

R E P O R T

Northern Development Initiative Trust

*Economic Assessment of Highway 97 :
Constraints to Movement of Goods and
Opportunities for Economic Growth*

JUNE 2009



Associated
Engineering



Report

Northern Development Initiative Trust

Economic Assessment of Highway 97

Constraints to the Movement of Goods and Opportunities for Economic Growth

June 2009

CONFIDENTIALITY AND © COPYRIGHT

This report was prepared by Associated Engineering (B.C.) Ltd. for the account of Northern Development Initiative Trust. The material in it reflects Associated Engineering (B.C.) Ltd.'s best judgement, in light of the information available to it, at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Associated Engineering (B.C.) Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Executive Summary

BC Provincial Highway 97 provides a vital link between Quesnel and Prince George in the south and Dawson Creek, Fort St. John and other communities and resource developments in the northeast of the province. This link is crucial to the economic well-being of many businesses.

The Northern Development Initiative Trust and the BC Ministry of Transportation and Infrastructure have identified constraints along this corridor that are seen to impede the flow of commercial traffic, more specifically oversized loads. These constraints include four overhead railway crossings between Quesnel and Prince George and three overhead railway crossings and two bridges (Salmon River Bridge and Parsnip River Bridge) between Prince George and Dawson Creek. These constraints reportedly result in the inability of local contractors to competitively bid against companies from outside the province on service and supply work on major construction contracts within BC.

The purpose of this study is to give Northern Development an assessment of the potential economic benefits and opportunities for economic diversification in northeastern BC resulting from mitigating constraints along the Highway 97 corridor between Quesnel and Dawson Creek.

Ministry data reported a total of 11,575 single-trip permits issued for the movement of over-dimensional trips to/from/thru/within the Peace area over a one year period (2008/2009). This translates into approximately 30 over-dimensional loads moving daily to/from/thru/within the study area. Approximately 40% of all over-dimensional permits issued were for over-size loads (height and/or width and/or length), approximately 33% were issued for over-weight loads, and approximately 25% were issued for loads that were both over-size and over-weight.

Information gaps exist related to total over-dimensional travel demand. In addition to permitted trips provided as part of the Ministry database, the total travel demand includes:

- trips where permits are denied on the basis of load size; and
- trips that used alternative routes knowing that permits would be denied.

For example, certain loads (i.e., mobile cranes, pre-fabricated buildings, wind tower components) may be too large (over-height, over-width, over-length respectively) to be physically accommodated on the Highway 97 corridor and as such are not permitted to move along that corridor. The existing industry practice for these loads is to bypass the study corridor by using alternate routes.

In addition, a wide awareness of the study corridor restrictions exists among industry currently generating over-dimensional loads destined to/from/thru/within the Peace area. Therefore, industry has adjusted the logistics of their operations by using alternate routes when necessary.

As a result of industry practices and due to the information gaps described above, it is difficult to quantifying the unmet travel demand of the Highway 97 study corridor.

Several industries are establishing or expanding their presence in Northern BC. These include hydro-electric power generation (upgrading of existing generating facilities and development of a new generating facility at Site C in the Peace), wind-generated power (in the Peace and Chetwynd areas), oil and natural gas (west of Chetwynd), mining (both metal and mineral), prefabricated buildings (Dawson Creek), and transportation (resulting from expansion at the port of Prince Rupert).

These types of industries are heavily reliant on large machinery and equipment for their operation. The result of the projected industry expansion will be an increased requirement to transport over-dimensional loads, both in size and weight. Additional pressure will be placed on the transportation network to accommodate these loads, exasperating the existing issues associated with the infrastructure constraints. Alternate routes to Highway 97 are available allowing these types of loads to reach their destination, mainly via Alberta.

The perspective of this analysis is that opportunities for economic growth in the Quesnel to Dawson Creek corridor will be related to the resource developments described in the report including:

- Oil and gas exploration, production and transportation (pipelines);
- Mining;
- Hydroelectric power generation;
- Wind power generation; and
- Transportation via the Quesnel – Dawson Creek Corridor to/from Kitimat, Prince Rupert and Vancouver ports.

This study identifies the “market” as comprising resource development opportunities in northeastern BC, including goods and services now imported from Alberta.

After discussion with industry representatives, we believe that the following industries already located in the Quesnel – Dawson Creek Corridor can reasonably expect to compete for new clients/markets for their goods and services:

1. Metal fabricating;
2. Prefabricated buildings (residential, institutional and industrial);
3. Oil and gas field machinery;
4. Mining services; and
5. Transportation and storage.

The northeastern BC market for these five sectors is estimated at some \$2 billion annually.

The estimated capital cost of the improvements to Highway 97 along the Quesnel – Dawson Creek Corridor is \$135 M. Discounting at an interest rate of 5% (the current long term provincial bond yield ⁱ), this sum is

equivalent to paying \$11 million per year over 20 years. Thus, economic benefits to BC over the next 20 years should equal or exceed \$11 million per year if the expenditures are to be economically justified.

The results of the analysis indicate that to justify the project from the perspective of economic benefits as measured by incremental GDP growth (i.e., to achieve a Benefit: Cost ratio of 1.0 or greater), BC companies would need to capture an average of 0.75% (i.e. less than 1%) of the market share presently held by Alberta producers. In terms of employment, this level of market penetration would create 84 new full-time jobs. It would also lead provincial tax revenues to grow by over \$700,000 annually.

Given the marketing services and financial encouragement of federal, provincial and regional economic development agencies, this level of market penetration seems achievable and therefore, the proposed upgrades are deemed to be economically feasible. Note that this project is deemed feasible even without accounting for the economic benefits of reduced travel time, fuel savings and truck maintenance that would accrue from highway improvements.

Table of Contents

SECTION	PAGE NO.
Executive Summary	i
Table of Contents	iv
1 Context	1-1
1.1 Opportunity	1-1
1.2 Northern Development Initiative Trust	1-2
2 Identification of Corridor Constraints	2-1
2.1 Study Corridor	2-1
2.2 Corridor Standards	2-2
2.3 Existing Transport Haul Use	2-2
2.4 Corridor Needs	2-7
3 Industrial Profile	3-1
3.1 Economic Present	3-1
3.2 Economic Future	3-2
4 Opportunities	4-1
5 Benefits to BC of Quesnel - Dawson Creek Corridor Improvements	5-1

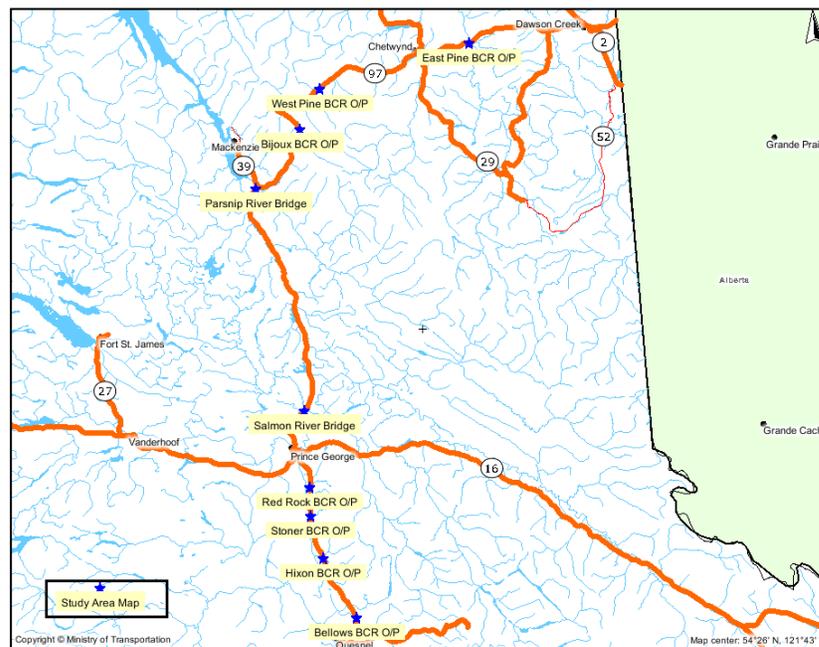
1 Context

1.1 OPPORTUNITY

BC Provincial Highway 97 provides a vital link between Quesnel and Prince George in the south and Dawson Creek, Fort St. John and other communities and resource developments in the northeast of the province. This link is crucial to the economic well-being of many businesses.

