All-Weather Road to Pukatawagan Economic Assessment Study

Report

August 2001

Pukatawagan Economic Assessment Study
for an All-Weather Road

Province of Manitoba,
Transportation and Government Services

00-8093-0101

Submitted by

Dillon Consulting Limited/ Westdal & Associates

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Our File: 00-8093

September 7, 2001

Province of Manitoba
Transportation and Government Services
15th Floor - 215 Garry Street
Winnipeg, Manitoba R3C 3Z1

Attention: Mr. Donald S. Norquay
Assistant Deputy Minister

All-Weather Road to Pukatawagan
Economic Assessment Study - Executive Summary

Dear Mr. Norquay:

We are pleased to submit this Executive Summary for the All-Weather Road, to Pukatawagan Economic Assessment Study.

The Study involved community consultation, analysis of existing and future transportation costs for the existing Winter Road, Rail, and Air Transport System, analysis of several All-Weather Road Scenario transportation costs, and the identification of potential economic spin-offs, environmental impacts, and socio-economic consequences. This work was initiated in April 2000 and completed approximately one year later.

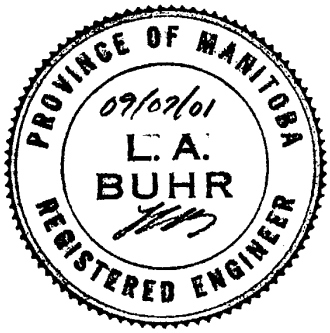
Completion of the study was achieved due to the energetic and enthusiastic support of numerous people; too many to thank individually. We would, however, like to acknowledge the support of Officials, Managers, and Staff from Provincial Government, Federal Government, and the Pukatawagan First Nations. They were very helpful and cooperative. The same was true of the various Resource development companies and Transport companies whose interests were also involved.

We would also like to thank the Steering Committee representing various communities and other potential stakeholders who were very generous with their insights and comments. We wish to thank all the individuals and groups who expressed an interest in this study. A special thank you to the Department of Transportation and Government Services, whose leadership made the successful completion of this Study possible.

We trust the study results will assist government and community decision makers in their future deliberations on the All-Weather Road issue.

Respectfully submitted,

Dillon Consulting Limited



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Enclosure

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

SYNOPSIS

The First Nations community of Pukatawagan with a population of 1,743 relies on the Hudson Bay Railway winter road and Northern Airlines for the movement of freight and passengers. This transport system has been described by the community leadership as providing an unreliable, unsafe, and very slow (yet high cost) level of service.

An analysis of the existing transport system, in comparison with an All-Weather system, indicates that an All-Weather Road would have a net cost (negative benefit) of $63.4 M (20-year present value). This evaluation is based on the understanding that the railway would continue to operate, that the Hudson Bay Mining & Smelting's mine near Leaf Rapids remains open, and that Tolko's forestry operations are likely to continue employing a rail haul system.

If, as projected by 2005, Hudson Bay Mining & Smelting shuts down the mine near Leaf Rapids, the railway is likely to cease operations unless the lost revenue can be offset by higher charges to other users, including Tolko and the Pukatawagan First Nations community or by government subsidies. Rail closure would substantially increase passenger and freight costs to the community and haul costs in the forest industry.

Without a railway, the existing transport system costs would rise by $52 M (20-year present value). Consequently, the net cost (negative benefit) of an All-Weather Road would be reduced to $5.7 M (20-year present value).

An All-Weather Road to Pukatawagan generally parallelling the railway built to conventional provincial highway standards involves capital cost of approximately $100 M. As long as the railway continues to operate, such an expenditure is difficult to justify. Lower cost alternatives, if in fact feasible, provide much lower benefits, have short-term value (limited life), and are equally difficult to justify.

To deal with this substantial uncertainty and to some degree, improve the level of service, it is recommended that the following initiatives be undertaken:

- Examine with Hudson Bay Railroad the feasibility of improving and upgrading the railway alignment, possible joint usage of the Churchill River Bridges for road traffic, and the potential, if any, for improved passenger service initiatives.

- Examine with Tolko the feasibility of improving and extending the forestry road system along the railway north of Sherridon to provide more reliable winter road access to the Pukatawagan area.

- Define the most feasible alignment of a long-term future All-Weather Road (if and when the railway shuts down), to ensure that short-term investments in the winter road/forestry road network have long-term value.

The foregoing issues need to be addressed before an overall strategy for longer-term future access to Pukatawagan can be defined.

STUDY FINDINGS

General Conclusions

- The existing railway and winter road system continues to provide marginally acceptable service to Pukatawagan in most years, but total costs are rising with the growing population.

- The Pukatawagan community would appear to support an All-Weather Road on the basis of reduced cost of living, more reliable emergency services, improved health, education and social services, and enhanced personal travel opportunities.

- These communities however have some concerns about the impacts on an All-Weather Road and the resulting resource development on traditional lifestyles, on land use, on the environment, and control over their future destinies.

- Despite a population growth (2.5%/year), an All-Weather Road for Pukatawagan is difficult to justify on a transportation economics basis. Funding of an All-Weather Road to Pukatawagan would be difficult to justify given the existing rail service.

- The construction of an All-Weather Road to Pukatawagan (built to conventional Highway standards), while the railway and HBMS (Ruttan Lake) continue to operate, would have a capital cost of $100 M, with a 20-year present value of $80 M. Actual transportation cost savings would be $2.7 M/year (20-year present value of $18 M) suggesting a 22% cost coverage. Socioeconomic benefits and undefined economic spin-offs would have to cover 78% of the cost. The net cost (negative benefit) of the All-Weather Road system would be $63.4 M (20-year present value).

Under these circumstances, it is anticipated that the capital cost would have to be funded almost entirely by the First Nations/Federal Government. The benefits to provincial government, Manitoba Hydro, MTS, Lodges, Tolko, HBMS, and other resources industries would be relatively small.

- It is likely that an All-Weather Road for Pukatawagan will face stiff competition for government funding priority. Given the existing rail service (which has its limitations), the community does have more reliable service than most other remote communities.

- One pivotal question remains about the continuity of rail services. If the rail service were to be discontinued, the overall transport costs for the Pukatawagan community and the general area would rise from $113 M (20-year present value) to $165 M (20-year present value). Under such a no-rail

service scenario, the net cost (negative benefit) of an All-Weather Road system would be $5.7 M (20-year present value).

- Mild winter conditions have and are a significant cost issue for winter road systems. If global warming forecasts are even partially correct, the frequency of weather road system failures will become a regular and very expensive occurrence.

- The forecasted doubling of the region's population within 30 years will put a tremendous strain on the existing transportation/infrastructure system and even on the social/traditional fabric of the Pukatawagan community and the regional environment.

- Environmental impacts of an All-Weather Road can be acceptably managed if the appropriate steps are taken to define the important resources in the area, to identify appropriate land uses, and to set in place a regional control process for administering access and use.

- Socioeconomic issues for Pukatawagan would probably support an All-Weather Road providing that the community and regional planning processes have definitive input to the project and post-project approval steps.

- A tourism development plan and other development strategies are needed to maximize community economic benefits.

- Traditional values/traditional land uses will have to compete actively with the growing population/infrastructure needs of the community. A rational at times compromising approach/dialogue will be required to ensure that the future development draws the best from traditional/technological sectors.

Study Qualifications

The study findings presented should be viewed in the context and scope of the Terms of Reference:

- No specific All-Weather Road route alternative was actually identified; however, several alternatives were examined at a very conceptual level. The connection to PTH 10 was assumed to follow the existing Sherridon Road. An alternative for more direct connection to Flin Flon was not precluded.

- Cost analyses of road freight rates assumed total community freight requirements at average unit freight costs. Winter road freight was based on 16 tonnes per full load; All-Weather Road freight was based on 23 tonnes per full load. Reality may be that both freight rates would be higher given that the analysis did not address such aspects as warehousing/spoilage/financing. However, freight rate savings between the All-Weather Road and Winter Road systems would be higher.

- The estimated costs and distances for an All-Weather Road are based on conceptual plans only. More reliable cost estimates can only be established after a more detailed route location study and environmental review has been carried out.

- All-Weather Road costing essentially reflected minimal travel distances/times. Hence, All-Weather Road costs could also be higher if more indirect routes are chosen.

- The economic analysis with an 8% discount factor assumed that the All-Weather Road was in place in Year One. Reality is that the All-Weather Road would not be in place until Years Five to Ten; population growths would start from a higher base and as a result, 20-Year Present Value project benefits would be greater.

- A lower net discount factor of 5% or 6% could have been considered if current borrowing costs and inflation rates were the only factors being considered; greater net benefits would result from the use of a lower discount value.

- Because no specific route was identified, environmental and social impacts could not be specifically identified. Mitigation costs should be small if good environmental and socioeconomic practices are used in route selection.

- Community leadership contacts to date should not be perceived as a substitute for public/environmental hearings.

- All-Weather Road service to Pukatawagan is more readily justified if HBMS mine operations at Ruttan Lake near Leaf Rapids were to cease and railway service were consequently discontinued.

1.0 INTRODUCTION

As per the April 27, 2000 Terms of Reference from Manitoba Transportation and Government Services, Dillon Consulting Limited (Dillon) in partnership with Westdal and Associates has prepared this study addressing the economic justification for an All-Weather Road from P.T.H. No. 10 to Pukatawagan. The study area is located in northwestern Manitoba and primarily affects the communities of Pukatawagan First Nations and Sherridon and to a lesser degree, Lynn Lake. Pukatawagan is currently serviced by air, rail, winter road (Kississing Lake to Pukatawagan), as well as an existing pioneer road (P.T.H. No. 10 to Sherridon). The absence of an All-Weather Road has imposed costs on individuals, communities, government, and industry with respect to freight and transportation costs, as well as the stress related to a system that is in part dependent on weather.

1.1 Scope

The potentially high capital cost of building an All-Weather Road requires a long-term commitment from all stakeholders. This study sets out to assess the transportation costs of all modes associated with the present system, assess future costs and benefits that would come with an All-Weather Road, determine stakeholder benefits, and examine other indirect spin-offs that might accrue from an All-Weather Road. The determination of the most appropriate roadway corridor location was not the intent of this study.

Our approach to this study involves building a database which will allow us to define the existing transportation system (modes/service levels/costs/risks), the All-Weather Road system (essential components and service levels/costs/risks), the added benefits/opportunities of the All-Weather Road, and the potential environmental/social impacts of the project.

Stakeholder input is key to this evaluation, as well as accurate information and statistics. Stakeholders who are expected to have a vested interest in the outcome of this study include:

- Pukatawagan First Nations
- Sherridon Community
- Hudson Bay Railroad (HBRR) (Omnitrax)
- Freight Haulers
- Air Transporters
- Tolko Industries Ltd.
- Lynn Lake

To the extent possible, we have used actual costs of transportation for the existing system in terms of annual expenditures/freight rates/air flight rates, etc., however, that data is limited, and it has been necessary to

establish costs by inference from budgetary programs (e.g., percentage of budget related to travel/remote locations, etc.).

Key factors relevant to this study are future population growth and future economic development initiatives. An analysis of area demographics, and historical development was necessary to determine the key issues affecting Pukatawagan/Sherridon.

1.2 Context

Historically, transportation networks in northern Manitoba have served to meet two requirements. That is to provide reliable, regular transportation into and out of isolated and semi-isolated communities, as well as to provide bulk transportation to meet the demands of major resource development. The existing highway and road transportation system in northern Manitoba is confined to those areas where resource developments have advanced sufficiently to warrant the major investment involved in All-Weather Road construction. The present and future resource development in the area is a critical factor in the justification on such a project.

The development of a transportation system in northern Manitoba has generally began with aircraft playing the pioneering role in northern exploration. This was followed by roads or railways when larger communities were established. Smaller settlements continue to be served by float and ski-equipped aircrafts and/or winter roads.

The concept of adequacy is a key consideration in transportation system development. A transportation system that might be adequate relative to the movement of commodities may still be entirely inadequate relative to the movement of people. Adequacy must therefore embrace availability of service, standards, and rates within an affordable system.

The overriding principle of public convenience and the necessity to the specific area in question is important when establishing standards and criteria. Additionally, the creation of an available, uninterrupted system with reasonable rates and service levels is a concern for any transportation system.

In carrying out the technical evaluation and stakeholder consultation process, it was necessary to:

- Assess the costs of various travel modes associated with the present transportation system.
- Assess future costs and benefits that would be derived from an All-Weather Road.
- Define stakeholder benefits.
- Examine other indirect spin-off benefits that might accrue from an All-Weather Road.
- Gauge stakeholder support for the construction of an All-Weather Road.

1.3 Report Organization

In order to present an effective and comprehensive assessment of the economic justification of an All-Weather Road from P.T.H. No. 10 to Pukatawagan, this study is structured in the following manner:

- Synopsis and Study Findings precede this Introduction.

- Section Two **"Community Profile"** presents the population forecasts for the stakeholder communities of Pukatawagan and Sherridon/Cold Lake. This section will also include a description of the winter road, railway, and air systems.

- Section Three, entitled **"Existing Transportation System"** outlines the community freight figures on the winter road, railroad, and air freight systems. This section will also describe passenger traffic.

- Section Four projects the **"Future System Forecasts and Costs"** for road, air, railroad, and individual travel to communities.

- Section Five details the specific **"Reliability Constraints"** of the reoccurrence of unusually mild winters, other weather issues impacting on winter roads, as well as the factors impacting on air travel and rail transportation.

- Section Six, entitled **"Economic Spin-off Benefits"** evaluates spin-offs within the context of forestry, commercial fishing, mining and resource development, tourism, the service sector, as well as other benefits accruing through the development of an All-Weather Road.

- Section Seven presents a **"Comparison of All-Weather Road and Winter Road System Costs".** This section outlines the basic cost assumptions made in this report, develops an economic analysis, presents the 20-year present value benefits, as well as describing other benefits.

- Section Eight presents **"Alternative Alignments and Strategies",** which identifies significant project issues and cost consequences for different conceptual alignments and alternative lower cost strategies.

- Section Nine entitled "**Stakeholder Identification"** defines the relative benefits and potential cost allocations that might be appropriate for the various parties having an interest in the development of an All-Weather Road.

- Section Ten entitled **"Community Interests and Concerns"** identifies the local community issues that would support or oppose the constraints of an All-Weather Road, and includes the minutes for the January 15, 2001 Steering Committee Meeting.

- Section Eleven entitled **"Identification of Environmental and Social Concerns"** examines the areas of potential environmental and social impacts that would result from an All-Weather Road.

