-2%

A scenario associated with a substantial iron ore deposit in the Yukon was also studied. The potential traffic volume associated with this deposit was so large that it exceeded the design capacity of the railroad and the operating parameters of the operations cost model. This traffic was analyzed on a stand alone basis for routing between Carmacks and Haines, Delta Junction, or Hazelton. The results of this analysis are summarized in Table 2 below. The analysis indicates that the lowest operating and capital cost per ton mile option for the transportation of the iron ore would be via a rail route connecting Carmacks and Hazelton. However, the longer distance between Carmacks and Hazelton means that the lowest cost option on a per ton basis is Carmacks to Haines.

Table 2 – Yukon Iron Ore – Investment Model results

	Phased Option Haines	Phased Option New Hazelton	Phased Option Delta Junction
Operating Cost per Ton Mile	0.0099	0.0063	0.0081
Total Cost per Ton Mile	0.0214	0.0171	0.0292
Total Cost per Ton ($)	6.35	15.40	12.27

The economic impact work conducted by Stage One consultants was reviewed in an attempt to summarize the quantifiable benefits that the ACRL might have on the region. However, the results of the economic impact work only reflected the direct and indirect impact effects that the ACRL will have on the economy and did not account for many of the socio-economic costs that are associated with increased economic activity. The economic impact work also did not capture economic costs such as economic activity that is displaced by the development of the ACRL. A more detailed cost-benefit analysis will need to be undertaken to fully quantify the net benefit that the ACRL would have.

The Stage One consultant's economic impact work identified a number of potential savings that government might experience. The more significant potential savings include:

- A $37 million reduction in the construction cost of the Alaska pipeline that would increase Alaska government revenues, federal tax receipts and revenues to industry.
- Savings of approximately $153 million[1] in road maintenance.
- Reduced spending on road infrastructure resulting from less truck freight associated with the construction of the Alaska Gas pipeline in the order of $800 million. Of this $800 million, only $250 to $300 million will be saved as a result of the ACRL.
- Potential savings of approximately $1billion[2] on the cost of general merchandise in Alaska and Yukon as a result of lower transportation costs.

These savings are not net economic benefits but are indicative of the types of benefits that government might experience as a result of the ACRL. The economic impact study should be expanded to capture the full economic costs and benefits of the ACRL.

[1] Assumed inflation of 2% per annum, discounted at 5% for the proposed assessment period of 50 years

[2] Assumed inflation of 2% per annum, discounted at 5% for the proposed assessment period of 50 years

Macquarie North America Private Sector Assessment

The analysis conducted by MNAL leveraged off the Investment Model created by E&Y. A key difference is that the MNAL analysis was done from the perspective of the private sector investor. The private sector investor requires a high degree of certainty in the value and timing of the cash flows to ensure that debt can be serviced and that a reasonable return can be provided to equity investors.

In the opinion of MNAL, none of the revenues have an adequate degree of certainty to attract private sector investment in their current form. However, MNAL identified those traffic volumes that they felt had the potential to attract private sector investment under the right circumstances. These are volumes that had been categorized as Tier 1 traffic.

Tier 1 traffic included the following traffic:

- **Inbound intermodal traffic** – for this traffic to attract private sector investment it would need support from an existing shipping operator who owns one of the connecting rail links and a rail barge business which transport good from Seattle or Prince Rupert to Alaska.
- **Outbound intermodal traffic** – it is difficult to assess the ability of this traffic to attract private sector investment without final results from research conducted to assess the potential for intermodal container traffic to flow to North America through an Alaskan port.
- **Bulk mineral traffic** – none of the mines associated with this traffic are currently in production. To attract private sector investment the certainty of this traffic would have to be improved. This could be achieved through long-term take or pay contracts on the mineral volumes.
- **Industrial product traffic** – the traffic associated with the construction and operation of the mines would be capable of attracting private sector investment if the mines were developed.
- **Pipeline traffic** – once the timing of the construction of the pipelines is known these traffic volumes should be able to attract private sector investment.

The reliability of cost estimates will be equally as important to attracting private sector investment. MNAL felt the operating and capital costs were generally appropriate given the stage of the development of the project. However, operating costs were found to be on the low end and could be considered optimistic by private sector investors. The large capital cost of the railroad means that a small percentage change in capital costs could have a large impact to total costs. Furthermore, the assumption that the railroad will only take 2 years to complete is ambitious for a project of this size.

MNAL felt that planning issues around the following would need to be addressed before the project could attract private sector investment:

- Port access and development
- Timing and cost for permitting and approval
- White Pass Railroad
- Alaska Railroad

MNAL identified three broad types of investors that might consider investing in the ACRL:

1. **Class I Railroad Investors** – traditional owner operators of long haul railways
2. **Financial Investors** – refers to a financial structure where the railway operations and ownership is divided into three separate companies.
   I. A ***"Track Company"*** that owns or leases the track and is responsible for the maintenance of the track
   II. An ***"Operating Company"*** that is responsible for operating the railway.
   III. A ***"Rolling Stock"*** company that purchases the locomotives and leases them to the operating company.
3. **Supply Chain Investors** – may be interested in investing in the railway to ensure reliability of supply of a mineral commodity or to ensure the development of land bridging opportunity

MNAL proceeded with the assessment of the same route options that E&Y studied only from the perspective of the private sector investors identified above. The results of this analysis are shown below in Table 3 and 4. The Carmacks to Delta Junction segment would attract no private sector investment because this phase has extremely low traffic volumes. Furthermore, the Carmacks to Hazelton segment would also fail to attract private sector investment because, in most years, the operating and maintenance costs are not covered by revenues.

Table 3 Summary Table – Private Sector Participation - Full route

	Private Sector Participation	Funding Gap	Revenue Gap Annual	Multiple of current rates required to achieve revenue gap
Class 1 Railway	$2.1 billion	$9.0 billion	$1,200 million	3.2x
Financial Investor	$4.4 billion	$6.7 billion	$360 million	1.7x
Supply Chain Investor	$3.4 billion	$7.7 billion	$654 million	2.2x

Table 4 Summary Table – Private Sector Participation - Carmacks to Skagway

	Private Sector Participation	Funding Gap	Revenue Gap – Annual
Class 1 Railway	$32 million	$657 million	$94 million
Financial Investor	$72 million	$617 million	$35 million
Strategic Investor	$55 million	$633 million	$59 million

From the private sector perspective, one of the advantages of developing the ACRL in stages is that it allows the large injection of capital to be spread over time. This may provide comfort to investors that the construction schedule can be met. Unfortunately, limited private sector financing is attracted to the phased options as a result of a lack of intermodal traffic.

MNAL also studied the development of a substantial iron ore deposit as a separate scenario from the perspective of a strategic investor. MNAL analyzed the possibility of shipping iron ore via the three phased options. MNAL estimated both the operating cost, inclusive of ongoing capital expenditure, per ton and the total operating cost and cost of capital per ton to ship iron ore from Carmacks to the end of the ACRL (i.e. extra costs would be incurred to ship the minerals from the end of the ACRL to port in the case of the Delta Junction and Hazelton options). The results of this analysis are shown in Table 5 below.

Table 5 Summary Table Yukon Iron Ore (Strategic Investor Perspective)

	Operating cost per ton	Operating cost per ton mile	Capital and operating cost recover
	$ ton	$ ton mile	$ ton
Carmacks – Haines	$2.10	$0.012	$13
Carmacks - Delta Junction	$2.50	$0.010	$15
Carmacks – Hazelton	$4.30	$0.008	$33

Note: operating cost is inclusive of ongoing capital expenditure

As indicated earlier, there is a substantial funding gap that government will need to address. Some potential mechanisms for bridging this funding gap include:

- Capital grants during the construction period
- Operating period performance payments
- Revenue shortfall guarantees
- Subordinated debt instruments
- Subordinated equity instruments
- Contribution of existing assets
- Taxation incentives

Although the public sector will need to address the funding gap there are mechanisms that can be put in place to help ensure that government recoups a portion of their contribution to the project when and if it generates a significant commercial surplus. Some of these mechanisms include:

- **Upside sharing mechanism** – public sector acquires an increasing share of revenues over and above a pre-determined volume
- **Sharing of re-financing gains** – public sector shares in the gain made from the refinancing of debt after the ACRL has demonstrated its operating performance.
- **Concession length** – public sector can benefit from the residual value of the assets if it takes back ownership and control of the assets at the end of the concession period

Partnerships BC Qualitative Assessment

PBC studied a number of factors that are difficult to quantify but have important impacts on government objectives. These factors were evaluated for the impact that the construction of the ACRL would have relative to a base case where there is no significant mine development in the Yukon and regional re-supply continues to be done via the current transportation system. Each factor was assessed as to whether the construction of the ACRL would have a "Negative", "Neutral" or "Positive" net impact on government objectives.

The factors evaluated included:

- **Economic Development** – construction of the ACRL should lead to lower transportation costs which should in turn increase the competitiveness of local businesses leading to further export development, lower the construction cost of the Alaska Gas pipeline, attract tourists, develop a new cargo transportation industry to handle Asian imports and encourage natural resource development.
- **North American Integration** – construction of the ACRL would create an alternative mode for goods traveling to and from the region which should result in better economic integration of the region with the rest of Canada and the lower 48 states, improved Canadian and American

national economic security and enhanced Canadian sovereignty in the Northwest.

- **Environmental** – construction of the ACRL would lead to an increase in emissions associated with intermodal re-supply traffic, traffic associated with mine development and the container traffic flowing to North America through an Alaskan port. It would also increase the potential for hazardous material spills and have a negative impact on wildlife and habitat along the railroad right-of-way, at mine sites and along mine access roads that are developed as a result of the ACRL. Although the ACRL will have a net negative impact to the environment it should be noted that development of mines using the current road infrastructure could lead to significantly more emissions and a higher probability of smaller magnitude hazardous spills.
- **Transportation Safety** – construction of the ACRL has the potential to improve highway safety by removing a significant percentage of existing Alaska Highway truck traffic and reducing potential truck traffic associated with the construction of the Alaska Gas pipeline. However, the ACRL will also have a negative impact on road safety as a result of a significant increase in traffic along mine access roads and the potential for accidents at railroad level crossings.
- **Transportation System Reliability** – the ACRL would add considerable capacity and improve the reliability of the transportation system in the region. This strategic redundancy would help ensure reliable flow of freight in and out of the region.
- **Other Transportation Providers** – the ACRL would increase competition and reduce demand for existing marine and truck transportation services. However, the mine development resulting from the creation of the ACRL would increase demand for trucking services between mines and the railhead.
- **Other Transportation Infrastructure** – the ACRL would have an impact on other transportation infrastructure in the region such as:
    - ***Road Infrastructure*** - reduced highway traffic should lead to a reduction in highway maintenance costs but there should also be a significant increase in the maintenance and construction costs associated with mine access roads
    - ***Port Infrastructure*** – ports that currently handle re-supply traffic will have a reduction in demand for their services. Port facilities will need to be expanded to handle international container traffic and increased mineral volumes. West coast ports should also experience a reduction in congestion if international container traffic shifts to Alaskan ports and the ACRL.
    - ***Adjacent Rail Infrastructure*** – traffic on the ACRL will increase the utilization of adjacent railways.

- **Social** – communities that the ACRL passed through should benefit from improved affordability of goods, better job opportunities and economies of scale in the provision of public services. However, those same communities may experience a strain on the capacity of community services during the construction of the ACRL and a permanent change in the character and aesthetic of the community.
- **First Nations and Alaska Native Corporations** – in addition to the social impacts mentioned above, First Nations and Alaska Native communities would experience an impact to their traditional use of their lands and areas that are of archeological and spiritual importance.

The outcome of the qualitative impact analysis is shown in Table 6 below. It is important to note that the outcome of the analysis is not scored and summed across the various factors. Governments need to weigh each individual factor according to their perceptions of what is important to their publics and how they meet government objectives. Furthermore, government needs to carefully consider how they can enhance the positive impacts and mitigate the negative impacts.

Table 6 Summary Qualitative Impacts

	Build ACRL *versus* Status Quo
Economic Development	Net Positive
North American Integration	Net Positive
Environmental	Net Negative
Transportation Safety	Neutral
Transportation System Reliability	Net Positive
Impact on other Transportation providers	Net Negative
Impact on other Transportation Infrastructure	Neutral
Social	Net Positive
First Nations and Alaska Native Corporations	Neutral

As discussed by MNAL, the uncertainty of traffic volumes means that none of the revenue in its current form would attract private sector investment. PBC identified some of the key risks inhibiting private sector investment as political risk, cost risk and traffic volume risk. Government can help address these risks through actions such as:

- creating a favorable railway regulatory environment while still protecting public interests
- enshrining government commitments in long-term contracts
- coordinating railway policies with other government policies
- creating a dedicated project team
- conducting and funding technical and environmental studies
- facilitating inter-governmental approvals
- managing public, First Nations and Alaska Native Corporation consultations
- assembling the right-of-way and reducing land acquisition costs
- creating tax incentives to encourage investment
- creating tax structures to reduce operating construction costs
- accessing government debt instruments
- providing construction inputs at lower costs (e.g. royalty-free aggregate and ballast)

The financial modeling work conducted by E&Y indicates that, with a discount rate of 5%, the full route option will result in a 74% recovery of the initial $10.9 billion in initial capital expenditures (CAPEX). This indicates that governments involved will need to take a lead role in the development of the ACRL.

Governments have a much broader and longer term perspective of the project and will need to consider how the project will impact their broader objectives. As shown in the economic impact analysis some of the broader economic implications of the ACRL could be quantified through a detailed cost-benefit analysis. However, it is important for governments to consider both the quantifiable and the non-quantifiable impacts when evaluating the ACRL project.

Recommendations:

The results of the business case analysis discussed in this report indicate that the private sector would not invest in the project in its current form. The results indicate that if government were to develop the project on their own with a 5% cost of financing the project, they would fail to recoup their investment in the project. However, the study also points out that government may choose to pursue the development of the ACRL to meet their broader and longer term objectives.

If government decides to pursue the project they should conduct further detailed analysis to confirm that the benefits of the project, as identified by the analysis completed to date, will come to fruition. The studies conducted over the past year will help government identify the key benefits of the ACRL that warrant more detailed analysis.

Many of the key benefits are related to economic development that is a result of the ACRL. Some of the key benefits are associated with reduced transportation costs and the development of industries such as the mining industry and an international container shipping industry. Further analysis could include a more detailed study of the factors impeding Yukon mineral development to confirm that the mineral activity in the Yukon will in fact materialize if the railway is constructed. Additional analysis could also help to confirm the viability of international container traffic flowing through an Alaskan port to the rest of North America.

Government could also conduct further analysis into the key costs associated with the project such as the impact that the project may have on the environment. Building on the work conducted over the past year, a more detailed analysis of the key benefits in conjunction with further analysis of the key costs would allow a more detailed and fulsome economic analysis to be conducted. This would help support government's decision moving forward.

2 ERNST & YOUNG PUBLIC SECTOR ASSESSMENT

2.1 INTRODUCTION

E&Y has collaborated with PBC and MNAL to undertake a strategic investment analysis of the financial viability of the ACRL.

E&Y undertook the development of an Investment Model to facilitate the analysis of various route options developed by the Stage One consultants. The principal objective of this Investment Model was to provide a tool for the other Stage Two consultants that would extract information from a cost model developed by the Stage One consultant, Innovative Scheduling, Inc. (the "Cost Model") and allow for various route options and segmentation of revenues and expenses estimated through the assumptions contained in the Cost Model. MNAL then undertook a private sector "participation" assessment drawing on the outputs from the Investment Model. PBC undertook a qualitative analysis of the public policy considerations and summarized the outcome of the Stage Two study into a comprehensive report to the ACRL project management.

This section of the report provides an overview of the Investment Model and its findings.

The analysis contained herein is based on assumptions obtained from the Stage One consultants, the Yukon Economic Development group and consultation with the ACRL project management and its other Stage Two consultants. The sources of information and bases of the estimates and assumptions are summarized herein and can be found in greater detail in the respective Stage One consultants' final reports.

While we believe that the sources of information are reasonably reliable, E&Y has not, as part of developing the Investment Model performed an audit or reviewed any of the financial or other information used in the Cost Model and therefore cannot and does not express an opinion or any other form of assurances on the accuracy of such information.

The analyses contained in this report are not considered to be a "forecast" or a "projection" as technically defined by the Canadian Institute of Chartered Accountants ("CICA"). The use of the words "forecast," "project" or "projection" used alone within this report relates to broad expectations of future events or market conditions and the quantification of the potential results of operations under those conditions. Since the analyses are based on estimates and assumptions that are inherently subject to uncertainty and variation depending on evolving events, they are not represented as results that will be achieved. Some assumptions inevitably will not materialize, and unanticipated events and circumstances may occur; therefore, the actual results achieved may vary materially from the estimates.

As part of this study, no verification of the legal, ownership, engineering and regulatory requirements applicable to the ACRL, including zoning and other provincial, state and local government regulations, permits and licenses was undertaken. Further, no effort has been made to determine the possible effect of present or future federal, provincial, state or local legislation, including any First Nations land claim, environmental or ecological matters or interpretations thereof.

With respect to the demand and revenue analyses for the ACRL, the work did not include a detailed quantification of the potential impact of any sharp rise or decline in local or macro economic conditions.

2.2 DEFINITIONS

These items referred to in the document have the following meanings:

- Dollars/$ - refers to US Dollars unless otherwise stated
- Weight - Tons are Short Tons
- Distance – miles
- Investment Model – E&Y Investment Model
- Cost Model – Innovative Scheduling, Inc.'s Cost Model

2.3 INVESTMENT MODEL METHODOLOGY & ASSUMPTIONS

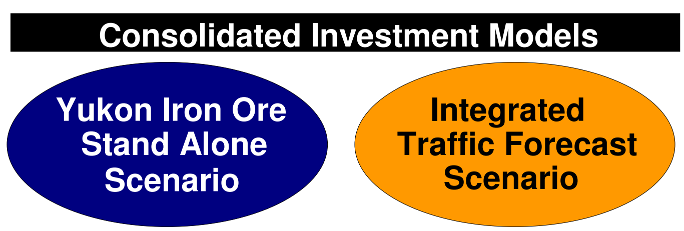
Overview

An assortment of data inputs in different forms have been produced by various project consultants, including, major assumptions about: the location of the rail link, the timing of its construction, its capital and operating costs, and the potential usage volumes from various transportation needs, such as intermodal usage, support of pipeline development and development and production from mineral deposits along the respective routes.

These inputs form the key drivers for Innovative Scheduling, Inc.'s Cost Model which consolidates this data in conjunction with their costing matrix for the ACRL. E&Y has not reviewed the workings of the project consultants, management steering committee or the formulas contained in Innovative Scheduling, Inc's Cost Model to ensure the assumptions and data used were adequately supported and reasonable or modeled accordingly.

E&Y has used the outputs from Innovative Scheduling, Inc.'s Cost Model as the basis for its analysis. These outputs are used as the key assumptions that drive the Investment Model developed by E&Y that is simply designed to assess the ACRL by route option and type of volume use. The Investment Model has been used to facilitate the analysis of two strategic investment scenarios, the first being the integrated traffic forecast of the entire route, including all traffic flows other than the Yukon Iron Ore and the second being the transportation of iron ore from the proposed Yukon Iron Ore deposit.

Figure 2: Investment Model Overview



Although the Yukon Iron Ore can be analyzed within the integrated traffic forecast scenario, given its significant size and potential production risks a separate scenario was created. Traffic volumes from the site are potentially 28 million tons per year at a maximum, more than all other traffic on the proposed rail link combined. Also, steel prices and global demand for iron ore pose a significant production risk to the development of the Yukon Iron Ore, as low steel prices would affect operating margins and the price per ton the rail link may charge. Given its size and pricing uncertainty, even small changes to the Yukon

Iron Ore assumptions will have a material effect on the financial analysis of the ACRL. Accordingly, it has been excluded from the integrated traffic forecast scenario and analyzed on a stand alone basis.

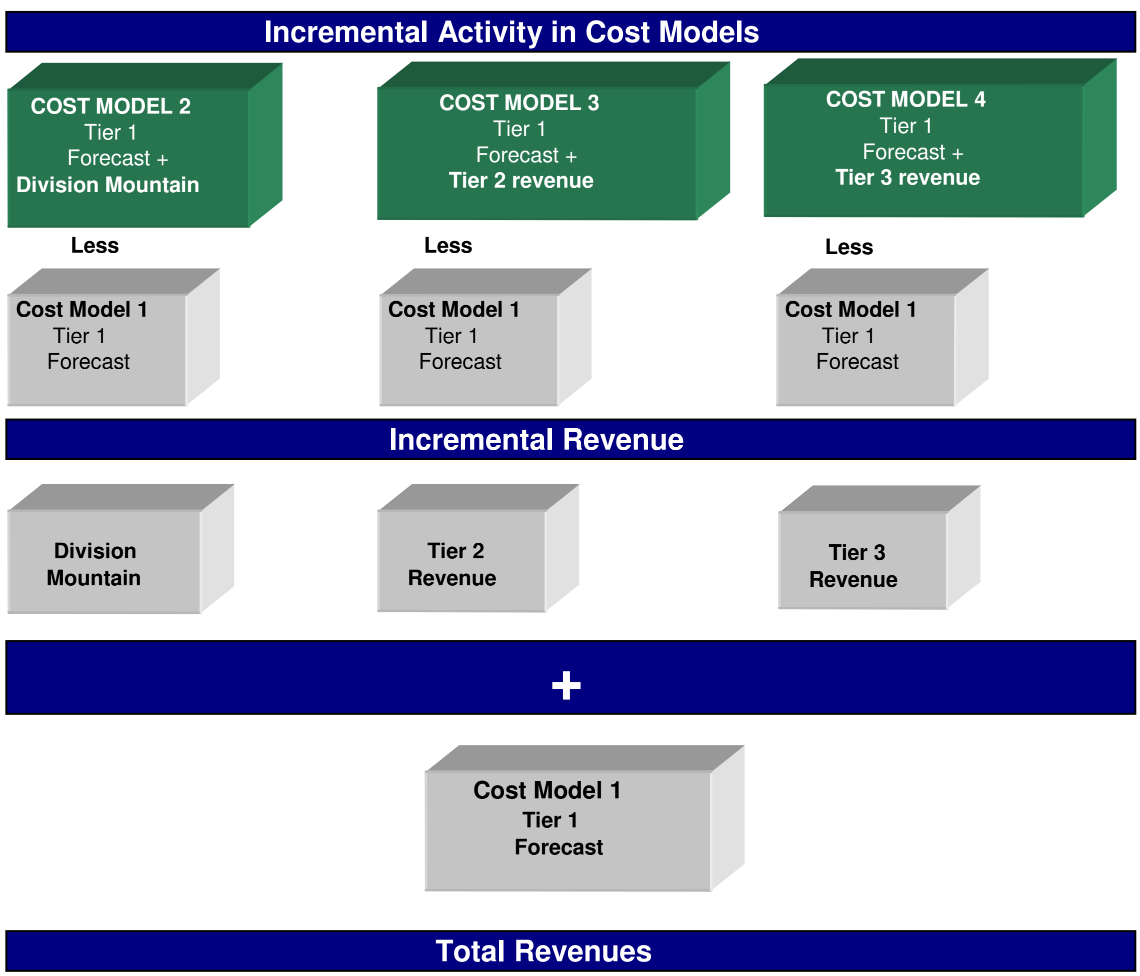
The Yukon Iron Ore stand alone scenario contains many of the same general assumptions as the integrated traffic forecast scenario; however, the tidewater port of Skagway cannot adequately support the proposed volumes of the Yukon Iron Ore, so it is assumed that the port of Haines is utilized in the Yukon Iron Ore stand alone scenario. This results in significantly higher capital expenditures (approximately $1.8 billion) to build an entire new section of rail between Whitehorse and Haines, unlike the Skagway route, which will only require an upgrade from a narrow gauge track to a standard gauge track. An analysis of the Yukon Iron Ore follows the integrated traffic forecast scenario analysis in the sections below

Integration of the Innovative Scheduling, Inc's Cost Model in the Integrated Traffic Forecast Scenario and the Yukon Iron Ore Stand Alone Scenario

The following section provides a summary of the integrated traffic forecast scenario and the Yukon Iron Ore stand alone scenario as modeled through the Investment Model and Cost Model.

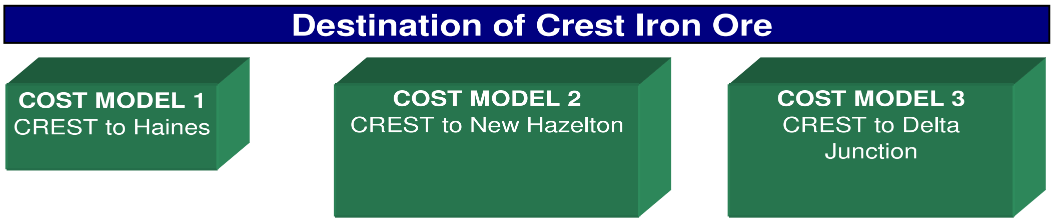
The integrated traffic forecast scenario provides a structure from which expected revenues and costs from the Cost Model can be dissected and consolidated for financial analysis. To achieve this, the Investment Model uses multiple versions of the Cost Model in order to capture all incremental revenue streams and associated operating costs while not double counting fixed operating or capital expenditure costs. This approach has been adopted to accommodate the additional volumes that were added to the forecast which differ in terms of robustness and timing of being realized when compared with the original volume forecast provided by the Stage One consultants QGI Consulting.

Figure 3: Investment Model



Also, in order to analyze the different route options for the rail link, multiple cost models are used in the Yukon Iron Ore stand alone scenario.

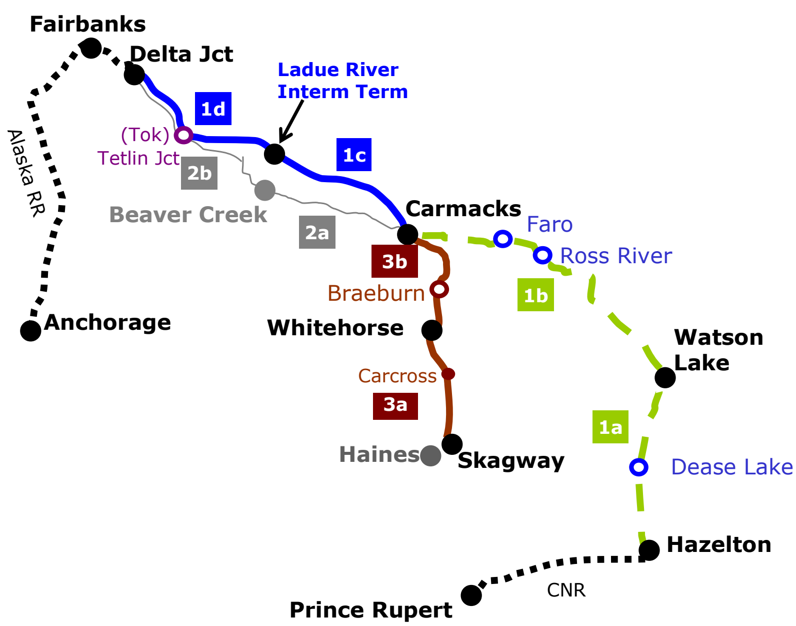
Figure 4: Yukon Iron Ore Stand Alone Scenario



Rail Route Options

At the beginning of the Stage Two financial analysis, the ACRL project management identified the following route as the "preferred full route" and the one to be used in the financial analysis.

Figure 5: Map of Full Route



**Map courtesy of Innovative Scheduling, Inc.*

The full route is divided into the following segments:

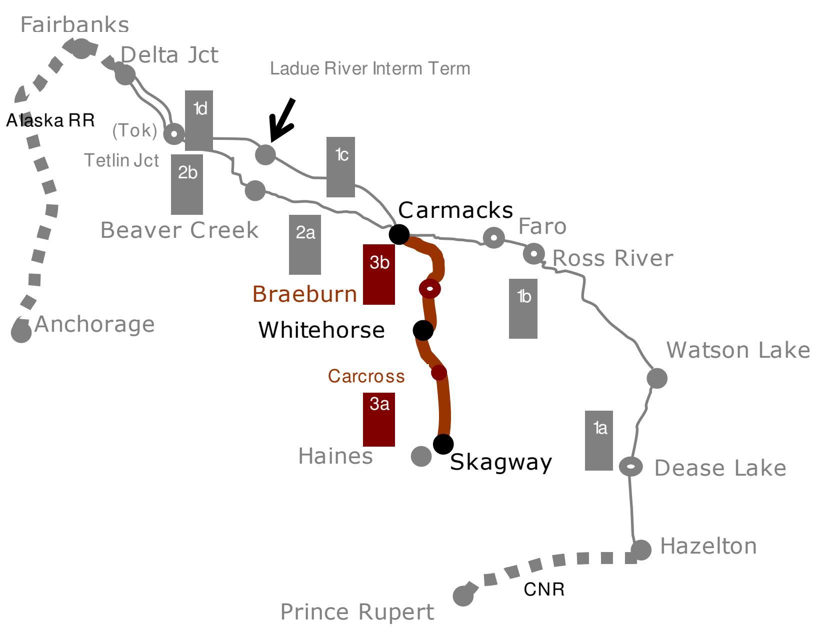
Segment 1a – Hazelton to Watson Lake
Segment 1b – Watson Lake to Carmacks
Segment 1c – Carmacks to Ladue River

Segment 1d – Ladue River to Delta Junction
Segment 3b – Carmacks to Whitehorse
Segment 3a – Whitehorse to Skagway

Preliminary analysis and discussions with the ACRL project management revealed that certain traffic flows, such as mineral exports, will not cross the full route in order to reach an export market and may contribute significantly to a specific segment's commercial viability. To investigate whether some segments or "phased routes" were more desirable than others, the integrated traffic forecast scenario and Yukon Iron Ore stand alone scenario were equipped with a switch that would select the segments built in the Cost Models. The following three phased routes were investigated for both models:

Phase Option A: Carmacks to Port of Skagway (Port of Haines in Yukon Iron Ore stand alone scenario)

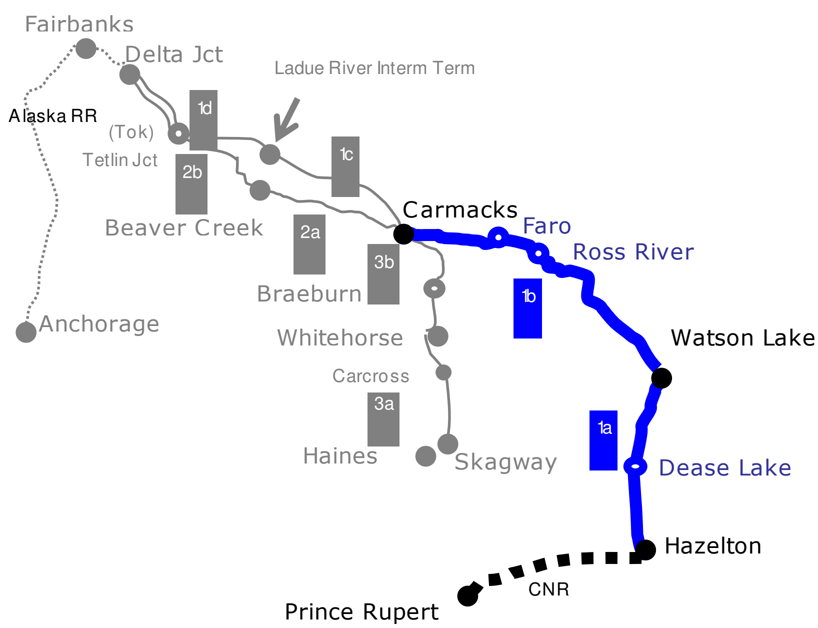
Figure 6: Segments 3a and 3b



**Map courtesy of Innovative Scheduling, Inc.*

Phase Option B: Carmacks to Hazelton (Ridley Terminal at Prince Rupert and Canadian National Railway)

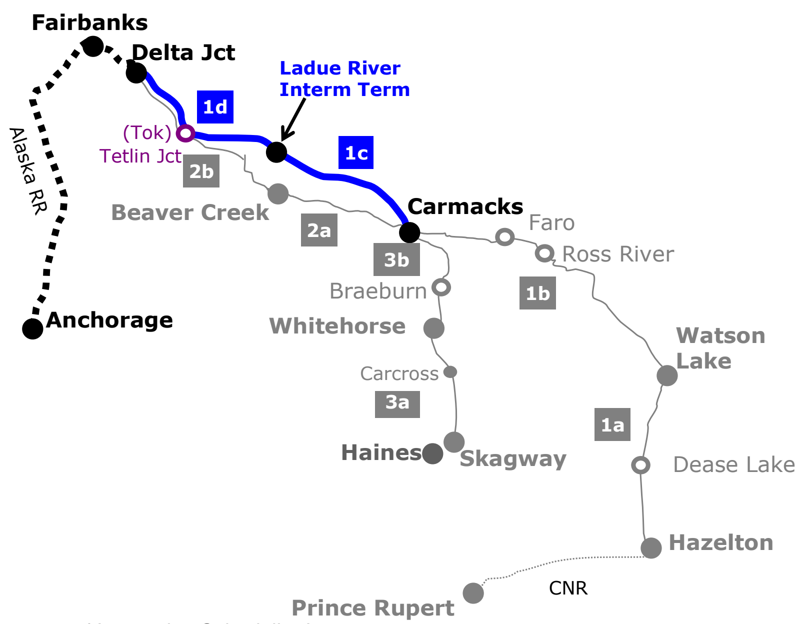
Figure 7: Segments 1a and 1b



**Maps courtesy of Innovative Scheduling, Inc.*

Phase Option C: Carmacks to Delta Junction (Port McKenzie and the Alaska Rail Road)

Figure 8: Segments 1c and 1d



Map courtesy of Innovative SchedulingInc.