The Northern Development Initiative Trust (Northern Development) and Ministry of Transportation and Infrastructure (MOT) have identified constraints along this corridor that are seen to impede the flow of commercial traffic, more specifically oversized loads. These constraints, shown in **Figure 1-1**, include four overhead railway crossings between Quesnel and Prince George and three overhead railway crossings and two bridges (Salmon River Bridge and Parsnip River Bridge) between Prince George and Dawson Creek.

**Figure 1-1
Highway 97 Study Corridor Constraints**



*Source: NORTHERN DEVELOPMENT

The recorded vertical clearance of the seven overhead railway bridges varies from 4.64 m at the Red Rock BCR Overpass to 6.3 m at the Bijoux BCR Overpass. We note that for the latter, the 6.3 m vertical clearance as well as that for the East Pine BCR Overpass meet the current minimum vertical clearance standard of 5.0 m.

Businesses and industries have indicated that the low overhead railway bridge clearances and the width restrictions on the bridges hampers their ability to accommodate large loads and structures through the section of Highway 97 from Quesnel to Dawson Creek. In order to meet the height and/or width constraints at the overhead railway bridges and the Salmon River and Parsnip River Bridges the large equipment and structures require disassembly into smaller loads prior to transport along the Highway 97 corridor between Quesnel and Dawson Creek. As a result, the local industry and businesses are forced to sustain the inflated costs for material goods movement. This has reportedly resulted in the inability of local contractors to competitively bid against companies from outside the province on service and supply work on major construction contracts within BC. While they could bypass Pine Pass by going via Alberta, this is inefficient as it adds not only to transport costs, but also to time delay.

Through this study, the Northern Development Initiative Trust wishes to better understand the degree to which the existing overhead railway bridge crossings, narrow bridges, and other identified roadway constraints on the subject section of Highway 97 are hindering business and industry diversification in the region. The purpose of this study is to give Northern Development an assessment of the potential economic benefits and opportunities for economic diversification in northeastern BC resulting from mitigating constraints along the Highway 97 corridor between Quesnel and Dawson Creek.

1.2 NORTHERN DEVELOPMENT INITIATIVE TRUST

Northern Development was established in 2004 by the provincial government to provide economic opportunities for central and northern BC. Northern Development is a catalyst for communities to reach their economic potential by:

- Leveraging and encouraging others to invest in economic development
- Creating a positive investment climate
- Diversifying and increasing the economy of the communities and regions
- Influencing the type of growth by encouraging sustainable enterprises

Northern Development holds a vision for the future: that Northern BC has world-class industries, diversified regional economies and growing energetic communities.

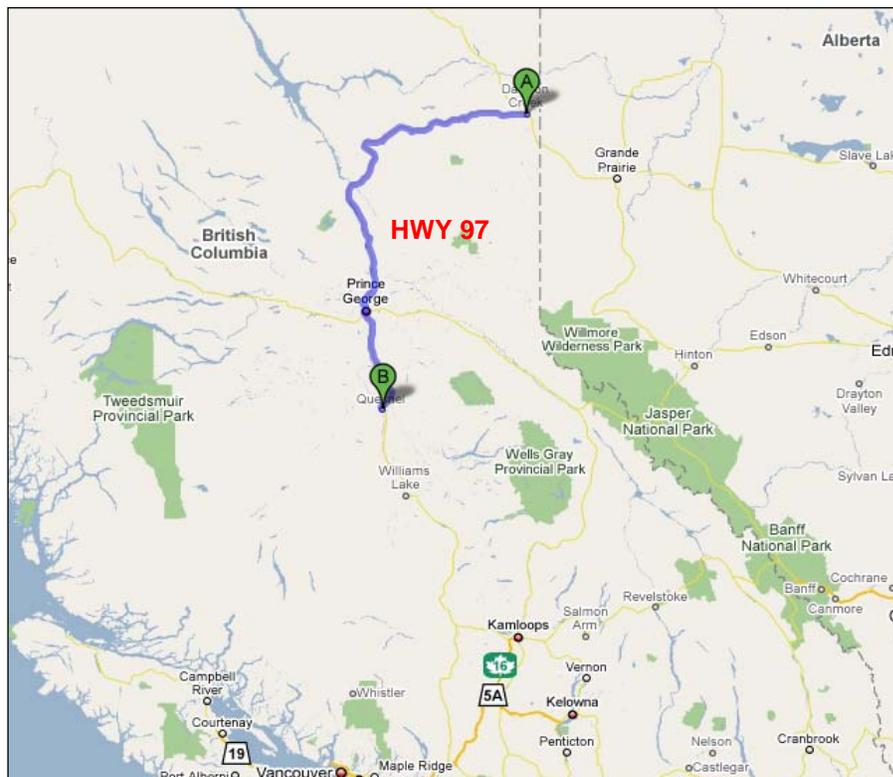
2 Identification of Corridor Constraints

2.1 STUDY CORRIDOR

Highway 97 is part of the provincial highway system that stretches from the Canada/US border to the BC/Yukon border. It is a major north/south route linking several major BC communities to local, national and international markets.

The subject of this study is approximately 525 km of the Highway 97 corridor from Quesnel and Dawson Creek, shown in **Figure 2-1**. The corridor passes through several major northern communities including Prince George, Quesnel, Chetwynd and Dawson Creek. Along the way, the corridor spans varying terrains, ranging from rolling hills to mountainous areas, most notably Pine Pass. The highway crosses several rivers and tributaries, most notably the Peace River. BC Rail crosses Highway 97 at several points along the study corridor. Highway 97 within the study area has a combination of urban and rural cross-sections, with majority of the corridor having a two-lane undivided rural cross-section.

**Figure 2-1
Study Corridor**



*Source: Google Maps

The daily traffic volumes along the study corridor vary from approximately 1,200 vehicles per day in rural areas (i.e., north of Chetwynd), to 3,000 vehicles per day in Dawson Creek, 5,000 vehicles per day in the Quesnel area and 20,000 vehicles per day in Prince George.ⁱⁱ

Trucks comprise upwards of 20% of the total traffic volumes on rural sections of the Highway 97 corridor and 5% of the total traffic volumes on urban sections.

2.2 CORRIDOR STANDARDS

While this study looks particularly at the vertical clearances of highway structures along the Highway 97 corridor between Quesnel and Dawson Creek, highway width and weight limits also affect the movement of goods. In an effort to better understand corridor limitations, this section summarizes the basic vertical clearance standards, highway width standards, and allowable weight limits imposed on the study corridor.

2.2.1 Vertical Clearance

Vertical clearance is the dimension measured from the roadway surface to the underside of a structure. Vertical clearance requirements vary widely across jurisdictions.