2.0 COMMUNITY PROFILE

2.1 Population Forecast

The On-Reserve population in Pukatawagan has increased from just under 1,000 people in 1978 to 1,743 people in 1998. Based on the population growth since 1995, the future population growth is estimated to be 2.5% per year. Figure 2.1 shows the projected on Reserve population for the next 20 years which is as follows:

- 1998 - 1,743 people
- 2010 - 2,240 people
- 2020 - 2,880 people

Note: Population of Sherridon and other small settlements is estimated at less than 100.

The foregoing assumes that the past population growth has been primarily a function of birth and mortality rates and members added under the provisions of Bill C31. The in and out migration of First Nations people is expected to have an ongoing cyclical pattern with no abrupt shifts. The current non-reserve band population of 735 is also assumed to vary in proportion to the First Nation's growth.

The next 20 years will see the population of Pukatawagan and Sherridon increase by approximately 65 percent to 3,000 people. This will create an increasing demand for services and financial support. Therefore, it is essential that the current study deal with these future needs and reflect these in the comparison of the current transportation system with the proposed All-Weather Road system. The scenario involving a complete loss of rail service will also have to be discussed.

2.2 Community Services

The following community services exist for the community of Pukatawagan:

- Health needs of the Pukatawagan community are initially met by a First Nations Authority operated nursing station, with a staff of 14 including dental and drug/alcohol workers. However, it relies on the Norman Regional Health Authority and its medical staff for acute care and/or hospitalization in The Pas, Flin Flon, or Thompson. Medivac and patient referrals to Winnipeg are a frequent occurrence.

- Education needs are primarily provided by on-reserve First Nations schools (Kindergarten to Grade 9). High school and post-secondary students travel to Cranberry Portage, The Pas, Flin Flon, Lynn Lake, etc.

See Figure 2.1 Population History and Forecast

- Social services are largely administered locally by the Mathias Columb First Nations.
- Hydro and telephone services are on a land line system.
- Water and sewage utilities include limited treatment facilities and distribution/collection pipe systems.
- Fire protection is provided via two pumper trucks and a fire hydrant system.
- Police protection is provided locally by three First Nations constables supported by RCMP.

2.3 Economic Activities

Local businesses include a hotel, Northern Store, two other retail outlets, pool hall, two crisis and one youth centre, as well as construction and repair companies.

The economic base of the Pukatawagan community consists primarily of trapping, fishing, and wild rice operations. Forestry operations in the general area also provide employment opportunities. Mining activities exist on a limited basis at Lynn Lake to the north and Sherridon to the south. Local government and community services account for most of the employment. Approximately 27% of the workforce was unemployed in 1996 based on the active work force.

3.0 EXISTING TRANSPORTATION SYSTEM

3.1 General

The Pukatawagan area transportation needs have been met primarily by rail since the 1950s. Prior to the rail line being advanced from Sherridon to Lynn Lake, the transportation needs were met by a combination of rail and watercraft in summer and tractor trains in winter.

While the existing rail transportation is reasonably dependable throughout the year, the general freight costs for goods and materials being transported into Pukatawagan are fairly high. For this reason, a winter road has been constructed and maintained by the Department of Highways each winter since 1989. The winter road sees very heavy personal vehicle use and variable amounts of heavy freight movement depending on winter ice conditions and whether there are any ongoing capital projects taking place in Pukatawagan.

While the construction of a community airstrip and the existence of a Band-owned airlines has resulted in a higher volume of air passenger travel, rail passenger travel has also increased significantly since 1992. This would indicate that there is an increasing number of trips per year/capita to larger centres.

The existing transportation modes, when all are available, serve the community of Pukatawagan reasonably well. However, the existence of the rail line from The Pas to Lynn Lake is threatened by the pending closure of the Ruttan Mine near Leaf Rapids. Operations at the Ruttan Mine currently account for over 40% of the freight being moved on the rail line. For the operation of the rail line to remain feasible, either freight rates would have to increase significantly and/or the volume of other freight being shipped by rail would need to rise substantially to compensate for the loss of freight due to the mine closure.

If the rail line ceases to exist, an alternate mode of transportation would need to be developed. The Department of Highways records indicate that the winter ice road into Pukatawagan from Sherridon is not very reliable. While the winter road usually opens for individual vehicles, it is common for the ice road not to be opened to transport trucks. In addition, the loss of rail would also jeopardize Tolko's forestry operations near Laurie River and hinder the proposed operations in the Charles area. The resulting job loss would be a significant blow to the Mathias Columb band residents of Pukatawagan and Marcel Columb band members from the Lynn Lake area.

3.1.1 Winter Road System

The current winter road system runs between Pukatawagan and Collin's Point on Kississing Lake (directly west of Sherridon) where it connects to Tolko's forestry road and then to the Sherridon All-Weather Road system, which subsequently joins Provincial Highway #10 to the south (see Figure 3.1). The winter road consists of 15 km over land and 52 km on ice for a total length of 67 km. The winter road is generally open to individual passenger vehicles, but poor ice conditions at several smaller river crossings and the Churchill River as it passes through Pukatawagan Lake has rendered the road unusable by heavier vehicles during four of the eleven years that the road has been maintained by the Department of Highways.

Use of the winter road by individual vehicles is reportedly very heavy while use by transport trucks and heavy equipment has been largely dependent on ice conditions and whether there are major capital projects taking place in Pukatawagan. The winter road is used in preference to the railway due to significant transportation cost savings.

3.1.2 Pukatawagan Airstrip

There is a 3,000 foot long gravel airstrip located on the Pukatawagan Reserve, but is operated by Manitoba Northern Airports. The airstrip, like most airstrips in smaller northern communities, can accommodate older turbo prop aircraft, but not the newer high speed/pressurized turbo prop aircraft. The current airstrip is not amenable to moving large volumes of freight. Its primary function is for air passenger traffic, carry on freight, and mail.

Extension of the runway would only be justifiable if the railway were to cease operations and if an All-Weather Road were not built.

3.1.3 Existing Rail Service

The existing rail line from The Pas to Lynn Lake which services Pukatawagan is owned and operated by HBRR. The rail line was advanced north to Sherridon in the 1930s to service the Sherridon Mine. In the 1950s, the line was advanced up to Lynn Lake to service new mines being developed in that area. Railway freight to and from Pukatawagan is transported by truck via a 10 km gravel road extending west from the rail line to Pukatawagan.

See Figure 3.1 Study Area

Commercial freight volumes being transported from The Pas into Pukatawagan are estimated at approximately 2 600 tonnes/year. The majority of freight being transported on this rail line comes from the mining activities near Leaf Rapids and the forestry operations. Hudson Bay Mining and Smelting Company Ltd. (HBMS) ship approximately 140 000 tonnes of ore concentrate from their Ruttan Mine operation to Flin Flon for smelting each year. This freight haul will cease when the mine is scheduled to close, probably sometime in the year 2004.

Tolko's forestry operations at Laurie River (north of Pukatawagan) ship approximately 45 000 tonnes of timber per year to The Pas. The proposed forestry operations near Charles (southeast of Pukatawagan) would supply an additional 45 000 tonnes per year for rail transport. If the rail line is decommissioned, the proposed Charles forestry operation would have to be re-evaluated. Tolko's largest forestry operation in the area is at Jungle Lake (east of Sherridon). This operation produces nearly 140 000 tonnes of logs per year. While the rail line is used to transport logs from this operation, the Jungle Lake operations are also accessed by an all-weather forestry road.

When the ore concentrate shipments from Leaf Rapids cease, it will probably not be economically viable to continue rail operations into Lynn Lake or Pukatawagan given the current freight volumes and freight rates. The only significant increase in freight volume would come from the proposed forestry operation near Charles. However, the Charles vicinity forestry operation would only make up about one third of the volume of freight lost due to the mine closure.

Increasing freight rates while maintaining the rail line is also an option. Without any further forestry development, it is estimated that freight rates would have to double for the rail line to remain economically viable. Additional growth in log haul traffic would be a mitigatory influence on freight rate increases and could be a factor on the decision to maintain future operation of the rail line.

Passenger service is not a significant revenue source.

3.2 Freight Transport, Costs, and Service Levels

The freight movements into Pukatawagan are achieved by rail, air, and winter road. The rail line operated by HBRR accounts for the majority of the general freight going to Pukatawagan. Although the winter road is only open to individual vehicles for approximately three months per year, it is estimated that a significant volume of general freight is brought into Pukatawagan via the winter road. Large freight hauls into Pukatawagan for capital projects are usually brought in by winter road (during those years that the ice road is capable of supporting heavy loads).

3.2.1 Winter Road Traffic - Community Freight

The winter road system into Pukatawagan has been maintained by the Manitoba Transportation and Government Services since 1989. Table 3.1 summarizes the Department's winter road freight haul data from 1989 to 1999.

Table 3.1: Pukatawagan Winter Road Freight Haul Summary

Year	Total Haul Weight (kilograms)	Total Number of Loads	Average Weight per Load (kilograms/load)
1989-1990	118,000	12	9,800
1990-1991	251,000	15	16,700
1991-1992	188,000	19	9,900
1992-1993	--	--	--
1993-1994	C	--	--
1994-1995	--	--	--
1995-1996	1,811,300	49	37,000
1996-1997	1,348,500	142	9,500
1997-1998	--	--	--
1998-1999	100,000	4	25,000
Totals	3,816,800	241	~16,000

The winter road is typically open to transport truck freight hauls from January 23 to March 19, although the road was not opened to freight trucks during four of the ten years listed in Table 3.1 due to poor conditions. Department of Transportation and Government Services personnel report that lighter vehicles have used the track every year, but personal vehicle use is not monitored.

The winter road is also used by lodge owners to transport building materials, equipment, and supplies. The volume of the freight is expected to account for a small proportion of the total freight volume moved on the winter road.

It has been assumed that the supplies and materials transported via the winter road by MTS and Manitoba Hydro for maintenance and construction projects have been monitored and have been included in the basic truck freight analysis. The volume of freight being backhauled on the winter road by construction companies, MTS, Manitoba Hydro, and others has not been identified in the Department of Transportation

and Government Services winter road transportation data. Backhaul volumes have not been included in the basic truck freight analysis.

3.2.2 Winter Road Freight Costs

The unit freight costs relating to the winter road system servicing Pukatawagan vary with the maximum allowable load. Based on six years of the Department of Highways data, the average allowable ice road loading is 16 000 kg. Based on this loading, the incremental unit freight cost per kilogram from The Pas to Pukatawagan is $0.07/kg.

The trucking firms list their freight rates originating from Winnipeg. The incremental unit freight rates were calculated by factoring out the Winnipeg to The Pas portion of the freight rate from Winnipeg to Pukatawagan.

The incremental freight rate from The Pas to Pukatawagan is shown in Table 3.2.

Table 3.2: Winter Road Freight Rate (The Pas to Pukatawagan)

Route	Freight Rate (based on 16 000 kg loads)	
	Cost ($)	Cost per Kilogram ($)
Winnipeg to Pukatawagan	2,750	$0.172
Winnipeg to The Pas	1,615	$0.101
The Pas to Pukatawagan	1,135	$0.071 (incremental cost)

3.2.3 Rail Freight Traffic and Costs

The Hudson Bay Railway line from The Pas to Lynn Lake is currently the primary means of moving freight into and out of the Pukatawagan area. The vast majority of rail freight being hauled on the line is ore concentrate from the Ruttan Mine (transported to Flin Flon for smelting) and logs from Tolko's woodcutting operations (transported to Tolko's mill in The Pas). The breakdown of typical railway freight by commodity and shipping costs is presented in Table 3.3.

Table 3.3: Estimates of Typical Railway Freight/Freight Rates

Commodity	Inbound (tonnes/year)	Outbound (tonnes/year)	Freight Rate* ($/tonne)	Approximate Shipping Cost* ($/year)
Ore Concentrate		140,000	16	2,300,000
Logs		155,000	16	2,500,000
Diesel Fuel	370		220	80,000
Heating Fuel	95		220	21,000
Gasoline	395		220	87,000
Fish		185	360	67,000
Building Material	110		220	25,000
Machinery	70**		220	15,000
Foodstuffs	1,250		240	300,000
Other	310		240	75,000
Totals	**2,600**	**295,185**		**$5,470,000**

Notes: Tonnages are estimated from data supplied by businesses shipping by rail into the region and document typical volumes and rates.

* Estimates based on limited historical data; reflect "best guess" of current market price situation.

** May include a small amount of equipment/machinery backhauled to The Pas.

Approximately 99% of the railway freight is outbound ore concentrate (47%) and logs (52%). The remaining 1% is freight bound for Pukatawagan, Lynn Lake, or Tolko logging operations, and materials being backhauled to The Pas.

Specific freight rates for the two main Hudson Bay Railway customers were not available. It was therefore necessary to estimate the shipping rates for logs and ore concentrate based on lowest known alternative shipper costs or $16.00/tonne. The freight rates for ore concentrate and logs are low because HBMS and Tolko do their own loading and unloading, they ship large quantities, and each car is bulked out.

Shipping costs for fuels, machinery, building materials, foodstuffs, etc. vary with the size of the load, but are generally between $220/tonne and $240/tonne. Fish transportation costs are even higher due to the small size of the shipments and because the product requires special packing. It is estimated that fish transport costs are approximately $360/tonne.

The freight rates, which for full loads are $0.22 to $0.24/kg can be significantly higher (up to $0.45/kg) for small/partial loads. An empty tanker truck is shipped into Pukatawagan to facilitate transporting gasoline from the rail tanker cars into Pukatawagan. The shipping costs for an empty tanker truck is reportedly $2,900 each way (~$290/tonne). Shipping costs for an automobile is $520 (~$500/tonne).

Even though the railway freight costs can range from $0.24 to $0.45/kg (much higher than the estimated cost of $0.07/kg for winter road freight), the railway is still used to transport foodstuffs, fuel, etc., even during times when the winter road ice can accommodate fully loaded transport trucks. It is suspected that typical contractual arrangements preclude short-term switches in freight carriers.

Several problems have been identified with the existing rail service into Pukatawagan. These include:

- Not a daily service.
- Very slow travel, at times unsafe due to frost heaving, etc.
- Freight rates are high.
- Access road to community is in very poor condition.
- Rail transport for fishing industry is unreliable and has resulted in significant volumes of spoiled product.

The advantage of the rail service is that it is not particularly dependent on weather conditions and rail fares to The Pas are reasonably low (around $35.00 one way).