Each specific use of the railway traffic flow was reviewed to determine whether it would be fully captured along a phased route option. It is reasonable to assume that traffic would have to travel continuously along the phased route without interruption from a segment not being built. For instance, intermodal traffic bound for Alaska and coming onto the rail link at Hazelton would require segments 1a, 1b, 1c and 1d be built in order to be delivered to Alaska. If the analysis were for Phased Option B (1a and 1b) or Phased Option C (1c and 1d), this Intermodal traffic would not be captured as only part of the required route would be modeled under these options.

In the case of the Yukon Iron Ore, its mineral export traffic will also travel from Carmacks to a tidewater port for export. Consequently, the Yukon Iron Ore stand alone scenario will only look at the three phased options.

Functionality of Investment Model

Scenario Analysis

The Investment Model can switch between the full route and phased route options.

Sensitivity Analysis

Data that is passed through the Stage One Cost Model is standardized so that the user can perform sensitivities on the following:

- Price per ton mile by type of traffic
- Ton-miles by type of traffic
- Operating cost per ton mile by type of traffic (except tourism gross profit)
- Capital costs
- Discount Rate

Segment Analysis

Under any scenario, the user can analyze a segment and evaluate the performance of the segment relative to other segments in the route.

General Model Assumptions

General assumptions were developed after extensive consultations with the Stage One consultants, Stage Two consultants, the Yukon Economic Development group and the ACRL project management. We anticipate the next stage of the process will revisit these assumptions to form an exhaustive business case.

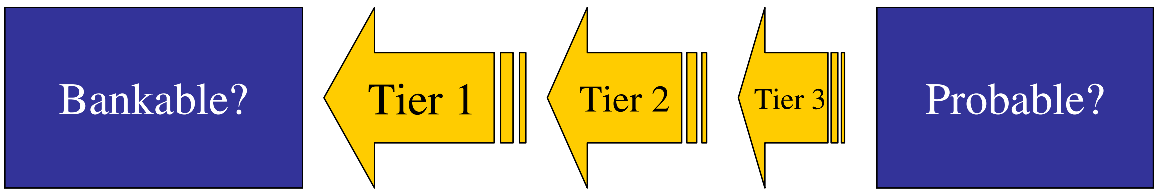
Key general assumptions are as follows:

- Fifty year operating period;
- Nominal cost of capital on free cash flows of 5% given the expectation the project will be publicly funded and the current rate of borrowing on 30 year government bonds (Note: a sensitivity of 10% was conducted in the analysis); and
- Annualized inflation rate on free cash flows of 2%.

Traffic Forecast and Revenue

The traffic volumes that drive the rail link analysis have been consolidated from many sources, at different depths of research, independence and expertise. Accordingly, the Investment Model attempts to capture the likelihood of realization (See Figure 9) by ranking them as Tier 1, Tier 2 or Tier 3 (Tier 1 being the highest quality). To capture incremental cash flows, multiple Innovate Scheduling, Inc. Cost Models were required to run specific traffic forecast scenarios that were then deducted from a base forecast. Also, due to its significant size, the Investment Model allows the user to analyze Tier 1 coal traffic from Division Mountain (greater than 1 million tons per year) independently.

Figure 9: Incremental Traffic Forecast Structure



Tier 1

Traffic forecasts derived during the projects Stage One analysis are categorized as Tier 1 or as the highest quality revenues, due to the in-depth technical research performed by qualified consultants at Stage One of the project. The volume and pricing data is based on factual market data gathered from existing transportation traffic moving in Alaska, Yukon and British Columbia and from mineral resource data collected over years of study. The data was sorted and interpreted by QGI Consulting and used to produce a comprehensive tonnage and revenue forecast schedule that was inputted into the Innovate Scheduling, Inc. Cost Model.

Several assumptions and numerous risks were considered in determining the volume and price of traffic along the rail link. They can be found in **Work Package: a1&2(g),** available through the ACRL Project Office.

Key traffic forecast and revenue assumptions are as follows:

Intermodal

This Traffic is categorized as general merchandise traffic to support economic activity and import/export container traffic from Asia. The majority of intermodal revenues will come from transporting traffic by way of linking the Alaska Rail Road to the Canadian National Railway such that Alaska will receive goods via the rail link as opposed to truck or barge.

QGI Consulting developed two traffic forecasts as a sensitivity of expected intermodal traffic to be included in the event the full rail route is built in a single phase, linking Alaska to the lower 48 states. The optimistic scenario assumes 100% of existing traffic will be captured, while a separate scenario assumes only 50% of traffic would convert to full rail. Given a lack of financial information on the operations of marine transportation companies that operate between Seattle and Alaska, an estimate of the competitiveness of these companies as a threat to new transport modes could not be adequately determined. Accordingly, the 50% scenario was used in the analysis.

- Expected to capture 50% of the Seattle-Alaska marine transportation market and 100% of the Alaska container export market;
  Specifically bridge traffic (travelling across the entire segment) will have a 0% retention rate if only a phased portion of the route is built;

In the event the full rail link is constructed, the Alaskan Ports will require a major upgrade to manage an estimated 5,000,000 tons of import/export container traffic bound to and from Asia. The freight would come from Asia and be bound for the Mid-West United States. Presently, there is no documented research supporting these estimates; however, this volume is plausible, given trans-Pacific shipping times are shorter to Alaska than other more established ports such as the Port of Long Beach and Port of Seattle and these ports are currently experiencing congestion.

Minerals and Coal

Discussions with QGI discovered the methodology used by Gartner Lee to assess the mineral and coal data from Stage One, specifically, mineable resource viabilities, focused on operating costs in terms of a mine's net ore value, rather than the net value of ore concentrate shipped. The revised methodology resulted in several more viable mineral resource deposits being included in the traffic forecast.

An initial review of the timing of viable resource exports revealed traffic volumes began simultaneously for all ore deposits and were forecast to last 30 years on an annualized basis. Given that the timing of cash flows may significantly impact project viability, it was recommended adjustments be made to the traffic forecast to better reflect actual conditions, whereby mine production is based on the specific extraction capacity of a mine and the length of time it will take to exhaust reserves based on that extraction rate. Accordingly, QGI prepared a revised volume forecast, based on staggering the start of mineral exports over multiple years and adjusting the duration of specific exports to reflect the estimated mine life given its total shippable tons.

The following summarizes the key mineral traffic assumptions:

- The start of traffic will be staggered over a three year period subsequent to the construction of the rail link or segment. (Yukon Iron Ore is expected to come online the year after construction of the rail link).

- Mineral resource exports are based on mine life not an average annualized estimate.

- Exports coming online north of Watson Lake and south of Ladue River will be brought to tidewater at Skagway (Haines in the Yukon Iron Ore stand alone scenario).

Pipeline

These traffic volumes are based on the predicted specific movement of pipeline materials used in the construction of the Alaska and McKenzie Gas pipelines. It is assumed pipeline development will coincide with the start-up of the ACRL.

Industrial Products

This traffic consists of inbound supplies to construct and maintain identified mining operations and pipeline activity in Alaska, the Yukon, and B.C. The construction period of each mine is expected to last two years and precede the export of resources traffic from the specific mine site. Once construction is complete, specific supply traffic will correspond to production of a mine over its mine life. There is no data that specifies the amount of supply traffic to be required by Yukon Iron Ore. Consequently, in the Yukon Iron Ore cost scenario it is assumed not to have Industrial Products volumes.

Figure 10: Tier 1 Traffic Forecast

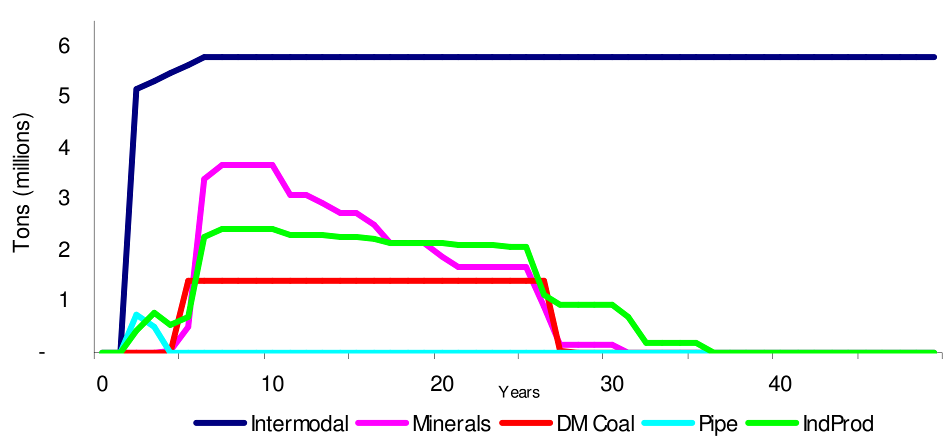


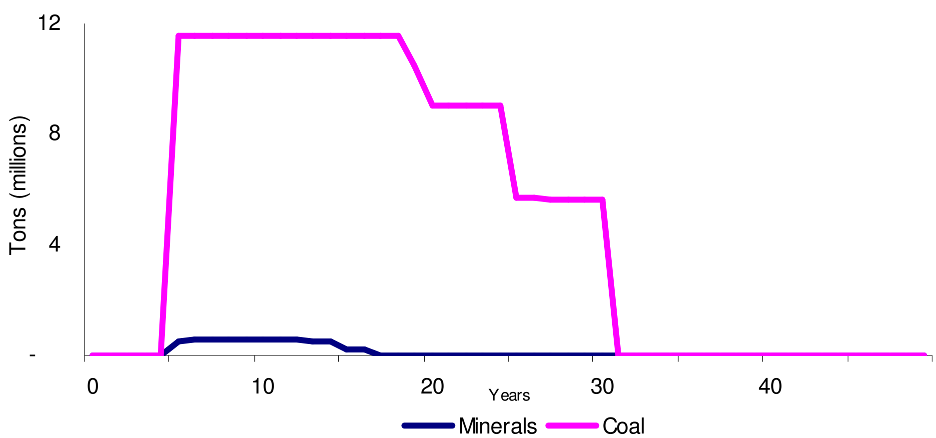
Figure 10 illustrates the average annual tons of potential Tier 1 traffic, segregated by type of revenue. The most significant volumes are from Intermodal traffic at close to 6 million tons per year. This is followed by mineral export traffic which peaks in year 10 and decreases steadily to zero by year 30.

For further detail on Tier 1 traffic forecast see APPENDIX B

Tier 2

The Yukon Economic Development group ("YED") prepared a report estimating mineral resource exports from deposits in the Yukon and Northern B.C. The findings were based on a seven year study, which has recently concluded. Many of the mineral deposits the YED considered viable were also included in reports by QGI Consulting and Gartner Lee at Stage One of the project, however, the estimated volumes by the YED are mostly in excess of those included in the Tier 1 traffic forecast.

Figure 11: Tier 2 Traffic Forecast



The YED methodology differs from Tier 1 in that it assumes mineable deposits will have a lower cost structure on the basis of transportation by rail, whereas the Tier 1 feasibility analysis was conducted assuming existing transport. These cost savings will result in greater available capital to extract reserves once considered too costly and the potential to realize better economies of scale. Also, for the same reasons, YED considers several coal deposits in Northern B.C. viable, unlike QGI Consulting and Gartner Lee (See the tonnage forecast at Figure 11 above).

Coal traffic is expected to reach a maximum of 11 million tons between year 5 to year 18, then gradually decrease to zero in year 30. Most of the coal traffic will travel from Little Klappan River to Hazelton for export at Ridley Island in Prince Rupert.

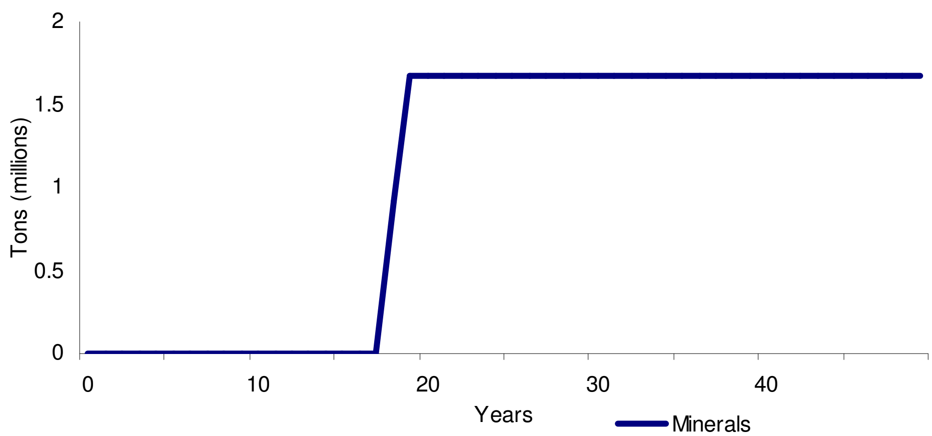
Although we consider the methodology used by YED to determine further coal activity and additional mineral volumes plausible, the potential traffic is based on cost savings that have a greater risk of materializing than that conducted within a standard viability assessment, as done at Stage One. Also, given the lack of independence between the YED and management steering committee, we have placed the incremental mining activity and coal traffic within Tier 2. Furthermore, we have not included additional Industrial Product volumes that would likely correspond to more mining activity.

For further detail on the Tier 2 traffic forecast see APPENDIX B

Tier 3

The YED prepared a statistical estimate of potential shippable tons from criteria that reviews probable mineral discoveries within a 150 kilometer corridor of the ACRL route. The estimates have only been prepared along the rail link in the Yukon and Northern B.C. Traffic begins along the rail link in year twenty; however, it is recognized that export of future mineral discoveries may occur before year twenty. Mineral exports from these activities are expected to average 1.7 million tons per year for 30 years (See the tonnage forecast at Figure 12 below).

Figure 12: Tier 3 Mineral Traffic



For further detail on the Tier 3 traffic forecast see APPENDIX B

Tourism

Tour operator consultant, Mary Klugherz, prepared revenue projections of a tour rail operator expected to make year round trips between Prince George and Fairbanks. Revenue estimates were supported by benchmarking the operation against other tour rail operators. The rail link will receive a track fee equivalent to

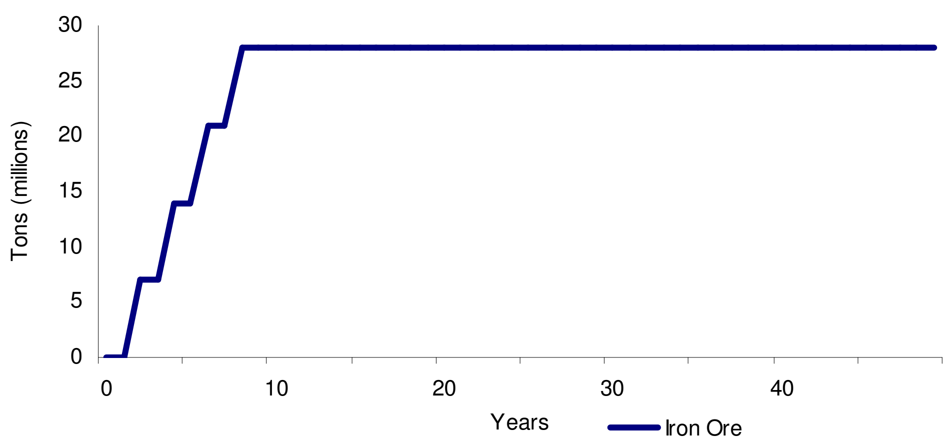
10% of its revenues. Tourism fees are immaterial compared to other track revenues.

Yukon Iron Ore

At Stage Two, a focused analysis of the viability of the Yukon Iron Ore was conducted by the Yukon Economic Development group, drawing on the Yukon Government's collection of extensive geological surveys and records. Shippable ton estimates were based on those from the comprehensive Yukon Iron Ore feasibility study completed in 1965. The Yukon Economic Development group also performed a simulated operating analysis of the Yukon Iron Ore as benchmarked to other global iron ore operators and produced an in depth cost analysis as compared to similar operations at Carol Lake, Newfoundland & Labrador; however, further analysis has to be conducted in order to properly price the volume on a per ton basis and quantify the likely revenue for the rail link. Presently, the ACRL project management team is exploring three transport options:

- From Carmacks as Pelletized iron ore
- From Carmacks as Bulk commodity
- To tidewater from the Yukon Iron Ore site by pipe

Figure 13: Yukon Iron Ore Traffic volumes



More analysis needs to be conducted on the Yukon Iron Ore to determine the least costly method to transport the commodity. Our analysis considers transport of the Yukon Iron Ore as a bulk commodity from Carmacks. Figure 13 summarizes the estimated traffic from the Yukon Iron Ore

All detailed reports supporting the assumptions and conclusions by Stage One consultants are available from the ACRL project office.

Cost Assumptions

In Stage One of the project, Innovative Scheduling, Inc. prepared a Cost Model to determine operating costs for the rail link and evaluate costs across a number of route alternatives. Unfortunately, it was built to identify the best possible route, not to perform segmentation or phased development of segments as was required at Stage Two. As such, it was not designed with the functionality to adjust traffic volumes and the direction of traffic flows, a feature important to properly analyze the viability of the rail link. This in turn led to the size, complexity and inflexibility of the Investment Model because it needed to be configured to provide an effective analysis of the rail link under various investment options. As noted above, rather than recreate a full new model with the proper functionality, the Investment Model consolidates the results of four costs models different by their respective traffic forecasts. Consequently, the Cost model is a principal part of the Investment Model and considerable reliance has been placed on its ability to compute accurately the cost structure of the rail link.

Significant assumptions stemming from the use of Innovate Scheduling, Inc.'s Cost Model within the Investment Model are summarized as follows:

- **Management Strategy** - All Innovative Scheduling, Inc. Cost Models imbedded in the Investment Model will use management strategy 1, the lowest cost strategy. This strategy employs low horsepower per ton standards and maximizes fuel efficiency per ton-mile of freight. Although the feasibility cost analysis report suggests that management strategy 2 be the "most likely" strategy to employ, the ACRL project management has recommended we use management strategy 1 to represent a low cost scenario. The management strategy is used across all segments of the railway, regardless of their specific terrain type (see the "Limitations" section below).

- **Operating Costs** - The Innovative Scheduling, Inc.'s Cost Model is a very detailed rail road model that uses Activity Based Costing methodology to arrive at calculated cost items. Operating costs are distinguished as either "above the rail or "below the rail" costs. Costs labelled "above the rail" are pure variable costs that are driven by traffic ton miles. "Below the rail" costs are *less variable* depending on the cost item. These costs are dependent on operational strategy, type of traffic and velocities; however, the Innovative Schedule, Inc.'s Cost Model does not separate these costs, nor separate the true variable components from the more fixed components of operating cost. Given a rail road will have significant fixed operating cost and realize economies of scale at higher volumes, we assume costs metrics such as the dollar cost per ton-mile may vary significantly across a range of volumes.

The following four operating cost items are detailed in the Investment Model:

- **Maintenance of Way** – These costs are mainly costs for track maintenance and include an allocation of labour, rail parts and supplies, track materials and purchased services.
- **Maintenance of Equipment** – These costs relate to expenditures to maintain locomotives and rail car assets and include an allocation of labour.
- **Transportation Costs** – Fuel costs, car hire costs and labour make up the bulk of transportation expenses.
- **General and Administration Costs** – Consist of office supplies, legal cost, and staff labour.

The operating costs are allocated to different traffic types based on total ton miles.

- **Start-up Costs and yearly fixed costs** – There are also initial start-up fixed operating costs and yearly minimum fixed operating costs that have been broken out in the Investment Model. Regardless of the route option, minimum yearly fixed operating costs are approximately $6.9 million.

- **Initial Track capital** – These costs have been added to the Cost Model by Innovative Scheduling, Inc. under consultation with Stage One engineering consultants such as UMA Engineering. The preferred full route is expected to be built over a 2 year period and cost an estimated $11 billion. We consider a two year construction period to be an aggressive estimate (See Table 7 below). As noted above, Segments 3a and 3b which run from Carmacks to Skagway are expected to take only 1 year to build (the Yukon Iron Ore to Haines will take 2 years).

Table 7: Initial Track Capital by Rail Link option

$ millions

Route	Segment						
Options	1a	1b	1c	1d	3a	3b	Total
Full Route	3,953	3,302	2,023	1,046	127	545	10,994
Phased A - Skagway	-	-	-	-	127	545	672
Phased A - Haines					1,048	545	1,593
Phased B	3,953	3,302	-	-	-	-	7,254
Phased C	-	-	2,023	1,046	-	-	3,069

- **Rehabilitation Costs** – These costs have been added to the Innovative Scheduling, Inc. Cost Model after Stage One and include lifecycle replacements of significant assets such as locomotives, ties, rail ballasts and equipment. These costs are incurred at different times, depending on the lifecycle of the cost item. Significant rehabilitation costs include locomotives, which are scheduled to retire after 30 years. Over an operating period of 50 years $145 million is estimated to be spent to replace locomotives. Similarly, replacement track is expected to require yearly replacement and is estimated at $660 million[3].

- **Financing Costs** – There are no financing costs included in the Investment Model.

All detailed technical reports supporting the Capital Cost and Operating Cost assumptions and conclusions by Stage One consultants are available from the ACRL project office.

[3] Based on 2006 dollars present valued over the 50 year operating period

2.4 LIMITATIONS

Cost Model

We identified many inconsistencies in the Innovative Scheduling, Inc. Cost Model, which required significant time to ensure consistency with the methodology of the financial analysis; however, we did not audit nor validate any of the data or assumptions within the Investment Model. The outputs from the Innovative Scheduling, Inc.'s Cost Model were simply used as inputs to build the Investment Model.

We noted that one management strategy will be used across all segment profiles, regardless of a specific segment's terrain profile, which influences the number of locomotives and number of cars per train. For instance, the Whitehorse to Skagway segment (segment 3a), has harsh terrain and requires six locomotives and only 60 cars per train for it to move through that area of the rail link. This cost strategy is employed across all other segments in the route, despite other segments, such as Watson Lake to Hazelton (segment 1a), with only moderate terrain conditions. A moderate segment strategy (uses 3 locomotives and 110 cars per train) across the Full route and Phased Option B (Carmacks to Hazelton) results in a cost difference from the harsh terrain strategy of only $40 million and $140 million respectively. Given the differences are less than 5% of the overall projects net cash flows, rather than adding another level of complexity to the Investment Model, the harsh terrain management strategy is a more conservative approach and results in cost figures within an acceptable range of error for our analysis.

Traffic Density

While there seems to be reasonable demand in terms of traffic volumes, there are limits on the amount of traffic that can be handled both physically within the track system and within the current Investment Model structure. Discussions with UMA Engineering and Innovative Scheduling, Inc. indicate the rail link in its present form was designed to a handle a maximum density of 20 Million Gross Tons (MGT) of traffic and would require further capex (e.g. signalling system) to accommodate higher densities. We reviewed all route options and discovered forecasted traffic volumes in the full route scenario exceeded 40 MGT along segment 1a. Since Intermodal traffic will only move across the full route, this traffic created higher densities than other scenarios. Consequently, Tier 2 B.C. Coal (approximately 11.5 millions tons per year for 19 years) and Tier 3 mineral discoveries (1.6 tons per year for 30 years) were removed from the full route scenario to accommodate the maximum density.

See the adjusted full route density per year by segment in the Appendix

Also, in the Yukon Iron Ore stand alone scenario, iron ore volumes are predicted to peak at 28 million tons per year in Year 9 and remain at this level across the operating period. At these volumes, densities will reach 39 MGT along each rail link segment in the different route options, exceeding capacity. To fall within the density constraint of 20 MGT, traffic volumes were scaled to 14 million tons at its peak.

Significant Costs Excluded

Several costs have been excluded from the investment model. The analysis assumes the ACRL project management will obtain further analysis on these issues from other sources and assume they materially affect the feasibility of the rail link, beyond the data discussed herein. The following costs were excluded:

- Port upgrade costs to handle bulk traffic
- Pre-development period costs (i.e. Environmental Impact Assessments)
- Right-of-way land acquisition costs
- Connecting operating costs over to major Class 1 railway operations in British Columbia to Canadian National Railway and in Alaska to the Alaska Railroad

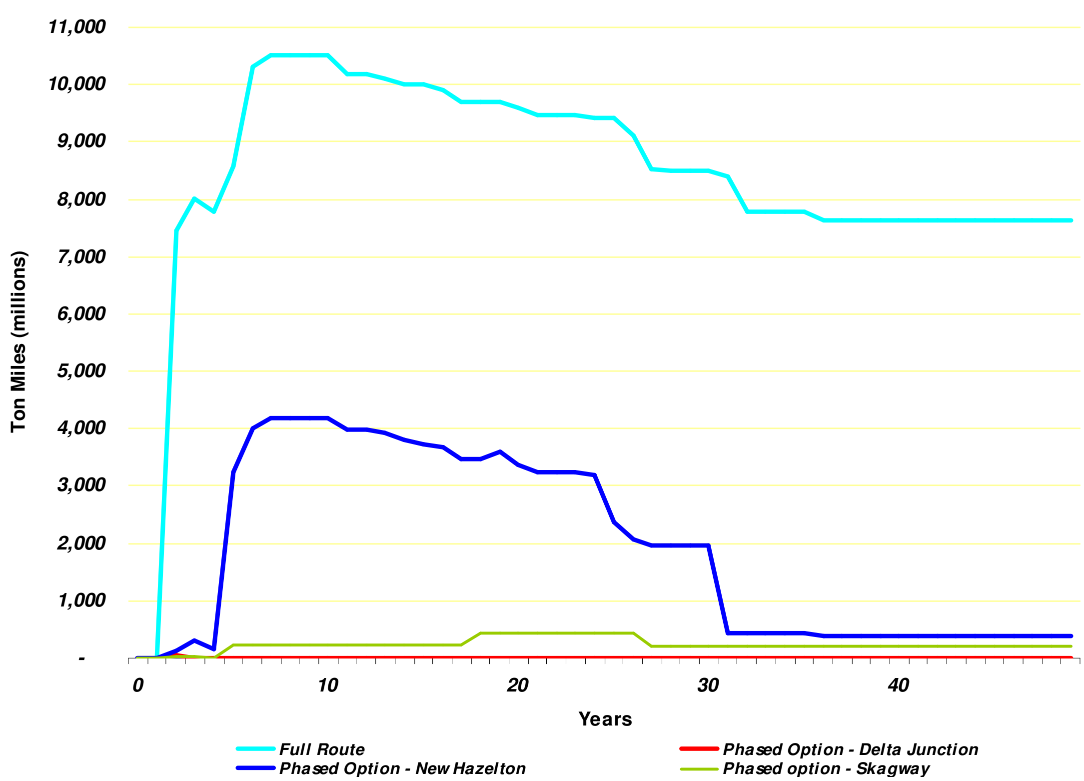
2.5 FINANCIAL RESULTS OF INTEGRATED TRAFFIC FORECAST SCENARIO

Ton Miles

Figure 14 highlights the estimated ton miles across each phased route scenario and the full route over the fifty year operating period. Ton miles are the main cost driver in the Innovative Scheduling, Inc.'s Cost Model and are the industry standard measurement of volumes across a railway. While the traffic forecast captures the tons to be shipped, the distance those tons are shipped will determine whether the item will be profitable or not to the rail link.

In the full route option, ton miles immediately increase to 8 billion per year for the first few years, then move up to a peak of 10.5 billion per year for the next five years. At year 10, traffic gradually declines across the full route, before stabilizing again in year thirty. This is due mainly to mineral resource traffic being exhausted; leaving only intermodal traffic on the rail link. It should be noted that this does note include the Yukon Iron Ore which has an estimated mine life of 200 years.

Figure 14: Fifty year transport forecast by route option



Phased Option B (Carmacks to Hazelton) has the second highest amount of ton miles, due partly to it being the furthest distance of track (900 miles), but more because of higher traffic volumes than the other phased options. Figure 14 illustrates the Phase Option A and C have significantly lower ton miles, due mainly to lighter resource traffic and less distance from Carmacks.