The minimum vertical clearance standard in British Columbia is 5.0 m.ⁱⁱⁱ

2.2.2 Highway Width

Highway width is the width of the travelled way (3.7 m per lane) plus shoulder width. Shoulder widths of 2.5 m on undivided rural highway sections with 100 km/hr speed limits should be carried through across the bridge or underpass.^{iv}

2.2.3 Weight Limits

The Highway 97 corridor between Quesnel and Prince George has an allowable Gross Vehicle Weight (GVW) of 63,500 kg and allowable axle group weight limits as follows:

- Steering/Single – 9,100 kg
- Tandem – 17,000 kg
- Tridem – 24,000 kg

2.3 EXISTING TRANSPORT HAUL USE

This section summarizes the commercial vehicle travel demand along the study corridor as it relates to the movement of over-dimensional loads. The information presented is obtained from the BC Ministry of Transportation permit database. The Provincial Permit Centre, located in Dawson Creek, issues over-dimensional (size and weight) vehicle permits to carriers and keeps a record of all permits issued. Synthesis of the data from the permit database provided information on each over-dimensional load's

origin/destination, type (size or weight or both), and commodity permitted to be moved into the Peace River area over a one year period, from March 2008 to April 2009. The permit database is the most complete set of information available on over-dimensional loads in the study area and is therefore most suitable for use in this study. The data base does not however distinguish between loads transported on Highway 97 from loads transported on other highways north.

During the one year period a total of 11,575 single-trip permits were issued for the movement of over-dimensional trips to/from/thru/within the Peace area. This includes permits for movement on all roads, including those from Dawson Creek, for example, to Fort St. John. This translates into approximately 30 over-dimensional loads moving daily to/from/thru/within the study area. As a result of a recent decline in the global economy, the number of over-dimensional permits issued in 2008/2009 is likely lower than it has been in the past.

The following sections provide a summary of the types of permits issued, types of commodities transported, and the origins/destinations of over-dimensional trips made over a one year period to/from/thru/within the study area.

2.3.1 Types of Over-Dimensional Loads

Based on the information provided in the permit database, from March 2008 to April 2009 approximately two-fifths (4,766) of all over-dimensional permits issued were for over-size loads (height and/or width and/or length), approximately one-third (3,815) were issued for over-weight loads, and approximately one-quarter (2,994) were issued for loads that were both over-size and over-weight.

2.3.2 Origins / Destinations of Over-Dimensional Loads

Table 2-1 shows the origins, destinations and frequencies of over-dimensional loads.

**Table 2-1
Origins and Destination Matrix of Over-Dimensional Trips in Percent Area**

From/To	Alberta	Hwy 97 (Dawson Creek to Prince George)	Hwy 97 (South of Prince George to Quesnel)	West of Prince George	North of Dawson Creek	South of Quesnel
Alberta	0	19	0	0	9	0
Hwy 97 (Dawson Creek to Prince George)	10	32	2	2	2	3
Hwy 97 (South of Prince George to Quesnel)	0	6	1	0	0	1

From/To	Alberta	Hwy 97 (Dawson Creek to Prince George)	Hwy 97 (South of Prince George to Quesnel)	West of Prince George	North of Dawson Creek	South of Quesnel
West of Prince George	0	2	0	0	0	0
North of Dawson Creek	4	1	0	0	0	0
South of Quesnel	0	4	1	0	0	0

*Source: BC Ministry of Transportation – Provincial Permit Centre (March 2008 to April 2009)

Approximately 40% of all over-dimensional trips were made to/from locations within the study corridor limits between Quesnel and Dawson Creek. Similarly, approximately 40% originated in or were destined to Alberta and/or points further east. The data does not indicate how many of these trips were made along Highway 97. Approximately 5% originated in, or were destined to, areas west of Prince George and areas north of Dawson Creek, respectively. The remaining 10% of the over-dimensional trips originated in or were destined to areas south of Quesnel, including the Lower Mainland, and southeast BC.

2.3.3 Over-Dimensional Commodities

Table 2-2 shows the over-dimensional commodities transported to/from/thru/within the study area during a one year period (March 2008 to April 2009). For the purposes of this study the load types provided as part of the Permit Centre database have been grouped into eight commodity groups.

**Table 2-2
Over-Dimensional Commodities**

Commodity	Annual Count	Percent of Total (%)
Logging	1,090	9
Oil and Gas	231	2
Agriculture	41	0
Mobile Building	746	6
Machinery (General)	3,935	34
Vehicle Transport (including vehicle parts)	529	5
Construction Materials	604	5
Other (Undefined)	4,933	38
Total	11,575	100

*Source: BC Ministry of Transportation – Provincial Permit Centre (Mach 2008 to April 2009)

Approximately one-third of all over-dimensional trips in the study area are moving machinery, which includes items such as excavators, loaders, graders, pavers, etc. A large proportion of the information provided in the database, approximately two-fifths, did not identify the commodity transported as part of the over-dimensional trip. Nearly 10% of all over-dimensional commodities transported are related to the logging industry, and 6% are mobile building moves. Vehicle transport and construction materials each account for approximately 5% of all over-dimensional vehicle moves to/from/thru/within the study area.

2.3.4 Unmet Travel Demand

While the permit database provides information on the over-dimensional trips being made to/from/within/thru the area, it does not provide information on the total over-dimensional travel demand. In addition to permitted trips, the total travel demand includes:

- trips where permits are denied on the basis of load size; and
- trips that used alternative routes knowing that permits would be denied.

For example, certain loads (e.g., mobile cranes, pre-fabricated buildings, wind tower components) may be too large (over-height, over-width, over-length respectively) to be physically accommodated on the Highway 97 corridor and as such are not permitted to move along that corridor.

Some loads, for example mobile cranes and wind tower blades, are irreducible meaning that the load can not be broken down into components that could be accommodated along the corridor. In other cases, the loads are reducible, for example pre-fabricated buildings can be manufactured in a “transport system friendly” way. Industry identified that 4.72 m is a common height most equipment is designed to reduce to for road travel. However, industry may not wish to incur the cost associated with transporting several components.

Both reducible and irreducible loads may not be eligible to travel along the study corridor and are, for the purpose of this study, assumed to be the travel demand currently unmet by the Highway 97 corridor between Quesnel and Dawson Creek. The existing industry practice for these loads is to bypass the study corridor by using alternate routes.

Currently the Provincial Permit Centre keeps records of permitted loads but does not document the denied permits. In addition, a wide awareness of the study corridor restrictions exists among industry currently generating over-dimensional loads destined to/from/thru/within the Peace area. Therefore, industry has adjusted the logistics of their operations by using alternate routes when necessary.

As a result of industry practices and due to the information gaps described above, it is difficult to quantify the unmet travel demand of the Highway 97 study corridor. However, Ministry representatives^v have indicated that the number of permits currently denied on the basis of height clearance restrictions is less than 1% of total permit applications. The relatively small percentage reflects industry awareness of study corridor restrictions and the consequential adjustment of their logistics practices when transporting over-dimensional loads.

Furthermore, CVSE representatives estimate that about 80% of the travel demand currently unmet on the basis of height clearance restrictions along the study corridor would be accommodated should those clearances meet 5.33 m, which is higher than the BC standard of 5.0 m. In addition, CVSE representatives estimate that 99.9% of the demand would be met should all structure height clearances be increased to 5.5 m. The remaining demand requiring vertical clearances exceeding 5.5 m is considered to be negligible.

2.3.5 Alternate Routes

The approximate distances and travel times between relevant points along the Highway 97 study corridor are as follows:

- from Quesnel to Prince George (122 km, 1hr 27 min);
- from Quesnel to Dawson Creek (525 km, 6 hrs 5 min); and
- from Prince George to Dawson Creek (405 km, 4 hrs 44 min).^{vi}

Routes alternate to the Highway 97 study corridor used for over-dimensional load transport between Quesnel, Prince George and Dawson Creek are highly dependent on the type cargo being transported, resulting in variable travel times to bypass the study corridor.