The owners of the HBRR (Omnitrax) do not anticipate that the line will remain economically viable once mining operations cease in Leaf Rapids. Shutdown of the Leaf Rapids operation is anticipated by 2004. At this time, the rail line will likely close given the existing economic conditions. Servicing the community of Pukatawagan will then become problematic given the unreliability of the winter road.

3.2.4 Air Freight

Only a small portion of the total freight being transported into Pukatawagan currently comes in by air. This is due to the lower freight rates on the rail line which passes 10 km east of Pukatawagan. Both commercial air carriers which service Pukatawagan bring in small quantities of freight. Air freight totals into Pukatawagan for the 1999 calendar year are as follows:

- Via Thompson - 42 200 kg.
- Via The Pas - 52 500 kg.

Because the regular mail service for Pukatawagan is Thompson-based, the air freight rate from Thompson is approximately $0.50/kg while from The Pas the air freight rate is approximately $0.99/kg. Despite the freight rate from The Pas being considerably higher, increasingly more freight is transported into Pukatawagan through The Pas than through Thompson. Most of the freight is likely shipped by the individual air travellers. Since there are approximately 35% more travellers taking commercial flights from The Pas to Pukatawagan than from Thompson, it is understandable that the majority of air freight is coming through The Pas. In recent years, the air freight volume being shipped from The Pas has grown by 15% per year.

The air freight service is available six days per week from The Pas and six days per week from Thompson. Only one of the thirteen flights per week that lands in Pukatawagan occurs during normal working hours, when records are kept by the Northern Airports. Therefore, the above information had to be obtained from the commercial carriers servicing Pukatawagan.

The total volume of freight being transported into Pukatawagan for the year 2000 is estimated to be 6150 tonnes (3.5 tonnes/capita). Of this, 2590 tonnes (42%) is transported by rail, 770 tonnes (12.5%) is transported by truck on the winter road, and 95 tonnes (1.5%) are transported as air freight. The remaining 2695 tonnes are unaccounted for freight volumes. The unaccounted for volume of freight was determined by comparing the freight volumes of Pukatawagan to a community of comparable size. It is reasonable to assume that of the 2695 tonnes of unaccounted for freight, 1910 tonnes can be transported by personal vehicles travelling on the ice road, 540 tonnes are transported as carry-on rail freight, and 245 tonnes are transported as carry-on air freight.

3.2.5 Overall Freight Summary

While the winter road is primarily geared to handling freight movements, which have been reasonably well monitored over the last eleven years, there has been considerable personal vehicle/passenger traffic that has not been monitored to date. During four of the eleven years since the ice road has been maintained, there are no records of any freight movement. This is likely because the road was closed to heavy traffic due to poor ice conditions at river crossings (truck companies confirmed that the winter road into Pukatawagan

is often not passable). However, the winter road reportedly has been heavily used every year by personal vehicles.

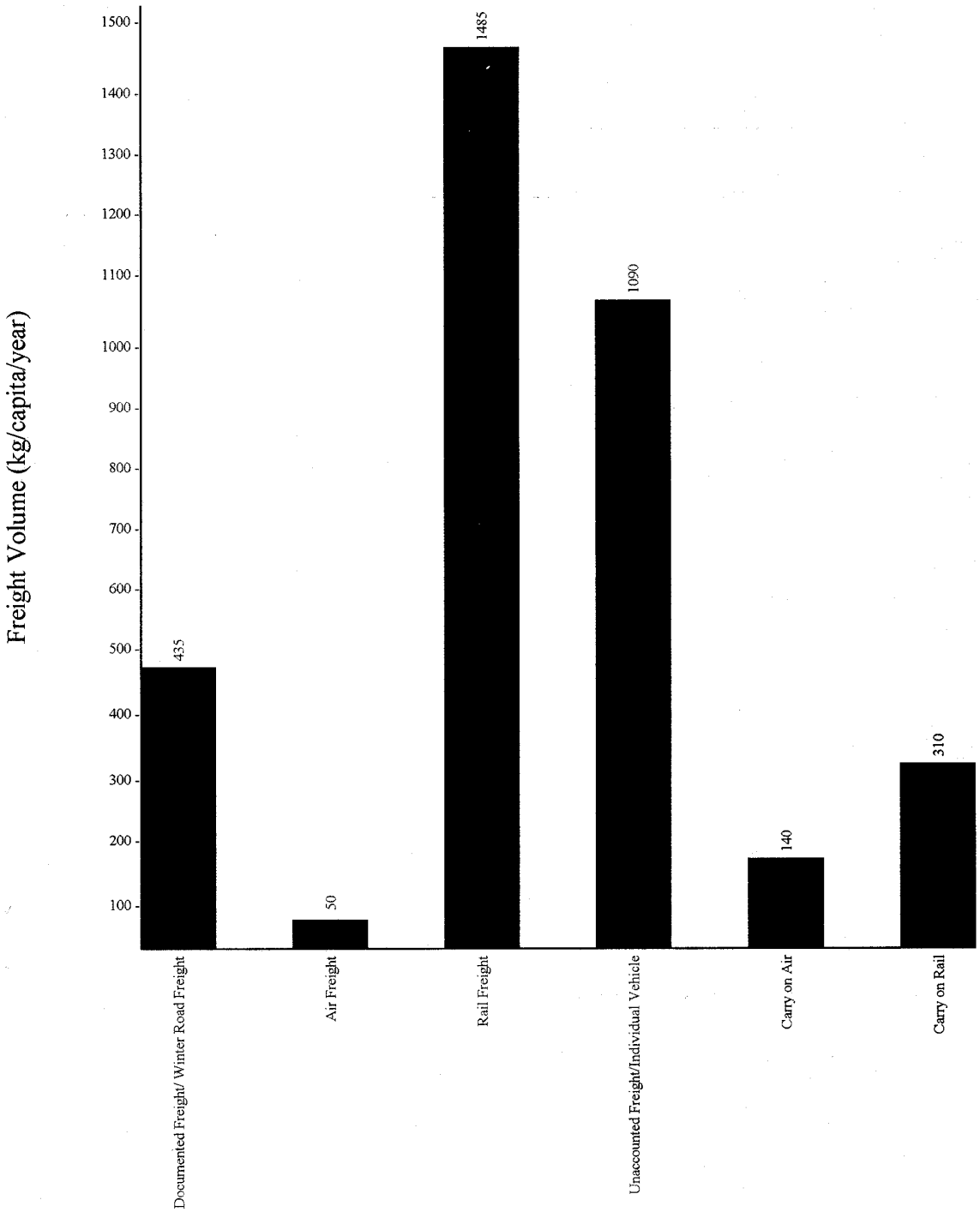
Analysis of the winter road freight transport data indicates that on an annual per capita basis, the documented freight hauls on the winter road varies from 80 to 1170 kg/capita/year, with an average of 440 kg/capita/year (for years, the winter road was open to freight transport). The two largest freight hauls occurred during consecutive winters in 1996 and 1997. The majority of this freight was building materials, machinery, fuel, and food used for capital construction projects (new school and nursery station). During an average year when the winter road is open to trucking and when there are no large capital projects, the documented freight hauls are approximately 125 kg/capita/year. Because the communities of The Pas and Flin Flon are only about a three hour drive from Pukatawagan, a considerable proportion of freight is carried by private vehicles. It is estimated that approximately 1090 kg/capita/year of freight is transported to Pukatawagan by private vehicle. Table 3.4 provides, for comparison, the per capita winter road, rail, and air freight traffic movements for various commodities. Figure 3.2 is a graphical comparison of freight volumes versus mode of transportation.

Approximately 43% of the total freight moving into the Pukatawagan area can be attributed to commercial freight (12%) and personal vehicles (31%) travelling on the winter road.

Table 3.4: Freight Volumes - Transport Mode (kg/capita/year)

Commodity	Winter Road Freight	Air Freight	Railway Freight	Individual Vehicles	Carry On Air	Carry On Rail	Totals
Diesel Fuel	45	0	210	35	0	0	290
Heating Fuel	0	0	55	20	0	0	75
Gasoline	30	0	225	250	0	0	505
Building Material	230	0	55	130	0	0	415
Machinery	85	0	40	0	0	0	125
Food	15	0	720	525	105	125	1,490
Other	30	50	180	130	35	185	610
Total	**435**	**50**	**1,485**	**1,090**	**140**	**310**	**3,510**

Figure 3.2: Freight Volumes (kg/capital/year) Versus Mode of Transport



3.3 People Transport

A community such as Pukatawagan with a population of 1,743 has a considerable demand for people movement. The existing rail system scheduled and charter air services and individual vehicle travel (via winter road) all help to meet this demand.

Without the benefit of scientific surveys, it is necessary to speculate on the specific-use related to personal travel into and out of Pukatawagan. A reasonable assumption would be:

- Shopping and Personal Business:
  - primarily rail and individual vehicles via winter road

- Medical (Referrals and Escorts/Medivac):
  - primarily air and some rail

- Educational:
  - primarily rail and some winter road

- Social Services:
  - primarily rail and some air travel

- Governmental:
  - primarily air travel, but some winter road

- Resource Industries:
  - primarily air and some winter road

- Hydro/MTS/Lodges:
  - primarily air and some winter road

3.3.1 Rail Passengers

Rail passenger service is provided by VIA Rail. Passenger ticket sales are well documented for The Pas departures, but not for Pukatawagan departures. Table 3.5 shows the number of fares from The Pas to Pukatawagan since 1992.

Table 3.5: Train Fares from The Pas to Pukatawagan

Year	Number of One-Way Fares	Comments
1992	4,873	Fair ice road conditions.
1993	4,834	Poor or no winter road.
1994	4,869	Poor or no winter road.
1995	4,654	Poor or no winter road.
1996	2,518	Very good ice road conditions.
1997	2,607	Good ice road conditions.
1998	3,805	Poor or no winter road.
1999	4,294	Poor ice road conditions.

From the above table, it is apparent that in-bound train passenger travel averages and is relatively constant at about 4,300 per year However, in years when the winter ice road is in good condition (e.g., 1996 and 1997), the travel numbers drop significantly.

Outbound passenger traffic has been assumed to be approximately the same as in-bound, even though this cannot be confirmed by what is believed to be incomplete fare records. The total train travel for 1999 has been estimated at 8,600 (one-way fares).

Rail fares between Pukatawagan and The Pas range from $33.17 for a one-way fare booked seven days in advance to $44.94 for a one-way walk-on fare. Assuming that most travellers would book fares in advance, it is estimated that approximately $285,000/year is spent on rail fares each year.

Although travel by rail is significantly slower than by air and the train only travels a couple times per week, a considerable number of travellers still use the train. The relatively low fares and large quantities of allowable carry-on baggage likely contributes to the train being a popular mode of travel.

3.3.2 Air Passenger Traffic

Air traffic records are maintained by the Province of Manitoba, Northern Airports, and Marine Operations. However, these records only reflect air traffic data for weekdays between 7:00 a.m. and 4:00 p.m. Currently, only one of the fourteen scheduled flights into Pukatawagan falls within this window, therefore, the Northern Airports data is missing a large portion of the flight information. The air transport data provided in this report is estimated based on information obtained from the commercial carrier and charter services flying into Pukatawagan. There are two commercial airlines servicing Pukatawagan. Calm Air flies out of Thompson and Beaver Air Lines (owned by Mathias Columb First Nation) flies out of The Pas.

Air passenger movements into and out of Pukatawagan were approximately 12,000 trips in 1999, with approximately 54% of the flights attributable to the air charter industry. The vast majority of charter flights are from The Pas on Beaver Airlines. For scheduled commercial flights, approximately 58% originate from The Pas while the remaining 42% originate in Thompson. Since 1997, the number of passengers flying by charter into and out of Pukatawagan via The Pas has remained constant at approximately 6,475 trips per year. During the same time frame, trips on commercial carriers via The Pas have increased by 32 percent, while trips via Thompson have decreased by 1 or 2%.

In addition to Beaver Air Services Ltd., the Mathias Columb First Nation also operates their own Medivac aircraft. The Medi-van flights generally fly to The Pas.

In total, approximately 80% of the scheduled air traffic in Pukatawagan travels to/from The Pas, with the remaining 20% flying through Thompson. Charter air services from Flin Flon (Jackson Air) accounts for a very small portion of the total air traffic.

Most of the air transport into Pukatawagan for both people and freight is moving through The Pas. There have been significant increases in air traffic from The Pas in recent years. At the same time, slight decreases in air traffic from Thompson have been noted. No doubt, this is in a large part, due to poor ice conditions on the winter road in 1998 and 1999.

In total, there are approximately 12,000 air passengers flying into and out of Pukatawagan per year. Table 3.6 identifies the major commercial and charter air carriers servicing Pukatawagan, the routing flight frequency, and costs.

Table 3.6: Pukatawagan Flights (1999)

	Carrier	Schedule	Number of Fares	One Way Average Cost ($)
Commercial Flights				
from The Pas	Beaver Air Services	7 Return Flights/Week	3,120	110.00
from Thompson	Calm Air	6 Return Flights/Week	2,300	91.00
Charter Flights				
from The Pas	Beaver Air Services	As Required	6,475	1,046.00 (8 people) 131.00/person
from Flin Flon	Jackson Air	3 Trips/Month	140	550.00 (2 people) 275.00/person

Notes: Additional ground transportation not included.

Scheduled flights are available from The Pas every day of the week except Sundays (twice on Mondays) and from Thompson everyday except Saturdays.

Air charter costs are slightly higher than the schedule flight costs, but most people are choosing to fly by charter to and from The Pas.

3.3.3 Overall People Transport Summary

Although there is limited data on the numbers of vehicles and people using the winter road system, it is estimated that this mode of travel accounts for 60% of the total people movements in and out of Pukatawagan. Figure 3.3 illustrates the estimated annual distribution by mode of transportation.

Figure 3.3 Total Freight Movement into Pukatawagan

4.0 FUTURE SYSTEM FORECASTS AND COSTS

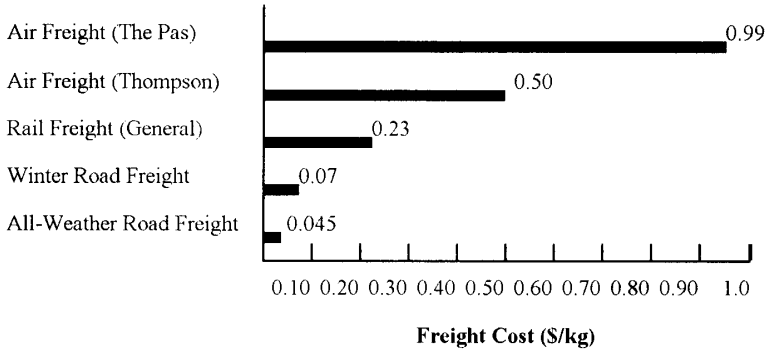
The future traffic and freight volumes into the Pukatawagan area are directly related to the annual population growth rate of 2.5 percent in the community. The population of Pukatawagan is expected to double within the next thirty years. The demand for freight and passenger services is expected to increase accordingly.