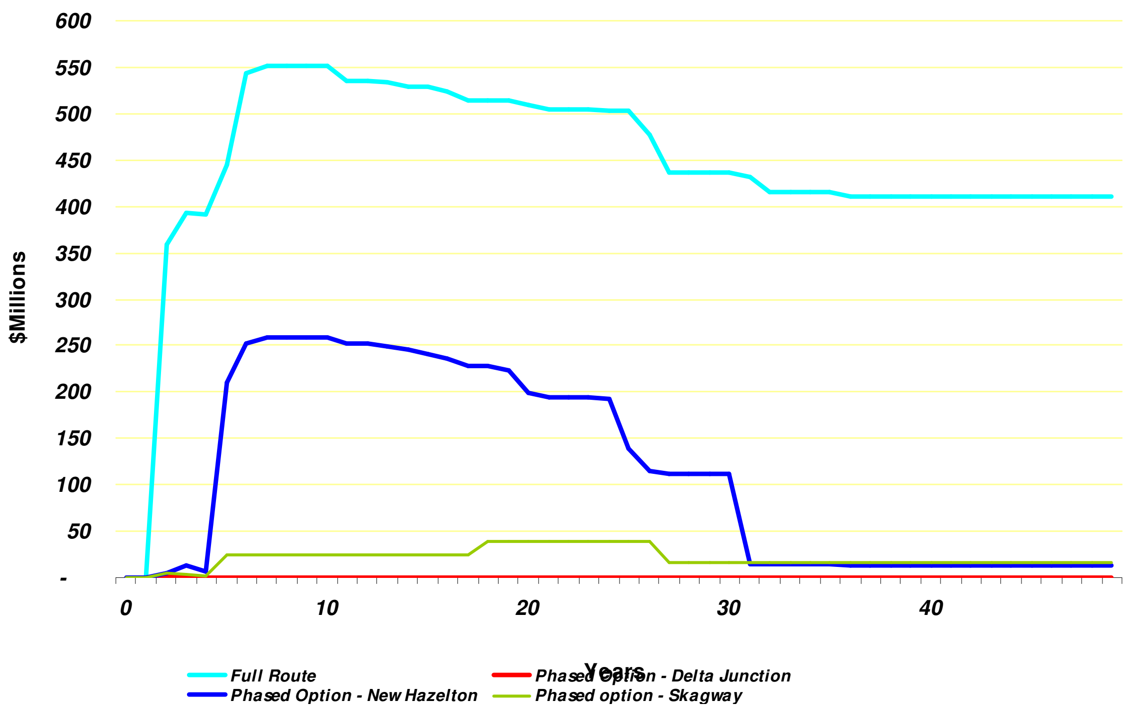
See APPENDIX B for detail on the ton miles per year across the different phased route options.

As noted above, greater ton miles translate into more variable costs and tiered fixed operating costs to the rail link. Unfortunately, these costs are not usually passed on to the consumer in the form of higher prices. Rather it is anticipated most consumers will remain indifferent to a route option so long as the destination port can effectively handle its volumes and provide access to international markets.

Revenues

Figure 15 examines the revenue forecast of the different route options over a fifty year operating period. The revenue graph results are very similar to the Ton mile graph as the full route option will exploit all transport opportunities. Annual revenues in the full route scenario will peak near $550 million and plateau at $400 million over the long run.

Figure 15: Rail Link Revenue Forecast by Route Option♠



Phased Option B captures the next largest amount of revenue, with revenues peaking near $250 million in years 4 through 10. From years 10 to 30, revenues steadily decline as mineral and coal resource traffic becomes exhausted. Skagway significantly lags the two other route options as the volumes along this route are mainly represented by Division Mountain. Only Pipeline traffic contributes to revenue along the Delta Junction phased option (i.e. the revenues allocated to the Yukon Iron Ore is analyzed on a stand alone basis).

♠ Based on 2006 dollars, revenue figures are expressed in real terms.

Figure 16: Rail Link Revenue per Ton-Mile by Route Option

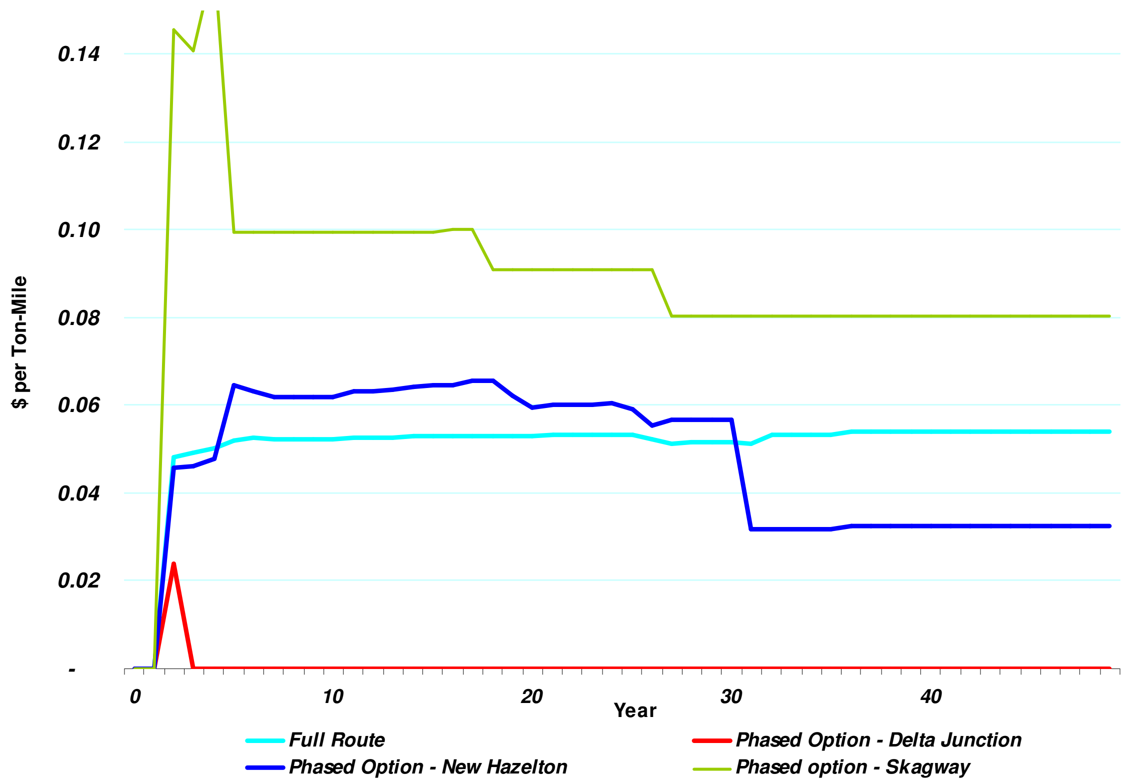
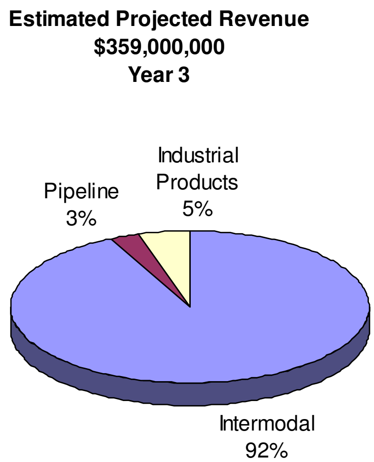
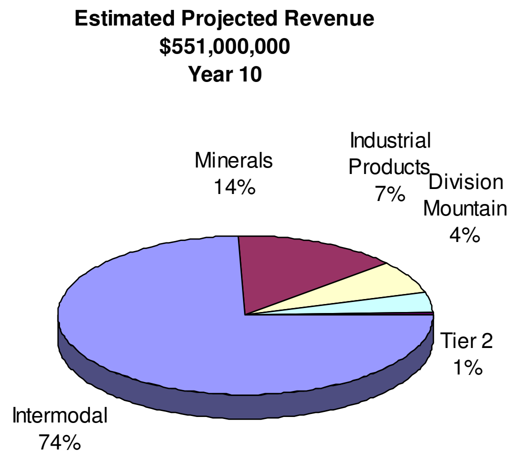


Figure 16 shows differences in revenue when analyzed on a dollar per ton-mile basis. The differentiation in rail link revenue is attributable to market pricing and competition. For instance, revenue per ton-mile is lower where there is competition (i.e. intermodal) and higher where competition is scarce (i.e. mines). The full route option generates a consistent dollar per ton despite having several different forms of revenue traffic. Contrast this with Phased Option B (Carmacks to Hazelton), which generates roughly $.06 per ton mile in the early years when specific resource exports and industrial product imports are most prevalent, it then tapers downward and settles at $.03 per ton mile after year 30 when only Tier 3 volumes are expected to be active. Figure 16 also shows that Phased Option A (Carmacks to Skagway), has a high revenue per ton-mile. This is likely due to the fact Division Mountain is not far from Skagway, but would still command a similar dollar per ton as other deposits.

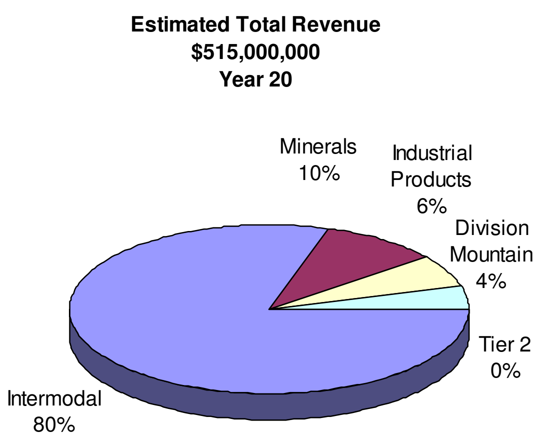
Due to the differences in type of revenue and the start of those revenues sources coming onto the rail link, measuring revenue on a dollar per ton basis may be misleading. It is important to note how revenues would change over the operating period. Using the Full Route option, the charts on the next page illustrates the change of revenue in years 3, 10, 20 and 30.

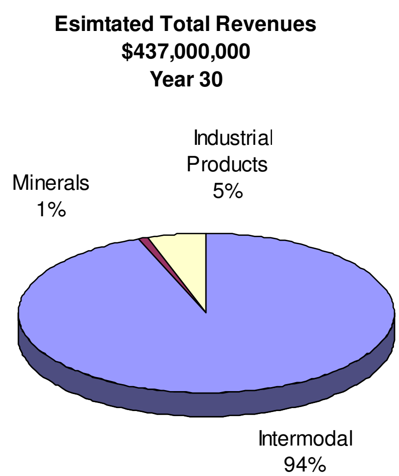
In year 3, revenues are dominated by Intermodal traffic. Mines will be constructed during this period, reflected by Industrial Products representing 5% of total revenues. By year 10, resource exports are contributing a combined 19%, 26% including industrial products that supply the sector.





By year 20 overall revenues have decreased slightly due to a decrease in mineral traffic and industrial products. By year 30, Division Mountain coal and Tier 1 mineral resources are exhausted, however, revenues remain fairly robust due to intermodal traffic. This analysis clearly illustrates its significance and importance to the rail link throughout the operating period.





Operating Costs

The Innovative Scheduling, Inc.'s Cost Model assumes a class 1 low cost operating strategy. Operating costs for each of the route options as illustrated in Figure 17 vary significantly on a dollar per ton mile basis. Since railways have considerable fixed operating costs, it was anticipated that the full route would realize greater economies of scale given its projected ton miles are much larger than the other route options. The full route averages just under $.015 per ton mile. Hazelton averages around $.02 per ton mile in the early years when mineral and B.C. Coal traffic volumes are high, but cost increase after year 30 when tier 3 volumes make up the bulk of traffic.

Phased option A (Carmacks to Skagway) has much higher operating cost per ton mile due to the low economies of scale. The three phased options have very high costs per ton mile in the first few years due to low volumes.

Figure 17 – Operating Costs per Ton-Mile

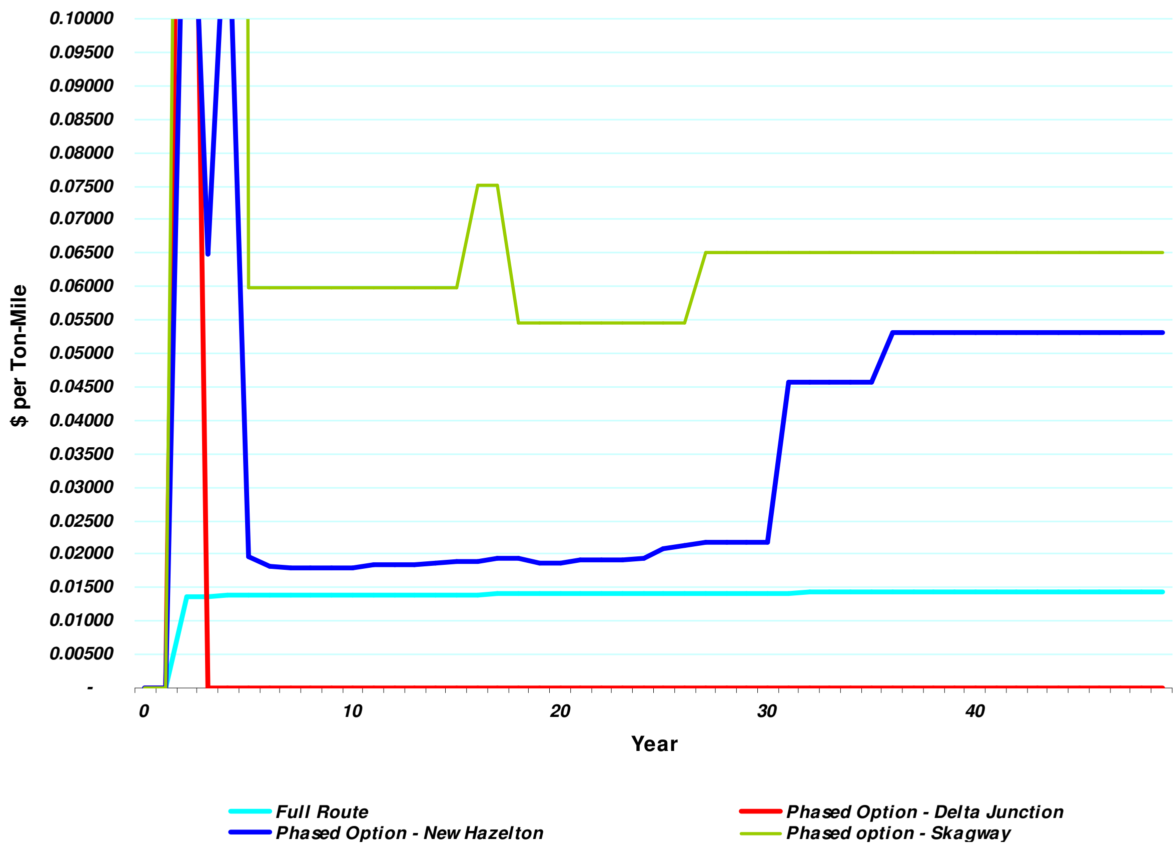


Table 8 summarizes the average operating statistics for the route options over the fifty year operating period. The operating ratio was calculated by dividing the operating costs by total revenue. The two routes options with reasonable traffic volumes, the full route and Phased Option B (Hazelton) have operating ratios 27% and 37%, respectively. Standard class 1 railways have operating ratios of between 65-85%. Comparatively, these operating ratios are very low. Phased Option A (Skagway) has an operating ratio of 72%, near that of the class 1 railway average; however, the volumes for this option are much lower than that of the rail link's capacity and likely economies of scale as witnessed by the higher volumes in the full route and Phased Option B (Hazelton). The operating ratio for Phased Option Delta Junction is not applicable nor comparable as this option only includes pipeline traffic. (i.e. does not include Iron Ore which is analyzed on a stand alone basis).

Table 8: Operating Statistics of Route Options over the Operating Period

($'s per ton mile)	Full Route	Phased Option Skagway	Phased Option New Hazelton	Phased Option Delta Junction
Revenue per Ton Mile	0.053	0.089	0.059	0.024
Operating Cost per Ton Mile	0.014	0.064	0.022	6.531
Operating Ratio	26.8%	72.0%	37.4%	N/A

Capital Costs

Table 9 highlights the differences in initial track capital costs between the phased route options. The Skagway phased route has the lowest initial capital expenditures, with an estimated $672 million in track costs, considerably less than the other phased options at $3.1B and $7.3B for Delta Junction and Hazelton, respectively. Although Phased Option A (Skagway) appears lower than the other ports, it will only have a capacity of 3.5 million tons per year, restricting its capability of handling significant mineral export discoveries.

Table 9: Initial Track Capital Expenditures

	Initial Track Capital
Full Route	$ 10,994,485,000
Phased Option - Delta Junction	$ 3,068,645,000
Phased Option - New Hazelton	$ 7,254,340,000
Phased Option - Skagway	$ 671,500,000

2.6 COMMERCIAL VIABILITY ASSESSMENT OF INTEGRATED TRAFFIC FORECAST SCENARIO

For the purposes of the analysis commercial viability is defined as positive net discounted cash flows. E&Y reviewed the present value of the rail links net cash flows for the different route options to assess its commercial viability. E&Y also conducted a sensitivity analysis, discounting net cash flows at varying rates to reflect different levels of project risk and cost of financing. The ACRL project management provided the Stage Two consultants with the discounts rates of 5% and 10% in determining the discounted net cash flows for the integrated traffic forecast scenario and the Yukon Iron Ore stand alone scenario. The net cash flows were discounted back to coincide with the commencement of the construction of the ACRL project (i.e. year 0).

Discount Rate at 5%

Table 10 illustrates the net cash flows for the alternative route options at a 5% discount rate. The full route scenario has the largest expected capital cost recovery at 74% or $8 billion of initial track capital costs. The net shortfall on the full route option is estimated at $3 billion. The Skagway phased option is expected to recover 30% of initial capex, and incur a shortfall of $0.5 billion; however, the strength of this routes net discounted cash flow relative to initial capex is not as robust as it appears, given initial capex is much less expensive than that of other routes as it only entails an upgrade to an existing track. This will be clearer when cash flows are discounted at the 10% rate (see below). It is estimated Phased Option B (Hazelton) recover 28% of initial capital costs resulting in a shortfall of $5.0 billion. Due to the very low traffic volumes along the Delta Junction phased option, this option is not expected to recover any initial capital and will operate at an operating loss of 4%.

Table 10: Initial CAPEX and Net Cash Flows discounted at 5%

$ millions	Full Route	Phased A Skagway	Phased B Hazelton	Phased C Delta Junction
Discounted Initial Capex	10,537	652	6,946	2,938
Net Discounted Cash Flows	(2,743)	(459)	(4,972)	(3,053)
Recovery %	74%	30%	28%	-4%

This analysis reveals the full route is realizing greater economies of scale due to higher traffic volumes such that higher margins are resulting in better discounted operating cash flows despite having much higher capex costs than other routes.

Discount Rate at 10%

Table 11: Initial CAPEX and Net Cash Flows discounted at 10%

$ millions	Full Route	Phased A Skagway	Phased B Hazelton	Phased C Delta Junction
Discounted Initial Capex	9,847	623	6,482	2,742
Net Discounted Cash Flows	(6,421)	(555)	(5,490)	(2,804)
Recovery %	35%	11%	15%	-2%

At 10% cost of capital, the full route recovers 35% of initial capex costs, an expected shortfall of $6 billion, but the best recovery among the route options (See Table 11 above). At a higher rate, Phased Option A has an expected recovery of 11% of capex against a 30% recovery at the 5% discount rate as noted above. The recovery on this route option fell more than that of Phased Option B, which decreased from 28% recovery to 15%. The change in discount rate illustrates the weakness in Phased Option A as due to its relatively low capex costs, its recovery is more volatile to the changes in discount rates. Again, Phased Option C is expected to cost a further 2% of initial cost or $3 billion.

2.7 YUKON IRON ORE STAND ALONE SCENARIO RESULTS

The Yukon Iron Ore has been analyzed on a stand alone basis given that its significant traffic volumes and possible price volatility will materially affect the financial analysis of other rail link traffic. It is understood that attracting private sector partners with confidence to develop the rail link hinges on finding reliable, cost effective transport that will allow the operation to continue throughout all phases of the commodity cycle of iron ore. Consequently, the ACRL project management has other studies that are ongoing that are considering all combinations of transport modes.

The transport of iron ore has been analyzed along the same three phased route options as reviewed for the integrated traffic forecast scenario, except, due to a capacity constraint of 3.5 million tons at the Port of Skagway, the port has been changed to the Port of Haines. This change results in a further $1.7 billion in capital costs for route 3a (see Table 7 above). Notwithstanding, other rail link specifications and cost metrics within the Innovative Scheduling, Inc. Cost Model are consistent in both scenarios.

Under route options B and C, traffic has only been analyzed to the end of the rail link or Delta Junction and Hazelton respectively, and has not been cost to tidewater in our analysis.

Table 12 illustrates the overall discounted costs at 5% and 10% of projected volumes along the three different route options. Although the traffic forecast is the same across the three routes, the phased option from Carmacks to Haines has the lowest discounted cost along the rail link at $3.7 billion and has the lowest discounted operating costs at $1.27 billion; however, the operating cost per ton mile is $.005, the highest of the three options. This makes sense as Haines is the shortest distance from Carmacks at 297 miles, compared to 900 miles to Hazelton and 420 miles to Delta Junction. The Hazelton option to Prince Rupert has the highest total present value cost at a deficit of $9.5 billion and highest discounted operating cost at $2.6 billion because of its distance from Carmacks and initial capital cost. Iron ore traffic to Port McKenzie via Delta Junction will have an overall present value cost of $3.7 billion.

Table 12: Operating Statistics of Yukon Iron Ore at 5% cost of capital

5% Cost of Capital ($ millions)	Phased Option Haines	Phased Option New Hazelton	Phased Option Delta Junction
Discounted Cash Flows	(3,703)	(9,503)	(3,729)
Capital Cost Component	(2,438)	(6,946)	(2,938)
Operating Cost Component	(1,265)	(2,556)	(790)
10% Cost of Capital ($ millions)	**Phased Option Haines**	**Phased Option New Hazelton**	**Phased Option Delta Junction**
Discounted Cash Flows	(2,813)	(7,534)	(3,075)
Capital Cost Component	(2,287)	(6,482)	(2,742)
Operating Cost Component	(526)	(1,052)	(333)
Miles	**Phased Option Haines**	**Phased Option New Hazelton**	**Phased Option Delta Junction**
Distance along the Rail Link	297	900	420
Ton Miles (billion)	225	680	148

One of the scenarios currently being explored by the ACRL project management is the likelihood of a potential investor contributing substantially all or 100% of the development cost of the rail link. Naturally the returns a private investor would seek from a project of this risk would be substantially higher than 5%. To reflect a more realistic risk-return scenario, we have also analyzed costs at a 10% discount rate. Results are illustrated in Table 12. As anticipated, a higher discount rate results in a lower present value of costs across all three scenarios due to the time value of money.

Table 13: Operating Statistics of Yukon Iron Ore

	Phased Option Haines	Phased Option New Hazelton	Phased Option Delta Junction
Operating Cost per Ton Mile	0.0099	0.0063	0.0081
Total Cost per Ton Mile	0.0214	0.0171	0.0292
Total Cost per Ton ($)	6.35	15.40	12.27

The operating statistics shown in Table 13 above indicates that the lowest operating and capital cost per ton mile option for the transportation of the iron ore would be via a rail route connecting Carmacks and Hazelton. However, the longer distance between Carmacks and Hazelton means that the lowest cost option on a per ton basis is Carmacks to Haines.

2.8 SUMMARY

E&Y's Investment Model has been used to drive the analysis of two strategic investment scenarios, the first being the integrated traffic forecast of the entire route, including all traffic flows other than the Yukon Iron Ore, and the second being the transportation of iron ore from the proposed iron ore deposit. Given the Yukon Iron Ore has significant traffic volumes and possible pricing volatility that will materially affect the analysis of other traffic along the rail link, we reviewed the Yukon Iron Ore as a stand alone scenario.

2.9 INTEGRATE TRAFFIC FORECAST SCENARIO

For the purposes of the analysis, commercial viability is defined as positive net discounted cash flows. The commercial viability analysis of the integrated traffic forecast scenario indicates all four options will fall short of covering both the operating costs and initial capital expenditures of any of the route options and require considerable funding before they can be deemed commercially viable. In all likelihood, government will be expected to provide a significant portion of this shortfall. It will require government to assess a preferred route and revisit government contributions against an anticipated social economic benefit to the respective region. For government to reach a financial conclusion further analysis of each of the routes net economic cost-benefit must be assessed. We recommend a comprehensive economic cost-benefit analysis be conducted for each route option before any conclusion be reached.

The Yukon Iron Ore Stand Alone Cost Scenario

The analysis of the Yukon Iron Ore was conducted to determine both the operating cost and capital cost of a route option on a present value basis. Given the volume and timing of traffic were consistent across the three route options, the Haines route appears to provide the lowest cost option. Also, the Haines route has traffic terminating at a tidewater port, unlike the Delta Junction and Hazelton options that require transport along another railroad to reach tidewater. It is important to reiterate that port upgrade costs and spur connecting costs to the Alaska Rail Road were not included in the analysis.

2.10 ECONOMIC IMPACTS

The commercial viability analysis on the full route option indicates that the rail link will fall short of covering its operating and capital costs over the 50 year operating period. This shortfall is approximately $3 billion for the full route option. Sufficient evidence to demonstrate that the ACRL will result in an economic benefit to meet or exceed the $3 billion shortfall will support a decision for government to invest and implement the ACRL project.

Economic Impact Analysis

Informetrica and Information Insights have prepared two separate reports that review the economic impacts for the ACRL project in Alaska and Canada. Though the economic impact assessments review the ACRL's projected capital spending and its operations in terms of direct and indirect effects on the economy, they do not take account of these impacts in the framework of a net benefit of the project on a regional or national basis.

For example on the regional versus national basis, the economic benefits of a project should not only take account of the net benefits to a region but should also take account of any loss of activity it may have caused in another region. In addition, the current reports have only taken account of the economic impacts and should be expanded to take account of all costs, such as social infrastructure costs associated with an expanding regional workforce, such as additional schools, roads, sewage and water treatment facilities, emergency services, etc.

Expanding these studies to include an assessment of the associated costs is critical to then allow an assessment of the net economic benefits of the ACRL and allow an "apples to apples" comparison to the shortfall of $3 billion currently estimated for the ACRL.

As a result the sections below summarize the key economic impacts highlighted through the reports produced by Informetrica and Information Insights and provide an indication of the commercial viability of the ACRL from the perspective of government if the economic impacts alone, without any associated costs as mentioned above, are taken into consideration. In compiling the summary below, no further verification was undertaken by other Stage Two consultants and the information provided is only a summary of information from the reports of Informetrica and Information Insights.

Economic Effects and Considerations

The following highlights some of the key economic impacts from the Informetrica and Information Insight reports that identify an impact but do not capture the corresponding cost likely associated with such an impact. Consequently, these issues are included here as indications of the potential impact of the ACRL on the economy however additional cost issues need to be addressed in a comprehensive economic benefits analysis in order for a meaningful comparison to be made to the current projected shortfall for the ACRL of $3 billion:

- The reports assumed the Full Route rail link construction will result in capital spending of $10.9 billion. Although total capital spending is allocated based on location of track - $9.7 billion to the Canadian portion of the full route and $1.2 billion to Alaska, it is unclear where materials capital expenditures will be sourced, or better yet, from whom. For example, if the intention is to have a Chinese company design and build the railway, it is also possible that materials and other products may be sourced offshore as well. As a result, the comprehensive cost-benefit analysis should source the capital expenditures and determine whether the economic effect received from capital expenditures may only be reserved to those costs received by workers in the form of labour income.

- Construction, Indirect and Induced employment is estimated to be 206,000 person-years over the construction period, with 92% coming from the Yukon and Northern B.C. and 8% in Alaska. Annual labour income during construction is estimated at $625 million in Canada and $3.2 million in Alaska. The increase in labour income will have to be determined on a net basis and take account of any costs for social infrastructure associated with the increase in workforce in a given region. Also, while increased labour will generally result in higher tax revenues to governments, higher employment will also bring with it higher social costs. Particularly, in the Yukon where the population is only 30,000 people, but employment from the rail link is expected to require 33,000 person years over the construction period. In this instance, temporary social infrastructure costs may be required at considerable cost to the territory. The comprehensive cost-benefit analysis should capture these issues;

- The rail link will require the employment of 490 staff, with 50 employees residing in Alaska and 440 employees in Canada (260 in the Yukon, 180 in B.C.)

- Annual operations will contribute $1.32 billion to annual GDP in Canada and $26.1 million to GDP in Alaska. Once again, while GDP may be rising, the net costs associated with that growth are not clear.

- The rail link is expected to decrease the transportation costs of consumer products, which will reduce operating costs to suppliers and retailers in Alaska, the Yukon and Northern B.C. The lower wholesale costs are expected to be passed on to the consumer as reduced prices for goods and services. The CPI is expected to drop by 0.3% to 0.4%. As a result, real disposable incomes in the region will rise, leaving residents to enjoy a higher standard of living.

The following economic impacts extracted from the Informetrica and Information Insight reports identify savings that are likely from the ACRL project that may impact the assessment of the viability of the ACRL. Again, in compiling the summary below, no further verification was undertaken by other Stage Two consultants and the information provided is only a summary of information from the reports of Informetrica and Information Insights.

- Completion of the rail link before the start of Alaska pipeline construction will allow a switch from truck to rail and if the switch from truck to rail results in a halving of the freight rate then there is an opportunity for a $37 million saving on pipeline construction costs and resulting in an increase in the net present value of gas pipeline revenues to the Alaska government by an estimated $17 million over the life of the project. At the same time revenues to industry would increase by $13 million and federal tax receipts by $7 million over the life of the project.

- Reduced traffic from trucks on highways will result in lower maintenance costs estimated at $2 million per year for Alaska and $4 million per year for the Yukon and B.C. for a total of $6 million per year over the life of the project. On a present value basis this would indicate a savings of approximately $153[4] million over the 50 year period. Lower highway traffic will also translate into other potential benefits like lower vehicle emission and road safety. Better road safety will result in lower emergency services cost to governments.

- Given the switch from truck to freight and likely reduction in the need for expanded road infrastructure there is indication within the reports that government spending on road transportation infrastructure to meet these needs can be reduced by approximately $800 million. Of this $800 million, only $250 to $300 million will be saved as a result of the ACRL. As indicated by the Informetrica and Information Insights report, the savings will only be realized if the ACRL is completed and available as a means of transport during the construction and development of the Alaska Highway gas pipeline.