For example, loads higher than 4.64 m (vertical clearance of Red Rock BCR Overpass on the Highway 97 segment between Quesnel and Prince George) are required to use alternate routes, likely via Highway 5 and Highway 16. Loads exceeding 4.92 m height (vertical clearance of West Pine BCR Overpass on the Highway 97 segment between Prince George and Dawson Creek) are reported to use the Tumbler Ridge route.

In addition to height clearance constraints there are road width issues associated with transporting over-dimensional loads. For example, pre-fabricated buildings wider than 11.0 m are transported into the Peace area through Alberta due to width restrictions along the Highway 97 corridor (i.e., Pine River Bridge).

The alternate routes to Highway 97 for hauls between Quesnel and Dawson Creek have been identified by stakeholders as follows:

- from Prince George via Highway 16 (Yellowhead Highway) east into Alberta and north to Dawson Creek through Grand Prairie (898 km, 10 hrs 29 min)
- from Prince George via Highway 16/Highway 5 south to Highway 1 into Alberta and north to Dawson Creek through Grand Prairie (1,810 km, 21 hrs 5 min)
- from Quesnel via Highway 97 north to Prince George, and from Prince George via Highway 16 (Yellowhead Highway) east into Alberta, and north to Dawson Creek through Grand Prairie (1,009 km, 11 hrs 49 min)
- from Quesnel via Highway 97 south to Highway 1 into Alberta, and north to Dawson Creek through Grand Prairie (1,368 km, 16 hrs 30 min)
- from Prince George to Dawson Creek via Tumbler Ridge (Highway 29/Highway 52) (516 km, 7 hrs 51 min)
- from Quesnel to Prince George via Highway 97 south, to Highway 5/Highway 16 north (833 km, 9 hrs 37 min).

Over-dimensional loads are well accommodated on Alberta's highway system due to a combination highway geometry, highway structure clearances, and transportation policies. Alberta's transportation policies have in part been developed with the goal to accommodate the needs of an economy rooted in oil and natural gas exploration. As such, Alberta's commercial vehicle regulations reflect the dependency of this industry on large equipment.

2.4 CORRIDOR NEEDS

As part of this study information and input were solicited from the various stakeholders with respect to the key limitations along the Highway 97 corridor between Quesnel and Dawson Creek as they relate to the

transportation of over-dimensional loads. In addition, field observations were made by the study team and several limiting features identified along the study corridor during a site visit to the study area.

This section identifies the study corridor needs as they relate to the existing and future travel demand of over-dimensional vehicles. In addition to these needs, the BC Ministry of Transportation is committed to improving portions of the Highway 97 study corridor over the next year. These improvements are identified as part of this section.

2.4.1 Existing Needs

This section identifies, in qualitative terms, study corridor needs resulting from existing over-dimensional vehicle travel demand generated by existing industry. The constraints identified by stakeholders and other relevant information along the corridor are summarized in **Table 2-3**. The relevant limiting features of the Highway 97 corridor between Quesnel and Dawson Creek are also shown in **Figure 1-1**. The identification of these constraints is essential in assessing the need for infrastructure improvements, as well as the ultimate economic benefit potentially realized by BC as a result of implementing improvements.

Table 2-3
Limiting Features along Highway 97 from Quesnel to Dawson Creek

Limiting Feature	Description
Entire Hwy 97 Corridor between Quesnel and Dawson Creek	Utility line clearances
	Weight (64,000 kg)
Pine Pass	Horizontal and vertical road alignment in certain portions of the Pine Pass, and tight corners caused by several geographical features make it difficult for over-dimensional vehicles to negotiate.
Below CNR Overpass	Height*
Hixon CNR Overpass	Height*
Stoner CNR Overpass	Height*
Red Rock CNR Overpass	Height*
Bijoux CNR Overpass	Road super-elevation results in a significant difference in clearance between NB and SB lanes.
West Pine CNR Overpass	Height*
East Pine CNR Overpass	Height = 5.0 m
Salmon River Bridge	Width
Parnsip River Bridge	Width, Height = 5.05 m

* Limiting feature based on a minimum vertical clearance standard of 5.0 m (TAC); Source: NORTHERN DEVELOPMENT

The following are additional comments related to corridor limitations, as provided by the stakeholders:

- One of the main height clearance issues encountered along the Highway 97 corridor is the Salmon River Bridge. Highway 5 is used as a bypass route. However, this bypass increases the travel time on average by 12 hours.
- Generally over-dimensional equipment arrives in Northern BC from the east.
- Cargo arriving from Europe or South America arrives through the port of Houston.
- Oil field equipment arrives in Northern BC from Alberta via Highway 49.
- The mining sector moves involve large payloads (up to 100,000 kg); therefore, weight limitations are an issue along the study corridor.
- Rail lines encounter height clearance restrictions when moving equipment to the Peace River area (i.e. Blue River tunnel and Pine Pass tunnel)
- Bridge load rating issues exist along Highway 39 to McKenzie

- Majority of the loads observed by the Permit Centre as being effected by constraints along the Highway 97 corridor are involved in the mining sector operating in the Quesnel area. These loads use the Highway 5 route to avoid the relevant constraints.
- The Permit Centre has indicated that there has been a number of requests from industry to increase the allowable weights on the study corridor to 85,000 kg (GVW).
- CVSE staff and the Ministry bridge group have indicated that there is significant activity in the Hasler Flats area, just south of Chetwynd. Industrial operations in this area include the Pinesul plant (sulphur stripping plant) and the Willow Creek mine (coal mine). Both of these operations have access to rail and it is believed that this is their primary means of transporting these commodities.
- According to CVSE, the number of heavy hauls between Prince George and the Peace is increasing.

In addition to the infrastructure limitations, stakeholders identified limitations associated with geographic features (i.e., large boulders found along the highway corridor limit the turning radii of large trucks), a well established and accepted industry practice of transporting fully or partially assembled equipment, and utility clearances along the corridor. Winter road maintenance was also identified as an issue in commercial vehicle travel through the Pine Pass.

2.4.2 Infrastructure Improvements Underway

The Ministry of Transportation is currently undertaking several on-highway improvements along the Highway 97 study corridor. These improvements will benefit the movement of good along the study corridor:

Stone Creek Bridge and Four-Laning to Plett Road – Highway 97 between Quesnel and Prince George. The improvements include replacement of Stone Creek bridge with a new bridge and adding approximately 1.5km of four-laning south of the bridge (approximate capital expenditure of \$28 M). The design tender is currently in progress with expected construction and completion in 2010.;

Red Rock Weigh Scale – Highway 97 between Quesnel and Prince George. The improvements include construction of a new weigh scale (central median scale) and four-laning on either side of the scale (approximate capital expenditure of \$29.7M). The construction is currently underway with expected completion in the fall of 2009.

Simon Fraser Bridge to Sintich Four-Laning – Highway 97 between Quesnel and Prince George. The improvements include 5.5km of four-laning (approximate capital expenditure of \$27.5M). The construction is currently underway with expected completion in 2010.

Simon Fraser Bridge – Highway 97 between Quesnel and Prince George. The improvements include construction of an additional bridge over the Fraser River, resulting in a twin crossing

(approximate capital expenditure of \$43.4 M). The construction is currently underway with expected completion in 2009.

Wright Creek Passing Lane – Highway 97 between Prince George and Chetwynd. The improvement includes a 2.5 km climbing lane (approximate capital expenditure of \$3.5 M). The construction is currently underway with expected completion in 2009.

Bennett to Link – Highway 97 between Prince George and Chetwynd. The improvements include 11 km stretch of highway realignment, widening, and addition of two major bridges and three smaller structures (approximate capital expenditure of \$40.4 M). The design is planned to be tendered 2009, with construction completion 2011.

Additional projects involving four-laning along the Cariboo Connector are in the planning stages.

2.4.3 Future Needs

Discussions with several stakeholders including the BC Ministry of Transportation, the manufacturing industry and the heavy haulers lead to an understanding of potential opportunities for industry development in the study area.