4.1 Road Freight to Pukatawagan

Future winter road system freight quantities for Pukatawagan are expected to be proportional to the increase in population. The population growth rate, current population, and historical winter road freight weights were used to extrapolate future winter road freight volumes and costs.

Freight quantities for an All-Weather Road system for Pukatawagan were determined by adding the current winter road freight quantities and the estimated volume of freight diverted from air traffic and railway traffic. Because of reduced travel time and fewer restrictions on vehicle loading, the freight rates under an All-Weather Road scenario would be reduced significantly. The estimated freight costs of various modes of transportation are presented in Figure 4.1.

Figure 4.1: Freight Cost Comparison - The Pas to Pukatawagan



From the freight rate data shown, it can be seen that an All-Weather Road going into Pukatawagan would result in a 35% freight cost decrease compared to the winter road freight costs.

4.2 Air Freight to Pukatawagan

Air freight under the winter road system was estimated from recent historical data and then extrapolated using the population growth rate. From the freight rate data shown in Figure 5.1, it can be seen that air freight rates are between ten and twenty times higher than All-Weather Road freight rates. If an All-Weather Road system were built, one would expect the volume of air freight to be reduced by as much as 80%.

4.3 Air Passenger Travel

Air passenger travel with the current winter road/rail systems is expected to grow as the population increases. The historical volumes of air passenger traffic has been quite variable. During years when the ice road is in good condition, air travel decreases significantly.

If an All-Weather Road system were constructed, significant decreases in air travel would be expected given that The Pas, the primary destination, is less than 300 km from Pukatawagan. The decrease is estimated to be about 80%.

Minor decreases in air passenger travel to and from Thompson and Flin Flon would also be expected. The decrease in air travel from these two communities is estimated to be 20%. Although Flin Flon is relatively close to Pukatawagan, most of the air travellers from Flin Flon are MTS and Provincial Court employees. It is expected that it would remain cost effective for these people to continue travelling by air charter.

4.4 Rail Freight to Pukatawagan

The volume of rail freight being transported into Pukatawagan is expected to grow proportionally with the population under the current transportation scenario. Future freight volumes and costs have been extrapolated from the current estimated freight volumes, however, given the uncertain future of the Lynn Lake - The Pas rail line, accurate future predictions are difficult. If the rail line remains open after the Ruttan Mine ceases ore concentrate shipments, the Pukatawagan freight volumes would likely increase as predicted, but the freight rates may have to change significantly.

If an All-Weather Road system is constructed, and the rail line remains operational to service the forestry operations, it is estimated that a large portion of the rail freight to Pukatawagan will be transferred to road freight because of the considerable transportation cost savings. Under this scenario, the volume of rail freight to Pukatawagan would decrease by an estimated 80%, resulting in a $0.3 M/year cost savings.

4.5 Rail Passenger Travel

Historically, the volume of rail passenger travel varied significantly with the condition of the ice road. However, as long as the current transportation systems do not change, the overall future volume of rail passengers is expected to rise proportionally with the increase in population. Rail fares and allowable baggage weights currently makes rail travel an attractive option for some people. Changes in either of these factors could significantly affect future rail passenger volumes.

In the event that an All-Weather Road system is constructed and the rail line remained operational, an estimated 90% of rail travellers would switch to travel by road. Once this occurred, the rail passenger service would most likely be cancelled. After factoring in the travel costs on an All-Weather Road, little or no cost savings would be realized.

4.6 In-Community Operations and Maintenance

MTS and Hydro personnel currently make numerous trips into Pukatawagan each year to service the community. As the population increases, more equipment and more trips into Pukatawagan will be required.

Currently, both Hydro and MTS have equipment and machinery stationed in The Pas, therefore, do not make heavy use of the railway or ice road. Most equipment backhaul is done by winter road during years that the ice road is able to support transport trucks.

Currently, MTS and Hydro operations and maintenance cost for Pukatawagan are around $0.14 M/year. If an All-Weather Road system were constructed, the O & M costs would likely decrease by approximately 15%. Most of the savings would be attributable to a more efficient use of time due to improved transportation scheduling.

4.7 Individual Travel

The recorded freight volumes moving into Pukatawagan by rail, air, and winter road fall far short of the freight volumes required to service the current population. Consequently, it is reasonable to assume that individual travel via personal vehicle, train, and air provides the balance of the freight required to meet the community's needs.

An All-Weather Road into Pukatawagan would result in a significant shift in both freight traffic and individual passenger traffic. It is estimated that individual vehicle traffic would initially increase by approximately 70%. This would be followed by an expansion in vehicle ownership and corresponding increases in vehicle travel.

5.0 RELIABILITY CONSTRAINTS

5.1 Context

For the community of Pukatawagan, the primary modes of travel have been identified as:

- Rail for passengers and freight.
- Air for passengers and some freight.
- Winter road primarily for individual travel, personal freight, and some construction materials.

Aside from the cost and service level issues, the community has a reasonably reliable means of egress and ingress.

However, if in the foreseeable future the railway service is discontinued, the community's remoteness would be increased and personal travel, except in the winter, could become almost unaffordable. Employment opportunities would be reduced. The existing winter road would become very important.

In such circumstances, the unavailability of the winter road due to climate and weather conditions could force the community to rely entirely on air services.

5.2 Reoccurrence of Unusually Mild Winters

The circumstances that limit or preclude the use of a winter road are the combination of two or more of the following:

- High January and February or high February and March temperatures.
- High late fall to early winter precipitation (rain and/or snow), leading to high winter stream flows, particularly on the Churchill River.
- High November and December temperatures.
- Low January and February snowfall.

The above climatic events are almost always a result of weather systems that move in from the southwest The weather station located at The Pas has been recording temperatures and precipitation since 1910 and should be a reasonable indicator of events that would threaten a winter road.

In the last 90 years, there have been four years where conditions would have precluded a functional winter road; namely 1930-31, 1943-44, 1997-98, and 1999-00. In another six years (1918-19, 1931-32, 1934-35, 1953-54, 1983-84, and 1995-96), conditions were such as to threaten the viability and duration of a winter road. In a further ten years, two of the four elements preceding a road failure existed, but were not followed by high winter temperatures.

As the winter road to Pukatawagan involves 70% travel on lake/stream ice, heavy fall precipitation, which occurred in 20 of the last 70 years, the winter road could be at potential risk 20 to 25% of the years. It should also be noted that Saskpower's hydro generating station on the Churchill River has a significant influence on flows through Pukatawagan Lake, even a cold winter does not preclude poor ice conditions.

It is noteworthy that four of the above obvious threats occurred in 15 years during the 1930s and 1940s and three occurred in the last five years. There were only two potential events during the 40 years from 1950 to 1990.

It would appear that there is a recent trend toward wetter/milder winters after a long period of relatively cold winters. However, this is not necessarily a reflection of a global warming trend; the 1930s and 1990s did experience similar wet/warm winter conditions.

However, it is reasonable to conclude that a winter road system in the Pukatawagan area will experience highly unfavourable conditions with a high risk of non-operation at least 20% of the years. Because these situations cannot be predicted, the potential circumstances leading to winter road failure exist even more frequently. A one-year in five frequency appears to be a realistic probability.

6.0 ECONOMIC SPIN-OFF ISSUES

The direct and immediate benefits of an All-Weather Road are reduction in costs of transporting goods and people. The "spin-off" economic benefits are the opportunities for capital investment, income, and employment created by the improved access. This report notes some of the major categories, including commercial forestry, mineral exploration and mining, commercial fishing, tourism, and service-sector development. This a scoping study, and most of the information presented here has been assembled from information provided by various government departments and agencies and through personal communication with people in potentially impacted industries.[1] The impacts/benefits to these sectors are noted on an "order of magnitude" basis only.

The context of the "spin-off" economic benefits is important. Most isolated First Nation communities have extreme unemployment rates. These unemployment rates reflect the lack of opportunities outside of traditional pursuits. Without access to gainful employment, these people and communities are supported by transfer payments.

Mathias Columb Cree Nation has an On-Reserve population of some 1,700 and a total population of some 2700[2.] Community members are actively engaged in commercial fishing, wild rice, and other resource harvesting, service-sector jobs, and provision of local government services. In common with other isolated First Nation communities, however, there is a high dependency on social assistance (1996 census indicated a 25% to 30% unemployment rate based on the active work force. The actual unemployment rate would be considerably higher if based on total community population). In this environment, any loss of employment or potential employment opportunity is a serious issue and any new employment opportunity created by an All-Weather Road is more beneficial than it would be in an environment where there are employment alternatives.

This section of the report looks at the major employment sectors in the region and considers the impact of losing rail service and the impact of an All-Weather Road.

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1 As All-Weather Road transport replaces air transport, there will be impacts to airline industry. We have not estimated the economic impact of dislocations and adjustments that would occur in the existing transportation system.

2 Indian and Northern Affairs Canada, Community Profiles, lists the December 31, 1996 total population as 2,682.

6.1 Mining

Mining has been responsible for the development of much of the road, rail, and other infrastructure in northwest Manitoba. Figure 6.1 shows the general geology of Manitoba and the Greenstone Belts that host most of the mineral potential. South of Pukatawagan lies the Flin Flon/Snow Lake belt and to the north, the Lynn Lake belt. Pukatawagan itself lies in an area generally regarded as having low mineral potential.

The Flin Flon-Snow Lake belt is one of the most prolific mining belts in the world. A multitude of base and precious metal deposits of various sizes have been found in this relatively small area, some 250 km long and 45 km wide. There have been 25 operating mines in this area starting with the Mandy Mine, which first went into production in 1916. Most of these mines produce copper-zinc and associated precious metals, although at least three produced principally gold and silver. The mine at Flin Flon went into production in 1930. The discovery of that deposit led to the construction of a rail line from The Pas to Flin Flon in 1928, and the development of the Island Falls hydroelectric generating station on the Churchill River (upstream from Pukatawagan, in Saskatchewan).

The success at Flin Flon encouraged extensive exploration in the region, leading to the development of the Sherridon Mine. The mine at Sherridon went into production in 1931 and resulted in the rail line being extended from Flin Flon, 64 km north to the Sherridon community. Near the end of the life of the Sherridon Mine, new base metal deposits, and later gold, were discovered further north again, in the Lynn Lake greenstone belt. The rail line was again pushed further north, crossing the Churchill River east of the current community of Pukatawagan. All of the mines in the Lynn Lake area are now out of production with the exception of the Ruttan Mine, 25 km southeast of Leaf Rapids. The Lynn Lake mines have either exhausted their ore bodies or have become uneconomic due to a combination of low grades and low prices.

The Ruttan Mine is scheduled to go out of production in 2004. The Ruttan Mine is a low-grade copper-zinc deposit, producing some 2 million tonnes of ore per year. This results in a concentrate of 140,000 tonnes (per annum) hauled by truck to the railhead at Lynn Lake, and then by rail to the smelter at Flin Flon. Other significant transportation demands by the Ruttan Mine are for propane and lime. Propane is used to heat mine air, and lime is used as a reagent in the mill plus treating wastewater. Both come by truck via Thompson. Lime requirements are one truck load per day (35 tonnes) in summer (120 days) and two trucks per week in the winter. Propane requirements are 7.5 million litres per year. The Ruttan Mine directly employs some 388 people and is the principal employer in Leaf Rapids. It had an estimated remaining life of five years in 1987; it appears to still have five years left.

When the Ruttan Mine goes out of production, the rail line will lose most of its freight traffic originating in Lynn Lake and traffic on P.R. 391 will see a significant reduction.

Figure 6.1 General Geology and Metallogeny of Manitoba

There is ongoing exploration in the Lynn Lake greenstone belt. It is likely that at some time, commercial deposits will again be identified and brought into production. The timing of this is unpredictable and there is no way of reasonably forecasting when such an event might occur. A road to Pukatawagan, however, is not likely to stimulate additional exploration in the study area or result in any other economic activity related to mining.

The community of Pukatawagan on the other hand might be significantly affected by the closure of the Ruttan Mine mostly due to impact on the regional transportation system and in particular, the potential loss of rail service.

In some circumstances and types of mining, rail service increases the potential viability of a new deposit. Loss of rail service therefore will also reduce the attractiveness of the Lynn Lake greenstone belt for exploration.

6.2 Forestry

Forestry is one of the major land uses in the study area. The principal forestry company is Tolko Industries Ltd., which has a sawmill and paper mill located in The Pas. Figure 6.2 shows the Highrock Forest Section, which is one component of Forest Management Licence #2 (FML2).

The FML area derives from a Forest Management Licence Agreement under the *Forest Act* of Manitoba. There are only three FMLs in the province, all of which are reserved to sustain major forest companies. Other timber rights are granted by way of quotas and community allocations. Each of these are typically small entitlements. Quotas are renewable annually; subject to performance, while community allocations are for short terms of up to five years. There are no quota holders or community allocations in the study area. Within the study area, all of the timber rights are held directly by Tolko which harvests wood through contractors.

There are three main harvest areas in the study area:

- The Laurie River spur, north of the Churchill River, within Forest Management Unit (FMU) 64.
- Charles Spur, south of the Churchill River.
- The Jungle Lake spur, which takes in part of FMU 63 and 65.

Figure 6.2 Highrock Forest Section

The **Laurie River** spur is a contract operation managed by Black Sturgeon Logging, a corporation of the Marcel Columb First Nation from the Lynn Lake area. Production is 50 000 m^3 per year. Production is achieved by a mixture of modern mechanical equipment and some older skidder technology. Logs are hauled to the rail siding shipped year around (three times a week) by rail to the Tolko facility in The Pas. Total employment is in the order of 13 people, harvesting and hauling mostly in the winter.

Production at this rate is forecasted to last through the life of the current operating plan to Year 2009 and beyond. Since the annual production is based on estimates of annual allowable harvest, it should be able to be sustained at this rate on an indefinite basis, and provide a secure source of income and employment for the people of Marcel Columb. This production, however, is totally dependent on the rail line. Loss of rail service will sever access to this area, and an All-Weather Road to Pukatawagan probably would not help.