- Most consumer and industrial goods are transported by marine services to the Yukon and Alaska from the rest of Canada and the lower States. The ACRL is positioned to provide an alternative to these transportation modes and potentially provide a savings when compared with the current modes of transport. Informetrica estimates the potential savings attributable in the re-supply of the Yukon to be approximately $4 million per annum or

[4] Assumed inflation of 2% per annum, discounted at 5% for the proposed assessment period of 50 years

$102 million over a 50 year period. Information Insights estimated the potential savings attributable in the re-supply of Alaska to range between $40 million and $176 million per annum. However, Information Insights has indicated the basis of several of the assumptions provided for its analysis may over estimate the competitiveness of the ACRL, as such this summary includes the bottom end of the range of $40 million or approximately $1[5] billion over a 50 year period. Should the high end of the range be assumed, the total over the 50 year period would be approximately $4.5[6] billion

Based on the information summarized from the Informetrica and Information Insights reports, the total "savings" may reach an estimated level of $ 1.5 billion over the period under analysis for the ACRL.

Next Steps

Although the impact assessments by Informetrica and Information Insights draw conclusions that the rail link will have higher economic activity and regional cost savings during its construction phase and its operations, it fails to explore the project's actual net economic benefits in terms of hidden government cost to support these economic effects, whether the economic effects are true benefits, not substitutes and the total economic benefit of the ACRL. The economic impact study should be expanded to capture the full economic costs and benefits of the ACRL.

Before investing in the rail link, government will want further confidence the $3 billion short fall will be returned to government in the form of higher net economic benefits

[5] Assumed inflation of 2% per annum, discounted at 5% for the proposed assessment period of 50 years

[6] Assumed inflation of 2% per annum, discounted at 5% for the proposed assessment period of 50 years

2.11 ISSUES, CONSIDERATIONS AND NEXT STEPS

The following discussion points highlight some of the issues to be reviewed in the next stage of the project.

Integrity of the Investment Model

In the next stage of the project a more flexible and transparent model should be constructed. Once a reliable and stable financial model has been developed, it can then be used to determine a suitable financing strategy and prioritize actions for decision making. We believe it is essential to have a reliable, stable and workable model encompassing the overall investment plan (i.e. includes individual business structures). Many assumptions in the existing model could be leveraged in the development of a new model. At the same time, these assumptions should be benchmarked to other, comparable rail operations for reasonableness.

Comprehensive economic cost-benefit analysis by Route Option

The economic impact assessments do not capture other costs to be born by government. Also the data is not specific to a route option. This has made it difficult to assess the viability of each route segment.

Consistent Traffic and Reliability

The volatility of global commodity prices and its effect on mine viability needs to be further explored and analyzed. Factors such as a mine cost structure and quality of minerals will determine a mine's viability in times of changing commodity prices. A mine's viability will be critical to the commercial viability of a route option over the operating period.

Other issues such as travel time, system reliability, cost effective transport options, ease of access into and out of terminals, storage capacities, mining production/refining facilities among others, will be key to achieving an efficient, safe, reliable and fully integrated rail system that will be the preferred transport system of exporters and other participants. Further review is needed to quantify these costs to determine the needs of consumers and whether these concerns will significantly affect traffic volumes.

Yukon Iron Ore

A special business case must be developed and prepared for the Yukon Iron Ore and its supporting infrastructure. The size and quality of the mineral deposit, coupled with its proximity to Asia is significant in terms of global reserves. The business case should review the potential location of its production, smelting and refining facilities and address the impact the chosen locations would have on the different route options. Currently, the Investment Model assumes the Yukon Iron Ore exports will come online at Carmacks. Also, for the Yukon Iron Ore to be operational, a cost efficient energy source is needed. The business case must address the energy needs of the Yukon Iron Ore and the potential energy resource suppliers, such as the use of coal produced from Division Mountain and Bonnet Plume or from energy equivalents like natural gas.

It is critical the business case also examine the Yukon Iron Ore from the perspective of a strategic investor and the potential investment opportunity in the Yukon Iron Ore as a part of the rail link project or vice versa.

Government Contributions

Today's freight railway companies operate in a highly competitive transportation marketplace. To compete effectively against each other and against other transportation modes, rail must provide timely, high quality service at competitive rates. Historically most North American freight railway companies receive little government funding and support, particularly during the operational stage; however, most new freight rail operations in other parts of the world are heavily subsidized by governments.

Contributions can take many forms (tax incentives, concession loan and grant) and means (asset contribution, right of ways and public works) either upfront or over time. A program analyzing government contributions that bring the right mix and balance to the project or individual segments must be investigated. Government contributions are similar to investments made by the private sector in that the government will need to review a compelling business case before moving forward with its support.

Partnering

The sheer magnitude and complexity of such a major undertaking presents challenges to government, rail investors and mine developers, as well as other stakeholders and service providers. The challenge is to form the right mix of partnerships with a clear alignment of interests. Effort is needed to identify major players for potential partnering in the project. Also, Partners' experiences can be leveraged to refine its scope and diversify the rail links risks.

Bundling of rail assets (Alaska Rail Corporation)

Within our scope we did not examine the suitability of bundling the Alaska Rail Corporation as a merged entity with the rail link. A detailed financial analysis of the Alaska Rail Corporation and the potential synergies it would have with the rail link should be explored. A combined entity would likely see synergies in the transport of additional Intermodal traffic and potential resource exports through Port McKenzie. An assessment of any integration issues and the impact of linking Alaska Rail into potential business arrangements should be considered.

Risk Allocation

Proper risk allocation among governments, rail investors and mine developers must be carefully assessed and allocated appropriately in order to provide the best value for money to governments. Private investors will need to be compensated for the risks they assume, and they will demand a premium for perceived risks that they must also bear. Specifically for the ACRL project, we assume that private investors and developers will not invest prior to the various environmental and social impact assessments. Similarly, it would be highly unlikely that a private investor will assume traffic volume risk unless these revenues are backstopped by credit support from sponsors or major corporations. Considerable amount of work needs to be done to assess risk and properly communicate this in a business case to be presented to potential investors.

3 MACQUARIE NORTH AMERICA PRIVATE SECTOR ASSESSMENT

3.1 INTRODUCTION TO FINANCIBILILTY

The objectives of the private sector investor assessment conducted by Macquarie North America Ltd. are:

- To assess the work completed on project capital and operating costs, revenues and planning issues from a private sector investor perspective and identify any weaknesses or further work required;
- To identify the percentage of project capital and operating costs which could be met by a private sector investor and to identify the conditions necessary to attract such investment;
- To calculate the "Funding Gap", being the proportion of capital cost funding which could not be raised from a private sector investor on commercial terms and to provide a preliminary assessment of the options available to ACRL to bridge that funding gap.;
- To provide a preliminary overview of the benefits to ACRL and the public sector partners of delivering the project as a public private partnership and identify some high level institutional and structuring issues associated with such a delivery mechanism; and
- To recommend next steps in progressing project planning and delivery.

3.1.1 Revenues

In Macquarie's view, none of the revenue streams identified for the project are bankable in their current stage of development and further work will be required in order to ensure bankability.

3.1.2 Capital and Operating Costs

The capital and operating cost estimates for the Project are generally appropriate for the stage of development of the Project. However, some weaknesses have been identified from a bankability perspective.

3.1.3 Major Planning Issues

A number of major planning issues will need to be resolved before the project could proceed to attract private sector investment. These include:

- Port access and development
- Timescale and costs for environmental permitting and approval
- Co-ordination with pipeline development
- White Pass Yukon Railroad
- Alaska Railroad
- Phasing options

3.1.4 Types of Potential Investor

The private sector investment capacity has been calculated using a variety of investors as proxies for the market place. It is important to note that the actual appetite of these investors has not been established, although the assumptions are based on their financial attributes and case studies of similar projects which have been undertaken.

The broad types of investors analyzed were:

- Class I Railroad investors
- Financial Investors
- Supply Chain bulk mineral investors

3.1.5 Capacity to Support Private Investment

On the assumption that the bankability issues associated with costs, revenues and planning issues can be resolved without materially altering the economics of the Project, we calculate that the Project could support between a low range of $2.1 billion of private sector capital and a high range of $4.4 billion. (These figures exclude the potential revenue from Yukon Iron Ore).

This comprises both equity investment and non-recourse project debt finance.

3.1.6 Funding Gap

This level of private sector investment capacity leaves a significant funding gap, which would need to be supported by the public sector. The funding gap would be between a low range of $6.7 billion and a high range of $9.0 billion.

The funding gap can also be considered as a revenue gap, representing the amount of revenue (assuming no change in cost) that would be required to cover the full capital costs of the railway. The revenue gap varies between $360 million per year and $1,200 million per year depending on the cost of capital of the investor.

3.1.7 Phased options

Building the full route railway at once will be logistically difficult and will require an extremely large amount of capital upfront. This amount of capital would put strains on capital market and equity participants. Building the railway in segments allows the large injections of capital to be spread over time and may provide comfort to the lenders that the construction schedule will be met.

However the key driver to the bankability is the intermodal traffic, which requires the route from Delta Junction to Hazelton to be built. This results in limited private financing for the individual segments.

There is the potential that the first phased option would transport the Yukon Iron Ore from Carmacks to a port. This has the potential of providing significant capital investment at the initial phase of construction, with intermodal traffic coming on line at later stages of development.

3.1.8 Mechanisms to Bridge the Funding Gap

There are a number of potential mechanisms which the public sector could use to bridge the funding gap. These are intended to reduce the costs of the Project, minimize risk to the public sector, and ensure that the public sector enjoys the benefits of commercial upside from the project as it matures.
The major mechanisms are:

- Capital grants during the construction period
- Operating period performance payments
- Revenue shortfall guarantees
- Subordinated debt instruments
- Subordinated equity instruments
- Contribution of existing assets
- Taxation incentives

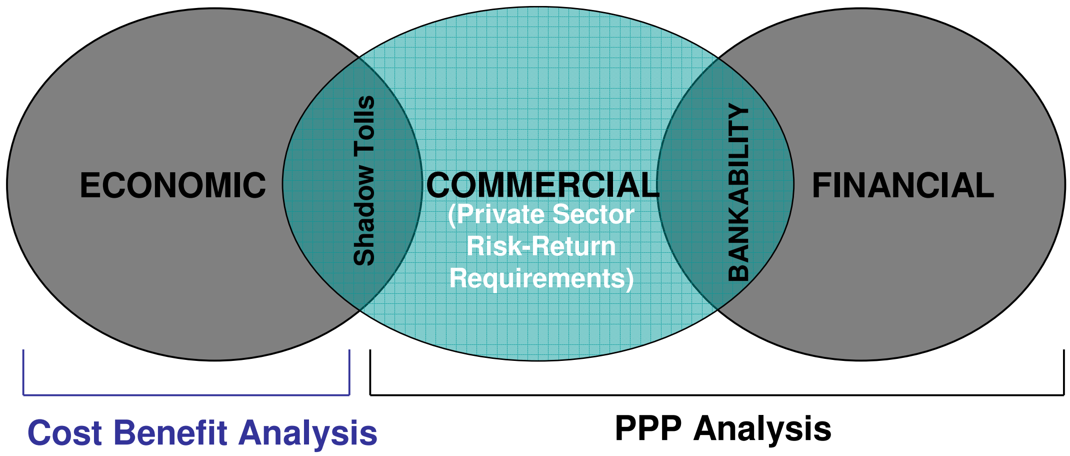
3.1.9 Recommended Next Steps

The key recommendation from the private sector finance perspective is that ACRL prepares a brochure or information memorandum on the results of the feasibility work for the project and proceeds into a more formal process of market soundings in respect of private sector investment appetite.

In parallel with this, it is recommended that ACRL gives thought to the type of procurement process which it may follow in order to seek and procure one or more private sector partners.

3.2 BANKABILITY

This section assesses the bankability of the Alaskan Canada Railway Project. The bankability analysis is different to an economic cost-benefit analysis, or a commercial analysis.



Economic Cost-benefit analysis looks at the full benefits obtained from the Rail project. This is the broadest of the three analyses. It includes the value of potential profit and also the wider economic benefits of increased employment associated with the railway, economic development stimulated by the railway, taxes and royalties received by Government, and positive and negative externalities associated with the railway which can include decreased pollution and increased road safety.

Commercial analysis looks at the commercial viability of the railway. This takes into account costs and revenues of the railway, the time value of money, and required rates of return of standard investors. This analysis does not include any benefits attributable to the Government or any other parties except for the railroad. This analysis also does not take into account the risk aversion of private sector investors.

The bankability/financial analysis looks at the same aspects as the commercial analysis but from the point of view of an actual private sector investor. Private sector investors need a high degree of certainty in the value and timing of the cash flows. The requirement of higher certainty in the revenues means that some revenues which are included in the commercial analysis such as Tier 2 and Tier 3 are not included in Financial Analysis as this revenue would be considered too risky for the private sector to invest in.

Generally, bankability can be defined as the ability of the Project to service principal and interest on debt and provide adequate yield and total return to equity investors over reasonable commercial time frame and with a reasonable degree of confidence.

For a project to be bankable, investors must have a high degree of confidence in the estimates of the revenues, operating costs, capital costs and other factors which may have an impact on the viability of the business including potential competitor reactions.

Only the Tier 1 revenue for the ACRL railway is considered potentially bankable and is used in the bankability analysis.

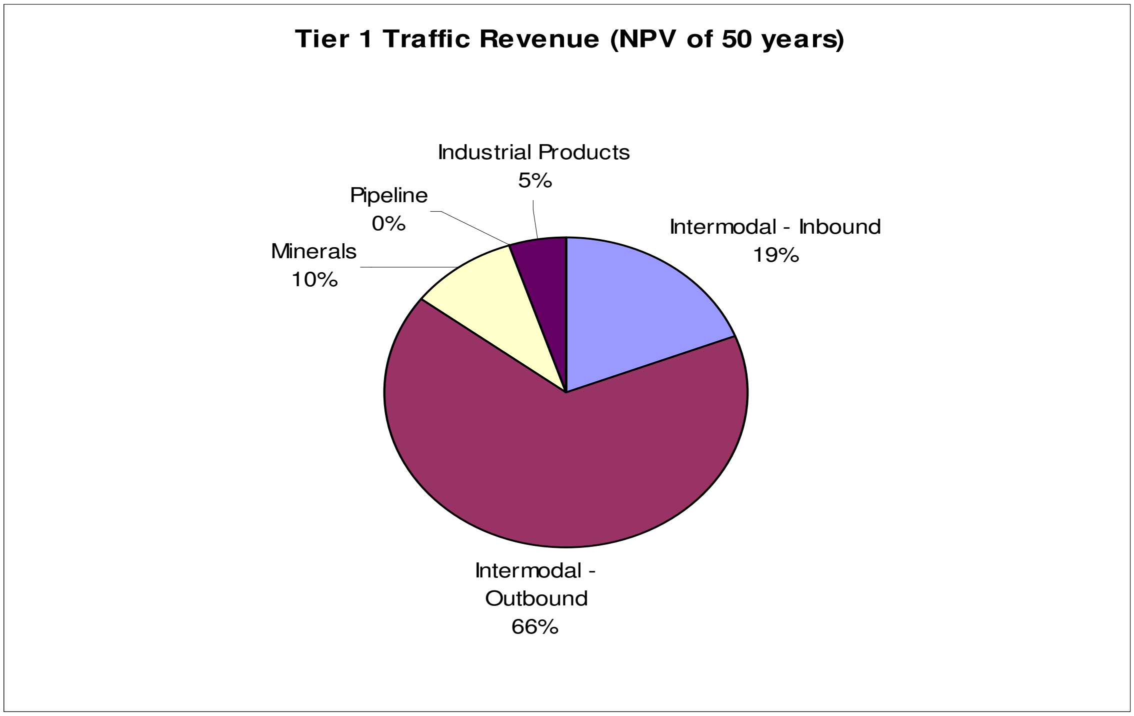
3.2.1 Revenue

The potential traffic for the ACRL railway has been classified in three tiers. Tier 1 traffic is the traffic outlined in the QGI studies plus additional outbound intermodal traffic. The Tier 2 traffic and Tier 3 traffic have a lower probability of occurring, and therefore are not included in the Bankability analysis.

Tier 1 Traffic Breakdown

	Tons	Revenue per Ton	NPV of Revenue	Percent of Revenue
	million	*$USD*	*$USD*	%
Intermodal	334	72	9,725	85%
Bulk Minerals	83	20	1,094	10%
Industrial Products	54	17	557	5%
Pipeline Traffic[7]	1.4	15	17	0.2%

[7] Industrial product traffic due to the construction of the pipeline are included in "Industrial Products"



For revenue of any category to be bankable there needs to be a high degree of certainty in the revenue, specifically; certainty of timing, certainty of volume and certainty of margins.

The certainty of the timing of the revenue is impacted by a number of factors including the risk that the construction is not completed on time. If construction completion is delayed, operating revenue is delayed and the debt cannot be repaid. This risk is discussed in the Section 14.2.2.

Certainty of margins is dependent on both the estimated revenue and estimated costs. The bankability of the operating costs will be discussed in the Section 14.2.1 and is assumed to be constant across all revenue groups.

3.2.1.1 Intermodal Revenue

Tier 1 intermodal traffic is divided into two main categories: inbound and outbound. Inbound intermodal traffic consists of general merchandise being transferred to Alaska. Outbound intermodal refers to intermodal traffic transporting goods out of Alaska. Intermodal traffic was a key driver to the development of the Alice to Darwin rail link in Australia.

3.2.1.1.1 Inbound intermodal traffic

Inbound intermodal traffic is the intermodal traffic identified by the QGI reports. It is primarily based on the assumption that the railway is able to capture some of the current traffic of goods which are transported from the mainland US to Alaska. Currently the majority of the goods are transported by barge from Seattle/Tacoma to Alaska. Only a small proportion of intermodal traffic is currently serviced by truck. It is assumed that the ACRL railway will be able to provide transportation service for rates which are competitive with the current transportation options and will capture 50% of the current intermodal traffic.

Certainty of Timing
The timing of the intermodal traffic is uncertain. It will take time for the customers to transfer from their current mode of transport to the ACRL railway, even if the rail option provides a cheaper and quicker service. Generally goods companies outsource their transportation to logistic companies. These logistic companies will need to relocate warehouses from the Seattle area to other areas on the CN network for the ACRL railway to win their business. It is assumed that there will be a five year ramp up period, with 20 percent of the inbound intermodal traffic coming on line each year. However, it is difficult to predict the ramp up period.

Certainty of Volume
The volume of inbound intermodal traffic is dependant on the total amount of goods being transported to and from Alaska as well as on the ability of the railway to gain market share.

The total volume of goods being transported to Alaska and the Yukon is relatively certain for the short term. It is assumed that there is no total volume growth over the long term.

The ability of the ACRL railway to gain market share of the intermodal traffic will depend on competitiveness of the rates charged per ton compared with the current modes of transportation. Although it can be determined if the railway is competitive compared to current rates charged by its competitors, it is unknown what the competitive reaction of the current market participants will be. This reaction is difficult to predict given the current market domination of the barge transporters. It is assumed only 50 percent of the existing resupply volume is expected to be captured.

Certainty of Revenue
Margins in intermodal traffic are generally low. The rates that can be charged will depend heavily on the competitive reaction of the current intermodal businesses. The current barge businesses are likely to lower prices; however, it is unknown how substantially the businesses can lower their prices while remaining profitable. The cost of rail transport will also have to be low enough to encourage the logistic operations to move their businesses to an area on the CN network.

Current Status
The intermodal revenues are not currently bankable. For this revenue to become bankable there will need to be support from an existing shipping operator, such as CN, who owns one of the connecting rail links and a rail barge businesses transporting goods from Seattle to Alaska.

Once the rail is built and there is evidence that logistic companies are using the railway, or will use the railway, the revenue will become bankable.

3.2.1.1.2 Outbound intermodal traffic – Land bridging

Outbound intermodal traffic is also referred to as "land bridging" traffic. It refers to the opportunity to capture revenue streams for the railway from attracting sea freight to use Alaskan ports, instead of other US and Canadian ports. ACRL would provide the opportunity to move this freight south to US and Canadian markets outside of Alaska and Yukon.

It is anticipated that any such landbridging traffic would be primarily inbound containerized traffic from Asia destined for US Midwest or east coast markets.

A study of landbridging opportunities for the ACRL was not complete when this report was written. There are a number of opportunities being considered in this area, including the development of a container terminal at the Port of Prince Rupert and a new container terminal in Mexico.

Landbridging was also part of the "blue sky" rationale for both public and private sector investment in the Alice–Darwin railway in Australia, although to date results in this area have been disappointing.
At the macro economic level, landbridging has a number of attractive features:

- There is currently an unprecedented rate of growth of containerized traffic from Asia and well documented capacity and congestion problems at the US and Canadian west coast ports. These congestion issues are related to both port and railroad capacity;
- Greenfield port and rail developments outside heavily built up urban areas can be more efficiently planned and improve operational effectiveness;
- Northern ports are significantly closer to Asia on the Great Circle Shipping routes saving several days in ship transit time.

However, these macro economic benefits are offset by several challenges:

- Major ports have traditionally developed in significant origin–destination markets, where the hinterland of the port generates significant import and export volumes. The case for large landbridging or transhipment ports is largely unproven in practice.
- The main reason seems to be the lack of backhaul freight at transhipment ports. The flow of freight volume is overwhelmingly inbound from Asia but both rail and shipping carriers need outbound backhaul freight to improve their transport economics. Due to the generally lower economic value of such backhaul freight it is more difficult to transport it long distances to a landbridge port and instead much backhaul is generated by the local market.

- A further issue is the economies of scale of container shipping lines which rely on making a limited number of port calls where they can offload substantial volumes. Hence a new northern landbridge port would need to achieve significant critical mass early in order to attract a rescheduling of shipping routes.
- As a result of these challenges it is unlikely that a private sector investor would make a significant investment in ACRL on the basis of landbridging opportunities. It is likely that investors will look closely at the experience of Port of Prince Rupert which enjoys significant advantages over more northerly landbridging opportunities because of geography and its already well developed port and rail infrastructure. Phase 1 of container development at Prince Rupert has commenced but is relatively small. Phase 2 which is intended to expand capacity to over 1m TEU's will provide a better test case for appetite for northern landbridging. This is due to commence development shortly. It will be essential for major shipping lines, port operators and rail providers to make a commitment to this expansion and this commitment is not yet apparent. It is likely that the full landbridging potential of Prince Rupert will not be apparent for a decade and that further investment in more northerly opportunities would not be committed until this has occurred.

However, over the long term and following construction of ACRL it is likely that landbridging opportunities may present themselves and enhance the commercial and economic (if not the short term financial) viability of the project.

Current Status
This traffic is not bankable as is due to the absence of research into this line traffic. To assess the bankablilty with respect to certainty of timing, volume and revenue an initial high level feasibility study needs to be conducted.

3.2.1.2 Bulk Minerals

The bulk minerals traffic forecasts for Tier 1 come from the QGI reports. This traffic accounts for 10 percent of Tier 1 revenue. The predicted traffic comes from assuming that mineral deposits will be developed in the future. The development of the mines depends on a large number of external factors exogenous to the development of the railway including world commodity prices, elasticity of supply of the commodity prices, and regional factors including the availability of power for the mines. These issues are outlined in QGI reports.

The advantage of mineral traffic over other types of traffic is that mining operations often have tight supply schedules to keep with their customers who use the good in their supply chain. Consequently, reliability of transport is vital for both the mining operator and the purchaser of the minerals. As such, mines are likely to enter into take or pay contracts with the railway. These long-term take or pay contracts substantially enhance the bankability of the traffic.

Certainty of Timing
The timing of the bulk mineral traffic is highly uncertain; however it is likely that the mines will be developed at some time in the future. Without discussions between ACRL railway and mining developers it will be difficult to determine the timing of this development. The development of mining operations and the railway is also somewhat a chicken and egg. The mines will not be developed unless there is an economic transport option available to transport the minerals; however it is difficult to develop a railway without any existing customers.

The Alice-Darwin railway in Australia was developed with the assumptions that providing an economic form of transport would help facilitate bulk mineral development. In reality the development of the mining operations had been slower than expected, however some mines have been developed.

The Model assumes the start up of the mines is staggered over a three years. This is a very aggressive assumption.

Certainty of Volume
The volume of bulk minerals transported is also uncertain as the exact sizes of the mine deposits are not known, and the volume of mineable tons at each mine is a function of the price of the mineral at the time of mining. Consequently, the actual amount of traffic will depend on prevailing economic conditions which are difficult to predict.

Certainty of Revenue
The price a railway is able to charge the mining companies is generally a function of the profitability of the mining operation, hence a function of the price of the mineral and costs associated with the mine, both of which are highly uncertain.

Current Status
Due to the uncertainty of the timing of the traffic, the revenue is not "bankable as is". However, mining operations generally require certainty in their transport arrangements and seek long term contracts for transporting their products. "Take or Pay" contracts could be entered into with the mining operators, even when the mines are in the development stage. With these take or pay contracts in place, the uncertainty associated with the volume and revenue is negated at least in the short term. These contracts make revenue bankable.

3.2.1.2.1 Iron Ore

The iron ore deposit in the Yukon is one of the largest iron ore deposits in the world. There are potentially 28 million revenue tons annually per year in iron ore which could be transported on the railway. None of this potential traffic is accounted for in the bankability analysis.

Section 17.4 outlines the potential of Yukon Iron Ore in the phased route option.

3.2.1.3 Industrial Products

The Industrial Product traffic is the traffic associated with the movement of industrial products for the construction and ongoing operation of the mines and the construction of the pipeline. The traffic forecasts for Tier 1 industrial products are taken from the QGI reports.

Certainty of Timing
The Industrial Product traffic is dependant on the mining development; therefore the certainty of the timing of the industrial products traffic has the same risk characteristics as the timing of the bulk mineral traffic discussed above.

Certainty of Volume
The volume associated with Industrial Products is related to whether or not the mines are developed. If the mines are developed there should be high certainty of volume unless there are major changes in the mining technology.

Certainty of Revenue
The price the railway is able to charge the mines will be dependent on the profitability of the mines, as with the bulk mineral traffic discussed above.

Current Status
The bankability of this revenue is dependent on the probability of the mines being developed. This revenue should be bankable if the mines are developed.

3.2.1.4 Pipeline Traffic

Pipeline traffic refers to the traffic volume associated with the construction of the Alaska and McKenzie Gas pipelines. The revenue associated with the pipeline is small; however it would occur in the early years of the project, where other revenues are most risky. Therefore it is proportionately more important to bankability than the NPV of the revenue indicates.

Certainty of Timing
The timing of the construction of the Pipeline is uncertain. There is the risk that the pipeline will be built before the rail is operating and in this case there will be no traffic volume associated with the pipeline. Similarly, the timing of the pipeline revenue is more sensitive than other revenues to the timing of construction of the rail project.

Certainty of Volume
The estimations of the volume of traffic are likely to be accurate.

Certainty of Revenue
Estimated revenue for the pipeline appears to be reasonable.

Current Status
Once the timing of the construction of the pipeline is known, and it is planned to be constructed after the railway, the pipeline revenues should be bankable.

3.2.2 Bankability of Cost Forecasts

The reliability of the cost estimates is equally important in determining the bankability of the Project as revenues. For this analysis the operating costs associated with each type of revenue were not analysed individually.

The capital and operating costs for the Project are generally appropriate for the stage of development of the project. However there are some weaknesses which need to be investigated further.

3.2.2.1 Operating Costs

The operating costs (inclusive of ongoing capital expenditure), for the ACRL railway excluding depreciation, are 1.8 cents per ton mile. This indicates an efficient, low cost railway, with operating costs per ton mile at the low end compared to operating costs per ton mile of Class 1 railways in North America which have decades of operating experience. This is partly due to the new track requiring less maintenance than other rail ways. The ACRL railway costs per ton mile need to be verified, as private sector investors will query their validity due to lack of sufficient evidence behind the estimate as they may appear to be too low.

3.2.2.2 Design Build Costs

The cost of the design build project is vital in the bankability of the Project. Currently the full rail route is estimated at $11.0 billion (2006 USD); therefore small percentage differences have a material impact. At this stage of the Project it is likely that this number will change by plus or minus 25 percent.

The accuracy of the construction schedule is key to bankability. If the Project is late in completing construction and the start of traffic is delayed there will be no revenue to pay the interest on debt, let alone equity return. The current assumption that construction of the entire railway will only take two years is ambitious compared to other projects, especially with the skilled labour shortages which are currently being experienced in Western Canada and if the seasonality of the work due to climate are taken into consideration. The construction schedule needs further analysis to ensure this it is realistic.

3.3 PRIVATE SECTOR INVESTORS

3.3.1 Types of Investors

Three different types of "investors" have been analyzed to determine the maximum potential investment in the railways. The investors are used as proxies for different return requirements and leverage requirements. The three investors are:

- Traditional rail owner and operating investors
  - Class 1 rail investors; for example CN, BNSF
- Financial investors
  - Track Company
  - Operating Company
  - Rolling Stock Company
- Supply Chain investors
  - Large mining companies; for example BHP, Rio Tinto
  - Large intermediate users of the bulk mineral products; for example Mitsubishi, Mittal Steel

3.3.2 Class 1 Railway Investors

Class 1 railway investors are the traditional owner operators of long haul railways. These include companies such as Canadian National, Burlington Northern, Norfolk Southern, UP and Canadian Pacific. All these companies could be the potential investors; however such large scale capital investments from these types of companies are becoming increasingly rare.

Canadian National is one of the most likely investors as they own the track which would connect the ACRL rail to the North West.

A potential issue with this structure is that the owner of the railway can stop other companies from using the track, which may be of benefit to the owner as they are able to retain their monopoly position; however, it may not be of benefit to the users.