Several industries are establishing or expanding their presence in Northern BC. These include hydro-electric power generation (upgrading of existing generating facilities and development of a new generating facility at Site C in the Peace), wind-generated power (in the Peace and Chetwynd areas), oil and natural gas (west of Chetwynd), mining (both metal and mineral), prefabricated buildings (Dawson Creek), and transportation (resulting from expansion at the port of Prince Rupert). Section 3.2 of this report describes in more detail the economic environment of the region by sector.

These types of industries are heavily reliant on large machinery and equipment for their operation. The result of the projected expansion will be an increased requirement to transport over-dimensional loads, both in size and weight. Additional pressure will be placed on the transportation network to accommodate these loads, exasperating the existing issues associated with the infrastructure constraints. At this time alternate routes to Highway 97 are available for these types of loads to reach their destination, mainly via Alberta.

3 Industrial Profile

3.1 ECONOMIC PRESENT

The Highway 97 corridor under study has several population centres, including Prince George (pop. 71,000), Quesnel (pop. 9,300) to the south and Mackenzie (pop. 4,500), Chetwynd (pop. 2,600) and Dawson Creek (pop. 11,000) to the north.

As shown in **Table 3-1**, population in the study area is projected to increase from 157,000 today by 6% over the next 10 years (to 167,000) and by 13% over the next 20 years (to 178,000). The population has remained fairly static over the past 15 years and has generally ebbed and risen along with the fortunes of the forestry industry.

**Table 3-1
Population Projections**

Year	Regional District		
	Fraser-Fort George	Peace	Total
1989	90,899	53,110	145,009
1994	98,832	56,017	154,849
1999	101,161	57,383	158,544
2004	97,254	58,498	155,752
2009	95,702	61,443	157,145
2014	96,128	65,377	161,505
2019	97,737	69,379	167,116
2024	99,696	72,894	172,590
2029	101,763	76,109	177,872

*Source: BC Stats

A BC Ministry of Transportation (MOT) report states that “The Highway 97 Corridor from Kamloops to Dawson Creek is a key transportation corridor for manufacturing shipments destined for export. The largest share of this traffic is forest products. Forest products accounted for 46% of freight flows on Highway 97

south of Prince George and 27% of flows between Prince George and Dawson Creek.”^{vii} This MOT report forecasts growth of traffic in the corridor of at least 2.5% annually.

The Northern Development Initiative Trust's 2008 report “Northwest Corridor Manufacturing Strategy” indicates that there are some 175 manufacturing companies with annual sales of \$2.2 billion in study area (taken to comprise the Central and Northeast parts of the Northwest Corridor).

As shown in **Table 3-2**, the local economies in the study area are primarily dependent on the forestry and mining industries, public sector employment and some tourism.

**Table 3-2
Income Dependency**

% of After Tax Income Derived From:	Williams Lake	Quesnel	Prince George	McBride Valemont	Dawson Creek	Fort St. John	Fort Nelson
Forestry	30	43	31	30	16	7	31
Mining	2	1	1	0	17	32	19
Agricultural	3	2	1	2	5	4	1
Tourism	6	5	4	15	4	6	8
High Tech	0	0	1	1	0	0	0
Public Sector	24	21	28	18	25	19	17
Construction	6	3	6	4	6	10	6
Other	3	2	7	5	6	7	7
Transfer Pmts	16	16	13	16	15	10	6
Other Non-Employment	9	8	8	10	6	5	4

*Source: BC Stats: British Columbia's Heartland at the Dawn of the 21st Century – 2001 Economic Dependencies, 2004

3.2 ECONOMIC FUTURE

Northern Development's 2008 report “Northwest Corridor Manufacturing Strategy”, presents a detailed inventory and assessment of the manufacturing sector in the study area. Several conclusions from that report bear repeating:

“Medium to long Term Opportunities: specialized machinery, chemical products, transportation equipment, fabricated metals, computer and electronic products and non-metallic mineral products....Some opportunities are more easily achievable than others. Those that use inputs produced in the region, such as machinery, transportation equipment and fabricated metals appear particularly viable” (page 15)

The Northwest Corridor area (of which the Peace River and Fraser-Fort George regional districts form the eastern half) is linked by Highways 16 and 97 and CN Rail, which provides access to major continental markets... and by newly expanding ports at Prince Rupert and Kitimat which offer significant supply chain inducements (“Prince Rupert is more than 1,000 nautical miles closer to Asian ports than competing US gateways, thereby reducing trans-Pacific sailing times by up to 60 hours each way”) (pages 8, 11)

“The region could become more than a flow through transportation corridor by exploiting several other key site location advantages – low industrial land costs, competitive energy costs, relatively low rent and housing costs, and a quality of life among the best in the world” (page 11)

Today, mining (oil and gas, coal) and electrical generation (wind, hydro-electric) projects offer major opportunities for manufacturers with a presence in the region, specifically metal fabrication (tanks, equipment parts) and prefabricated buildings. These projects include:

3.2.1 Hydro-Electric Power Generation

BC Hydro regularly upgrades and replaces turbines and other equipment at its WAC Bennett Dam facility. The most direct transportation routing from southern BC is via Highway 97, but constraints limit what can be transported and also limit the type of work that could be carried out by fabricators and other equipment manufacturers in the south of the region (i.e. Quesnel and Prince George).

BC Hydro is also contemplating proceeding with a major new hydro-electric power generating facility at Site C in the Peace area. Current plans are for six generating units with a total capacity of approximately 900 MW (about eight per cent of B.C.’s existing electricity demands). This construction project would offer major opportunities to local industry. However, local potential is hindered by the same highway constrictions that currently militate against local involvement in Bennett Dam upgrading.

3.2.2 Wind-Generated Electric Power Generation

Wind generated electricity is being pursued in the Peace and Chetwynd areas. A 2008 report to BC Hydro^{viii} identified 96 potential sites in the Peace Region. The combined potential rated capacity of these sites is 18.5 GW.

Two companies appear to be moving forward in this area. GE Canada, through the purchase of assets from Earthfirst Canada, has broken ground on the Dokie Wind Project near the WAC

Bennett Dam and has plans for the Dokie Expansion Project and the Wartenbe Project near Chetwynd. Aeolis Wind Power Corp. has opened a regional office in Fort St. John and has projects in the environmental assessment stage for Thunder Mountain (south of Tumbler Ridge) and Hackney Hills; an estimated 338 generators are planned for these two sites.^{ix}

There are also some six wind energy projects before the BC Environmental Assessment Office:

Mount Clifford (southeast of Tumbler Ridge);
Tumbler Ridge (northwest and southwest of Tumbler Ridge)
Bullmoose (west of Tumbler Ridge)
Wildmare (northwest of Chetwynd)
Mount George (southeast of Prince George)
Quality (northeast of Tumbler Ridge).

3.2.3 Biomass Energy

The Mackenzie Green Energy Centre will harness energy from wood waste in BC's northern interior to produce enough green electricity for up to 50,000 homes per year, provide an economic source of steam to the Pope & Talbot mill through co-generation, facilitate the closure of beehive burners and contribute to improved air quality.

The Mackenzie Green Energy Centre is an excellent northern economic development opportunity for British Columbia. The project is \$225 million dollar investment that will create 28 permanent, high quality jobs.

3.2.4 Natural Gas Exploration and Development

Northeastern BC is a centre of natural gas development. Both the Horn River Shale and Montney Shale basins are world scale shale gas resources. Development of these resources will require large equipment for gas production, compression and transmission facilities.