The **Charles** spur is a proposed operation that would be operated under contract to members of the Mathias Columb First Nation. It is anticipated that production would also be in the order of 50 000 m^3 per year. It would be operated on a similar basis as the Laurie River operation. The proposed Charles operation could potentially operate with an All-Weather Road alone, but it would be a high cost operation always subject to the vagaries of market conditions. If rail service were withdrawn, the operation would be re-evaluated on the revised economics of road haul versus rail.

A combination of an All-Weather Road and rail, however, would lead to an increase in viability, providing increased returns to the contractor. The increased viability comes from easier movement of staff, and the ready availability of parts, supplies, and service personnel.

The **Jungle Lake** operation is managed by four contractors working east of the rail line in FMUs 63 and 65. Two of these contractors are highly mechanized and two harvest with older equipment. In total, annual production averages 150 000 m^3 per year. Woods employment associated with this harvest is in the order of 35 to 40 people, a significant percentage of whom are aboriginal, some being from Pukatawagan. Loss of rail service would reduce the returns to this operation, but it would continue.

In total, the operations in the study area employ some 85 to 90 people in woods operations, operating equipment worth $7,500,000 and having a total payroll in the order of $2,500,000. It is clearly a key industry to be considered in any further analysis of the regional transportation system.

6.3 Tourism

There is a significant tourism industry in the Flin Flon area and extending north through Pukatawagan and Lynn Lake. This is mostly lodge based, non-resident, sports fishing, and big game hunting.

Effectively, every large lake throughout this area that is not dedicated to commercial fishing has either a lodge, outpost, or boat cache. With all the lakes occupied, there is limited opportunity for expansion except within the established operations. The principal exception to this is that there is no lodge accommodation on the Churchill River in the vicinity of the Pukatawagan community. That opportunity exists with or without a road, but with a road in place, there is a potential for developing a destination facility with boat access to an extensive area.

Potential negative impacts of a new All-Weather Road derive from the potential to provide access to lakes that are now marketed as fly-in/wilderness locations. Lodge owners would have significant concerns about any road that provided vehicle access to these lakes, directly or indirectly via stream crossings that lead to these lakes. An alignment that follows the existing rail bed would likely provide the least impact to the existing industry. Most of the tourist lakes lie to the east or west of this alignment, with none directly in the path of this route.

We have not estimated the scale of a new (end of the road) tourism facility at Pukatawagan. Because of that potential created by the road, however, the overall tourist impact of this road will be positive - provided that the route location can be selected that does not impact existing facilities.

Third party consultation with the established tourist industry is very important in the route selection stage. Significant planning and consultation is required with Mathias Columb First Nation respecting the opportunity they will have to participate in the tourist industry. Planning will be necessary to ensure the road alignment provides for the maximum commercial tourism benefits. Consultation is required to establish the community interest in developing such a facility. At a minimum, it will be necessary to protect this opportunity for the future should the community not want to proceed in the near term.

6.4 Commercial Fishing

Commercial fishing is one of the more important industries to the community of Pukatawagan. As shown in Table 6.1, study area lakes have produced some 185 000 kg of fish work in excess of $500,000.

Table 6.1: Commercial Fishing - Pukatawagan Area Deliveries (delivered weight in kilograms)

Lake	Export Whites	Cont. Whites	Cutter Whites	WF Roe	Pickerel	Northern Pike	Cont. Tail.	Mullet	Other	Total	Initial $
Churchill River	0	0	14,439	267	21,497	19,649	6,852	2,413	506	65,623	$164,273
Highrock	0	0	0	0	33	17	43	0	1	93	239
Russell	0	899	0	2,860	0	1,118			54	4,931	18,398
Sisipuk	0	0	77	0	14,204	7,545	0	0	268	22,094	90,995
Burntwood	970	0	0	0	9,921	1,664	0	11,708	138	24,401	64,323
Kississing	0	0	22,181	0	5,153	1,186	0	14,136	0	42,656	55,078
1999/2000	**970**	**899**	**36,697**	**3,127**	**50,808**	**31,179**	**6,895**	**28,257**	**967**	**159,798**	**$393,306**
Churchill River	22,401	0	141	436	28,601	15,688	6,098	7,048	904	81,317	$214,661
Highrock	0	222	0	0	607	265	0	0	0	1,094	3,818
Russell	0	3,157	0	0	4,955	3,035	28	291	650	12,116	33,609
Sisipuk	1,685	0	0	0	11,356	7,020	0	0	222	20,283	74,427
Burntwood	702	0	0	0	12,978	1,045	0	9,597	161	24,483	69,678
Guthrie	6,413	0	0	0	3,238	4,191	0	8,258	0	22,100	33,942
Kississing	0	0	9,709	0	5,450	1,027	0	7,122	0	23,308	42,724
1998/1999	**31,201**	**3,379**	**9,850**	**436**	**67,185**	**32,271**	**6,126**	**32,316**	**1,937**	**184,701**	**$472,859**
Churchill River	12,336	0	0	124	17,417	7,071	1,994	1,428	676	41,046	$107,219
Girouard	18	0	0	0	21	32	83	70	1	225	246
Highrock	0	73	0	0	44	66	0	0	0	183	349
Morin	0	505	0	0	282	198	1,066	264	4	2,319	2,781
Russell	0	546	0	0	3,304	1,174	0	0	542	5,566	18,165
Sisipuk	1,440	0	0	0	11,299	5,260	0	0	168	18,167	62,988
Burntwood	816	0	0	0	17,394	1,894	0	3,962	272	24,338	79,247
Kississing	0	0	6,447	0	5,232	1,084	0	3,628	0	16,391	33,231
19971998	**14,610**	**1,124**	**6,447**	**124**	**54,993**	**16,779**	**3,143**	**9,352**	**1,663**	**108,235**	**304,226**

Source: Fresh Water Fish Marketing Corporation

The Churchill River fishery is the largest single component. It is fished exclusively by some 25 licenced fishermen from Pukatawagan[3] who fish these lakes under a single quota. This fishery operates like a community operation, although the fishermen are each independent producers. The Churchill River fishery includes Pukatawagan Lake, Highrock Lake, and Flatrock and the river system in between. In 1998/99, this produced some 82 000 kg of fish with an initial price of $218,500. This is principally a summer fishery with all production shipped by rail south to The Pas. The rail delivery system has been problematic. Fishermen complain of an inconsistent train schedule, and problems with properly icing and loading fish in rail cars that are used for general freight. This has resulted in significant losses due to spoilage.

Loss of rail service (unsatisfactory as it may be) would significantly reduce this fishery. The Churchill River is affected by the Island Falls generating station, located upstream in Saskatchewan. The operation of this plant results in poor winter ice and heavy slush conditions that would make converting to a winter fishery difficult. Maintaining the current open water fishery without rail service would require flying out the catch or tying into some of the resource roads that are approaching the southern end of Flatrock Lake. The economics and logistics of this suggest a much reduced fishery if rail service is lost and not replaced with an All-Weather Road.

An All-Weather Road would maintain this fishery and increase returns to fishermen. While an All-Weather Road would increase the viability of the fishery and directly increase the incomes of individual fishermen, the Department of Conservation is of the opinion that it would not, result in significant expansion. Given the lack of employment opportunities in Pukatawagan, maintaining or enhancing the commercial fishing industry is a priority.

The Russell Lake fishery and other fisheries north of the Churchill River are at absolute risk if rail service is withdrawn. This is principally a fall fishery that has recently produced some 12 000 kg of fish worth some $33,000. This production is shipped by rail north to Lynn Lake and by road to the packing facility at Leaf Rapids. The only alternative to rail is air, and this is likely uneconomical. A road to Pukatawagan would not maintain this component of the fishery, as there is no transportation link between Russell Lake and the community.

The Sisipuk fishery is unaffected by either the current rail service or a potential road. This is a summer fishery with production going by boat to Sandy Bay, Saskatchewan.

The Burntwood and Kississing fisheries shown in Table 6.1 are also unaffected by either the current rail service or a potential All-Weather Road. This production is currently shipped by a combination of resource and All-Weather Roads and production would not change with alternative road service.

[3] There are 43 licenced fishermen resident in Pukatawagan, 25 of whom are consistent producers.

6.5 Wild Rice Harvesting

The community of Pukatawagan has identified a significant/active wild rice harvesting operation with an estimated value of several hundred thousand dollars per year. It is their belief that this operation could be expanded substantially if an All-Weather Road were put in place and transport costs were reduced by 80% to 90%.

6.6 Service Centre Development

The two broad economy sectors are the goods producing sector and the service sector. The goods producing sector includes primary (resource) industries, manufacturing, utilities, and construction. The broadly defined service sector includes transportation, trade, government, communications, and services including health, education, business, and personal services. An All-Weather Road may have a neutral overall impact on the services component of the regional economy.

An All-Weather Road has the effect of reducing transportation costs and making business less expensive. The same road, however, will give a broader part of the community easier access to shops and services in larger population centres. This drain of purchasing power is the common experience in all small communities. The local market, within Pukatawagan is not big enough to attract the type of retail and service business that occurs naturally in the larger centres. The expectation is, therefore, that the retail/service sector in Pukatawagan will shrink with an All-Weather Road. Compensating for this will be an expansion in local transportation services (e.g., local bus/taxi service) and a potential expansion in the accommodation industry to meet the needs of the new rubber tired travellers.

The regional beneficiaries of an All-Weather Road to the south will be the most accessible large centre at the south end of the study area. This will be either Flin Flon or The Pas, depending on the final road alignment. The Pas seems to have more extensive health services, but Flin Flon is closer.

While the study does not assign benefits to this sector, it is clearly another focal point for economic development planning. In particular, the potential for the creation of a limited or secondary level regional service centre needs to be further addressed. Within the context of this scoping study, we have not studied this issue. The development of such a regional centre, however, may be an important component of an overall strategy to retaining economic activity within study area communities.

6.7 Other Benefits

Other benefits of an All-Weather Road include community health and less tangible benefits related to reduced isolation. Community health benefits derive from reduced costs of foods that, in turn, should lead to improved diets. In all of the isolated communities, the cost of fresh fruit is so high as to make it beyond the ability of most families to include these items in the family diet on a regular basis.

The current transportation system of winter roads and air travel also imposes isolation. This isolation is not just from the Aoutside world,@ but equally important, from one northern community to another. While Pukatawagan has air access and rail service, it is difficult and expensive to travel from any one community to a neighbouring community. Typically, this would require flying to a major centre and then back on a scheduled flight (the next day) to the final destination or by arranging a charter. In either case, this effectively cuts communication and social interaction between communities.

6.8 Summary of Spin-off Issues

The following table documents a summary of the spin-off issues:

Table 6.2: Summary of Spin-off Issues

	Loss of Rail Service	Loss of Rail/ New All-Weather Road	Maintain Rail/ New All-Weather Road
Mining/Exploration	HBMS/Ruttan Mine closes.	HBMS/Ruttan Mine close.	HBMS/Ruttan could operate. Increased exploration.
Forestry			
• Laurie River	Would close.	Might close.	Would continue.
• Charles Spur	Might close.	Would continue.	Would continue.
• Jungle Lake Spur	Would continue.	Would continue.	Would continue.
Commercial Fishing			
• North of Churchill River	Would decline.	Would decline.	Would continue.
• Churchill River	Would decline.	Would continue.	Would continue.
• Southern Study Area	Might continue.	Would continue.	Would continue.
Tourism			
• Existing Industry	Would continue.	Would continue.	Would continue.
• New Opportunities	Would not happen.	Would happen.	Would happen.
Wild Rice Harvesting	Would decline and possibly close.	Would grow.	Would grow.
Service Sector	Might grow.	Some losses, some gains.	Some losses, some gains.
Medical Services	Become more costly and less available.	Become less costly and more available.	Become less costly and more available.

7.0 COMPARISON OF ALL-WEATHER ROAD AND WINTER ROAD SYSTEM COSTS

7.1 Basic Strategies

There are a variety of circumstances which will influence the economic viability of an All-Weather Road system strategy. These are briefly described as follows:

- Existing Transportation Situation
- Existing Situation with an All-Weather Road
- Existing Situation minus Railway
- All-Weather Road to Replace No Rail/Winter Road System

Each of the above scenarios was analyzed on the basis of capital costs, operating and maintenance costs, ongoing basic freight costs, ongoing passenger travel costs, resource industry freight costs, mild winter cost implications, and other special issues. The evaluation employed a 2.5% community for growth, freight, and for passenger traffic, an 8% discount factor, and a 20-year present value analysis assuming the scenario existed at Year One.

7.2 Existing Transportation Situation

The community of Pukatawagan transportation needs are met by a combination of railway, airline, and winter road travel. The costs incurred are in the order of $3.2 M/year ($38 M - 20-year present value), of which:

- 30% is rail related.
- 35% is air related.
- 35% is winter road related.

Additionally, there are transportation costs incurred by:

- Tolko ~$3,100,000/year - 20-year present value of $31 M.
- HBMS ~$2,300,000//year - 20-year present value of $23 M.
- Fishery Operation ~$65,000/year - 20-year present value of $0.65 M.
- Wild Rice Operation ~$100,000//year - 20-year present value of $1.0 M.
- Norman Health Authority ~$1,000,000/year - 20-year present value of $12 M (Medivac only).

When winter roads are impassable due to mild winter conditions/high winter flows on the Churchill River/etc., there are additional costs related to rail freight replacing winter road freight which equates to $0.38 M (20-year present value).

Winter roads/pioneer roads must be constructed annually at estimated costs of $0.4 M/year ($4 M 20-year present value).

In total, the area's transportation needs under the existing situation involve costs of $11.0 M/year (including mild weather/special infrastructure scenarios) or $113 M (20-year present value).

7.3 Existing Situation with an All-Weather Road

If an All-Weather Road were built (to Highways Standards) from P.T.H. 10 to Pukatawagan over a total distance of 175 km, there would be a significant shift in the freight and passenger movements. It is estimated that 80% of freight currently moved by air and rail would shift to All-Weather Road travel. Rail passenger service would likely be eliminated. All rail passengers would be expected to switch to All-Weather Road travel.

The cost of such an All-Weather Road is estimated at $100 M, which equates to $8 M/year when amortized at 8% and maintained over a 50-year facility life (a 20-year present value of $80.0 M).

Under these circumstances, the transportation costs incurred by the community of Pukatawagan would be reduced from $3.2/year to $2.3 M/year (a reduction equivalent to $11 M 20-year present value).

HBMS and Tolko (which would continue to use rail) costs remain unchanged, fishery and wild rice operations would see a 20% reduction in cost. Health transport costs would be reduced by 50%. Mild winter/high river flow situations would cease to be an issue; with a cost saving of $0.27 M (20-year present value).