Financial Characteristics

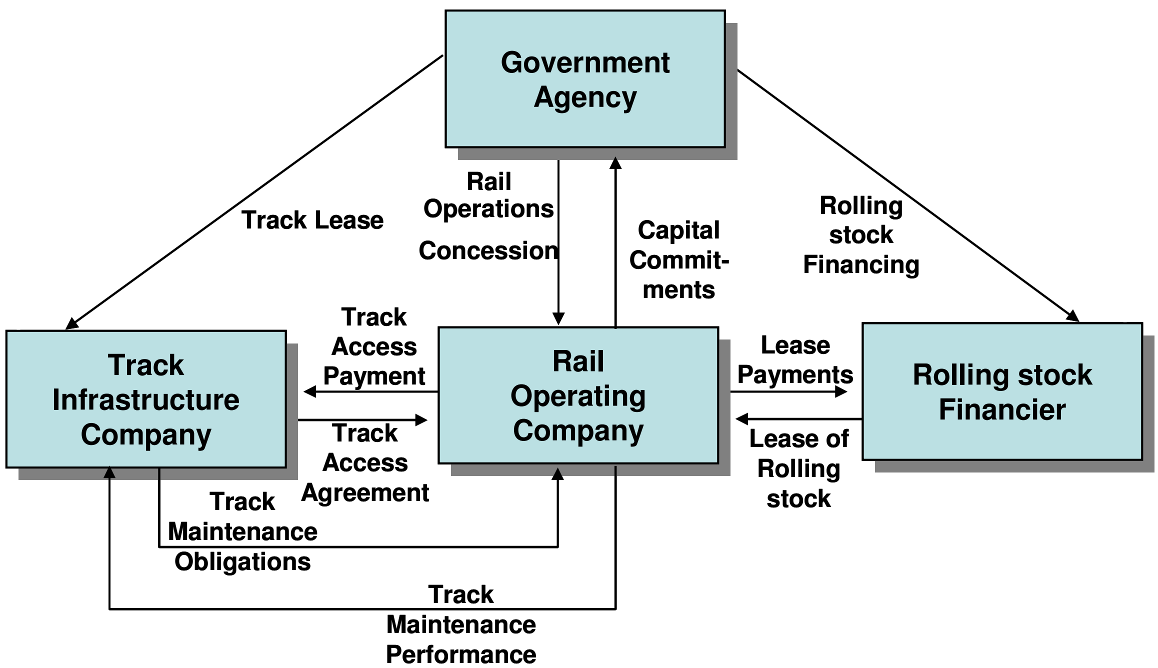
Financially, Class 1 Railways are characterized by moderate gearing levels of 40 percent. They usually have credit rating in the BBB range which generally translates to a margin of 2.5 percent on debt.

3.3.3 Financial Investor

A "financial Investor" refers to the structure where the railway operations/ownership is structured into three separate companies namely:

- Track Company (Financial Investor)
- Operating Company
- Rolling Stock Company

This structure is becoming more common as it can provide optimal results in terms of financing and utilization of the rail road. The structure is often used in Australia where the Track Company and the Operating Company have to be separated for regulatory reasons. The diagram below shows the relationships between the three companies and the Government Agency.



Track Company

The Track Company is responsible for the track. It owns the track or leases it under a long term contract from the Government and is responsible for the maintenance of the rail and limited other aspects of the railway.

The Track Company business is characterized financially by:

- Stable cash flows due to long term usage contracts
- Small variability in operating costs (actual traffic volumes do not have a large impact on operating costs)

These characteristics mean that the Track Company is a company with stable predictable cash flows, allowing a much greater percentage of debt to be injected into the project. This also makes the company attractive to financial investors with a low cost of capital.

Operating Company
The Operating Company is responsible for the running of the railway. This is often done by the traditional rail owners such as the Class 1 Railways or Short Line Operators.

The Operating Company will have a Track Access Agreement with the Track Company to ensure access to the track and pay regular access payments to the Track Company.

Rolling Stock
The Rolling Stock Company purchases the locomotives and leases them to the operating company. This is becoming common place in North America.

Financial Characteristics
Only the Track Company invests directly in the track. It is assumed the Track Company receives a percentage of the revenue Operation Company receives and pays for the rehabilitation of the track.

The Financial Investor typically has approximately 80 percent leverage. Because of the high level of debt, the total amount of private sector financing is highly sensitive to revenues available in the early years.

3.3.4 Supply Chain Investors

Supply Chain Investors are investors who have an interest in the commodities that the railway transports and they want to ensure reliable supply. The most likely supply chain investor in this case will be an investor with an interest in the large Yukon Iron Ore. There is the possibility that a transportation company, interested in developing the land bridging opportunity would also invest strategically.

For the Supply Chain Investor securing reliable supply is paramount especially as more companies move to “just in time” inventory systems. This means delays in transportation or derailments can have significant financial implications.

Financial Characteristics
Companies which are large users steel or manufactures of steel, such as BHP, Rio Tinto, Mitsubishi, or Mittal Steal, may be suitable Supply Chain Investors. These companies typically have leverage of approximately 35 percent and are highly rated giving them a low cost of debt. Equity returns for this category of companies are currently very high due to the current commodities boom. For the purpose of this analysis it is assumed that the Investor would require a lower equity return than they are current receiving due to the strategic benefits of the rail investment.

3.4 PRIVATE SECTOR PARTICIPATION AND FUNDING GAP

On the assumption that the bankability issues associated with costs, revenues and planning issues can be resolved without materially altering the economics of the Project, we calculate that the Project could support between a low range of $2.1 billion of private sector capital and a high range of $4.4 billion. The actual appetite of investors this investment has not been determined.

This level of private sector investment capacity leaves a significant funding gap, which would need to be supported by the public sector. The funding gap would be between a low range of $6.7 billion and a high range of $9.0 billion. Funding gap is calculated as the difference between (initial capital costs + interest during construction plus + start up costs) and the private sector participation.

The funding gap can also be considered as a revenue gap, representing the amount of revenue (assuming no change in cost) that would be required to cover the full capital costs of the railway. The revenue gap varies between $360 million per year and $1,200 million per year depending on the cost of capital of the investor.

3.4.1 Financial Assumptions

Assumptions regarding the financing characteristics of each investor were determined to evaluate the maximum amount of private funding available.

All Tier 1 revenue is bankable: Although it is not currently bankable "as is", with some work it could be bankable. Assuming this also provides a starting point for future analysis when more certainty in the revenues and costs are known.

Inflation: Revenues and cost increase by two percent each year due to inflation. Note the Innovative cost model does not include an inflation assumption.

Financial Assumptions: The following financial assumptions are based on the industry average for each type of investor:

- Equity return plus a greenfields premium to account for the additional risk
- Debt margin[8] based on average credit ratings of projects
- Leverage[9]

[8] The percentage above the base interest rate the investor must pay in interest

[9] Leverage refers to the percentage of debt of private financing

Summary of Investor Financial Requirements

	Class 1 Railway	Financial Investor	Supply Chain Investor
	%	%	%
Required Equity Return	17	10	12
Base Interest Rate	4.7	4.7	4.7
Margin on Debt	2.5	1.0	1.0
Total Cost of Debt	7.2	5.7	5.7
Leverage	40	80	35

Debt Tenor

The financial model is a 50 year model, however it is unrealistic to assume to debt to be amortized over 50 years. The debt is initially assumed to be 30 years length post construction completion with the debt being refinanced at year 20 for the remaining 30 years. Effectively, this means that the principal and interest repayment is higher for the first 20 years than for the remainder of the project.

Interest is assumed to be capitalized during construction, and debt is amortized from two years post construction completion, four years from the start of construction.

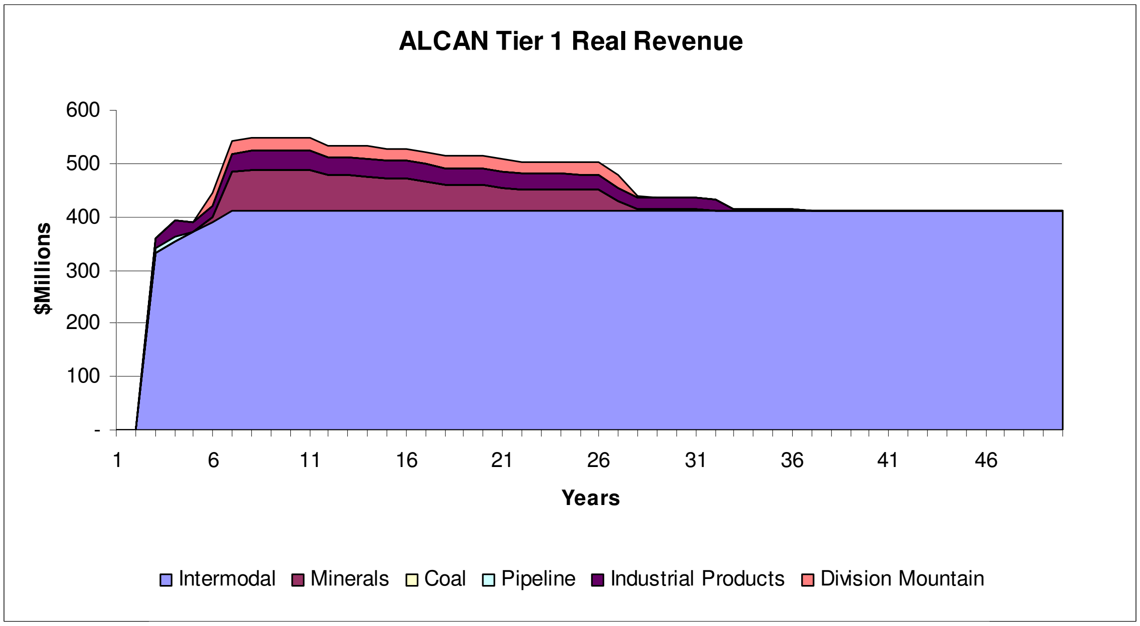
Access to Revenue

Operating and maintenance cost have priority to revenue, then debt service. The remainder of the cash flow is then available for the equity holders.

In the case of the Financial Investor, the Operating Company has access to revenue earns a 20 percent margin on its costs, the remained of the revenue then flows to the Track Company to cover track rehabilitation expenses and service debt and equity.

3.4.2 Overview of Full Route Private Sector Investors

The full route analysis assumes the full route railway is built over a two year period. On the full route the majority (85 percent) of the traffic travels from Hazelton to Delta Junction or visa versa, as almost 100 percent of the intermodal traffic is transported this full distance. Only a small amount of traffic travels on an individual segment. The bulk minerals fall into this category, with the Division Mountain coal being transported Braeburn to Skagway.



The revenue gap is calculated by determining the amount of revenue which would be required to cover the full capital costs of the railway, given the capital structure of the investor. The revenue is assumed to be constant in real dollars over the life of the project. It is inflated at the same rate as the actual revenue. In the case of the financial investor, all the additional revenue flows to the financial investor.

Class 1 Railway

A traditional Class 1 rail investor would be able to support private investment of $2.1 billion, comprising of $870 million in debt and $1.3 billion in equity. To cover the full capital cost of the railway with the existing traffic, the ACRL railway would require $1.2 billion annually in additional revenue, or price outbound intermodal traffic at approximately $6,000 per container.

Financial Investor

A financial investor would theoretically be able to invest $4.6 billion in the railway, leaving a funding gap of only $6.7 billion. A financial investor is able to make a large investment due to their low cost of capital, though high leverage which they are able to maintain due to smooth cash flows. To cover the full capital costs of the railway, the outbound intermodal traffic would need to be priced at approximately $2,700 per container.

If the revenue had a more variable profile, or had a longer ramp up period, the amount of debt may be constrained at different time periods and the financial investor may not be able to invest as much as a supply chain or a Class 1 rail investor.

Supply Chain Investor
Given the traffic forecast a Supply chain investor would be able to invest $3.5 billion, $1.2 billion of debt and $2.3 billion of equity. However in this case where the intermodal traffic is the core traffic of the railway; it is less likely that there would be a Supply chain investor interested in the investment. An additional $654 million annually in revenue is required for the railway to cover the capital investment. This is equivalent to outbound container traffic revenue being priced at over $3,900 per container.

Summary Table

	Private Sector Participation	Funding Gap	Revenue Gap Annual	Multiple of current rates required to achieve revenue gap
Class 1 Railway	$2.1 billion	$9.0 billion	$1,200 million	3.2x
Financial Investor	$4.4 billion	$6.7 billion	$360 million	1.7x
Supply Chain Investor	$3.4 billion	$7.7 billion	$654 million	2.2x

3.5 PHASED INVESTMENT ANALYSIS

Building the full route railway at once will be logistically difficult and will require an extremely large amount of capital upfront. This amount of capital would put strains on capital market and equity participants. Building the railway in segments allows the large injections of capital to be spread over time and may provide comfort to the lenders that the construction schedule will be met.

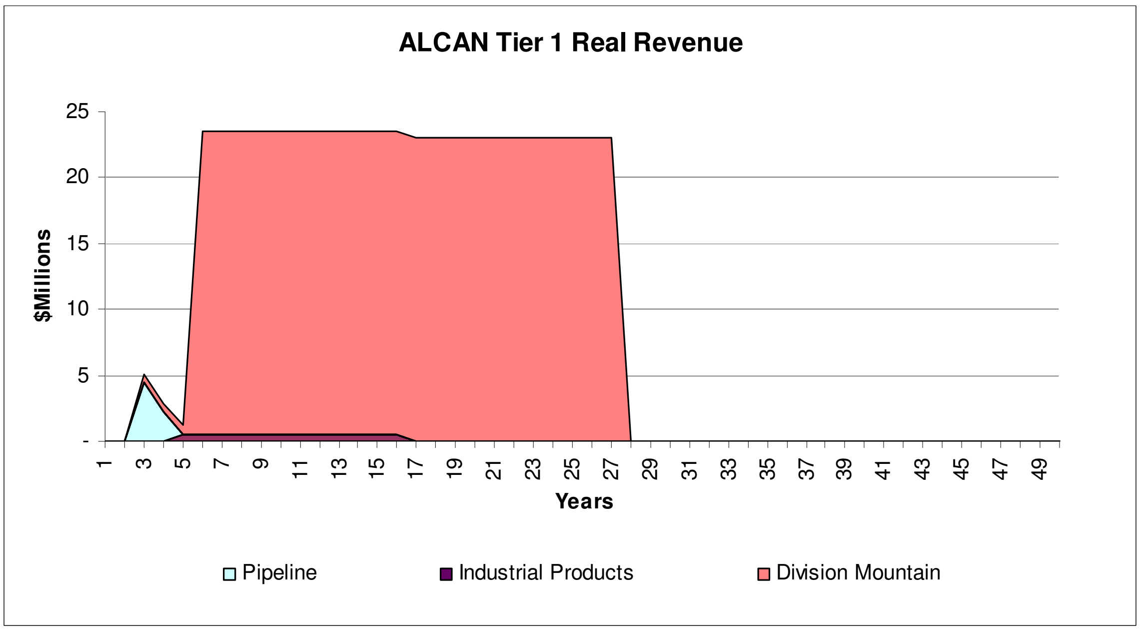
After the first phase is built there is a potential for the revenue that was previously not bankable to become bankable. Mines may be developed with the anticipation that the rail will be built with the previously build section giving confidence to the process.

However, as the intermodal traffic is currently assumed to be the key driver of the ACRL railway, with the majority of the traffic traveling the full north to south leg. If only one segment is built, it is unlikely that any of the inbound or outbound intermodal traffic would be captured. For this reason the phased investment option looks worse than it may be in reality if the Yukon Iron Ore traffic materializes. Minerals in particular are unlikely to use a full route, as generally they are simply transported to the closest tide water and could greatly enhance the economics of a phased investment. The impact of the Yukon Iron Ore on a phased investment is discussed below. This scenario provides further rationale for a phased investment.

3.5.1 Carmacks to Skagway

In the phased option from Carmacks to Skagway, the primary source of traffic is from the Divisions Mountain mine. The graph below outlines the source and timing of the Tier 1 revenue for the Carmacks to Skagway phased option. The railway covers its operating costs in years 7 to 27.

Due to the different revenue profile for the phased investments, private sector debt is assumed to be capitalizing interest until year 7, and is amortized from year 7 to 26. This long interest capitalization period is a very aggressive assumption.



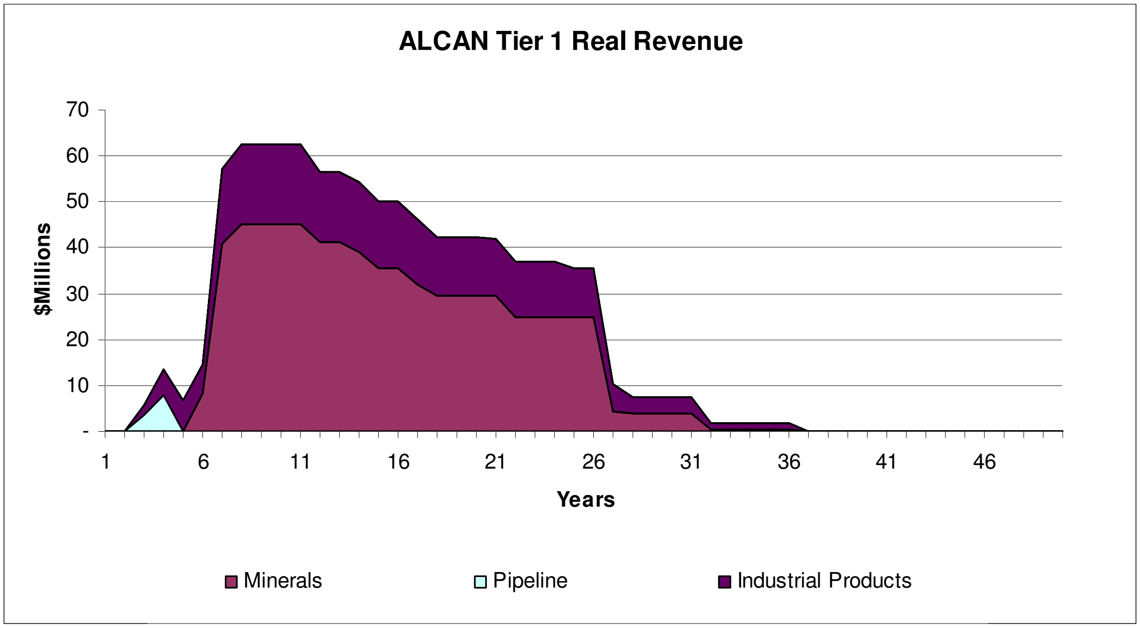
Private sector investors would only be able to contribute between $32 million and $72 million in this option; however, there are substantially lower capital and start up costs for this option, resulting in a funding gap of between $617 and $657 million.

Summary Table

	Private Sector Participation	Funding Gap	Revenue Gap – Annual
Class 1 Railway	$32 million	$657 million	$94 million
Financial Investor	$72 million	$617 million	$35 million
Strategic Investor	$55 million	$633 million	$59 million

3.5.2 Carmacks to Hazelton

In the phased investment option Carmacks to Hazelton, the traffic consists primarily of bulk minerals. This low volume of traffic covers its operating costs from years 7 to 26. However, the maintenance capital expenditure is not always covered over this time period. Only between years 8 and 13 are the operating and maintenance costs covered by the revenue. Because of this very short time period it is assumed that there is no private sector participation in scenario.



3.5.3 Carmacks to Delta Junction

In the phased option of Carmacks to Delta Junction, the only Tier 1 traffic on this line is the Pipeline traffic. This traffic only occurs for one year. Because of the extremely limited traffic in this case there would be no private sector investment.

3.5.4 Yukon Iron Ore

When evaluating the phased investment the Yukon Iron Ore should be considered. If it is likely the mine will be developed in the near future the segment which transports the iron ore to port should be build first. Depending on the amount the mine is able to pay for transport costs and the port which the iron ore is exported out of, the traffic could fund a significant portion of the capital costs. Operating costs in this segment include ongoing capital expenditure.

3.5.4.1 Skagway/Haines

The port closest to the Yukon Iron Ore deposit is Skagway, however the current track to Skagway requires significant capital improvements to carry the expected 28 million tons per year and the port cannot handle the volume of iron ore.

If a track to Haines was built and a bulk handling port was developed simultaneously, it would cost $2.10 per ton in operating cost to transport the iron ore from Carmacks to Haines. To cover the operating costs and initial capital investment (excluding the costs of the port development) $13 per ton would need to be charged assuming a Supply Chain investor.

3.5.4.2 Port McKenzie

If the iron ore was exported out of Port McKenzie, it would be transported from Carmacks to Delta Junction on the ACRL railway. On this route it would cost $2.50 per ton in operating costs, and if this traffic was to cover the capital costs of building the Carmacks to Delta Junction segment $15 per ton would be required to cover the capital cost assuming a Supply Chain investor

This does not take into account the amount that it would cost to transport the iron ore from Delta Junction to Port McKenzie.

3.5.4.3 Port of Prince Rupert

To ship the iron ore to Port of Prince Rupert, it would cost $4.30 per ton in operating costs on the ACRL railway from Carmacks to Hazelton. To cover the capital costs of building this section and the operating costs of transporting the iron ore, $33 per ton would need to be charged, assuming a Supply Chain investor.

From Hazelton the iron ore would be transported on CN's track to Port of Prince Rupert. This cost has not been taken into account.

Summary Table

	Operating cost per ton	Operating cost per ton mile	Capital and operating cost recover
	$ ton	$ ton mile	$ ton
Carmacks – Haines	$2.10	$0.012	$13
Carmacks - Delta Junction	$2.50	$0.010	$15
Carmacks – Hazelton	$4.30	$0.008	$33

3.5.5 2nd Phase

After the initial phase is built, additional private sector investment will be able to be contributed at the second phase. If initially either Carmacks to Hazelton or Carmacks to Delta Junction is built, building a second phase connecting Hazelton to Delta Junction would allow the inbound and out bound intermodal traffic. If this traffic is bankable it could bring significant new private investment. The amount of private sector investment is likely to be only marginally lower than the amount of private sector investment outlined in the full route option, where the intermodal is the key driver to the private sector investment.

In the case where there is the Yukon Iron Ore and intermodal on the same track segments the density of the traffic is high for a single track railway. In this situation capital costs and some operating costs may be marginally higher than indicated in the financial model.

3.6 INSTITUTIONAL STRUCTURE FOR THE RAILROAD

Institutional structure refers to the overall ownership and regulatory environment associated with ACRL.

This is important as different ownership and regulatory structures will have differing outcomes in respect to protecting the public sector interest in the Project and in determining the appetite of different types of private sector investors for the Project.

We anticipate that ACRL would be regulated by The US Surface Transportation Board and by Transport Canada as applicable in accordance with standards applied to all other similar railroads. However, if delivery of the Project includes a private sector partner it would be reasonable to expect that the concession agreement governing this Public Private Partnership would also include various contractual provisions designed to protect the public interest.

Broadly speaking railroads in North America are owned and operated as vertically integrated entities. In other words the same party owns and maintains the track infrastructure and runs the above rail operations. Railroad owners tend to use this vertical integration to limit the use of their track and other infrastructure by competitors. This does not always maximize utilization of the assets. Generally, other operators are granted access to track through running rights. Such running rights typically grant less favorable rights to a party that does not own the underlying infrastructure.

Other countries have taken a different approach. Australia, in particular, rigorously separates economic ownership of below rail (track) and above rail (operations) to ensure open access on equal terms to all operators.

Some of the financing structures analyzed in this report envisage separate investment in and ownership of different components of the infrastructure. Financial investors will generally seek to maximize utilization of assets even at the expense of competing operators on the track. Railroad and Supply Chain Investors on the other hand will identify most value if competitor access to the track is as limited as possible. Hence the choice of institutional structure will have an impact on both the types of investors interested in the Project and their appetite for investment.

Potential broad institutional structures which may be appropriate for ACRL include:

- Outright ownership of the project by a private sector investor or consortium on a vertically integrated basis. Given the level of public sector contribution likely to be required to deliver the Project, we consider this to be an unlikely structure.

- Ownership of the Project by a public sector agency with a long term lease on a vertically integrated basis to a private sector investor or consortium.
- Ownership of the right of way and/or track work associated with the Project by a public sector agency with a long term lease to a private sector investor or consortium which then makes investments in operating assets to create a vertically integrated railroad.
- Ownership of the right of way and/or track work associated with the Project by a public sector agency which then grants operating concessions on a non-exclusive basis to separate private sector parties for different geographic elements of the Project or different commodity markets. Alternatively the concession terms could include "open access" provisions.

It is beyond the scope of this report to provide a detailed analysis of the advantages and disadvantages of these institutional structures from the public sector perspective. Preliminary indications of the potential effects on investment appetite are provided in the financial analysis. It is recommended that further consideration is given to these issues early in progressing the project to the next stage.

3.7 MECHANISMS TO BRIDGE THE FUNDING GAP

There are a number of different mechanisms which could be used to bridge the private sector funding gap using public sector capital or risk support.
These include:

- Capital grants during the construction period
- Operating period performance payments
- Revenue shortfall guarantees
- Subordinated debt instruments
- Subordinated equity instruments
- Contribution of existing assets
- Taxation incentives

Each of these are addressed in turn below.

3.7.1 Capital Grants

Capital grants are the most commonly used method of public sector support for infrastructure projects in both the US and Canada. They represent the "cheapest" source of finance for the project as they carry no interest rate, repayment obligation or return requirement.

For this reason public sector capital grants are frequently contributed upfront and are the first source of finance drawn for development and construction activities. This reduces the cost of other forms of finance both by deferring drawdown (and thereby reducing interest during construction) and decreasing the risk of other sources of finance.

Upfront contribution typically matches well with federal government budget processes. Capital grants are also typically associated with specific components of the assets comprising the project. For example the public sector may own the right of way and the track bed improvements, leaving the private sector to own and finance track work and/or operating assets.

However, upfront capital grants are "dead" money in respect of encouraging risk transfer to a private sector partner because they are sunk costs. A good example of this was the Channel Tunnel Rail Link project in the United Kingdom. Although significant private capital was promised for this project, the public sector contribution was contributed first. When difficulties were experienced in raising the private sector portion of the capital the government faced huge pressure to bail out the project because its investment was already sunk.

For these reasons best practices in Public Private Partnerships are tending to avoid upfront capital grants. Where grant contributions are required these tend to be drawn down pro-rata to private sector capital contributions against completed construction milestones, or in some cases only paid at the completion of construction (leaving the private sector to fund all construction costs on a short term basis).

Due to the scale of the likely required public sector contribution to ACRL and the significant development expenditures required before a private sector financial close could be achieved, it is likely that a significant proportion of any public sector support will need to be in the form of capital grants. Development expenditures will almost certainly need to be funded largely by the public sector. However, consideration should be given to balancing the increased costs of deferred capital contributions and the other forms of support described below with the significant improvements achievable in terms of risk transfer if a public private partnership delivery model is selected.

The base case analysis of the financial viability of the project described in this report is based on all public sector contributions contributed as upfront capital grants, as this is the simplest mechanism to understand. Sensitivity testing has also been run on alternative mechanisms of public sector support.

3.7.2 Operating Period Performance Payments

In contrast to capital grants during the construction period, PPP's are often structured based on a stream of operating period payments over the life of a private sector concession. These operating period payments can be contractually linked to the performance of the asset (for example the availability of track or number of train services run) and would be subject to abatement for poor performance and cancelled in the event the private sector partner defaults on its obligations or abandons the project. In contrast to capital grants, operating performance payments can be very effective drivers of risk transfer and can be structured precisely to achieve public sector objectives. Such payments are financed at a private sector cost of capital reflecting the level of performance risk transferred and the credit quality of the public sector agency guaranteeing the payments. The private sector also bears the full costs of interest during construction.

For these reasons operating performance payments are very effective for supporting specific public sector objectives (for example provision of a minimum freight service level on the railroad or provision of an uneconomic passenger service). Care must be taken to ensure they do not conflict with the commercial market based revenue streams. For these reasons operating performance payments may have only limited application to the ACRL Project.

An exception could be "shadow" payments, which in some respects are more similar to the revenue shortfall guarantees described below. These are operating period payments linked to usage of the asset (rather than "availability" or performance), and reflect the difference between the commercial revenues available from traffic and their full economic costs or value. Shadow payments leave market risk substantially with the private sector partner and can more easily be adjusted or phased out as commercial revenue streams grow to reflect the full costs of service provision.

Recent examples of these types of structures in the North American market include the Richmond-Airport-Vancouver Rapid (RAVP) Transit Project (a mix of capital and operating contributions), the Sea-to-Sky Highway Improvement Project and the Edmonton Ring Road. Both RAVP and Sea-to-Sky have elements of shadow payments.

3.7.3 Revenue Shortfall Guarantees

Revenue shortfall guarantees provided by the public sector are similar to shadow payments described above except they are contingent liabilities rather than planned payment streams. Their use is appropriate when there is a reasonable likelihood of commercial revenue streams but sufficient uncertainty to limit the availability of private sector capital or make it prohibitively expensive. They also act to ensure that the public sector shares the same incentives as the private sector partner where the public sector has mechanisms to influence usage or revenue streams.

Examples of revenue shortfall guarantees include the Korean PPP road and rail program under which the government underwrites 90% of the usage risk and the Guangzhou-Shenzen – Zhuhai Superhighway in southern China.

Revenue shortfall guarantees credit enhance the revenue stream for private capital and reflect only a contingent liability for government. Typically they are challenging for the public sector budgetary processes as there is uncertainty whether they will or will not be called. Accordingly their use is recommended only where there is high confidence that the forecast revenue streams will materialize. If called revenue shortfall guarantees can then be transferred into grants or subordinated debt or equity instruments.

3.7.4 Subordinated Debt and Subordinated Equity instruments

A part of the Funding Gap comprises revenue streams which are reasonably commercially viable but because of their timing or risk uncertainty, cannot be efficiently financed in private sector financial markets at the outset of the Project. There are many examples of this in the ACRL Project including the intermodal revenue. Hence we believe that an element of public sector subordinated debt is likely to be an effective mechanism for partial bridging of the Funding Gap.

The contribution of subordinated debt (debt which ranks behind senior debt but ahead of equity) which has a lower cost and deferred interest and/or principal payments can be effective in bridging this gap and allowing additional debt to be raised in the early years of the Project. Sources of subordinated debt exist in private sector financial markets but are less likely to provide the combination of lower cost and extended repayment terms that a public sector contribution could have.

Correctly structured subordinated debt is effective as a risk transfer mechanism (because it ranks ahead of equity) and in avoiding distortion of the commercial features of the project because it requires a return and repayment. It does expose the public sector agency to the credit risk of the Project and accordingly requires careful analysis.

There are numerous examples of both preferential and subordinated debt, including:

- Access to the US tax exempt bond market, either through issuance of revenue bonds to support the Project by an exempt public sector agency or through the use of new Private Activity Bonds (introduced in SAFETEA-LU).
- Use of USDOT TIFIA financing which was successfully combined with private sector capital in the SR 125 toll road in San Diego, CA.

Subordinated equity instruments are a variant of subordinated debt and achieve effectively the same results except that the public sector contribution in this case ranks behind private sector equity. In this way they are akin to revenue upside sharing mechanisms which are common in PPP's structured with public sector capital grants. The advantage is that they provide a form of funding upfront. Care must be taken that such instruments have commercial viability (i.e.; are likely to be serviced and repaid at some point in time) and are not simply capital grants in disguise. For this reason government budgetary processes often have difficulty characterizing these types of instruments. Care must also be taken to ensure these instruments do not take away all of the upside for private sector capital (e.g.; through an absolute return cap) as this would have negative effects on incentives.

3.7.5 Contribution of Existing Assets

There are a number of existing assets which are essential to the success of the Project. These include:

- Land
- Some existing structures
- Port facilities
- Whitepass Yukon Railroad
- Alaska Railroad

These assets could support the Project through arms length contractual agreements with ACRL or by being integrated into the railway itself.