"Among upcoming developments is Encana's Cabin gas plant which will initially process 400 million cubic feet of natural gas per day, a \$400 million investment. In addition, TransCanada has committed \$340 million to building a pipeline from the Horn River basin to Edmonton, and the BC government has committed over \$187 million to expand roads and traffic capacity making the Horn River more accessible and lowering overall costs for exploration and development in the area".^x

Industry sources indicate that most of the equipment and machinery loads are too large for Highway 97 and will be sourced in Alberta and transported by winter road into BC. Previously, when building gas compressor stations along Highway 97, equipment was dis-assembled in order to move along the Quesnel – Dawson Creek Corridor.

3.2.5 Oil and Natural Gas Pipeline Construction

Moving the natural gas to eastern and western markets requires the construction of pipelines. As noted above, TransCanada announced the successful completion of shipper commitments for transportation of 378 million cubic feet of natural gas per day, connecting new shale gas supply in the Horn River basin to Alberta. The \$340 M pipeline will run about 155 km.

TransCanada also announced^{xi} gas transmission service from the Groundbirch area, west of Dawson Creek to its Alberta System. The proposed \$250 pipeline would be about 78 km long.

PNG plans to export LNG from Kitimat via its Kitimat-Summit Lake Natural Gas Pipeline Looping Project, a natural gas transmission pipeline system from Summit Lake to Kitimat.

At Kitimat, Enbridge is seeking approval for two parallel 1,170 km pipelines between northern Alberta and Kitimat. One would carry 525,000 barrels of oil per day westbound, largely from the oilsands. The eastbound line would transport 193,000 barrels a day of imported condensate, used to thin heavy petroleum products moving by pipeline.

3.2.6 Coal

BC is Canada's largest coal producer, 90% of which is high quality steel-producing coal. The province has an estimated 20 billion tonnes of reserves. Almost exclusively exported, coal generated 27% of provincial mining revenues in 2007. BC's top coal markets are Japan (33%) and South Korea (20%). China and India remain under-exploited potential markets for BC steelmaking and thermal coal.^{xii}

The study area contains three active coal mines (Brule, Wolverine and Willow Creek) with a fourth mine (Roman) presently going through the Environmental Assessment and Permitting process.

In 2007, \$10.5 M was spent on coal exploration in the Northeast Region.^{xiii}

3.2.7 Other Mining

Approximately 75% of BC's metal and mineral products are exported, with Japan being the destination for about 50% of the total product. British Columbia is Canada's largest producer of copper, which provided almost 30% of the province's mineral revenues in 2007. The province is also Canada's only producer of molybdenum. Other BC mineral products include gold, silver, zinc, lead, magnetite, gypsum, limestone, dimension stone and aggregate.^{xiv}

There are five metal mines in the North-Central^{xv} region:

- Gibraltar – copper / molybdenum
- Kemess South – gold/copper

- Mount Polley – gold/copper
- QR – gold
- Endako – molybdenum.

There are also several new mining projects under Environmental Assessment review including Mt. Milligan, Prosperity, Morrison and Cariboo.

In 2007, \$94.6M was spent on exploration in the North-Central Region.

3.2.8 Transportation

The 500,000-TEU (20-foot equivalent units) Prince Rupert Container Terminal is one of the most efficient facilities on the continent. The terminal also opened a new Asia-North America high-speed gateway, the first transpacific trade corridor to be created in a hundred years.^{xvi}

These projects offer significant potential for goods and services providers on the south end of Highway 97 corridor to sell north, and for goods and service providers on the north end to expand their markets to southern BC and to Asia. These goods include heavy machinery, turbines, compressors, tanks and boilers, prefabricated buildings, oil and gas field equipment. At present, these goods are transported mostly from Alberta to development sites via highway or winter road, or from Vancouver ports and the Lower Mainland via the TransCanada Highway (thus avoiding Highway 97 constraints that are the subject of this report).

4 Opportunities

The problem to be solved can be stated simply as:

- If the existing physical constraints on Highway 97 between Quesnel and Dawson Creek are removed, will opportunities open up for businesses in the region to take advantage of forecast industrial development?
- How much are these opportunities worth to the BC vis a vis the costs involved in removing these constraints?

Although much has been written about the opportunities^{xviii} that development in Northeast BC has for the rest of the province, little has been found in the literature about the actual value of these opportunities.

The perspective of this analysis is that opportunities for economic growth in the Quesnel to Dawson Creek corridor will be related to the resource developments described in the previous section of this report:

1. Oil and gas exploration;
2. Oil and gas production;
3. Oil and gas transportation (pipelines);
4. Mining;
5. Hydroelectric power generation;
6. Wind power generation; and
7. Transportation via the Quesnel - Dawson Creek Corridor to/from Kitimat, Prince Rupert and Vancouver ports.

In the following paragraphs, we look at key industrial sectors that have some presence in the Quesnel - Dawson Creek Corridor and that would appear to be able to produce goods and services for these resource development activities.

Given the geographical position of the Quesnel – Dawson Creek Corridor and with MOT statistics showing the extent of trade between BC and Alberta, this study identifies the “market” as comprising resource development opportunities in northeastern BC, including goods and services currently imported from Alberta.

After discussion with industry representatives, we believe that the following industries already located in the Quesnel - Dawson Creek Corridor can reasonably expect to compete for new clients/markets for their goods and services:

1. Metal fabricating;
2. Prefabricated buildings (residential and industrial);
3. Oil & gas field machinery;

4. Mining services; and
5. Transportation and storage.

These industries are matched with development sector requirements in **Table 4-1** below.

Table 4-1
Local Goods and Services vs. Resource Development Needs

Development Sector	Metal Fabricating	Prefabricated Buildings	Oil & Gas Field Machinery	Mining Services	Transportation & Storage
Oil and Gas Exploration	Yes		Yes	Yes	Yes
Oil and Gas Production	Yes	Yes	Yes	Yes	
Oil and Gas Transportation (Pipe)	Yes		Yes		Yes
Mining	Yes	Yes		Yes	Yes
Hydroelectric Power Generation		Yes			Yes
Wind Power Generation		Yes			Yes
Transportation	Yes				Yes

What are the current sources of these goods? **Table 4-2** presents interprovincial trade statistics for BC and Alberta in the sectors of mining services; fabricated metal products; transportation and storage; and forestry, lumber and wood products.

Table 4-2
Interprovincial Trade in Selected Industries

BC Imports from Alberta	(\$ x millions)	BC Exports to Alberta
Mining Services		
268	2005	<1
251	2004	<1
153	2003	<1
101	2002	0
163	2001	<1
49	2000	0
Fabricated Metal Products		
330	2005	254
258	2004	248
324	2003	209
267	2002	227
263	2001	200
228	2000	213
Transportation and Storage		
577	2005	1063
467	2004	998
455	2003	856
483	2002	852
458	2001	728
443	2000	785
Forestry, Lumber & Wood Products		
147	2005	993
182	2004	892
147	2003	836
121	2002	803
156	2001	605
177	2000	532

*Source: Stats Canada Table 386-0002: Interprovincial and International Trade Flows at Producer Prices

Alberta exported well over \$1.3 billion worth of products in these four manufacturing sectors to BC in 2005, the last year for which data is available. The mining services sector is particularly noteworthy in that BC exports close to zero to Alberta while importing over a quarter of a billion dollars annually from Alberta.

The mining services sector includes “establishments primarily engaged in providing support services required for the mining and quarrying of minerals and for the extraction of oil and gas”^{xviii}. These services include exploration and surveying services.

The fabricated metal products sector includes “establishments primarily engaged in forging, stamping, forming, turning and joining processes to produce ferrous and non-ferrous metal products”^{xix} including:

- Architectural and structural metals manufacturing
 - Plate work and fabricated structural product manufacturing
 - Prefabricated metal building and component manufacturing
 - Metal window and door manufacturing
- Boiler, tank and shipping container manufacturing
 - Metal tank (heavy gauge) manufacturing
 - Metal can, box and other metal container (light gauge) manufacturing
- Machine shops
- Coating, engraving, heat treating and allied activities
- Other fabricated metal product manufacturing
 - Metal.