In total, this All-Weather Road scenario would see a net increase in the transportation costs for the Pukatawagan area of $63 M (20-year present value) from $113 M to $176 M. Figure 7.1 illustrates these relative impact of the All-Weather Road on the existing transportation system.

Figure 7.1 Cost Benefit Analysis (Existing Transportation System, including Rail versus All-Weather Road)

7.4 Existing Situation - Minus Railway

If the HBMS mine at Ruttan Lake were to close in the near future, it is likely that the HBRR would cease operations to Pukatawagan and Lynn Lake. Under these circumstances, it is estimated that almost all current rail freight would have to shift to winter road haul, with a small diversion to air freight. It is also anticipated that 100% of the former rail passenger travel will switch to an alternate mode of transportation. Air travel will likely account for 25% of the former rail passenger travel, while winter road travel will account for the remaining 75%.

Under these circumstances, the basic transportation costs for the community of Pukatawagan will increase by $0.1 M/year ($1.2 M 20-year present value).

Hudson Bay Mining & Smelting's concentrate transport would cease to be a consideration. To continue, logging operations in the area would be forced to employ winter road haul with annual transport costs of $10 M/year compared to $3.1 M/year) under the existing situation. This equates to a $66 M (20-year present value) cost increase.

Fishery and wild rice operations would have to switch to air freight haul at approximately five times the cost.

The impact of mild winter/high river flow situations would be much greater, with full reliance on air freight. Costs would equate to $5.4 M (20-year present value) compared to $0.38 M (20-year present value) under the existing situation.

In total, the transportation situation without a railroad would incur costs of $17 M/year ($165 M - 20-year present value) or an increase of $6 M/year ($52 M - 20-year present value) under the existing situation.

7.5 All-Weather Road System to Replace No-Rail/Winter Road System

$2.3 M/year. A saving of $12 M (20-year present value). With no rail service, the modal split for freight would become:

- 99% All-Weather Road (formerly 95% winter road).
- 1% Air (formerly 5% air).

For passengers, the modal split would be:

- 80% All-Weather Road (formerly 40% winter road)
- 20% air (formerly 60% air).

The forest industry would experience cost savings of $5 M/year (relative to no rail/winter road) or the equivalent of $40 M (20-year present value). This assumes the industry could continue to operate in the study area after rail closure on an economic basis, which is not necessarily the case.

Manitoba Hydro/MTS/Lodge operations as a group would be expected to achieve savings of $0.7 M (20-year present value).

Health service transport costs might be reduced by $0.5 M/year ($6.0 M - 20-year present value) in the areas of referred patient and escort travel plus Medivac costs.

Whether or not HBRR/VIA would have reduced long-term costs depends on the nature of existing governmental agreements for long-term rail service.

In total, an **All-Weather Road system** compared to a **No Railway/Winter Road** scenario would see overall costs of $17 M/year ($170 M - 20-year present value); an increase of $5.7 M/year (20-year present value). Figure 7.2 illustrates the relative impacts of the All-Weather Road.

Figure 7.2 Cost Benefit Analysis (Current System Without Railway versus All-Weather Road)

8.0 ALTERNATIVE ALIGNMENTS AND STRATEGIES

8.1 Background Information

In the late 80s, a Flin Flon to Lynn Lake Highway Corridor Study was carried out which examined a series of routes that might be appropriate with a continued rail service. Conceptual cost discussion from that study was employed and expanded on to provide All-Weather Road construction cost estimates for use in the foregoing system cost evaluations.

Four general route scenarios from the 80's study were further considered for this report. These were:

- All-Weather Road - West Alignment
- All-Weather Road - Combination of West Alignment with South Entry via Existing Churchill River Railway Bridges
- All-Weather Road - Generally Following Railway Alignment
- All-Weather Road - Closely Parallelling Railway Alignment

An alternative connection to PTH 10 near Flin Flon while not precluded, was not examined, but would likely have similar costs to an upgrading of Sherridon Road.

In addition, several Alternative Transport Improvement Strategies were examined and partially costed in order to establish their relevance to the Pukatawagan access situation.

8.2 All-Weather Road Access Alternatives

a) All-Weather Road - West Alignment

- Construction of an All-Weather Road to Pukatawagan could involve:

- 35 km of upgrading the existing Sherridon north from P.T.H. 10.

- 15 km of upgrading the existing forestry resource roads skirting the west side of Kississing Lake.

- 125 km of new alignment skirting to the west and north of Pukatawagan Lake and entering Pukatawagan from the north.

- Twelve major bridges (over 100 m long) are required; Kississing River (existing Tolko Bridge), near Lamont Lake (3), near Wright Lake (3), Pukatawagan River, Little Pukatawagan River, Churchill River (2), west of Arrow Lake

- 23 minor bridges (30 m or less in length).

The terrain on the northern half of this route is extremely rugged; river channels are deeply incised into the Precambrian bedrock. As a result, this 175 km route with steep grades and difficult curves is estimated to have capital costs in the range of $140 M, including $65 M for major and minor bridge structures.

If these bridges were single lane, the capital costs would be reduced by approximately $20 M. However, it would be very difficult to single lane much of the road itself without creating extreme safety hazards.

b) All-Weather Road - Combination of West Alignment with Southeast Entry via Existing Churchill River Railway Bridges

This alternative would involve:

- 35 km of upgrading the existing Sherridon Road north from P.T.H. 10.

- 15 km of upgrading the existing forestry resource road skirting the west side of Kississing Lake.

- 100 km of new alignment to reach the Churchill River outlet of Pukatawagan Lake.

- 15 km of new alignment parallel to the railway and connecting to the existing Pukatawagan access road.

- Seven new major bridges (over 100 m long).

- Joint use of the existing three Churchill River bridges, with the Hudson Bay Railway.

- Fifteen minor bridges (30 m or less in length).

This alignment enters similar rugged terrain, but avoids several major river crossings and is 10 km shorter. The total capital cost (not including any acquisition or upgrading costs related to the railway bridges) is estimated at $105 M, including $35 M for other major and minor bridge structures.

If these bridges were all reduced to single lanes, the costs would be reduced by approximately $10 M. However, if new bridges were required for the Churchill River crossings, an additional cost of $15 M would be incurred.

c) All-Weather Road - Generally Following the Railway Alignment

This alternative would involve:

- 80 km of upgrading the existing Sherridon Road.
- 100 km of new alignment approximately parallelling the existing railway connecting to the existing Pukatawagan access road.
- Six railway cross-overs.
- Three major bridges (over 100 m long) at Kississing River, Kennedy Creek (2).
- Joint use of the three existing railway bridges crossing the Churchill River.
- Seventeen minor bridges (30 m or less in length).

The terrain along this alignment is much less rugged. The railway itself alternatively skirts rock and swamp while maintaining grades of less than 2 percent. Estimated total costs for this 180 km alternative (not including acquisition or upgrading costs for the Churchill River railway structure) are $105 M, including $25 M for new bridge structures.

If the bridge structures were single lane, there would be a $10 M cost reduction. However, if new bridges were required for the Churchill River crossings, an additional cost of at least $15 M would be incurred.

d) All-Weather Road - Closely Parallelling the Railway Alignment

This lower standard/pioneer road alternative which is geared to providing a low speed (non-standard grades and curvatures) pioneer or resource type access road, would involve:

- 80 km of existing (not upgraded) Sherridon Road.
- 100 km of alternatively new alignment and where possibly, railway alignment from Sherridon to the Pukatawagan access connection.

- Six railway cross-overs.

- Three major bridges (over 100 m long) at Kississing River and Kennedy Creek (2).

- Seventeen minor bridges (30 m or less in length).

Because the railway alignment does not lend itself to travel speeds of more than 30 to 40 kph (short sharp curves, no curve transition distances to achieve superelevation changes), and the fact that most of the existing structures are narrow trestles, there would be little benefit in attempting use of the existing rail embankment (should it become available).

Estimated total costs of building a pioneer/resource access type road with single lane bridges and no upgrading of Sherridon Road would be approximately $60 M (not including acquisition or upgrading costs for the Churchill River railway structures).

8.3 Alternative Transport Improvement Strategies

a) ***Maintain Rail Services through Increased Costs to Remaining Users -*** After HBMS closes its Ruttan Lake operations, rail service to Lynn Lake logging operations/Pukatawagan/Sherridon would only be available if the remaining parties paid significantly higher freight and passenger charges (perhaps double current rates).

   Alternatively, it might be possible for the major public sector stakeholders (First Nations/Federal/Provincial) to provide subsidy payments to Hudson Bay Railroad to offset the current revenue lost (see Figure 8.1) from Hudson Bay Mining & Smelting. More frequent service and local facility upgrades might be achievable under such an arrangement.

   It is estimated that the forest industry=s total future costs to operate entirely on winter roads would roughly triple (from $3.1 M/year to $10.0 M/year). As such, the area timber resources may become uneconomic. Alternative wood sources and market conditions would no doubt determine what level of increased cost could be absorbed by the industry.

b) ***HBRR rail systems*** **- Rented by stakeholders with customer-owned track vehicles (rail buses/ specialized freight cars).** This approach would have high initial capital costs, but would not significantly improve the passenger operational safety (and comfort) or efficiency of resource produce delivery.

Figure 8.1 Omnitrax/Hudson Bay Railway - Revenue Needs

This strategy would probably involve:

- A leasing agreement with Hudson Bay Railroad to operate on their lines on a similar basis to the existing VIA arrangement.
- Participation in the cost of selective upgrading of the rail line between Cranberry Portage and Pukatawagan in order to provide safer travel.
- Purchase of rail bus/freight units capable of running on this line.
- Construction of a rail station at Pukatawagan.
- Construction of a rail bus shed/maintenance facility in The Pas.
- Dedicated rail bus crews.
- Annual operating and maintenance (including fuel).

It is probable that such an operation would cost upwards of $0.75 M/year (not including rail maintenance equipment purchase, rail line leasing, and upgrading). The 20-year present value of such an initiative would be at least $7.5 M plus any purchase/lease and upgrading costs.

This strategy would not provide substantial service level gains for the Pukatawagan community compared to the existing situation. It might, however, have greater relevance if Hudson Bay Railroad were to cease operations north of the Flin Flon junction.

c) ***Reduced length of All-Weather Road with Ferry Service to south end of Pukatawagan Lake*** - This strategy could only be regarded as a short-term staging effort. A 10% reduction in road length plus new bridge avoidance would reduce the All-Weather Road capital cost by $10 M. Offsetting this would be ferry operating costs of at least $200,000/year ($2.0 M - 20-year present value). Such a system would still leave the community with no road access for six to eight weeks in spring and in fall.

d) ***Construction of a lower standard access road*** - This approach implicitly accepts lower safety standards and higher liability problems. It would involve:

   - Joint use of Tolko's forestry roads north of Sherridon.
   - Single lane only bridges and use of Hudson Bay Railroad - Churchill River crossings.

- Single lane stream crossings and narrow road cross section.
- Lower operating speeds (40 to 50 km per hour).
- Low speed horizontal curves.
- Excessive longitudinal road grades.
- Seasonal and stormy weather loss of road function.
- Periodic roadway washouts.
- Shorter facility life/more frequent maintenance.
- More frequent and possibly more serious accidents.

Such an approach is normally not acceptable over the longer term. In the short-term, it might be acceptable if started at the north end and tied to Tolko's road network. It would however be essential to plan and design an ultimate (full-standard) roadway and look to achieve interim capital cost savings by selectively reducing the standards. This might involve going around rock outcrops/swamps/etc. to minimize rock cuts or deep fills and single laning bridges and other stream crossings/etc. It is suggested that with the lower standards, the initial capital cost could be reduced by 30% to 40% for a route closely parallelling the HBRR.

However, when considering the long-term annual costs of building/maintenance/etc., it is likely that such a facility would have a much shorter design life (e.g., 15 to 20 years) and hence, a 20-year present value of $60 M, compared to the $80 M (20-year present value) for a full highway standard All-Weather Road. A lower standard road would not generate the same level of transport benefits (e.g., $6.0 M savings as compared to $18 M savings on a 20-year present value basis). Overall, the economic justification would not be any greater than for a full standard road.

9.0 STAKEHOLDER IDENTIFICATION

9.1 General

The construction of an All-Weather Road from Highway 10 to Pukatawagan will provide benefits and disbenefits. The obvious economic benefits will flow directly to the First Nations. The Government of Canada and Province of Manitoba will also gain, as may Manitoba Hydro and Manitoba Telephone System to a lesser degree.

Within the resource industries:

- HBMS would lose out if the railway closed as a result of the All-Weather Road being built.
- Other mining ventures might or might not see benefits.
- Tolko would not like to see a rail closure, but would support an All-Weather Road if a rail closure resulted in the loss of service to logging operations.

Within the tourism industry:

- Remote lodges and fly-in camp operations would not benefit from an All-Weather Road.
- Road-based tourist operations would likely increase in number and scale of operations.

Within the transport industry:

- Air travel service could be reduced/redistributed.
- HBRR would probably cease operations on the line to Lynn Lake.
- Truck transport companies would see an increase for their business operation.
- Competition would be reduced and prices might rise for the Lynn Lake community.

Area communities such as Flin Flon, Cranberry Portage, The Pas, and even Thompson would be impacted to some degree:

- Postal service/air service between Thompson and Pukatawagan would be likely curtailed.
- Medical and social services could access both Flin Flon and The Pas.
- Education needs at the secondary school level would be met in Flin Flon, Cranberry Portage, and The Pas.
- Service industries in Flin Flon/Cranberry Portage and The Pas could compete for Pukatawagan customers.
- Pukatawagan and Sherridon would both have easier and safer access.

Traditional land use for First Nations people could be made easier with an All-Weather Road, but increased pressure on area wildlife and fisheries could make living off the land less viable. An All-Weather Road would mean easier access to the area and the communities, hence more outsider contact and more change to the traditional lifestyle.

Within the health services sector:

- Norman Regional Health Authority would see significant All-Weather Road costs savings related to reduced travel costs for Medivac and referred patients (and escorts). The region might also achieve some staff effectiveness gains for medical and medical support trips to Pukatawagan.

Within the education and social service sectors:

- Teachers and students will benefit from greater travel opportunities and lower costs.
- Social services staff and clients will also benefit from more frequent contacts and lower costs.