The contribution of existing assets can significantly improve the viability of the Project. Such asset contributions are akin to capital grants except where the asset has a strategic importance to the Project and/or generates cash flow surpluses of its own during the construction period. A recent example is the contribution by the Australian Federal government of the Tarcoola–Alice Springs railway to the private sector concessionaire building the Alice–Darwin railway. This allowed for both advanced planning and marketing of operational aspects of the railroad and cash flow contribution during the construction period.

It is also common for new infrastructure projects to be supported by land grants or other concessions beyond those necessary for the construction of the railroad itself. US and Canadian railroads were supported by significant land grants which the railroads developed to support capital investment and to benefit from the increased economic activity generated by their infrastructure investment. Modern examples of this are also common, including rapid transit rail in Hong Kong. No assessment has yet been conducted of the potential value of this form of support in the case of ACRL.

3.7.6 Taxation incentives

Taxation incentives are a common method of encouraging private sector infrastructure development and economic development. Given the scale of ACRL and the substantial taxation benefits which would be attached to private sector investment in the ordinary course, it is unlikely that these will form a substantial part of bridging the funding gap although attention to this will be very important around the margins of the project economics.

3.7.7 Upside Sharing and Recapturing the Value of Public Sector Investment

Public sector agencies will want to ensure that they recoup a portion of their contribution to the Project when and if it starts to generate a significant commercial surplus.

This can be achieved through a number of mechanisms including many of the contribution methods described above. However, given that it is likely that capital cost grant contributions will form a significant part of any decision to bridge the Funding Gap, it is useful to consider other mechanisms to ensure that the public sector shares in the commercial benefits.

Again there are a number of mechanisms which have been used in PPP structures. These include:

- Upside sharing mechanisms: where the public sector enjoys an increasing share of revenues over and above pre-determined volume, revenue or rate of return on investment targets. The most important feature of these mechanisms is that they need to be structured so that they do not distort commercial incentives and that they do not cap private sector returns at levels inappropriate for the downside risks that the private sector investor is taking.

- Sharing of re-financing gains: it is common for infrastructure projects such as ACRL to obtain significant benefits from the refinancing of debt once the Project is completed and demonstrating operating and revenue performance. It is common for a PPP concession to include provisions for the public sector partner to share in these refinancing gains. Again, it is important that these mechanisms are structured to avoid distortion of incentives and to take into account any refinancing which the private sector has relied upon as part of its initial investment decision.
- Concession Length: PPP's are structured with concessions of varying lengths which typically reflect the economic life of the underlying asset and the time taken to obtain a reasonable rate of return on the initial investment. The public sector can choose to take back ownership and control of the asset at the end of the concession or alternatively pretender a new concession for a concession fee. This can generate significant value for the public sector and the "residual value" at the end of the concession should be taken into account in any economic assessment of ACRL from a public sector perspective. The analysis for ACRL has been based on a 50 year concession, which seems reasonable given the scale and economic life of the project. Further consideration should be given to concession term as the project proceeds and both longer and shorter concession terms are possible. For example the Sea-to-Sky Highway has a 25 year concession whilst the Chicago Skyway has a 99 year concession.

4 PARTNERSHIPS BC QUALITATIVE ANALYSIS

4.1 INTRODUCTION – GOVERNMENT PERSPECTIVES

This section will highlight the crucial role for governments in the development of the ACRL. It will begin with a high level discussion of the broader goals of the various governments involved. Then a number of the key qualitative impacts will be discussed. This will be followed by a description of some of the actions that government could take to reduce the funding gap. The section will then outline the implications of a phased development of the ACRL. Finally the section will conclude with a discussion of potential next steps for governments to consider.

Much of the analysis discussed in this section draws upon the findings of Stage 1 consultants. The work conducted by the Macleod Institute, Information Insights, Informetrica, IRIS Environmental and HDR Engineering was used to develop and support the analysis described in this section.

The financial modeling work conducted by E&Y indicates that, with a discount rate of 5%, the full route option will result in a 74% recovery of the initial $10.5 billion in initial CAPEX. Furthermore, the work performed by MNAL indicated that, in their current stage of development, the revenue streams identified for the project would not attract private sector investment. This indicates that the governments involved would need to take a lead role in the development of the ACRL.

One must keep in mind that government takes a different perspective of the project than the private sector does. Governments have a much broader and longer term perspective of the project. Governments need to consider how the project will impact their broader objectives.

As shown in the economic impact analysis some of the broader economic implications of the ACRL could be quantified through a detailed cost-benefit analysis. However, there are a number of important impacts that cannot be quantified. It is important for governments to consider both the quantifiable and the non-quantifiable impacts when evaluating the ACRL project.

Caution must be made to ensure that impacts that are quantified in the economic analysis are not double counted in the qualitative analysis. Some of these impacts that have the potential to be double counted would include aspects of the qualitative analysis associated with economic development, other transportation providers and transportation infrastructure. Given that the quantitative analysis is at a somewhat preliminary stage, PBC felt it was appropriate to highlight these factors for consideration.

4.2 GOVERNMENT OBJECTIVES

One of the many complexities facing the ACRL is that the railroad passes through a number of different jurisdictions. These include; Canada, the United States of America, the State of Alaska, the Yukon territory and the province of British Columbia. Each of these jurisdictions has its own objectives that need to be considered in evaluating the ACRL project.

4.2.1 Regional Objectives

There are strong similarities in the objectives of the governments for the three jurisdiction through which the proposed ACRL would run. This is particularly true for the governments of Alaska and the Yukon.

Both Alaska and the Yukon governments are focused on improving their transportation systems and have a history of collaborating on transportation projects, such as the reconstruction of the north Alaska Highway and the Haines road. Alaska and the Yukon have set up a bilateral advisory committee specifically to address the development of the ACRL.

4.2.1.1 Alaska Objectives

Some of the key objectives of the Alaskan government that are relevant to the development of the ACRL include:

Development of transportation infrastructure. Alaska has made transportation infrastructure a priority. The government sees significant potential benefits to connecting its isolated communities to the rest of the state and the lower 48 states.

Importance of developing natural resources. In the 2006 State of the State address the key to Alaska's future is highlighted as being the responsible development of the state's natural resources.

Importance of private sector initiatives to economic development. The 2006 State of the State address highlighted development initiatives that created 13,600 new private sector jobs.

Pursuing a policy of fiscal prudence. In 2005 the State of Alaska generated a substantial budget surplus and the State has set funds aside in a budget reserve fund.

4.2.1.2 Yukon Objectives

Some of the key objectives that Yukon has that may be addressed through the development of the ACRL include:

Development of transportation infrastructure. Yukon has made transportation infrastructure a priority. With no direct access to an ice-free port, the Yukon is dependent on road infrastructure for the vast majority of its transportation needs. The lack of an inexpensive transportation alternative is considered a hindrance to economic development. Improved port access is an important aspect in the development of the Yukon transportation infrastructure and the Yukon government is participating in a Port Access Study as part of its strategy to improve transportation infrastructure.

Importance of developing natural resources. As stated in the 2006-2007 budget address, mining activity is seen as the driver of Yukon economic growth over the next ten years.

Importance of private sector initiatives to economic development. In the 2006-2007 budget address it is mentioned that the Yukon government will continue to invest in capital projects that promote the development of the private sector.

Pursuing a policy of fiscal prudence. The past two Yukon budgets have been surpluses and the Yukon is forecasting balanced budgets for next four years

4.2.1.3 British Columbia Objectives

The province of British Columbia has an interest in economic development opportunities in the interior of the province. Much like the Yukon and Alaska, B.C. sees mineral resource development as an important aspect of economic development in Northwest BC. There are several mines currently being considered for development that are located a relatively short distance from the proposed ACRL right-of-way. The economics of these mines would be enhanced by access to a lower cost transportation mode.

The B.C. government is also supporting the development of the Port of Prince Rupert and the supply chain that accesses the port. Development of the ACRL Hazelton to Watson Lake segment would provide utilization of the Port of Prince Rupert and the CN line that connects Prince Rupert to the rest of the B.C.'s rail network.

4.2.2 National Objectives

As a result of its size, the ACRL will require support from both the U.S. and Canadian federal governments. Both the U.S. and Canada have key objectives that are consistent with the development of the ACRL.

4.2.2.1 United States Objectives

The Federal Railroad Administration (FRA) within the Department of Transportation (DOT) is responsible for developing U.S. national railroad policy. The mission of the DOT is:

"To develop and administer policies and programs that contribute to providing fast, safe, efficient, and convenient transportation at the lowest cost consistent with the national objectives of general welfare, economic growth and stability, the security of the United States and the efficient use and conservation of the resources of the United States."

The ACRL would provide a direct rail link between Alaska and the lower 48 states that is relevant to many aspects of the DOT mission statement. Perhaps the element of key importance is that the ACRL will improve U.S. economic security by adding an alternative connection to Alaska that improves the efficiency of the supply chain between the lower 48 and Alaska.

As an important component of the national transportation infrastructure, the ACRL could be eligible for support from federal programs such as the Transportation Infrastructure Finance and Innovation Act (TIFIA). TIFA is a federal program that provides funding to surface transportation infrastructure projects that are of national or regional significance.

4.2.2.2 Canada Objectives

Transport Canada is responsible for developing and administering policies relating to the Canadian transportation system. On their website Transport Canada states that its mission is

"…to develop and administer policies, regulations and services for the best transportation system for Canada and Canadians — one that is safe and secure, efficient, affordable, integrated and environmentally friendly."

The development of the ACRL addresses many of the key issues highlighted in this mission statement. The ACRL would improve the safety and security of the transportation system in the Yukon and northwest British Columbia. The ACRL would also improve the efficiency and affordability of the overall transportation system and should help to better integrate the economy of the Yukon with the rest of Canada.

As a part of the Canadian transportation infrastructure, the ACRL could qualify for assistance from Infrastructure Canada. Two Infrastructure Canada programs that the ACRL may be eligible for include:

Canadian Strategic Infrastructure Fund. The CSIF provides funding to programs that are of major importance to economic growth and quality of life. One of the five specific categories of projects is highway and railroad infrastructure projects.

Border Infrastructure Fund. The BIF was created to support the initiatives in the Smart Borders Action Plan by reducing border congestion and expanding infrastructure capacity over the medium term.

4.3 QUALITATIVE IMPACTS

Detailed financial analysis is an important aspect of project evaluation. However, it doesn't necessarily capture the full value that a project may have to the public. It is important to consider how the development of the ACRL will impact the government's broader objectives.

As discussed in Ernst & Young's section, some of the broader impacts to the economy on the whole can be estimated through an economic impact study. This economic analysis could be further developed through an in-depth economic cost-benefit analysis. However, there are still a number of important factors that are difficult to quantify that won't be fully captured and quantified by this analysis.

These factors are discussed in this section and include:

- Economic Development
- North American Integration
- Environmental
- Transportation Safety
- Transportation System Reliability
- Other Transportation providers
- Other Transportation Infrastructure
- Social
- First Nations and Alaska Native Corporations

The evaluation of these factors is based on a framework that looks at the impact that the construction of the ACRL would have relative to a base case. The base case is assumed to be the status quo. The status quo is the scenario where there is no significant mine development. In this base case the critical assumption is that truck based transportation costs will continue to inhibit mine production.

Each of the factors discussed will be assessed as to whether the impact of the construction of the ACRL would have a "Negative", "Neutral" or "Positive" net impact on meeting government's objectives. The purpose of this analysis is to identify the impact and its consequence for each of the factors. It is not possible, nor useful, to have a summary overall "score". Government decision makers will apply weightings to the various factors as is appropriate within the democratic process.

4.3.1 Economic Development

Many of the benefits associated with the economic development resulting from the ACRL are captured in the quantitative impact analysis discussed in Ernst and Young's section. Qualitative analysis helps to augment the quantitative analysis conducted and highlights issues that may not be fully captured in the quantitative analysis.

Since there would be no mine development in the status quo the greatest impact of building the ACRL would be the economic activity associated with development of the mines in the Yukon and Alaska. The construction of the ACRL should lead to lower cost transportation systems that should in turn lead to significant mineral development and the economic benefits associated with that development.

The work conducted by both Informetrica and Information Insights discussed the economic impact of mining activity resulting from the ACRL. The assumption made by both Information Insights and Informetrica was that access to lower cost transportation will lead to significant mine development. Information Insights and Informetrica estimated the amount by which GDP for each of Yukon (the Territories), British Columbia, Alaska and Canada would rise as a result of this increased mining activity. As mentioned earlier, these economic impacts are not a measure of net economic benefit. This is because economic impacts alone do not measure the extent to which economic activity generated by railway investment will shift from one part of the country to another and from one type of economic activity to another. Detailed cost-benefit analysis would be required to capture the net benefit of the increased mining activity resulting from construction of the rail line.

A key component of a complete cost-benefit analysis of a railway infrastructure investment would be for the quantification of the benefit of lower transportation costs to mine operators. This type of benefit quantification requires that one calculate the demand curves of mine operators for each mine. These demand curves are generally assumed to be downward sloping because mine operators are typically assumed to operate mines at a level of output where the average cost of production increases for each additional unit of mine output. These types of demand curves can at least conceptually be calculated from:

1. The mines' operating costs at various levels of output and
2. The price mine operators would expect to receive for delivery of mine output to the mine's customers or to location at which its customers would take possession of the mine output.

With these demand curves, one would also have to examine the assumptions about how the railway has priced its services to arrive at the revenue numbers used in the financial / investment model. The pricing of rail transport for mine output has two ceilings that ultimately limit the price that a railway could charge:

1. The first ceiling is the price of alternative modes of transportation. Generally, a rail operator would be competing with trucks as an alternative mode of transportation, and in the case of Yukon and Northwestern British Columbia mines, it would not have to compete with another railway or with inland water transportation. Truck costs have been estimated at about 11 cents per ton mile. This places a ceiling below which the rail operator can price, and still be competitive.
2. The second ceiling is mine operating costs. If a rail operator prices too aggressively, it will put mines out of business.

Accordingly, the rail operator's revenue maximizing strategy is to charge for transport, the amount that the mine can afford to pay and stay in business at a level of output that maximizes the earnings of the railway from shipments of mine output.

If the railway were pricing aggressively, it could capture as revenues a significant part of the benefit to the mine that arises from the availability of rail transportation. If the railway is not pricing aggressively, a significant part of the benefit of rail transportation would be captured by the mine operators.

The Stage One work did not directly address this issue. Railway revenues were estimated based on how much mines could likely afford to pay, but this was not based on rigorous analysis of mine and rail cost structures. For the Tier 1 mines, rail transport charges to mines are assumed to vary from as low as approximately 2 cents per ton / mile to as high as approximately 15 cents per ton / mile, with an average of about 7 cents. Without more detailed analysis of the mines' demand curves, based on their production costs and the price paid for their output, and rail pricing policy underlying the revenue forecast, it is not possible to quantify the value to mines of having a rail transportation infrastructure.

It is reasonable to suppose that this benefit to the mines would be indicated by the number of ton / miles their output is shipped, and that the benefit would be some metric of these ton miles. The exact amount is difficult to determine, except to say than it is very likely somewhat less that the difference between the cost of truck transport and the cost of rail transport, per ton mile, and it is also not likely to be a value that approaches zero.

The benefit to mine operators, not captured in the financial/investment model, is likely to be a significant but not quantifiable benefit at this time. Further work would be required on this matter if decision makers would like to have this benefit quantified, and particularly that portion of the benefit that would or could be captured by government as mineral royalties and levies.

The impacts to economic development resulting from the creation of the ACRL would be predominately associated with the economic development opportunities that would be created from access to a lower cost transportation system. A lower cost transportation link will allow business in the Yukon and Alaska to provide products at a price that is more competitive with products produced elsewhere in North America. This should lead to growth in the size of the market available for Yukon and Alaska products and should ultimately allow for more export development.

The creation of the ACRL would also help reduce the costs associated with the development of the Alaska Gas pipeline. Some of the potential cost savings include reduced transportation costs and highway maintenance costs. Lowering the costs associated with the construction of the pipeline should enhance the economics of the pipeline construction and help support the pipeline's development. Any potential impact to the Alaska Gas pipeline is contingent on the ACRL being built prior to the pipeline.

Much of the benefit of having access to a lower cost transportation alternative would be captured by the consortium building the pipeline. However, government and the North American public would benefit from the development of the pipeline.

The development of the ACRL would also encourage tourism. The ACRL would attract tourists who would be interested in seeing the interior of the Yukon, Alaska and Northern British Columbia from the comfort of a railcar.

Building the ACRL would open the possibility for the development of an international transportation shipping industry that shipped containers from an Alaskan port to the rest of North America. At the time that this report was written the results of a study into the viability of shipping containers from Asia to the rest of North America via the ACRL was not available.

4.3.1.1 Summary Economic Development Impact

Build ACRL *versus* Status Quo
+ Lower cost transportation link will facilitate: + Natural resource development + Competitiveness + Export development + Construction of the Alaska Gas pipeline + Tourism + Possibly lead to a new cargo transportation industry handling Asian imports
Net Positive

4.3.2 North American Integration

The construction of the ACRL would create another connection between Alaska, Yukon, Northwestern British Columbia and the rest of North America. This would add an alternative transportation mode for goods traveling to and from the region and would help to reduce the region's isolation. This would reduce the cost of transportation to and from the region and increase the flow of goods in and out of the region. Thus the ACRL would allow the region to be more fully integrated into the rest of the North American economy.

By adding an alternative mode of transportation, the ACRL would add strategic redundancy and reliability to the North American transportation system. This in turn would improve the overall economic security of both the Canadian and the American economies.

The ACRL also would allow both Canada and the United States to enhance their presence in the Artic region. This would enable the government to support objectives such as Canada's Northern Sovereignty claims.

4.3.2.1 Summary North American Integration Impact

Build ACRL versus Status Quo
+ Better economic integration with the rest of Canada and the lower 48 states + Improved Canadian and American national economic security + Enhanced Canadian sovereignty in the Northwest
Net Positive

4.3.3 Environmental

The construction of the ACRL is expected to have a variety of impacts on the environment. This discussion of the impacts is not expected to replace a detailed environmental impact assessment. IRIS Environmental Systems undertook a detailed strategic environmental assessment to study the potential impacts that the ACRL would have on the environment. This discussion is intended to provide a high level overview of the various environmental impacts that may result from the development of the ACRL.

The main environmental impacts considered include:

1. Pollutant emissions (air quality, dust, NOx, CO)
2. Impact on wildlife and habitat
3. Potential for hazardous materials spills

4.3.3.1 Impacts to Pollutant emissions (air quality, dust, Nox, CO)

As discussed in the detailed biophysical assessment conducted by IRIS Environmental Systems, rail emissions are affected by a number of factors such as; the age of the train, the type of fuel used, load capacity, maintenance of the engine and driving technique. In general however, marine transportation has lower emissions per ton-mile than both rail and truck transportation. Rail has slightly more emissions per ton-mile than marine. Diesel has significantly more emissions per ton-mile than both rail and marine transportation modes.

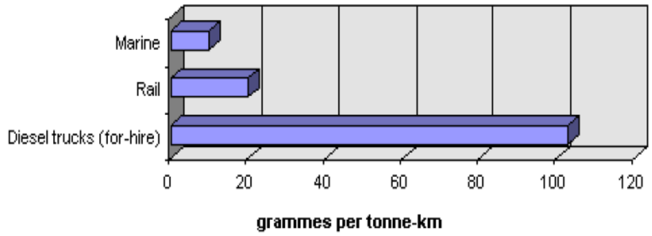


Figure 18: – Greenhouse gas freight emissions per tonne-km by mode, 1997
(Source – ACRL Biophysical Assessment IRIS Environmental Systems, June 2006)

The impact that the ACRL would have on emissions is dependent on how the traffic on the ACRL would be transported in the absence of the ACRL. If traffic shifts from marine to rail, then the impact would be an increase in emissions per ton-mile. If the traffic shifts from truck to rail then the impact would be a decrease in emissions per ton mile.

4.3.3.1.1 Pollutant Emissions – Intermodal and Industrial Product Volumes

The vast majority of re-supply traffic is currently shipped via marine. The emissions associated with this traffic would likely be higher both as a result of the longer distance that these goods would likely have to travel and the greater emissions per ton-mile produced by rail transportation. Thus, the intermodal and industrial product traffic that shifts to rail would most likely result in a slight increase in emissions.

The amount of intermodal and industrial product traffic currently shipped via truck is fairly small compared to the marine volumes. However, trucks emit almost five times the greenhouse gases per ton-mile as rail. Thus shifting truck traffic to rail can have a significant impact on emissions associated with intermodal and industrial product traffic.

The impact that the ACRL will have on emissions associated with intermodal and industrial product traffic would be dependent on how much marine and truck traffic shift to rail. It is likely that most of the truck traffic would shift to rail while only a portion of the marine traffic is likely to shift to rail. Depending on the actual volumes of traffic that shift to the ACRL it is probable that the overall impact to emissions associated with intermodal and industrial products traffic would be a modest increase in greenhouse gas emissions.

The increased intermodal volumes associated with container traffic that is being shipped from Asia to the rest of North America via an Alaskan port would result in an increase in emissions.

4.3.3.1.2 Pollutant emissions – Mineral Volumes

It is anticipated that the creation of the ACRL would lead to a substantial increase in the mineral volumes transported by truck, rail and marine. Mineral concentrates would have to be transported by truck from the mine site to the railhead, by rail from to the nearest port and then by marine to the destination. Since these volumes would most likely not exist under the current transportation system, all the energy consumed and emissions created by the production and transportation of these minerals would be a result of the creation of ACRL.

4.3.3.1.3 Pollutant emissions – Pipeline volumes

If the ACRL were in place prior to the construction of the Alaska Gas Pipeline and the Mackenzie Gas pipeline, a considerable volume of the freight associated with these projects could be transported to depots within Yukon, Alaska and Northern B.C. via the ACRL. The alternative to shipping these volumes via rail would be to ship these volumes via truck which consumes over 10 times the energy per ton mile than rail. Thus, the ACRL would help reduce the emissions associated with the construction of these pipelines.

4.3.3.1.4 Pollutant emissions – Summary

The creation of the ACRL would most likely result in an increase in pollutant emissions in the region. However, the benefits of the ACRL are considerable in a base scenario where mines in the Yukon are developed by road infrastructure. In this scenario the ACRL would shift traffic from roads to rail resulting in a significant reduction in greenhouse gas emissions. The development of the mines and the transportation of mine materials between the railhead and the mine site would occur regardless of the development of the ACRL. Thus, if the government's policy is to reduce greenhouse gases and develop mines, the government should consider alternatives to road transportation.

4.3.3.2 Impacts of Railroad right-of-way on wildlife and habitat

The creation of the ACRL would inevitably have a negative impact on wildlife and habitat within a corridor around the right-of-way. This is particularly true where the ACRL would run through areas that currently have no transportation infrastructure.

The ACRL would impact wildlife that lives along or migrates through the railroad right-of-way. The railroad would also impact the habitat of the wildlife that lives along the rail corridor. For a substantial portion of its length the ACRL would follow river valleys that contain sensitive wetlands.

Given the importance and rarity of pristine wildness areas one would expect the environmental approvals process to be a lengthy and detailed process. However, the railroad will be designed to mitigate its environmental impact.

The stimulus for mine development is assumed to be the development of the ACRL. Thus the impact that mine development would have on wildlife and habitat could be attributed to the construction of the ACRL. This would include the impact to wildlife and habitat at mine sites, along mine access roads and, as mentioned previously, along the railroad right-of-way.

4.3.3.3 Potential Hazardous spills

The development of mines that would result from the creation of the ACRL would lead to the transportation of various hazardous goods such as mine construction materials, mine concentrates and materials used in mine operations. The potential for a spill of any of these hazardous materials would be a negative impact resulting from the development of the ACRL.

It is generally accepted that the probability of a rail derailment is significantly less than the probability of a motor vehicle accident. Thus the probability of a hazardous material spill would be reduced by transporting hazardous materials on rail rather than road.

Although the probability of a hazardous material spill would be reduced, the magnitude of the spill would have the potential to be much greater. The volume transported in a railcar is typically larger than the volume typically transported in a truck. Furthermore, a train may have multiple railcars filled with hazardous materials. Therefore a train derailment could result in a significantly greater volume of hazardous material being dumped into the environment than an accident involving a single truck.

4.3.3.4 Summary Environmental Impact

Build ACRL *versus* Status Quo
- Slight overall increase in emissions from less use of marine balanced with less use of trucking for intermodal, industrial and pipeline traffic - Significant impact to wildlife and habitat: - Along the railroad right-of-way - At mine sites - Along mine access roads - Significantly higher emissions from increased traffic resulting from mine development and container traffic from Asia to North America - Greater potential for hazardous material spills Better to develop mines using rail as opposed to truck transportation because: + Significantly less emissions from use of rail to transport mineral concentrate + Potentially lower probability of a hazardous spill - Potentially larger magnitude spill from rail derailment
Net Negative

4.3.4 Transportation Safety

The creation of the ACRL would have the potential to impact the overall safety of the transportation system in Alaska, Yukon and Northwest British Columbia. The most significant impact to transportation safety would be related to the potential for a decrease in traffic on the Alaskan highway.

The amount of intermodal and industrial product volume sent to the Yukon is small relative to the total volume of intermodal and industrial product volume shipped to the entire region. However this traffic represents a significant percentage of the traffic on the Alaskan Highway. The creation of the ACRL should cause most of this traffic to be transported via rail rather than road. This would reduce the volume of traffic on the Alaskan Highway and result in a positive impact to the safety of the highway.

The same logic can be applied to highway traffic that will result from the construction of the Alaskan gas pipeline. If the pipeline is build using existing road infrastructure there would be a significant increase in traffic and a corresponding increase in vehicular accidents. If the ACRL were used to transport pipeline construction materials there would be less traffic and hence fewer accidents.

Although the population of Alaska, Yukon and Northern British Columbia is relatively sparse there would be safety issues at every location where there was a level crossing with a road. The risk of accidents at level crossings can be mitigated. Nevertheless, the possibility of accidents involving motor vehicles and trains would have a negative impact on the overall safety of the transportation system.

Mine development would occur as a result of the development of the ACRL. This means that there would be an increase in truck traffic on the roads between the mine sites and the railhead. The increase in truck traffic on these mine access roads would increase the probability of an accident occurring on those roads. This would have a negative impact on the overall safety of the transportation system.

For a base scenario where mines in the Yukon are developed using road infrastructure, the transportation safety benefits of the ACRL would be considerable. If mines are developed without the ACRL in place there would be a considerable increase in both highway and mine access traffic. Building the ACRL would still result in increased mine access road traffic however it would eliminate the need to use highways to transport mineral development traffic

4.3.4.1 Summary Transportation Safety

Build ACRL versus Status Quo
+ Potential to remove significant percentage of existing Alaska Highway truck traffic. + Potential to reduce the truck traffic associated with pipeline construction. - Level crossings increase the risk of an accident - Significant increase in traffic on mine access roads
Neutral

4.3.5 Transportation System Reliability

The creation of the ACRL would add an alternative transportation connection between Alaska, Yukon, Northwest B.C. and the rest of North America. This alternative mode would add considerable capacity and improve the reliability of the transportation system in the region.

The ACRL would add strategic redundancy to the transportation network that would help to ensure a reliable flow of freight in and out of the region. This increased redundancy would be useful in responding to emergency situations such as seismic events that damage ports and coastal transportation systems. In such an event, the ACRL could be used to deploy emergency relief to the interior of Alaska and the Yukon.

The amount of time that it requires to transport goods in or out of the region obviously depends on the origin and destination of the goods. Using an origin in the mid-west U.S. and a destination in central Alaska it appears that it would take approximately the same or maybe even slightly less time to transport goods via the ACRL than it currently takes to transport those goods via marine out of Tacoma. The fact that the ACRL could deliver goods quicker than the current transportation system reaffirms that the ACRL would be a strategic alternative to the existing transportation modes. Furthermore, it means that the ACRL should improve the efficiency of the overall transportation system.

The ACRL would increase the capacity available on other transportation modes as traffic shifts from marine and truck to rail. This increase in capacity available on other modes should increase the reliability of those other modes. With spare capacity shippers should face less congestion and fewer delays in transporting their goods. This is particularly important during peak construction seasons in Alaska.

The creation of the ACRL would lead to a substantial increase in mine traffic. The increase in traffic volumes on mine access roads would impact the reliability of transportation via those roads. Since the ACRL would run parallel to many of the major highways in the region, the increase in mine traffic should be limited to mine access roads. Thus, since most mineral volume traffic would be transported via rail rather than over highway infrastructure, mine development should have very little impact on the overall transportation system reliability.

4.3.5.1 Summary Transportation System Reliability Impact

Build ACRL *versus* Status Quo
+Create another alternative transportation mode in the Alaska and Yukon +Small time savings for inbound re-supply currently moving to Anchorage via Seattle/Tacoma from the U.S. mid-west + Potential to remove significant percentage of existing Alaska Highway truck traffic
Net Positive

4.3.6 Other Transportation Providers

The creation of the ACRL would add significant capacity to the transportation network connecting Yukon, Alaska and Northern B.C. with the rest of North America. This new capacity would increase competition between transportation service providers in the region. Existing transportation providers would most likely respond by reducing prices in an attempt to maintain market share.

The transportation service providers that would be impacted the most are:

1. ***Marine transportation companies servicing Alaska.*** It appears that the ACRL would be able to compete with the existing marine transport providers on both price and service. Current marine transporters would be most competitive on the transport of goods that originate in or are destined for the Pacific Northwest states (i.e. Washington, Oregon) and Alaskan port cities. Whereas, the ACRL would likely be most competitive on goods shipped between mid-west U.S. and interior Alaska cities that are located on or near the ACRL.

   The competitive response from marine transportation providers would most likely be a reduction in prices. The combination of reduced pricing and a loss of market share would have a negative impact on marine transport companies and put pressure on the profitability of their businesses. The extent to which existing marine transportation providers could manage an increase in competition is uncertain.

2. ***Truck transportation.*** Re-supply to the Yukon is currently provided almost exclusively by truck. Depending on the point of origin of the goods, truck may be capable of delivering goods to the Yukon in a shorter timeframe than the ACRL. However, it is likely that most re-supply will not warrant the higher cost of truck transportation. This would probably lead to a significant reduction in demand for truck transportation services into the Yukon.

   Although demand for trucking services for re-supply would be reduced, the demand for trucking services related to mineral resource development should increase dramatically. The transportation of materials between the mine sites and the railhead would most likely be conducted by truck transport. Trucking companies currently servicing the Yukon would be well positioned to benefit from this activity.

4.3.6.1 Summary Other Transportation Providers Impact

Build ACRL *versus* Status Quo

- Increased competition for existing transportation providers
- Reduction in demand for:
    - Trucking services
    - Marine barge services
+ Demand for transportation services between mines and railhead

Net Negative

4.3.7 Other Transportation Infrastructure

The ACRL would have an impact on other transportation infrastructure throughout the region. Traffic volumes would shift from existing modes to the ACRL, reducing the use of competing infrastructure while increasing the utilization of complementary infrastructure. The infrastructure affected by the creation of the ACRL includes:

1. ***Road Infrastructure.*** The impact that the ACRL has on road infrastructure would be dependent on the type of road.