The transportation and storage sector includes:

- General freight trucking
- Specialized freight trucking, long distance
- Bulk liquids trucking, long distance
- Dry bulk materials trucking, long distance
- Forest products trucking, long distance.

The forestry, lumber and wood products sector comprises such producers as:

- Logs
- Sawmills
- Veneer, plywood and other engineered products
- Millwork
- Doors and windows
- Manufactured homes
- Prefabricated buildings.

Table 4-3 presents the most recent data for four manufacturing sectors that produce goods which BC imports in significant quantities from Alberta: wood products, manufactured homes, prefabricated wood buildings and fabricated metal products.

**Table 4-3
Selected Manufacturing Statistics, BC and Alberta**

	Wood Manufacturing		Manufactured Homes		Prefabricated Wood Buildings		Fabricated Metal	
	2005	2006	2005	2006	2005	2006	2005	2006
Revenues (\$ M)								
Alberta	3,344	3,308	199	230	129	212	4,143	4,792
BC	11,425	10,917	75	84	164	170	2,210	2,383
Employees (#)								
Alberta	11,205	12,235	1,246	1,255	603	1,019	22,438	25,612
BC	35,118	34,825	498	564	681	771	13,462	14,204

*Source: Statistics Canada Table 301-0006: Principal Statistics for Manufacturing Industries

These statistics illustrate the manufacturing output in BC and Alberta in these sectors. While BC leads Alberta in wood products manufacturing, BC's output in manufactured homes and fabricated metal products is about 50% that of Alberta. In these four sectors alone, BC and Alberta have a combined output of close to \$22 billion.

Tables 4-4 and **4-5** provide focus on two sub-sectors of interest: oil and gas field machinery and metal tank manufacturing.

**Table 4-4
Production of Oil and Gas Field Machinery**

	2004		2005		2006		2007	
		% of Total						
Revenues (% M)								
Alberta	1,689	70%	2,615	77%	3,106	76%	3,040	71%

	2004		2005		2006		2007	
		% of Total		% of Total		% of Total		% of Total
BC	X		94	3%	105	3%	X	
Canada	2,396	100%	3,404	100%	4,068	100%	4,295	100%
Cost of Materials (\$ M)								
Alberta	913	72%	1,459	76%	1,837	79%	1,513	72%
BC	X		39	2%	44	2%	X	
Canada	1,268	100%	1,914	100%	2,313	100%	2,098	100%
Employees (#)								
Alberta	6,898	70%	9,878	74%	11,827	75%	11,488	69%
BC	X		423	3%	436	3%	X	
Canada	9,802	100%	13,417	100%	15,775	100%	16,614	100%

X: Suppressed to meet confidentiality requirements of Statistics Act

Source: Statistics Canada Table 301-0006: Principal Statistics for Manufacturing Industries

**Table 4-5
Metal Tank (Heavy Gauge) Manufacturing**

	2004		2005		2006		2007	
		% of Total						
Revenues (% M)								
Alberta	382	41%	516	46%	566	47%	492	43%
BC	28	3%	24	2%	X	X	X	X
Canada	935	100%	1,118	100%	1,202	100%	1,152	100%
Cost of Materials (\$ M)								
Alberta	211	42%	255	45%	278	47%	244	41%
BC	17	X	X	X	X	X	X	X
Canada	498	100%	561	100%	590	100%	593	100%
Employees (#)								
Alberta	2,471	41%	2,905	43%	3,003	45%	2,700	42%
BC	179	3	X	X	X	X	X	X
Canada	6,047	100%	6,726	100%	6,722	100%	6,407	100%

X: Suppressed to meet confidentiality of Statistics Act.

Source: Statistics Canada Table 301-0006: Principal Statistics for Manufacturing Industries

In both of these sub-sectors, which local industry representatives identified as key market opportunities for BC firms, BC's output is small enough that Statistics Canada will not publish statistics "in order to meet confidentiality requirements" – meaning that the industry is so small that it would be possible to derive company-specific information from the available survey results. Alberta accounts for about three-quarters of the oil and gas field machinery output and close to half the metal tank output in Canada. These statistics indicate that a large market within BC exists where provincial manufacturers are not meeting the demand.

This view may also be inferred from the data on BC expenditures on machinery and equipment in the sectors of oil and gas extraction, mining (other than oil and gas) and support activities for oil and gas. As shown in [Table 4-6](#), expenditures totalled almost \$1.0 billion in 2007.

**Table 4-6
Machinery Capital and Repair Expenditures in BC**

	2001	2002	2003	2004	2005	2006	2007	2008
	In \$ x M							
Capital Machinery & Equipment								
Oil & Gas Extraction	19	22	9	26	16	27	29	83
Mining (other than Oil & Gas)	117	68	63	100	235	376	391	440
Support Activities for Oil & Gas	48	14	17	39	43	52	27	50
Subtotal	184	104	89	165	294	455	447	573
Repair Machinery & Equipment								
Oil & Gas Extraction	1	5	5	6	7	9	8	n/a
Mining (other than Oil & Gas)	248	344	280	366	X	326	465	n/a
Support Activities for Oil & Gas	13	11	17	21	X	23	13	n/a
Subtotal	262	360	302	393	7	358	486	n/a
Total Capital & Repair	446	464	391	558	301	813	933	n/a

X: Suppressed to meet confidentiality requirements of Statistics Act

Source: Statistics Canada Table 029-0005: Capital & Repair Expenditures

Based on the information presented above on current expenditures in BC for products from several key manufacturing sectors and on future prospects in terms of supplying forecast resource development over the next 10 to 20 years, it appears clear that there are significant markets within the northeast of the province that are not being met by local companies. These are sectors where goods are presently sourced from Alberta for several reasons:

1. Alberta already has significant industrial know-how and capacity in these sectors given that province's history of oil and gas development.
2. The oil and gas industry itself in terms of head offices is based in Alberta and so common business practice is to use well-known sourcing channels and partners.

3. BC firms interested in supplying goods in these sectors have not been successful in developing business relationships with Alberta firms that might lead to orders for BC-made goods.^{xx}
4. Infrastructure constraints due to highway physical limitations and highway transport regulations make Alberta goods bound for northeastern BC, especially oversized loads, less expensive and with faster delivery times than goods sourced south of or within the Quesnel - Dawson Creek Corridor.

These Alberta advantages can be overcome. While other studies have looked at the marketing strategies required and while provincial and regional development agencies, such as the Northern Development, have provided and continue to provide funding for manufacturing company development, the choice may come down to:

- Develop manufacturing capacity north of the Quesnel - Dawson Creek Corridor to service northeastern resource development, thereby avoiding the need to upgrade Highway 97;
- OR -
- Remove physical constraints on Highway 97 so that existing and new manufacturing capacity both north and south of the Corridor can be utilized to meet the demands of resource development projects in northern and central BC.

We believe that developing markets for new and existing companies that are located at the southern end of the Quesnel - Dawson Creek Corridor as well as in the Lower Mainland makes more sense given the existing human and infrastructure resources. This does not mean, however, that existing or new firms located north of the Quesnel - Dawson Creek Corridor should not be fully supported; such firms will find their markets expanded beyond northeastern BC. The option to be taken should depend upon the economics of removing constraints along Highway 97.