9.2 Major Beneficiaries

The construction of an All-Weather Road from P.T.H. 10 to Pukatawagan would provide the following order of magnitude benefits (20-year present value) to:

	With Continued Rail Service		**Without Rail Service - No Tolko (Tolko*)**	
First Nations/Federal Government	$16 M	90%	$25 M	90% (33%*)
Government of Manitoba/Forest Industry	$1 M	5%	$2 M ($49 M*)	7% (65%*)
Utilities/Lodges	$1 M	5%	$1 M	3% (2%*)
Total Benefit/20-Year Value	**$18 M**	**100%**	**$28 ($75 M*)**	**100%**

* Assumes that logging operation continues in the area if log transport costs were to double or triple.

There are no readily definable benefits to HBMS and other mining interests. Within the transport industry, there are no overall benefits, but there may be net winners (trucking) and net losers (air and rail).

9.3 Other Stakeholders

Within the study area, there are many individuals whose interests and circumstances would lead them to strongly support and maybe oppose an All-Weather Road. These include local merchants, educators, health care providers, social service works, administrators, police, trappers/fishermen, loggers, construction workers, homemakers, community elders, and community leaders. However, in general, there did appear to be a strong appreciation of the need for improved access.

Support for an All-Weather Road tends to have an economic or social bias, but with some recognition of environmental concerns. Opposition to an All-Weather Road tends to be environmentally or socially based, but there are groups whose economic livelihood could be negatively impacted in either case.

It will therefore be very important to seek out a very broad range of potential stakeholders. Our intention here is to identify generic categories of stakeholders rather than single out specific organizations. In this vein, it would be important to include:

- Community members, elders, and young people (band members and non-treaty).
- Health system workers.
- Teachers and parents.
- Law enforcement and Justice.

- Social workers.
- Service industry owners/workers.
- Hunters/trappers/loggers/wild rice harvesters.
- Tourist operators/workers/guides.
- Community stores/chain stores.
- Contractors/workers.
- Transport companies/truckers/pilots/airport staff.
- Environmentalists/social action groups.
- Heritage preservationists.
- Governmental regulators.
- Utility companies/employees.
- Forest industries/workers.
- Mine operation and exploration companies/employees.

10.0 COMMUNITY INTERESTS AND CONCERNS

10.1 Community Consultation

Community support within Pukatawagan for and interest in the construction of an All-Weather Road is an important/central component of this justification and scoping study.

This is one of the geographic areas of the province not serviced by a system of All-Weather Roads. The absence of roads has imposed costs on individuals, communities and governments in terms of high freight and transportation costs and created other hardships related to a system that is dependent on the weather. The growing size of this community has also made the long-term future of the current system somewhat problematic. Given this, the community position on the road has been rather emphatically in favour. Roads bring fundamental changes. The community and its broader environment become a different place with the advent of a road. Further, roads bring with them the potential for enhanced resource developments. And until recently, First Nation communities have borne the environmental and social costs associated with resource developments but have not participated in the benefits.

To identify the community position, this study process included an initial meeting with Chief Shirley Castel and subsequently a project steering committee meeting in Flin Flon, where Chief Castel, three members of council, and the elders participated in discussion in order to provide information on the study, comment on the study process, and to identify community issues and concerns. The enclosed minutes of this January 15, 2001 meeting at the end of Section 10.0 reflects on those discussions. – **See Minutes**

Winter Road/Railway Current Transport System Issues

The comments about the existing winter road/railway transportation system were generally unfavourable. This community loses its non-rail road transportation system at break-up until after freeze-up for seven to nine months each year. In addition to the costs this imposes on the community, the lack of transportation in the late fall months interferes with the commercial fishing industry.

The winter road season is short and unreliable making it difficult to plan major projects. The current railway system service is a high cost, slow, and unpredictable. Consequently, the cost of food and other commercial goods is high, partially due to the fact that stores have to finance and inventory the purchase of their non-perishable items that come in on the winter road. Failure to bring goods in on the winter roads results in extremely high air freight costs. Either way, community members are faced with costs so high that they impact their quality of life. It was noted that the winter road system also imposes inter-community isolation. Travel to other communities, for most of the year, requires either chartering a plane or relying on unpredictable railway schedules. This air travel is prohibitively expensive and has limited the contact

with other communities. The cost of air fare and slowness of rail service also means that visiting children who are away at school and/or other band members living outside of the community is not easily achieved.

A generalized summary of community comments is presented below:

- Winter road season is short and unpredictable (unavailable in some years).
- Rough winter road surface is hard on vehicles
- Rail freight is slow/expensive.
- Very long travel time for rail passengers.
- Air freight and passenger fares are expensive
- Cost of air freight for perishable food items is very expensive
- Health care required outside of community very expensive.

Issues and Concerns – All-Weather Road

There are no specific major concerns about an All-Weather Road, however, land use issues, potential social impacts, and impacts on environment were identified as possible concerns.

Land Use Issues

- Lack of control over natural resource development
- Loss of traditional lands
- Increased hunting and fishing pressure
- Impacts to traplines
- Social Impact Issues
- Major change to lifestyle
- Concern about drugs and alcohol becoming more accessible.
- Concern about gang development and undesirable elements
- Environmental Impacts
- Water quality and wildlife

Benefits – All-Weather Road

The benefits of an All-Weather Road mirrored the comments about the negative aspects of the current transportation system. Specific benefits noted, included the following:

- Reduced cost of living
- Improved diet and better health
- Reduced cost of construction for housing and community infrastructure
- Reduced isolation

- Economic development opportunities
- Reduced cost of transportation
- Opportunities to visit children who are away at school
- Opportunities to visit hospital patients
- Reduced travel times

Natural Resource Development

Community perspectives on natural resource development are significant because the most important economic spin-off benefits of the road derive from the natural resource sector, particularly forestry, and mining.

A generalized overview of community opinion is one of:

- Support for natural resource development
- Support is conditional on participation and local controls over development
- Substantial planning and consultation is required to give communities reassurances they need about any one project

General Support

The study team concluded from the Steering Committee community meeting in Flin Flon that there was general support for the road. This general support is characterized as follows:

- Strong support that is somewhat qualified.
- Assurances are needed respecting control over local resources.
- Participation in highway construction and maintenance is important.
- Emphasis on maximizing community benefits.
- Need for in-depth community consultation on specific issues.
- Concern that an All-Weather Road built to provincial highways standards would be too costly and that the project priority would be low.
- Desire to explore all alternatives for reducing road access cost (e.g., single-lane bridges/substandard curvature and grades/seasonal closures/etc.).
- Reluctant consideration of improved rail service (e.g., rail buses/etc.) that did not involve rail line reconstruction.

MINUTES OF MEETING

PUKATAWAGAN ALL-WEATHER JUSTIFICATION STUDY
MINUTES OF JANUARY 15, 2001 STEERING COMMITTEE MEETING
FLIN FLON, MANITOBA

Attendees

Steering Committee Members		**Guests**	
Don Norquay -	Manitoba Transportation and Government Services	Gerard Jennissen, MLA -	Flin Flon Constituency
Amar Chadha -	Manitoba Transportation and Government Services	Rod Murphy -	Transportation and Government Services Minister's Office
Brett Wareham -	Manitoba Transportation and Government Services	Gabe Bighetty Elder -	Mathias Colomb C.N.
Reg Hiebert -	Flin Flon - Chamber of Commerce	Hyacinth Colph, Elder -	Mathias Colomb C.N.
Chief Shirley Castel-	Mathias Colomb C.N.	Emile Sinclair, Elder -	Mathias Colomb C.N.
Bill Henderson -	Tolko	Ernie I. Hunt -	Capital Works - Mathias Colomb C.N.
Bob Kimball -	INAC	Frank Dumas, Councillor -	Mathias Colomb C.N.
Larry Buhr -	Dillon Consulting Limited	Hanson Dumas, Councillor -	Mathias Colomb C.N.
Harold Westdal -	Westdal & Associates	Gordon Mitchell -	Chair of Norman Health Regional Authority
		Susan Crockett -	Norman Health Regional Authority

Meeting Process

- Introduction by Don Norquay/Amar Chadha - Manitoba Transportation and Government Services.

- Welcome/Prayers by Chief Shirley Castel/Mathias Colomb C.N.

- Presentation by Larry Buhr/Harold Westdal on Project Status:
  - Terms of Reference
  - Study Area and Existing Transportation system
  - Population
  - Passenger and Freight Traffic
  - Freight Rates
  - Hudson Bay Railway Revenue/Costs
  - All-Weather Road Costings
  - Economic Spin-offs (Forestry/Mining/Fisheries/Tourism/etc.)
  - Further Step

Discussions

- Community Issues:
  - Population 2718 (total = on and off-reserve). Study used 1700 on-reserve. (Additional Mathias Colomb ~100 @ Sherridon/150 @ Sandy Bay/120 @ Granville Lake.) (Marcel Colomb has population of 257 @ Hughes Lake near Lynn Lake.)
  - Study area should encompass Treaty Lands Entitlement proposals, also Granville Lake.

- Passenger Rail Service:

  - Rail service from a passenger standpoint is entirely unsatisfactory:

  - Chief Shirley Castel noted community was concerned about the safety of the rail passenger service. Safety is an issue due to:
    - Over crowded trains/standing room only.
    - Reduced maintenance.
    - No snow clearing.
    - No lighting at the Pukatawagan stop.
    - No station building/band operates heated shelter at own cost.
    - No water/heating system failures.

  - Community view is that travel is unsafe (people thrown out of train, several deaths are currently the subject of law suits), but expensive @ $45/one-way trip/service poor.

  - Elders noted that lack of track maintenance causes an uneven ride - which has thrown passengers around in the cars. Frequent derailments and reportedly in one instance, a bridge washout that went undetected/fortunately train stopped in time (engine got across, one car did not).

  - Travel is slow/unreliable (eight to twelve hours travel time - arrival in Pukatawagan after midnight with no station or safe house/no lighting). The lack of a proper station at Pukatawagan results in passengers walking around and in front of both passenger and freight trains when they are both in the Pukatawagan stop. (Arrival in The Pas also unpredictable, late pick-up in Pukatawagan and slow travel can mean 16 hours plus.)

- Rail Service for Freight

  - Freight is expensive, particularly for large items (e.g., cars/trucks needing major repairs or appliances/etc.). One vehicle sent out for maintenance can have a round trip cost in the range of $1,000; a trailer (one-way) can cost $2,500.

  - Full box car costs are often applied to partial loads.

  - Gravel is not available locally (train haul or local crushing are both very expensive and limit local construction programs).

  - Shipment of wild rice and fish $400/box car or $95 per 60 lb. bag.

  - Mail service by Calm Air out of Thompson is slow. Typically two weeks for mail to reach community; cannot be used for obtaining emergency small electric/mechanical parts for motors, etc./must be brought in by special charter.

- Air Service Safety/Reliability Issues

  - There are times when planes cannot get into the community. In the event of a medical emergency, the lack of an All-Weather Road puts community members in jeopardy. Railroad service too slow to be considered as an alternative.

  - Air freight - too expensive.

  - Air passenger service - too expensive.

General Support for All-Weather Road

Chief Shirley Castel, councillors, and elders all stated that they supported All-Weather Road development. Chief Castel stated Aour people would chose an All-Weather Road development over the train irrespective of the condition of the road.@ The community members also stated that they did not want to see the rail service removed, but that they saw All-Weather Road service as essential. Pukatawagan deserves comparable service to Sherridon and Sandy Bay communities. Considerable concern expressed by Mathias Colomb council and elders about potentially high cost of road construction (e.g., $80 M+). They believe it should be possible to build it at a lot lower cost even if conventional standards have to be sacrificed. Should also consider All-Weather Road to south end of Pukatawagan Lake with ferry to community.

Tolko agreed to provide a most recently approved plan of forest roads to permit study team assessment of resource road system expansion.

Economic Development

While railroad does currently service mining and forestry, elders and councillors noted that an All-Weather Road was essential for economic development. One of the elders related his experience with wild rice, which he regarded an important opportunity that could be developed and expanded with an All-Weather Road. Other opportunities related to the commercial fishing industry, expanded forestry, and a community sawmill; all would be more viable with an All-Weather Road. Tourism would also benefit from an All-Weather Road.

Mathias Colomb First Nations concerned about recent designation of possible future parks (Russell Lake area) without local consultation.

Tolko concerned that 20 percent of productive forests may be eliminated from future production by this park designation.

Winter Road Issues

Community members note that use of the winter road was affected by the Sask-Power operation of the Island Falls generating station in Saskatchewan. Large releases of water from that station during January to March create slush conditions on the lake and can cause the winter road crossing to become unusable, even if general weather conditions are suitable for winter road operation.

Vehicle maintenance (vehicle life of approximately two years) and insurance costs are also of concern.

Presentation by Norman Regional Health Authority (Gordon Mitchell/Susan Crockett)

Sue Crockett made a presentation on behalf of the Norman Regional Health Authority. She noted:

- There are master plans being developed for Pukatawagan to receive services from the Norman Regional Health Authority. The objective is to provide 365 days/year service in areas of emergency/acute/general case.

- An All-Weather Road would provide health benefits to Pukatawagan. These would result from better access to facilities, better access to staff expertise, and lower food costs which would improve nutrition.

- Crockett noted that Norman is one of the least healthy districts in Manitoba. Thirty percent of the $42 million budget is spent on dealing with Type II diabetes and complications. She estimated that at current rates of increase that in fifteen years their entire budget and hospital capacities would be consumed with this problem (Type II diabetes is strongly correlated to poor diet and is largely preventable).

- Northern patient transport consumes in excess of $2.2 M/year (not including medical team travel to communities and off-reserve temporary housing for patients).

Discussion arose as to the impact of an All-Weather Road on this medical problem and if such a road would reduce the incidence of this disease and reduce health care costs.

Sue Crockett offered to share health statistics with the Pukatawagan study team.

Chief Shirley Castel noted that treating a resident of Pukatawagan at an outside facility can cost in the order of $10,000 per stay.

Comments by MLA Gerard Jennisen - Transportation and Government Services

- He has been a long-time supporter of an All-Weather Road to Pukatawagan.
- Need to focus on creative solutions to reduce costs and maximize benefits.

Comments by Department of Transportation and Government Services (ADM Don Norquay, Amar Chadha, and Rod Murphy)

- Highways standards cannot be readily compromised; careful consideration of safety management required.
- Existing Sherridon Road does not meet Highways standards; its safe operating speed is probably less than 60 kph. Area residents are probably used to it and have few accidents, the risk is greater for strangers.
- All-Weather Road into Pukatawagan has a relatively lower priority in Manitoba government funding, given that other communities with larger populations having to rely entirely on winter road and air for access.
- Considerable federal government funding would be required to achieve an All-Weather Road.
- Loss of railroad service if it happens might increase relative priority of All-Weather Road.
- Upgrade of railway service is very expensive and hence unlikely.