   Highways that are currently being used for re-supply into the Yukon, Alaska and Northern B.C. should see a significant drop in truck traffic as re-supply traffic shifts to the ACRL. This should reduce the cost of maintenance, improve the safety and free up spare capacity on those highways. The benefit to highway infrastructure would be maximized if the ACRL is used to transport the Alaska gas pipeline construction materials.

   Roads that would be used to transport materials between the mine sites and the railhead would see a significant increase in truck traffic. Many new mine access roads would need to be built and maintained as mineral development progresses. Mine related traffic could have a significant impact on highways if the highways were used to connect mines to the railway. Mine access roads should be designed to minimize the use of road infrastructure and maximize the use of the ACRL.

2. ***Port Infrastructure.*** Port infrastructure would be affected by the ACRL in a number of different ways.

   As mines are developed, ports that are used to export mineral concentrates would see a substantial increase in activity. Mineral concentrates are usually shipped over the most direct route to tidewater to help minimize costs. With the exception of Prince Rupert, mineral concentrate handling capacity is constrained at most regional port facilities. To enhance the economic feasibility of Yukon mines and hence encourage mineral traffic volumes it may be necessary to develop port mineral handling capacity.

Ports currently being used to handle Alaska re-supply traffic may see some reduction in activity as traffic moves to the ACRL. This would predominantly affect Anchorage area port facilities. To the extent that the ACRL would attract international container traffic from Asia, expanded port facilities will need to be developed in Alaska to deal with this traffic. Shipping international container traffic via an Alaskan port and the ACRL would have the added benefit of relieving congestion at lower 48 U.S. west coast port facilities.

3. ***Adjacent Rail Infrastructure.*** The increase in traffic on the ACRL would lead to an increase in traffic on railways that connect to the ACRL. If the adjacent railway infrastructure were underutilized, then the extra volume would have a positive impact. However if the adjacent railway infrastructure were already congested, then the additional traffic would have a negative impact. It is expected that the ACRL impact on adjacent rail infrastructure would be positive because it would move traffic away from congested areas such as Seattle/Tacoma and onto railroads in Alaska and Northern B.C..

4.3.7.1 Summary Other Transportation Infrastructure Impact

Build ACRL *versus* Status Quo
+ Reduction in highway maintenance - Significant increase in maintenance of mine access roads to the railhead - Short-term reduction in port activity for inbound re-supply - Need to expand port facilities to handle international container traffic - Need to expand port facilities bulk mineral handling capacity + Relieve west coast port and rail congestion + Increase traffic on railways that connect to the ACRL
Neutral

4.3.8 Social

The ACRL would have a significant impact on every community that it passes near. These communities would gain the benefits of an improved transportation infrastructure. One the other hand, these communities would also experience inevitable side effects associated with growth and development.

The most significant social benefits will include:

1. ***Improved affordability of goods.*** The ACRL would increase competition between transportation providers that should result in lower transportation costs and hence reduce the cost and expand the selection of products sold in the region. This would effectively lower the cost of living in the region.
2. ***Employment opportunities.*** The ACRL would create a number of employment opportunities. Although the construction of the railroad would require skilled labor that would come from other regions it would also create a large number of job opportunities for local residents. As discussed in the economic development section, there would be a number of job opportunities associated with both the operation of the railroad and the economic activity, such as mine development, that result from the creation of the railroad. Some of the impacts and benefits associated with the creation of new businesses would be quantified in the economic cost impact study and could be better quantified in a full cost-benefit analysis.
3. ***Economies of Scale in provision of public services.*** Upon completion of construction there would be an increase in economic activity that would most likely lead to a longer term increase in population in the region. This increase in population would cause the per capita cost of providing public services to decrease.

Negative side-effects of the ACRL would include:

1. ***Strain on community services.*** During the construction of the ACRL there would be an influx of workers into the region. In the Yukon the influx of workers could substantially exceed the current workforce of the entire territory. This influx of workers will put a strain on community services in the region. The State of Alaska, Territory of the Yukon and Province of B.C. would need to temporarily increase their capacity to provide critical services such as health care.
2. ***Alter the character and aesthetics of communities.*** Improving the connection that remote communities have with the rest of North America would inevitably change the character of those communities. Small remote communities would be inundated with a large influx of people during the construction of the railroad. This influx of people may expose those communities to social issues that they would not be properly equipped to deal with.

After the railroad construction was complete, the character of the communities it passes through would be forever altered. Communities would now have regular train service that some community members would consider an intrusion to their privacy.

Communities that were not actually on the railroad would also be impacted. Those communities located near mine sites that are developed as a result of the ACRL would grow as mine employees move to the region. Furthermore, those communities located along mine access roads would see a dramatic increase in truck traffic.

The predicted impacts to communities would be different through different stages in the development of the ACRL. The construction stage would put significant strain on the communities that the railroad passes through. Regional governments would need to consider what they could do to minimize the strain that the influx of a large labor force will have on their communities.

After construction was completed the benefits of a lower cost of living and better job opportunities should outweigh the negative impacts that the ACRL would have on communities.

4.3.8.1 Summary Social Impact

Build ACRL *versus* Status Quo
+ Improve affordability of goods transported to the north. + Better job opportunities + Economies of scale in provision of public services - Alter the character and aesthetics of communities - Strain capacity of community services
Net Positive

4.3.9 First Nations and Alaska Native Corporations

The ACRL right-of-way would pass through or near many First Nation and Alaska Native Communities and Lands. First Nations and Alaska Native communities would experience the same social issues that have been described in the previous section. However, there would be a number of impacts that will be specific to First Nations and Alaska Native communities. These impacts include:

1. ***Traditional use of lands.*** As discussed previously, the ACRL would have an impact on the wildlife and habitat of the region. This would inevitably have a negative affect on traditional activities such as hunting and fishing.
2. ***Archaeological sites.*** The ACRL right-of-way may pass through areas that are of archaeological or spiritual significance. The impact to these sites could be mitigated through the design of the ACRL and would need to be addressed during the approvals process of the project
3. ***Partnership opportunities.*** The ACRL would represent a good development and partnership opportunity for First Nations and Alaska Native peoples. As discussed above, there would be significant potential benefits to communities such as better access to community services and job creation. By becoming an active partner in the ACRL, First Nations and Alaska Native peoples could ensure they maximize the benefits they reap from the railroad.

There would be significant social benefits that were discussed in the previous section. First Nations and Alaska Native peoples could further maximize these benefits by taking an active partnership role in the project. There should be significant investment opportunities available to Canadian First Nations and Alaska Native Corporations. Some initial analysis of the impact to Canadian First Nations and Alaska Native Corporations has been conducted by the MacLeod Institute however detailed impact studies and consultations would need to be conducted to better determine the extent and nature of the impact that the ACRL would have on First Nations and Alaska Native traditional use of lands and archeological sites.

4.3.9.1 Summary First Nations and Alaska Native Corporations Impact

Build ACRL *versus* Status Quo
- Railroad right-of-way may impact First Nations and Alaska Native peoples: - Traditional use of the lands - Archaeological sites + Investment and partnership opportunity + Improve affordability of goods transported to the north + Better job opportunities + Economies of scale in provision of public services - Alter the character and aesthetics of communities - Strain capacity of community services during construction
Neutral

4.3.10 Impact Summary

As mentioned earlier, the outcome of the qualitative impact analysis is not usefully scored and summed across the various factors. The purpose is to identify the impacts and their consequences. Governments will need to weigh the different factors according to their perceptions of what is important to their publics.

There would be a number of substantial positive benefits associated with creation of the ACRL. Many of the positive impacts such as economic growth and better integration with the rest of North America are clearly inline with government objectives. However, the potential negative environmental impacts go in the opposite direction. Governments would need to carefully consider how it can further enhance the potential positive impacts and what steps need to be taken to mitigate negative impacts.

	Build ACRL *versus* Status Quo
Economic Development	**Net Positive**
North American Integration	**Net Positive**
Environmental	**Net Negative**
Transportation Safety	**Neutral**
Transportation System Reliability	**Net Positive**
Impact on other Transportation providers	**Net Negative**
Impact on other Transportation Infrastructure	**Neutral**
Social	**Net Positive**
First Nations and Alaska Native Corporations	**Neutral**

4.4 ROLE OF GOVERNMENT

4.4.1 Opportunities for a risk minimization strategy (sources of risk)

As discussed in the section written by Macquarie North America, there is a significant gap between the costs of the project and the amount that the private sector is willing to fund. There are a number of issues that would deter the private sector from investing more capital in the project. Most of these issues stem from the risks of the project that the private sector is not willing to assume.

If these risks could be reduced the private sector may be induced to invest more capital in the project. There are a number of strategies that the government could pursue to address some of these risks. This section will discuss those risks and the steps that government could take to address those risks.

The risks can be broadly divided into three categories:

1. Political risks
2. Cost risks
3. Volume risks

4.4.1.1 Political Risk

Political risk refers to the risk that governments would change their policies and the regulatory environment facing the private sector railroad investor. A stable and predictable political regime is particularly important for projects with long timeframes. The ACRL will need substantial government support over a long period of time. Thus investors in the project will be particularly sensitive to any potential political changes that could impact government support of the project.

To help reduce political risk the governments involved can begin by creating a business and regulatory environment that encourages railway construction, operation and financing. Government can do this by enacting regulations and legislation that minimize the regulatory burden placed on the ACRL.

Different policies will be needed to enhance different aspects of the ACRL. To encourage investment and enhance return on capital the government could introduce legislation that encourages investment by granting special tax treatment for investments in the ACRL. Operating costs would be impacted by legislation that dictated taxes on items such as fuel. Revenues and volumes for a large part will be driven by the rates charged to transport goods. Government policy can help ensure the ACRL rates are set at an appropriate level to maximize both rail revenues and economic development.

Government can further reduce political risk by enshrining its commitments in long-term contracts. Long-term contracts further formalize government support and commitments. Legally binding contracts provide the private sector with greater confidence that they will have some form of recourse if policies change.

As discussed in the previous section, the ACRL would have an impact on a broad range of government objectives. This means that the ACRL would have to deal with numerous government departments within each jurisdiction. It would be important for governments to coordinate their policies to ensure the project is not hampered by conflicting polices.

The ACRL would cross a number of different jurisdictions. The ACRL developers would need to deal with the laws, legislation and political policies of Alaska, Yukon, British Columbia, Canada and the United States. Challenges in any one of the jurisdictions would discourage private sector investment.

To help the ACRL navigate the multitude of jurisdictions it would be important for the ACRL project team to have access to key political figures in each of the various jurisdictions. Governments can help the ACRL project by appointing key people to the project team. These people can help champion the project in the various jurisdictions.

In summary, government can help reduce political risk by:

- Enacting legislation that creates a pro-railroad regulatory environment
- Enshrining government commitments in long-term contracts
- Coordinating railway policy with other policies
- Creating a dedicated project team to coordinate and champion the project

4.4.1.2 Cost Risk

The costs associated with the ACRL project can be broadly divided into three categories:

- Pre-Construction costs
- Capital and Construction costs
- Maintenance and Operating costs

4.4.1.2.1 Pre-Construction Cost Risk

Pre-construction costs are the costs associated with the environmental and regulatory approvals and permitting process. The costs associated with projects such as the ACRL can be expected to be between 5% and 8% of the total capital costs associated with the project. The approvals and permitting process can also be expected to last approximately 5 years. These cost and time estimates don't include the impact of any legal challenges that may be mounted against the project.

From a private sector developer's perspective, the pre-construction cost risks are some of the most challenging risks facing the project. The ACRL developers face challenging approval and permitting processes in a multitude of jurisdictions.

During this stage there would be a considerable risk of the project being delayed or even failing to obtain approvals.

This uncertainty during the early stage of the project would have a considerable impact on the overall risk of the project. Thus government can have a significant impact on the overall risk of the project by reducing the early stage pre-construction risk.

The government can reduce the pre-construction risk through a number of initiatives such as:

1. ***Conduct and fund technical and environmental studies.*** The risk of the ACRL is very high during the early stages of the project. Capital invested in the early stages has the longest time to wait for a return and the highest probability of seeing no return. As a result of the greater risk it is more difficult to attract private capital investment during the early stages of the project. Covering the costs of the early stages makes the project more attractive to the private sector.

2. ***Creating a dedicated project team to oversee the process.*** Government needs to create a project team with people who are able to navigate the complex myriad of approvals and permitting processes facing the ACRL.

3. ***Facilitate inter-government approvals.*** The ACRL requires approvals in five jurisdictions. The multi-jurisdictional aspect of the project adds complexity to the approvals process. Government can help simplify the process by ensuring the approvals processes are harmonized between the different jurisdictions. This would help reduce costs by eliminating duplication and overlap of the process.

4. ***Manage public consultations.*** Government could conduct the public consultation process for the private sector.

5. ***Manage First Nations and Alaska Native peoples consultations and negotiations.*** The railroad right-of-way would pass through a number of First Nations and Alaska Native Corporation lands. Government will play a crucial role in ensuring First Nation's and Alaska Native people's needs are met. The private sector will not have the ability to negotiate with First Nations or Alaska Native Corporations.

6. ***Reduce land costs.*** The current capital cost budget does not include any costs for the acquisition of the railroad right-of-way. The cost of the ACRL would be substantially greater if the private sector has to purchase the land for the railroad right-of-way. This means that government would need to assemble the right-of-way and then make the right-of-way available to the ACRL. This may require government to grant government lands, negotiate deals with First Nations and

Alaska Native Corporations, and even expropriate lands if necessary to assemble the right-of-way.

Taking these initiatives to reduce the pre-construction costs and the risks associated with them would make the ACRL project more appealing to the private sector. This requires the government to take a strong leadership role in the early stages of the ACRL.

Although it may be government making most of the investment during the early stages of the ACRL, it would be important to have considerable input from the private sector. The government would want to benefit from private sector expertise to optimize the design of the ACRL. Furthermore, government would want to involve the private sector at an early stage to ensure the ACRL attracts more private sector investment during the next stages of the project.

4.4.1.2.2 Capital and Construction Cost Risk

As discussed earlier there is a significant gap between the capital cost of the project and the amount that the private sector would be willing to fund. This funding gap is an issue that government would need to address. In general, to address the funding gap government must attract more private capital, reduce capital costs, reduce construction costs or directly fund the project.

As discussed earlier, government could attract more private sector capital by creating a stable regulatory and business environment that encourages railroad development. Depending on the type of private sector investor the government may need to take a more active role in facilitating the private sector investment. This is particularly true for strategic investors such as mining companies. Government would need to coordinate its natural resource development policies with its railroad policies to ensure the strategic investor is encouraged to develop a railroad that benefits a broader spectrum of users. Government may also need to address policies that could hinder foreign investment.

Government could directly or indirectly reduce capital costs. Government could directly reduce the cost of capital through actions such as allowing the ACRL to access government debt instruments. This would allow the ACRL to borrow at a much lower cost than they would without government support. Government could indirectly reduce the cost of capital through programs such as tax credits for railway investors.

Government could help reduce construction costs by reducing the costs of the inputs required for the ACRL. For example government could allow the ACRL to excavate gravel for ballast without charging a royalty on the gravel. Government could also use incentives to encourage third party suppliers to make inputs such as concrete ties locally. Furthermore, the government could eliminate taxes such as sales taxes on inputs or taxes on fuel used in the construction of the ACRL.

Finally, it appears inevitable that the ACRL would require substantial direct funding from government. The government would have a number of options as to how it structures its capital contributions. Depending on the choice of structures and success of the ACRL the government may at sometime in future be able to recoup much of its capital contribution. For example the government could put capital into the ACRL in return for financial instruments such as equity, preferred shares, convertible debt or subordinated debt with warrants.

Government could also access existing government programs to directly fund the ACRL. In Canada the ACRL might access government funds through programs such as the Canada Strategic Investment Fund. In the United States the ACRL might access government funds through programs such as the Transportation Infrastructure Finance and Innovation Act.

4.4.1.2.3 Maintenance and Operating Cost Risk

It is anticipated that the majority of government support would be required during the pre-construction and construction phases of the project. The ACRL may also require some support during the initial stages of its operations until it attracts sufficient traffic volumes. During this phase the government may have to provide additional support by reducing costs or through direct funding.

Government could provide support by reducing taxes on items that affect the operations and maintenance costs of the ACRL. Taxes on consumables such as diesel fuel could be temporarily reduced or eliminated. Government could also temporarily eliminate or reduce property taxes.

If necessary, government may have to provide direct funding to support the ACRL during the initial years of operations. Fortunately maintenance costs should be low during the initial years of operations. However, government may need to contribute to operating costs that are commonly referred to as above the rail costs.

4.4.1.3 Volume Risk

A mentioned earlier, reducing the risks for the ACRL should attract more private sector capital to the project. Some of the more significant risks in the ACRL project are the risks associated with the traffic volumes that the railroad could expect to attract. In general traffic volumes can be divided into three categories:

- Mineral
- Intermodal and Industrial Products
- Pipeline

4.4.1.3.1 Mineral Traffic Risk

As discussed in the Ernst and Young section, rail traffic associated with mineral development would make up a significant amount of the volume of traffic transported on the ACRL. These mineral volumes predominantly originate from mineral development in the Yukon Territories and are dominated by the development of a large iron ore deposit. The volumes associated with mineral development can be broadly classified as mineral concentrates or pellets that are exported from the region and materials required for mine construction and operations that are imported to the region.

None of the mines included in the mineral volume traffic are currently in production. This makes these volumes speculative from the perspective of the private sector. Anything that can be done to reduce the risk associated with these volumes should help attract more private sector investment to the ACRL project. There are a number of issues facing the development of these mines:

1. ***Commodity prices.*** Perhaps the most important issue facing mineral development is the value of the commodities that are being mined. Commodities are currently in high demand. This has driven market prices to levels that support the development of new mines. Typically commodity prices move in a cyclical fashion and it is difficult to accurately forecast future commodity prices.

   Government could enter into long-term contracts with mine developers agreeing to take the mineral volumes at a set price. However, these contracts would prove onerous and expensive in the event of a downswing in commodity prices. These contracts would also imply that the government was willing to take a very active role in setting prices that are generally best set by market forces. This type of market intervention might also contravene agreements such as GATT and NAFTA. As such there is very little that government can do guarantee long-term commodity prices.

2. ***Transportation costs.*** Transportation of materials to and from the mine is a significant factor in the economic viability of mines located in the Yukon and Alaskan interiors. The Yukon Economic Development team conducted an analysis of an iron ore mine in Quebec that could be comparable to a similar mine in the Yukon. They found that transportation costs make up over 40% of the total cost of the commodity by the time it was loaded on a ship for export.

   Clearly the development of the ACRL would have a significant impact on the transportation costs associated with mineral development in the Yukon, Alaska and Northern British Columbia. This highlights the importance of having coordinated railroad and natural resource development policies.

3. ***Royalties.*** Royalties can make up a significant portion of the cost associated with the development of mineral deposits. In the same analysis mentioned earlier, the Yukon Economic Development team estimated that royalties made up approximately 10% of the total cost of the commodity. Government can reduce the royalties that it collects to help ensure mines are developed. This in turn would help stimulate mineral traffic volumes on the ACRL.

The royalties associated with mineral development could also be used in other ways. Government could use the royalties as a source of funds for railroad development or to fund the operation of the ACRL. Alternatively, government could investigate the possibility of capitalizing the royalty payment stream to fund the capital costs of the ACRL.

4. ***Cost effective power sources.*** Another important cost associated with the mining, milling, pelletizing and smelting of commodities is the cost of electrical power. Currently there is limited electrical power infrastructure in the majority of the areas where there are mineral deposits. Government could help develop access to low cost electricity to help improve the economics of mineral development and stimulate mineral traffic volumes for the ACRL.

5. ***Environmental and regulatory approvals and permits.*** All the mineral volume traffic would come from mines that are not yet in production. Each of these mines must obtain environmental and regulatory approvals and permits before they can proceed with development. Complications in the approval and permitting process could delay or hinder mine development. Government can encourage mineral development by streamlining the approval and permitting process to ensure that it isn't a costly and onerous barrier to development. For some key mineral deposits such as the large Yukon Iron Ore deposit, the government may want to take a more proactive role to help ensure those projects get moved ahead.

6. ***Cost and risk of exploration.*** The mineral volumes classified as Tier 3 are based on a Yukon Economic Development study on probabilistic mineral resource discoveries and development within a 150km corridor of the rail link. These volumes are not related to specific deposits. It is estimated that these mineral deposits will be developed as a result of exploration activity in the region. To help ensure this exploration occurs, government should continue to encourage exploration through programs such as the Yukon Mining Incentive Program and the Yukon Mineral Exploration Tax Credit.

7. ***Lack of other transportation infrastructure.*** The ACRL is only one piece of transportation infrastructure that is needed for mineral development. Two other critical components required are a port capable of handling mineral volumes and mine access roads.

   As discussed, there are a number of ports to which mineral volumes could flow. There are a variety of issues that will need to be addressed for each of the various ports. Government will need to take a lead role in developing ports to ensure the mineral volumes transported by the ACRL are not constrained by port capacity.

   Mine access roads will also need to be developed to ensure mineral traffic volumes can flow between the mine sites and the railheads.

Government will need to take an active role in developing these roads and ensuring the roads are designed to maximize the benefits of the railroad.

Government may have to take additional measures to reduce risks with key mineral deposits such as the large Yukon Iron Ore deposit. In the case of Iron Ore deposit, government may consider taking an active role to ensure the deposit is developed. This may include actions such as government acquiring a position in the development of key mineral deposits.

Clearly government policy would play an important role in determining the volume of mineral traffic. A number of different policies need to be coordinated to ensure the maximum potential mineral traffic is achieved without delays. Implementing policies that help ensure mines are developed would help reduce the risk associated with mineral traffic. This in turn would make the ACRL more attractive to private investors and attract additional private sector capital.

4.4.1.3.2 Intermodal and Industrial Product Traffic Risk

As discussed in the Ernst and Young section, intermodal and industrial product traffic is the second largest segment of traffic expected to be transported on the ACRL. This segment can be divided into two categories based on the origination and destination of the traffic:

1. Resupply
2. International container traffic

To capture a significant portion of the intermodal and industrial product traffic the ACRL will have to be competitive with other transportation alternatives. At a minimum the ACRL will need to provide a similar level of service at similar price level if it expects to be competitive. Subsidizing the ACRL prices would be unfair to other private sector marine and truck transportation providers and could ultimately reduce competitive transportation alternatives in the region. Thus it is important that prices for transportation of intermodal and industrial products be set by market forces.

Based on the work done by QGI Consulting it appears that the ACRL would be capable of competing on price for the resupply traffic. However, that analysis is based on current market pricing and it is uncertain what type of competitive pricing response the ACRL can expect from existing transportation providers. On the whole there is little the government can do to influence pricing other than ensure there are no subsidies to existing transportation providers that might give them an unfair advantage over the ACRL. At the time that this report was written no analysis had been completed to determine whether the ACRL would be a competitively priced alternative for international container traffic flowing from Asia to the rest of North America.

To provide a similar level of service the ACRL would need to provide services that consistently deliver products within a similar timeframe as the existing transportation providers. It appears that the ACRL should be able to deliver goods between the mid-west United States and Alaska in approximately the same amount time that the same goods would take if transported via marine through Tacoma.

These transit time estimates assume there are no delays at ports, interconnecting railways or border crossings. Any delays at these potential transportation bottlenecks could impact the ACRL's ability to compete on service. Government can help reduce the risk associated with intermodal and industrial product traffic volume risk by addressing these three potential inefficiencies.

Government could help ensure there are no delays at ports by encouraging the development of efficient port facilities that quickly transfer freight from ship to rail. Government could facilitate agreements between connecting railways to ensure railcars are not delayed. Furthermore, government could ensure systems are in place to expedite railcars as they pass international boundaries and cross between the United States into Canada and then back into the United States.

Transit time can also be affected by frequency of operation. Currently there are only 2 roll-on roll-off ship sailings and 2 container ship sailings per week between Tacoma to Alaska. In some situations freight could wait in Tacoma for a few days before it is loaded on a ship. Daily freight trains on the ACRL would enhance the ACRL's ability to deliver goods in a reliable and timely fashion.

In summary, the role of government in reducing intermodal and industrial product volume risk is to ensure the ACRL can provide a service that is competitive with existing transportation providers. Reducing the uncertainty of intermodal and industrial traffic volumes would help to make the ACRL more attractive to private sector investors.

4.4.1.3.3 Pipeline Traffic Risk

As discussed in the Ernst and Young section, traffic resulting from the construction of the Alaskan gas pipeline would be relatively insignificant over the life of the railroad but could be a very significant volume over the early stages of the railroad. Pipeline traffic could represent close to 10% of ACRL rail revenues for the years during which the pipeline is being developed.

How much of the pipeline traffic is captured would be dependent on which segments of the ACRL are in place when the pipeline is being built. Government can help ensure the ACRL maximizes the pipeline traffic by influencing the order in which sections of the railroad are developed.

4.4.2 Phased Investment

As discussed in the work conducted by Ernst and Young, the possibility exists to spread the development of the ACRL over a longer time frame by developing the railroad in segments. A phased development would allow for a smaller initial capital investment.

The majority of intermodal and industrial product traffic will only shift to rail after the completion of the entire Delta Junction to Hazelton segment. This means that a phased development would attract an insignificant amount of intermodal traffic. Thus, if a phased approach is pursued, the first phase should be selected to maximize mineral traffic to help maximize revenue. The next phases of the ACRL could then be built using revenues that were generated by the mineral traffic.

As mentioned in previous work the initial phases in a phased development approach that were considered include:

1. Carmacks to Skagway/Haines
2. Carmacks to Delta Junction
3. Carmacks to Hazelton

4.4.2.1 Carmacks to Skagway/Haines

This is the most direct route connecting mineral deposits in the interior of the Yukon with tidewater. Approvals and permitting should be less onerous for much of this route because a rail right-of-way already exits between Whitehorse and Skagway. Furthermore if Skagway is the port chosen, there is an existing narrow gauge railway and port facility in place. These factors help to make this one of the least capital intensive initial phases considered.

Since it is the shortest route to tidewater for Yukon mineral deposits, this phase would improve the economics of mines which should help to maximize mineral volume traffic. The route may attract some intermodal traffic with a Yukon destination. But this represents almost an insignificant amount of intermodal traffic. The route would also allow for the transportation of some Alaska Gas pipeline construction materials to a staging area in central Yukon.

Depending on the port and the mines that are developed there could be some significant issues with port handling capacity. The port at Skagway is not capable of handling the massive volumes that a mine like the large Yukon Iron Ore deposit will produce and there would be difficulties expanding Skagway port capacity by any significant amount. The port at Haines has space for expansion but the port would require extensive development. Furthermore, the use of Haines as a port would increase the capital costs of the construction of the railroad and the extent of approvals that are required.

This phase builds the entire segment of the ACRL that connects Carmacks to Skagway or Haines. However it builds no part of the intermodal rail corridor segment that will run between Delta Junction and Haines.

4.4.2.2 Carmacks to Delta Junction

This route is a considerably longer route and requires more capital than the Carmacks to Skagway/Haines segment. But it is shorter and would require less capital than the Carmacks to Hazelton segment. This segment would also require the full approvals and permitting process since it would run through regions that currently have no rail or road right-of-ways.

This route would allow for some mineral development and it would be a shorter route to a tidewater export position at Anchorage area ports than the Hazelton segment would be to Northern B.C. ports. But much like the Carmacks to Hazelton route, the long distance to tidewater would increase transportation costs which will impact the economic feasibility of Yukon mines and could result in significantly lower mineral volume traffic than the Carmacks to Skagway/Haines segment. There may be some mines in the interior of Alaska that would benefit from the development of the ACRL. However, these mineral concentrates would generate relatively low revenues as a result of the relatively short distances that they would travel on the ACRL.

This route would attract some Yukon re-supply traffic, but the revenues associated with that traffic are relatively small. The route would also allow for the transportation of some Alaska Gas pipeline construction materials to staging areas in the interior of Alaska and Yukon.

This route would most likely utilize port facilities in Anchorage, Port Mackenzie or Whittier. These ports would need to be expanded to handle the mineral volume traffic.

This phase builds approximately one third of the intermodal rail corridor segment that will run between Delta Junction and Haines. However, it builds no part of the ACRL that connects Carmacks to Skagway/Haines.

4.4.2.3 Carmacks to Hazelton

This route is a considerably longer route and requires more capital than the Carmacks to Skagway/Haines segment or the Carmacks to Delta Junction segment. This segment would also require the full approvals and permitting process since it runs through regions that currently have no rail or road right-of-ways.

It would allow for the development of some mineral resources. However the longer distance to tidewater would mean a number of mineral deposits would not be economically feasible. More research needs to be conducted to determine if this route would make key mines such as the large Yukon Iron Ore deposit uneconomical. Some mines in Northwest B.C. would benefit significantly from this segment as it saves some 500 miles of rail transport east to Prince George via Minaret and back to Prince Rupert. Although this traffic would generate relatively low revenues as a result of the relatively short distances that they would travel on the ACRL, the significant rail rate savings should allow B.C. mineral shippers to share in the capital costs of construction.

This route would probably attract slightly more Yukon re-supply traffic than the Carmacks to Skagway/Haines segment, but the intermodal volumes would still be relatively insignificant. The route would also allow for the transportation of some Alaska Gas pipeline construction materials to staging areas in Northern B.C. and Yukon.

The advantage of this route is that it accesses the one port in the region that has capacity to handle large volumes of mineral concentrates. The Ridley Island terminal at the Port at Prince Rupert is a high-capacity, deep-water facility that would need very little extra investment to handle B.C./Yukon mineral concentrates, coal and iron ore. The other advantage of the Port at Prince Rupert is that products flowing in and out of the Yukon would not need to cross a Canada-US border on their way to and from tidewater.

This phase builds approximately two thirds of the intermodal rail corridor segment that would run between Delta Junction and Haines. However, it builds no part of the ACRL that connects Carmacks to Skagway/Haines.

4.5 SUMMARY

Government has a much broader and longer term perspective of the ACRL than the private sector. Thus government will likely see benefits to supporting the ACRL that the private sector would not be able to monetize.

There are a number of important factors for which it is difficult to determine a quantifiable cost or benefit. A study of these factors indicates that the ACRL would have a positive impact on a number of these factors. The ACRL would have a positive impact on economic development, the integration of the region with the rest of North America, the reliability of the region's transportation system and a number of social factors. On the other hand, the ACRL would have a negative impact on the environment and competing transportation providers.