Based on this review of opportunities, we guesstimate the size of potential key markets for companies in northeastern BC in four industry sectors:

Machinery and equipment (new and repairs) for the oil and gas and mining sectors:	\$933 million (presently spent in BC, see Table 4-6)
Fabricated metal products such as heavy gauge tanks:	\$300 million (presently imported from Alberta, see Table 4-2)
Transportation and storage:	\$577 million (presently imported from Alberta, see Table 4-2)
Lumber and Wood Products such as prefabricated homes and industrial buildings:	\$147 million (presently imported from Alberta, see Table 4-2)

It is noted that not all the products imported from Alberta are destined for the resource developments in northeastern BC; nevertheless, these manufacturing sectors are particularly important to the region and can be taken as broad targets.

5 Benefits to BC of Quesnel - Dawson Creek Corridor Improvements

In order to assess the benefits to British Columbia of removing the identified constraints along Highway 97 in the Quesnel - Dawson Creek Corridor, provincial economic multipliers are used to calculate the impact of each additional million dollars of production in each industrial sector on BC gross domestic product (GDP). The number of fulltime jobs created is also calculated. Provincial tax revenue increases arising from these impacts were also estimated. These multipliers are presented in **Table 5-1**.

**Table 5-1
Provincial Economic Multipliers**

	Oil & Gas Extraction	Wood Products	Fabricated Metal	Truck Transportation
Gross Domestic Product	\$ per \$1,000,000 increase in output			
Direct	\$ 750,000	\$ 380,000	\$ 430,000	\$ 440,000
Indirect	\$ 111,000	\$ 370,000	\$ 130,000	\$ 220,000
Total	\$ 861,000	\$ 750,000	\$ 560,000	\$ 660,000
Employment	Number per \$1,000,000 increase in output			
Direct	0.26	2.89	5.37	7.56
Indirect	1.65	4.20	1.72	3.25
Total	1.91	7.09	7.09	10.81
Provincial Tax Revenues	\$ per \$1,000,000 increase in output			
Direct	\$ 24,000	\$ 22,000	\$ 21,000	\$ 67,000
Indirect	\$ 7,000	\$ 25,000	\$ 8,000	\$ 21,000
Total	\$ 31,000	\$ 47,000	\$ 29,000	\$ 88,000

* Source: BC Stats: 2004 British Columbia Provincial Economic Multipliers; 2008

The estimated capital cost of the improvements to Highway 97 along the Quesnel - Dawson Creek Corridor is \$135 M. Discounting at an interest rate of 5% (the current long term provincial bond yield^{xxi}), this sum is

equivalent to paying \$11 million per year over 20 years. Thus, economic benefits to BC over the next 20 years should equal or exceed \$11 million per year if the expenditures are to be economically justified.

Using the above multipliers, calculations were run to determine the value of economic benefits that would arise from capture of various proportions of the total markets in the four industrial sectors identified in Section 4:

Oil & Gas and Mining:	\$933 million / year market
Fabricated Metal Products:	\$300 million / year market
Truck Transportation:	\$577 million / year market
Wood Products:	\$147 million / year market
Total of these four industries:	<u>\$1,957 million / year market</u>

To maintain a conservative stance, market size is assumed to remain constant rather than experience annual growth (which would be more likely).

The economic benefits of growth are measured by the GDP produced. Also useful for understanding the economic effects of this growth (although already factored into GDP) are full time jobs created and provincial tax revenues increased.

Table 5-2 illustrates the potential economic benefits on a yearly basis to compare with the annualized capital costs of the capital construction program needed to remove the constraints along Highway 97 between Quesnel and Dawson Creek.

**Table 5-2
BC Economic Growth by Market Penetration**

	Oil & Gas Extraction	Wood Products	Fabricated Metal	Truck Transportation	TOTAL	Benefit: Cost Ratio
Minimum Penetration Required	0.75	0.75	0.75	0.75		
GDP	6,024,848	826,875	1,260,000	2,856,150	10,967,873	1.01
Employment	13	8	16	47	84	
Provincial Tax Revenues	216,923	51,818	65,250	380,820	714,810	
3% Penetration	3.0%	3.0%	3.0%	3.0%		
GDP	24,099,390	3,307,500	5,040,000	11,424,600	43,871,490	4.05
Employment	53	31	64	187	336	
Provincial Tax Revenues	867,690	207,270	261,000	1,523,280	2,859,240	
5% Penetration	5.0%	5.0%	5.0%	5.0%		
GDP	40,165,650	5,512,500	8,400,000	19,041,000	73,119,150	6.75
Employment	89	52	106	312	559	
Provincial Tax Revenues	1,446,150	345,450	435,000	2,538,800	4,765,400	
3% / 5% Penetration	3.0%	3.0%	3.0%	5.0%		
GDP	24,099,390	3,307,500	5,040,000	19,041,000	51,487,890	4.75
Employment	53	31	64	312	460	
Provincial Tax Revenues	867,690	207,270	261,000	2,538,800	3,874,760	

These results indicate that to justify the project from the perspective of economic benefits as measured by incremental GDP growth (i.e., to achieve a Benefit:Cost ratio of 1.0 or greater), BC companies would need to capture an average of 0.75% (i.e. less than 1%) of the market share presently held by Alberta producers. In terms of employment, this level of market penetration would create 84 new full-time jobs. It would also lead provincial tax revenues to grow by over \$700,000 annually.

Higher market penetration (illustrated by three other scenarios shown in **Table 5-2**) would produce even greater economic benefits to BC.

These numbers indicate that the proposed upgrades to Highway 97 between Quesnel and Dawson Creek can be economically justified if BC companies can capture just 0.75% of the identified market.

Given the marketing services and financial encouragement of federal, provincial and regional economic development agencies, this level of market penetration seems achievable and therefore, the proposed upgrades are deemed to be economically feasible. Note that this project is deemed feasible even without accounting for the economic benefits of reduced travel time, fuel savings and truck maintenance that would accrue from highway improvements.

REPORT

References

-
- ⁱ Financial Post: Yield for Govt. of BC bond maturing in 2029 is 5.05% on May 15, 2009
- ⁱⁱ Volumes obtained from the Ministry's Permanent Counting Stations (P-43-2NS, P-41-012NS, P-42-1NS, P-41-1NS, P-42-1NS, P-43-2NS)
- ⁱⁱⁱ Supplement to CHBDC S6-06, August 2007
- ^{iv} Transportation Association of Canada (TAC)
- ^v From discussions with CVSE representatives in Victoria, BC
- ^{vi} Google Maps
- ^{vii} BC MOT: Supply Chain Benefits from Infrastructure Investments on Major Highway Corridors in British Columbia; Draft, 2007
- ^{viii} Garrad Hassan: Assessment of the Energy Potential and Estimated Costs of Wind Energy in BC; 2008
- ^{ix} earthfirstcanada.com and aeoliswind.ca
- ^x hornriver.wordpress.com/2009/04/29/encanas-cabin-gas-plant-location
- ^{xi} www.energeticcity.ca/news/02/26/09/northeast-bc-pipeline-projects
- ^{xii} Government of BC: Mining Economic Task Force Report, 2009
- ^{xiii} www.empr.gov.bc.ca/Mining/MineralStatistics/Regional/northeast/Pages/Overview.aspx
- ^{xiv} Government of BC: Mining Economic Task Force Report, 2009
- ^{xv} www.empr.gov.bc.ca/Mining/MineralStatistics/Regional/northcentral/Pages/Overview.aspx
- ^{xvi} www.rupertport.com/development.htm
- ^{xvii} KPMG: Marketing Strategy for the BC Oil and Gas Service Sector; 2004
- ^{xviii} Statistics Canada: North American Industry Classification (NAICS) 2007
- ^{xix} Statistics Canada: North American Industry Classification (NAICS) 2007
- ^{xx} KPMG: Marketing Strategy for the BC Oil and Gas Service Sector; 2004
- ^{xxi} Financial Post: Yield for Govt. of BC bond maturing in 2029 is 5.05% on May 15, 2009