There are a number of different strategies that government could pursue to address the funding gap. By reducing risks associated with the project the government should be able attract additional private sector funding to reduce the funding gap. Some of the key risks that government could help mitigate include political risks, cost risk and traffic volume risks. Government can address these risks through actions such as:

- creating a favorable railway regulatory environment while still protecting public interests
- enshrining government commitments in long-term contracts
- coordinating railway policies with other government policies
- creating a dedicated project team
- conducting and funding technical and environmental studies
- facilitating inter-governmental approvals
- managing public and First Nations and Alaska Native Corporation consultations
- assembling the right-of-way and reducing land acquisition costs
- creating tax incentives to encourage investment
- creating tax structures to reduce operating construction costs
- accessing government debt instruments
- providing construction inputs at lower costs

It appears inevitable that government would have to provide some forms of funding to the project. However, government can structure its investment in the ACRL to allow it to benefit from the future success of the project.

Government could support construction of the ACRL in phases. This would help spread the capital investment over a greater time period. It would also generate revenues that could be used to finance the construction of later phases of the project.

5 RECOMMENDATIONS

The results of the business case analysis discussed in this report indicate that the private sector would not invest in the project in its current form. The results indicate that if government were to develop the project on their own, they would fail to recoup their investment in the project. However, the study also points out that government may choose to pursue the development of the ACRL to meet their broader and longer term objectives.

If government decides to pursue the project they should conduct further detailed analysis to confirm that the benefits of the project, as identified by the analysis completed to date, will come to fruition. The studies conducted over the past year will help government identify the key benefits of the ACRL that warrant more detailed analysis.

Many of the key benefits are related to economic development that is a result of the ACRL. Some of the key benefits are associated with reduced transportation costs and the development of industries such as the mining industry and an international container shipping industry. Further analysis could include a more detailed study of the factors impeding Yukon mineral development to confirm that the mineral activity in the Yukon will in fact materialize if the railway is constructed. Additional analysis could also help to confirm the viability of international container traffic flowing through an Alaskan port to the rest of North America.

Government could also conduct further analysis into the key costs associated with the project such as the impact that the project may have on the environment. Building on the work conducted over the past year, a more detailed analysis of the key benefits in conjunction with further analysis of the key costs would allow a more detailed and fulsome economic analysis to be conducted. This would help support government's decision moving forward.

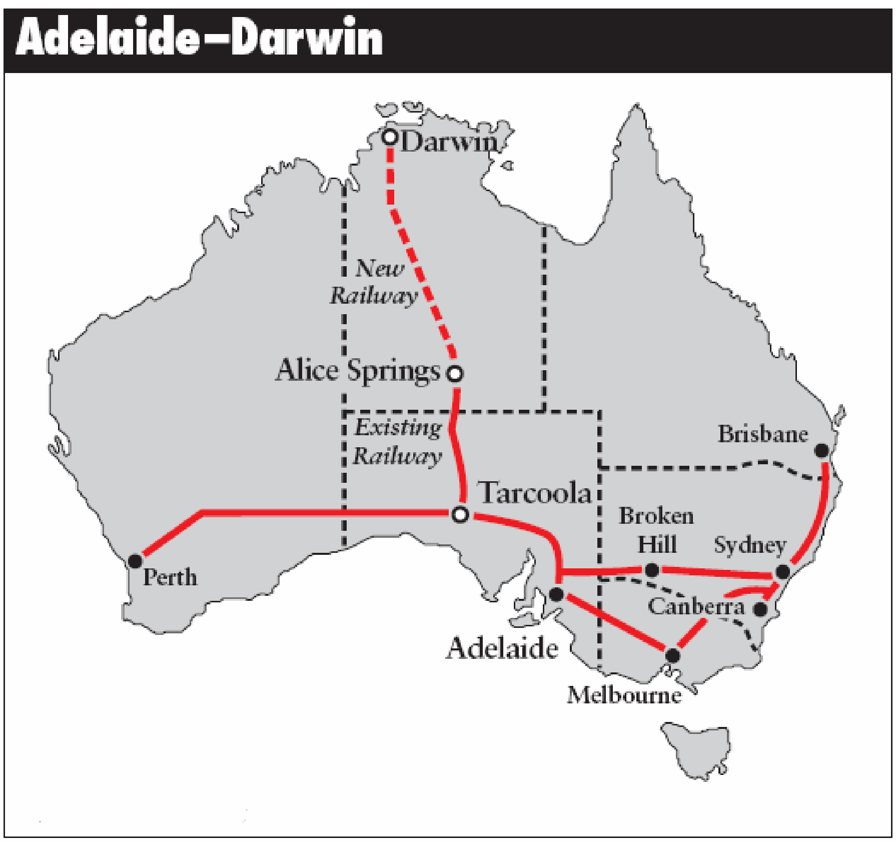
APPENDIX A - CASE STUDIES

Adelaide to Darwin Rail Link

The Adelaide to Darwin rail project is an A$1.32 billion public-private-partnership that began construction on 20 April 2001. The project entailed the completion of a rail link from Alice Springs to Darwin of approximately 1420 kilometres and the development of an integrated rail and port operation linking the southern Australian cities of Sydney, Melbourne, and Adelaide to Darwin in northern Australia.

A variety of different parties worked together on this project including;

- Financial Investors
- Large construction companies contributing equity
- Intermodal operators and
- Federal and Provincial Government.



Key Drivers

This Project was developed to provide a domestic rail link from the north to the south of Australia. It was believed this domestic rail link would provide an efficient, economic, and safe transport corridor through central Australia. General freight transportation through central Australia was, prior to construction of the rail line, minimized by the lack of rail access and primarily accomplished by truck. The rail project was intended to expand general freight capacity along the route by increasing efficiency.

The rail line was also intended to facilitate bulk minerals development along its traffic corridor through central Australia. In particular, several large projects, including a major iron ore mine, were contingent on development of the rail line. Rail infrastructure was intended to be the catalyst for major resource business development, as this rail project would provide access for resources to the northern Port of Darwin. It was also expected that a significant bulk liquids business would develop, both from the conversion from road to rail of the existing bulk liquid freight transportation, and from the increase in bulk liquids freight transportation in order to service the requirements of the major resource developments.

The Blue Sky of the rail line was to provide a rail link from the northern Port of Darwin to southern Australia for the purposes of international trade. It was believed the rail link could be more efficient for shippers than a circuitous sea route around Australia to reach the southern ports and cities. It was believed that this land bridge could increase traffic through the Port of Darwin and to the south of Australia. Given that the Port of Darwin was far closer to Australia's major trading partners in Asia, it was expected that this would increase the attractiveness of stopping in an Australian port and servicing Australia.

The Government Process

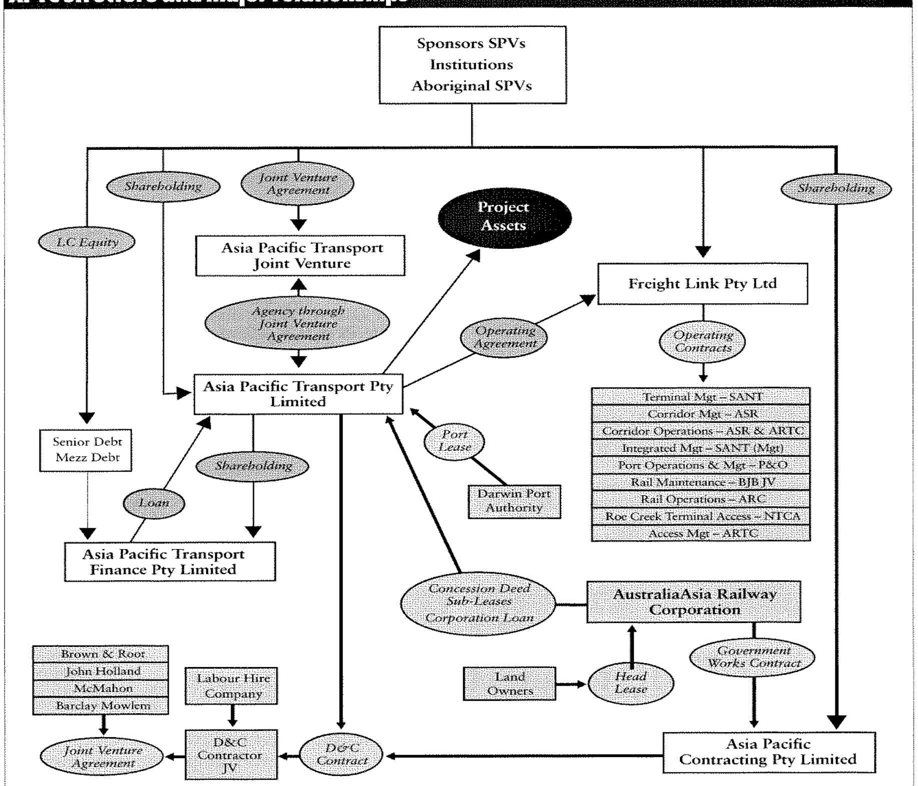
State and Commonwealth governments in Australia first conceived of the Adelaide to Darwin rail project in 1911. The project was considered to various degrees from 1911 until 1996, when, after many inter-Government reviews and expert panel reports, the government of the Northern Territory and governments in southern Australia agreed to call for private sector expressions of interest to develop the project in partnership with the public sector. The Commonwealth Government was also involved in the project, as it was necessary for the approval of any Rail Access regime under National Competition Policy guidelines.

In order to deal with the interaction with the private sector, the governments involved created a special project vehicle, the AustralAsia Railway Corporation, in order to evaluate expressions of interest, negotiate with potential consortiums, and provide a single point of access for parties interested in the development of the rail link. Given the significant number of different government agencies with a stake in the project, it was essential for the government to present a single organization for the private sector to conduct liaison with for the project.

The Consortium

The Asia Pacific Transport Corporation was chosen as the preferred bidder in November 1999. The consortium was formed in 1997 and represented eight partners – contractors Kellogg Brown & Rot, John Holland Group, Barclay Mowlem, and McMahon Holdings; transport operators Australian Railroad Group and PGA; and institutional investors. In addition, Macquarie Bank was the project's financial and commercial advisor, which included arranging the debt and equity financing, negotiating the financial terms of the Concession Deed, and arranging the financial contribution of governments. In addition, the consortium's underwriting group for the senior debt package was ABN-Amro, ANZ, RBS (Australia) and SG Australia.

APTC structure and major relationships



Source: Oil and Gas Journal

As can be seen from the diagram above, in order to execute the transaction Asia Pacific Transport required consortium members and contractors for a wide variety of functions, including design and construction, provision and arrangement of financing, interaction with the government to secure the ownership of concession deeds and sub-leases of land, and all of the required operational functions. Operations contracts included terminal management, rail maintenance, rail operations, access management, and port operations and management to deal with the integrated port aspect of operations.

The Deal

Under the terms of the deal, the consortium was required to design and construct the new railway between Alice Springs and Darwin, a railway of approximately 1420 kilometre. The consortium was also required to design and construct specific works for the Port of Darwin in order to integrate the new intermodal capacity of the port into the new railway. Finally, the consortium was to operate, maintain, and repair the new railway, together with the existing railway between Tarcoola and Alice Springs for 50 years following construction, after which the railway would revert to government control.

The final deal included a project concession for the operation of the rail line for 50 years, with a special regime developed to establish pricing frameworks for contestable and non contestable freight. Essentially, the government was willing to concede a pricing structure above that normally acceded to rail operations because of the significant risk profile accepted by the Consortium for this substantial Greenfield project. While many of the risks were standard, such as construction risk, force majeure, insurance, and maintenance standards, there were also other additional risks to be considered, including:

- Native title, heritage and sacred sites;
- Corridor leases;
- Access and competition;
- Change in law;
- Pre-existing contamination;
- Material adverse effect protection; and
- Early termination payment regime.

In addition to conceding a more profitable pricing structure to the project because of risk, the government also made additional contributions. These contributions included:

- The provision of the existing Alice Springs to Tarcoola rail link to Consortium for the concession period;
- A government loan of A$50m subordinated to equity investors at an interest rate of 8%, with an interest trigger of equity being at 1.10 times the base case estimates, and repayment at the end of the concession period or at the point of re-leveraging or refinancing;
- Government works contribution of A$428m with a drawdown schedule to meet the construction programme until month 15, followed by delayed payments of A$25m and A$20.5m;
- An A$100m improvement to the Port of Darwin in order to support the potential for international shipping through the rail link land bridge; and
- The extensive process of acquiring Aboriginal and Aboriginal-claimed land for the consortium along the proposed route. This land was approximately 32.3% of the total land necessary for the rail route.

Debt was provided on the basis that the senior lenders would only bank the domestic freight market exposure, as this was the only relatively certain exposure. Additional mezzanine tiers of debt were supported by the domestic land expectations and, to a limited extend, the expectation of international shipping land bridge freight. With the land bridge freight uncertain, senior debt providers could not accept any of the land bridge freight when assessing acceptable levels of senior debt.

For the equity providers, their minimum level of equity was intended to be achieved through returns from the domestic freight market, with strong upside potential coming from further resource development and the international land bridge freight.
The overall financing structure for the project was the following:

Funding Source	AUD$million
Equity	239
Mezzanine Tier 1	86
Mezzanine Tier 2	24
Senior Debt	491
Government Loan	50
Government Works Contribution	428
Total	1,320

The mezzanine and senior debt facilities were drawn 18 months after financial close, after the provision of government financing. The senior debt facility contained an equity bridge supported by irrevocable Bank Letters of Credit. Construction risk was supported by Joint and Several completion guarantees from the contractors' parent companies for fixed time, fixed price project delivery, with liquidated damages of 6% of the construction contract value. The tier 1 mezzanine lenders also provided a further A$66m of contingent equity to support the project during traffic ramp-up and provide cover for maintenance and operational costs of the existing railway during construction. Financial close for the project was achieved 20 April 2001, with expectation of construction completion by April 2004.

Results

Construction of the project was completed early in October 2003, with FreightLink (the operator) commencing operations in January 2004. FreightLink has successfully captured over 85% of the contestable freight market on the Adelaide to Darwin corridor and has achieved freight delivery reliability in excess of 90%, making it one of the best performers within the Australian rail industry. FreightLink also raised prices significantly during initial operations, resulting in some companies declaring that the rail line is not competitive with their truck operations, although this opinion is not borne out by the results: FreightLink's significant market share of potential traffic from southern to northern Australia.

The project also commenced bulk minerals traffic in April 2006 after the commissioning of mining operations in the region. The first resource operation commissioned will more than double transported freight along the line, with further significant increases expected from bulk mineral traffic in the near future, with a significant iron ore mine expecting to commence rail shipments in early 2007. The result of these significant increases in resource traffic along the rail line, and potential for greater increases in traffic in the future, has been the further development of bulk handling facilities at the Port of Darwin; the port will have invested A$22 million in facilities by early 2007. The bulk liquids freight volume along the rail line has also increased significantly as resource operations have commenced in order to support these operations.

FreightLink has had difficulty obtaining the international traffic expected for the rail line. As of 2005, the port needed a 50-fold increase in international container traffic in order to reach its projections for container traffic by 2007. There has not been any significant container traffic along the rail line to this point, and there is the perception that the rail link is not economical for international freight shipping in its current form. There has been limited agreement with international shipping lines to begin providing container service through Darwin and the rail line.

BHP Pilbara rail – strategic railway

BHP Billiton is one of the worlds largest mining companies. Reliable supply of the companies products are key to the customers of BHP. A delay in deliver of goods can cost the company heavily. To ensure reliability of supply BHP built two railway lines, one 426km in length and one 210km in length, in the Pilbara region of West Australia to transport iron ore mined inland to Port Hedland.

It is the sole owner and operator of the rail lines and BHP retains the rail lines on their balance sheet. The objective of the rail business for BHP is to secure their supply chain, and therefore it is a strategic asset.

As it is a strategic asset, BHP constructed the rail line using extremely high quality line and rolling stock in order to avoid derailments. As a result of the equipment, the line is able to run some of the longest and heaviest trains in the world at 7.2km in length. There are currently 12 trains a day running to the port along these rail lines.

BHP is facing strong government pressure to open its railway to another local metals producer. The National Competition Council is facing pressure from Fortescue Metals Group to declare part of the railway open access. BHP takes the position that the rail line is an essential part of their production process, and any interference in the rail line will be interference in their production process. The National Competition Council recommended that the rail line be opened, but the Australian Treasurer ignored their recommendation and rejected Fortescue Metals Group's request.

As an internally owned line, BHP has great incentive to maximize efficiency. Their drivers are trained on a similar in order to increase fuel efficiency, resulting in some of the highest efficiency in the world for the rail line at 12 net tonnes per Mega joule. This efficiency and high-quality equipment has been used to enhance BHP's argument that no other rail user should be given access to their rail line except through contracting with BHP, as additional users of the rail line would remove BHP's efficiencies and degrade their high-value infrastructure.

Financial Investor Case Study - WestNet Rail and Australian Rail Group

The Western Australian freight railway is structured railway as described in Section 3.4 with a separate Operating Company, Australian Western Railroad (AWR) and a Track Company, WestNet Rail.

The business was originally a government owned railway, which was acquired in by the Australian Rail Group (ARG) in December 2000 through the privatization of Westrail Freight, a Western Australia Government railway. ARG operated as a vertically integrated company and was responsible for over 5,000 km of track and carried over 33 million tonnes of freight rail each year.

In 2006 Babcock & Brown Infrastructure acquired 51 percent of ARG's "below rail" business WestNet Rail, under a long-term lease from the government in Western Australia. The remaining 49 percent of the purchase has been placed with a Babcock & Brown private equity syndicate, with Babcock & Brown retaining a call option to purchase the remaining 49 percent.

WestNet Rail offers access to its track network to both ARG's Western Australian operations and other rail operators. It is responsible for maintaining the track infrastructure, supply of the train control function and determination of track access fees.

Financial investors Babcock & Brown found the business attractive due to a number of key characteristics of the business which result in stable predictable cash flows. Some of the key characteristics were;

- The cost of rail transport generally represents a small component of the overall production cost of the commodity transported;
- The existing long-term customer contracts and the fact that such contracts are typically sought by resources customers to ensure adequate access to the supply chain to underpin production plans;
- The existence of some take or pay and flagfall arrangements; and
- The type and distance of product hauled and the critical nature of the grains and minerals industry to the West Australia economy overall and hence the strong level of government support.

ARG's above Rail business, Australian Western Railroad (AWR) was bought by Queensland Rail. Queensland Rail is a AUS$2.5 billion business owned by the state of Queensland and is responsible for the operation and maintenance of the railway system in the state of Queensland. The Southern Australia ARG below rail business was sold to Genesee & Wyoming.

APPENDIX B –TOTAL TRAFFIC FORECAST PER YEAR BY REVENUE TYPE

Tons ('000s) Tier	Revenue Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Tier 1	Intermodal	-	-	5,156	5,312	5,468	5,624	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
	Minerals	-	-	-	-	30	496	3,408	3,681	3,681	3,681	3,681	3,081	3,081	2,922	2,739	2,739	2,503	2,155	2,155	2,155	1,896	1,675	1,675	1,675	1,668
	DM Coal	-	-	-	15	15	1,393	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406
	Pipe	-	-	745	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	-	-	435	800	564	686	2,275	2,437	2,437	2,437	2,437	2,319	2,319	2,299	2,274	2,274	2,230	2,172	2,172	2,172	2,142	2,113	2,113	2,113	2,056
		-	-	6,336	6,638	6,077	8,199	12,869	13,305	13,305	13,305	13,305	12,586	12,586	12,406	12,199	12,199	11,920	11,513	11,513	11,513	11,224	10,974	10,974	10,974	10,910
Tier 2	Minerals	-	-	-	-	4	536	581	608	608	608	608	546	546	524	524	253	243	4	4	4	4	4	4	4	4
	Coal	-	-	-	-	-	11,569	11,569	11,569	11,569	11,569	11,569	11,569	11,569	11,569	11,569	11,569	11,569	11,569	11,569	10,494	9,033	9,033	9,033	9,033	9,033
		-	-	-	-	4	12,106	12,150	12,177	12,177	12,177	12,177	12,116	12,116	12,093	12,094	11,822	11,812	11,573	11,573	10,498	9,037	9,037	9,037	9,037	9,037
Tier 3	Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	1,669	1,669	1,669	1,669	1,669	1,669
		-	-	6,336	6,638	6,080	20,305	25,019	25,482	25,482	25,482	25,482	24,702	24,702	24,499	24,293	24,022	23,732	23,087	23,999	23,680	21,930	21,680	21,680	21,680	21,616

Tons ('000s) Tier	Revenue Type	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50
Tier 1	Intermodal	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
	Minerals	1,668	896	153	153	153	153	16	16	16	16	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DM Coal	1,406	1,406	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pipe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	2,056	1,138	921	921	921	921	691	192	192	192	192	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10,910	9,221	6,882	6,854	6,854	6,854	6,488	5,988	5,988	5,988	5,988	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
Tier 2	Minerals	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coal	5,702	5,702	5,674	5,674	5,674	5,674	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		5,706	5,705	5,674	5,674	5,674	5,674	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	Minerals	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669
		18,286	16,595	14,224	14,196	14,196	14,196	8,157	7,657	7,657	7,657	7,657	7,449	7,449	7,449	7,449	7,449	7,449	7,449	7,449	7,449	7,449	7,449	7,449	7,449	7,449

APPENDIX B1 – FULL ROUTE FORECAST PER YEAR BY REVENUE TYPE

Tons ('000s) Tier	Revenue Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Tier 1	Intermodal	-	-	5,156	5,312	5,468	5,624	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
	Minerals	-	-	-	-	30	496	3,408	3,681	3,681	3,681	3,681	3,081	3,081	2,922	2,739	2,739	2,503	2,155	2,155	2,155	1,896	1,675	1,675	1,675	1,668
	DM Coal	-	-	-	15	15	1,393	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406
	Pipe	-	-	745	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	-	-	435	800	564	686	2,275	2,437	2,437	2,437	2,437	2,319	2,319	2,299	2,274	2,274	2,230	2,172	2,172	2,172	2,142	2,113	2,113	2,113	2,056
		-	-	6,336	6,638	6,077	8,199	12,869	13,305	13,305	13,305	13,305	12,586	12,586	12,406	12,199	12,199	11,920	11,513	11,513	11,513	11,224	10,974	10,974	10,974	10,910
Tier 2	Minerals	-	-	-	-	4	536	581	608	608	608	608	546	546	524	524	253	243	4	4	4	4	4	4	4	4
	Coal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	4	536	581	608	608	608	608	546	546	524	524	253	243	4	4	4	4	4	4	4	4
Tier 3	Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	1,669	1,669	1,669	1,669	1,669	1,669
		-	-	6,336	6,638	6,080	8,736	13,450	13,913	13,913	13,913	13,913	13,132	13,132	12,930	12,724	12,452	12,162	11,517	12,429	13,186	12,897	12,647	12,647	12,647	12,583

Tons ('000s) Tier	Revenue Type	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50
Tier 1	Intermodal	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
	Minerals	1,668	896	153	153	153	153	16	16	16	16	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DM Coal	1,406	1,406	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pipe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	2,056	1,138	921	921	921	921	691	192	192	192	192	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10,910	9,221	6,882	6,854	6,854	6,854	6,488	5,988	5,988	5,988	5,988	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
Tier 2	Minerals	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10,914	9,223	6,882	6,854	6,854	6,854	6,488	5,988	5,988	5,988	5,988	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780

APPENDIX B2 – PHASED OPTION A (SKAGWAY TO CARMACKS) ROUTE FORECAST PER YEAR BY REVENUE TYPE

Tons ('000s) Tier	Revenue Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Tier 1	Intermodal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Minerals	-	-	-	-	30	30	30	30	30	30	30	30	30	30	30	30	-	-	-	-	-	-	-	-	-
	DM Coal	-	-	15	15	15	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406
	Pipe	-	-	313	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	329	195	45	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406	1,406
Tier 2	Minerals	-	-	-	-	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	-	-	-	-	-	-
	Coal	-	-	-	-	-	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
		-	-	-	-	4	33	33	33	33	33	33	33	33	33	33	33	29	29	29	29	29	29	29	29	29
Tier 3	Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	912	912	912	912	912	912
		-	-	329	195	48	1,468	1,468	1,468	1,468	1,468	1,468	1,468	1,468	1,468	1,468	1,468	1,435	1,435	2,347	2,347	2,347	2,347	2,347	2,347	2,347

Tons ('000s) Tier	Revenue Type	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50
Tier 1	Intermodal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DM Coal	1,406	1,406	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pipe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1,406	1,406	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coal	29	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		29	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	Minerals	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912
		2,347	2,347	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912

APPENDIX B3 – PHASED OPTION B (HAZELTON TO CARMACKS) ROUTE FORECAST PER YEAR BY REVENUE TYPE

Tons ('000s) Tier	Revenue Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Tier 1	Intermodal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Minerals	-	-	-	-	-	467	1,753	1,959	1,959	1,959	1,959	1,763	1,763	1,603	1,421	1,421	1,276	1,151	1,151	1,151	1,151	929	929	929	929
	DM Coal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pipe	-	-	157	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	-	-	61	227	239	253	1,684	1,847	1,847	1,847	1,847	1,728	1,728	1,728	1,704	1,704	1,660	1,602	1,602	1,602	1,572	1,543	1,543	1,543	1,486
		-	-	217	557	239	720	3,437	3,806	3,806	3,806	3,806	3,491	3,491	3,332	3,125	3,125	2,935	2,753	2,753	2,753	2,722	2,472	2,472	2,472	2,415
Tier 2	Minerals	-	-	-	-	-	533	534	555	555	555	555	534	534	511	512	240	240	1	1	1	1	1	1	1	1
	Coal	-	-	-	-	-	11,541	11,541	11,541	11,541	11,541	11,541	11,541	11,541	11,541	11,541	11,541	11,541	11,541	11,541	10,465	9,004	9,004	9,004	9,004	9,004
		-	-	-	-	-	12,073	12,074	12,095	12,095	12,095	12,095	12,074	12,074	12,052	12,053	11,781	11,781	11,542	11,542	10,466	9,005	9,005	9,005	9,005	9,005
Tier 3	Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	757	757	757	757	757	757
		-	-	217	557	239	12,793	15,512	15,901	15,901	15,901	15,901	15,566	15,566	15,384	15,177	14,906	14,716	14,295	14,295	13,976	12,485	12,234	12,234	12,234	12,178

Tons ('000s) Tier	Revenue Type	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50
Tier 1	Intermodal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Minerals	929	157	147	147	147	147	11	11	11	11	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DM Coal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pipe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IndProd	1,486	568	351	351	351	351	121	121	121	121	121	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2,415	726	498	498	498	498	132	132	132	132	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	Minerals	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coal	5,674	5,674	5,674	5,674	5,674	5,674	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		5,675	5,674	5,674	5,674	5,674	5,674	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	Minerals	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757	757
		8,847	7,156	6,929	6,929	6,929	6,929	889	889	889	889	889	757	757	757	757	757	757	757	757	757	757	757	757	757	757

APPENDIX C – ADJUSTED FULL ROUTE DENSITY PER YEAR BY SEGMENT

Segment Density (MGT)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Segment 1a	-	-	15.4	17.1	16.8	18.4	21.7	22.2	22.2	22.2	22.2	21.7	21.7	21.5	21.2	21.2	21.0	20.6	20.6	20.6	20.6	20.2	20.2	20.2	20.1
Segment 1b	-	-	15.2	16.3	16.6	17.5	19.5	19.7	19.7	19.7	19.7	19.3	19.3	19.3	19.3	19.3	19.2	19.1	19.1	19.1	18.9	18.9	18.9	18.9	18.8
Segment 1c	-	-	14.9	15.7	16.2	17.1	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Segment 1d	-	-	15.4	15.7	16.3	17.1	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Segment 3a	-	-	0.6	0.3	0.0	2.0	4.6	4.7	4.7	4.7	4.7	4.0	4.0	4.0	4.0	4.0	3.9	3.6	5.0	5.0	4.6	4.6	4.6	4.6	4.6
Segment 3b	-	-	0.2	0.4	0.3	1.4	4.0	4.2	4.2	4.2	4.2	3.5	3.5	3.4	3.4	3.4	3.3	2.9	4.3	4.3	3.9	3.9	3.9	3.9	3.9

(Cont'd)	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50
Segment 1a	20.1	19.1	18.8	18.8	18.8	18.8	18.5	17.6	17.6	17.6	17.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
Segment 1b	18.8	18.8	18.3	18.3	18.3	18.3	18.3	17.4	17.4	17.4	17.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
Segment 1c	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.4	17.4	17.4	17.4	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2
Segment 1d	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.4	17.4	17.4	17.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
Segment 3a	4.6	4.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Segment 3b	3.9	3.9	1.7	1.7	1.7	1.7	1.7	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4

APPENDIX D – TOTAL TON MILES BY ROUTE OPTION

TON MILES TIER 1	Full Route	*Phased Option A* Carmacks Skagway	*Phased Option B* Carmacks New Hazelton	*Phased Option C* Carmacks Delta Junction
Intermodal	364,069,664,768	-	-	-
Minerals	16,782,214,316	76,910,328	8,212,388,621	-
Coal	-	-	-	-
Pipe	350,031,050	54,259,700	241,989,300	53,782,050
IndProd	32,482,046,122	-	11,791,588,699	-
Division Moutain - Coal Exports	5,032,050,628	5,032,050,628	-	-
Division Mountain - Industrial Products	628,993,759	33,919,247	-	-
TOTAL TON MILES	419,345,000,643	5,197,139,903	20,245,966,619	53,782,050
TIER 2				
Minerals	434,641,666	7,997,519	1,909,640,481	-
Coal	105,604,884	105,604,884	60,363,164,088	-
TOTAL TON MILES	540,246,550	113,602,403	62,272,804,569	-
TIER 3				
Minerals	6,320,873,184	6,320,873,184	11,661,789,405	-
Coal	-	-	-	-
	6,320,873,184	6,320,873,184	11,661,789,405	-
Total Route Ton Miles	**426,206,120,377**	**11,631,615,490**	**94,180,560,593**	**53,782,050**

APPENDIX E – TOTAL REVENUES PER YEAR BY ROUTE OPTION

Revenues (Real) ($ millions)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Full Route	-	-	359	394	391	445	544	551	551	551	551	536	536	533	529	529	523	515	515	515	509	504	504	504	503
Phased Option - Delta Junction	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phased Option - New Hazelton	-	-	6	14	7	210	253	259	259	259	259	252	252	249	245	241	237	229	229	223	199	194	194	194	193
Phased option - Skagway	-	-	5	3	1	24	24	24	24	24	24	24	24	24	24	24	23	23	39	39	39	39	39	39	39

(Cont'd)	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50
Full Route	503	478	437	437	437	437	431	415	415	415	415	411	411	411	411	411	411	411	411	411	411	411	411	411	411
Phased Option - Delta Junction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phased Option - New Hazelton	139	114	111	111	111	111	14	14	14	14	14	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Phased option - Skagway	39	39	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16