Next Steps

Dillon indicated tentative agenda:

- Minutes of January 15, 2001 meeting by January 26, 2001.
- Examination/discussion of lower standard/low construction cost All-Weather Road, alternative forms of transportation and alternative delivery program.
- Review of health care costs for various northern communities with and without All-Weather Road.
- Draft report to Steering Committee (amended to March 15, 2001).
- Comments from Steering Committee (amended to March 31, 2001).
- Final report by early April.

Please provide comments/corrections to L. A. Buhr by February 8, 2001.

Circulation by fax to:

- Steering Committee Members
- Norman Regional Health Authority

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11.0 IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL CONCERNS

An All-Weather Road from P.T.H. 10 to Pukatawagan could potentially have significant impacts on the environment and the social fabric. It is therefore important at this stage to identify the general categories of impacts that would accompany the implementation of such a project.

In identifying the potential impacts of an All-Weather Road, we have assumed that all the processes (including community consultation) essential to achieving a successful All-Weather Road implementation will be carried out, most probably in the following sequence:

- Land Use Planning
- Route Selection
- Environmental Impact Assessments*
- Preliminary and Functional Design
- Right-of-Way Acquisition
- Final Design
- Environmental Approvals*
- Tendering/Employment Strategies
- Construction (staged to minimize impacts)
- MitigationOperation and Maintenance

* including the appropriate Federal Process.

11.1 Physical and Habitat Impacts

a) Preconstruction and Construction

Table 11.1 illustrates the relative scale of potential impact and potential mitigation actions that will have to be dealt with when building an All-Weather Road. These will apply regardless of the actual physical alignment of the roadway corridor Not surprisingly, the biggest concerns and most difficult to mitigate relate to right-of-way clearing, stream crossings, drainage, borrow pits, access roads, and embankments.

Table 11.1: Physical and Habitat Impacts

Activity	Impacts and Mitigation
Preconstruction	
• Surveys/Geotechnical	Planning/Controls
Construction	
• Right-of-Way Clearing/Stream Crossings	Streambed and Vegetation Protection
• Drainage/Borrow Pits	Erosion Controls
• Access Roads/Embankments	Licencing and Vegetation Protection
• Camp Sites/Fuel Handling	Surface Treatment
• Noise/Dust/Chemicals	Management Practices
• Wildlife Conflicts	Fencing
Road Location	
• Endangered Species/Migration	Avoidance/Mitigation
• Community/Public Safety	Avoidance/Mitigation
• Lakes and Streams	Design Strategies
• Traplines/Wild Rice	Design Strategies
• Heritage Resources	Avoidance
• Tourism/Lodges	Avoidance/Compensation
• Protected Areas/Preserves	Avoidance/Land Use Control
• Traditional Land Use	Licencing/Land Use Control

b) Route Location

Table 11.1 also shows the type of issues that will need attention in determining the most appropriate route for an All-Weather Road. The biggest concerns, and most difficult to mitigate, deal with endangered species habitat, migration routes, community proximity, public safety, protected areas, and natural resource reserves.

Particular concerns that will influence route location on an All-Weather Road to Pukatawagan include:

- Forest Management Issues/Firefighting
- Numerous Stream Crossings
- Various Lodges/Outfitter Camps
- Registered Traplines/Commercial Fishing Lakes
- Traditional Hunting Grounds
- Heritage/Archaeological Concerns
- Community Proximity at Sherridon (traffic through community)
- Potential Mining Finds
- Churchill River Crossings
- Kississing River Crossing
- Kennedy Creek Crossings

11.2 Consequential Physical/Habitat/Socioeconomic Impacts

a) Resulting Resource Development

Table 11.2 illustrates the type of consequences that would result from the presence of an All-Weather Road. Greater mobility will create new opportunities for resource development, resource exploitation, forest fire fighting, new settlements, and tourism. Some of these results will be net benefits while others may be negative.

Table 11.2: Physical/Habitat/Socioeconomic Impacts

Activity	Impacts and Mitigation
Resulting Resource Development	
• Access to Hunting/Fishing	Licencing/Control
• Tourism/Lodges	Licencing/Control
• Exploration/Mining	Resource Management/EIA
• Forestry/Fire Fighting	Resource Management/EIA
• New Reserve Settlements	Land Use Planning/EIA
• Unauthorized Roads	Licencing/Policy
• New Business	Licencing/Policy
• Off-Reserve Settlements	Land Use and Social Planning
Service Consequences	
• Higher Air Costs/Reduced Service	Alternative Transport
• Reduced Rail Service	Alternative Transport
Employment Opportunities	
• All-Weather Road Construction/Maintenance	Agreements/Training Programs
• Forestry/Mining/Fishing	Agreements/Training Programs
• Tourism/Service Industries	Agreements/Training Programs
Socioeconomic Values	
• Wilderness/Lifestyle/Traditional Values	Route Location/Land Use Control
• Resource Management	Multi-Stakeholder Council
• Financial Partnerships	Agreements/Training
• Local Medical/Justice/Schools	Regional Planning/Training
• Population Growth	Social/Community Planning

b) Service Consequences

Table 11.2 also shows some of the downside issues of an All-Weather Road. It is highly likely railway service will decline and possibly disappear. Air service will be reduced/costs will rise, and it will be more difficult to justify an airstrip upgrade.

c) Employment Opportunities

The All-Weather Road construction and maintenance will produce new job and job training opportunities. An All-Weather Road will drastically increase road transport and create some service industry employment.

It is possible that some of the regional service centre functions in the health/education fields and could be relocated to Pukatawagan from The Pas or Flin Flon.

Resource development is likely to be the largest job creator. This is more likely in the forestry sector than the mining sector. Increased fisheries and wild rice operations are also possible.

Tourism could, with an appropriate regional plan, create new jobs in specific areas. Growth of some existing lodge operations would have a similar effect.

d) Socioeconomic Values

Throughout the region and in each of the communities, an All-Weather Road, while it has the potential for new economic opportunities and a more affordable/better standard of living, will also result in losses. These will likely be most significant in the areas of Wilderness Setting, Traditional Lifestyles, and Traditional Values (Table 11.2). Considerable planning and effort will be required to minimize these losses.

Local participation in Resource Management, Financial Partnership Ventures, Community Health/ Education/Justice will be important if an All-Weather Road is going to benefit the Pukatawagan community. Longer range population growth will put great pressure on existing resources with or without an All-Weather Road. Planning strategies may need to be developed to deal with either scenario.

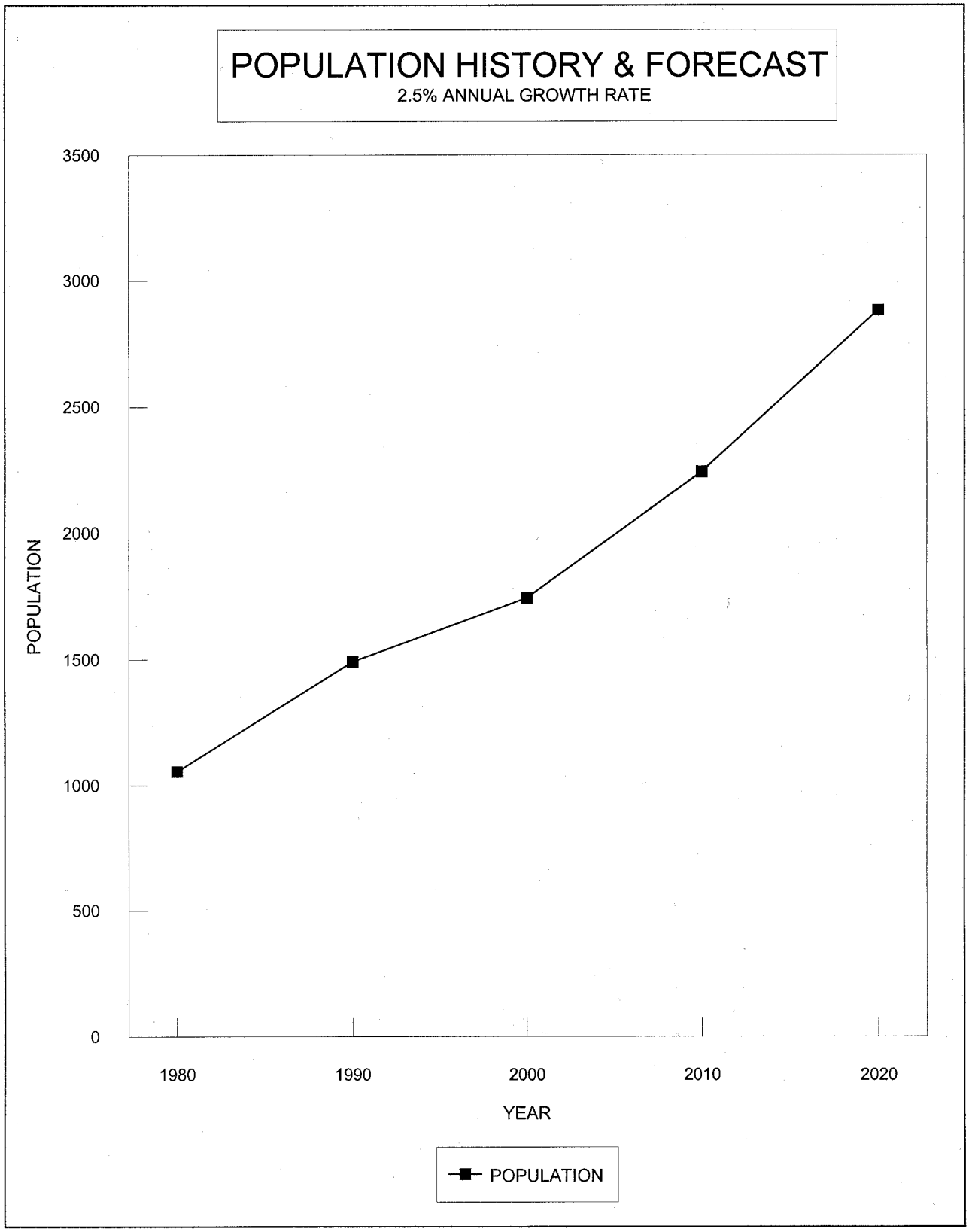
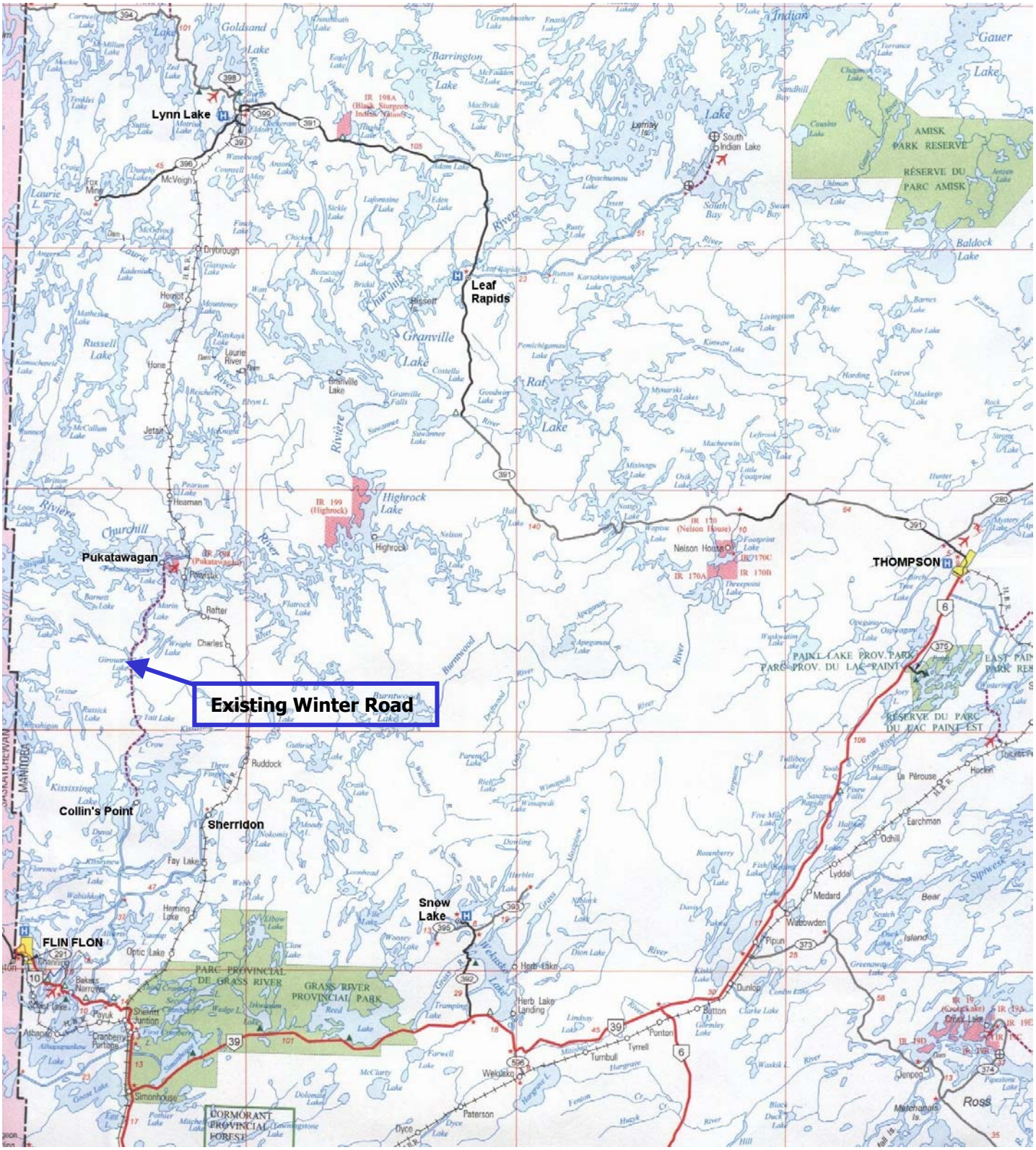

POPULATION HISTORY & FORECAST
2.5% ANNUAL GROWTH RATE
3500
3000
2500
2000
1500
1000
500
0
POPULATION
1980
1990
2000
2010
2020
YEAR
POPULATION

Figure 2.1



Pukatawagan All-Weather Road Study

Study Area

DILLON CONSULTING

Figure 3.1

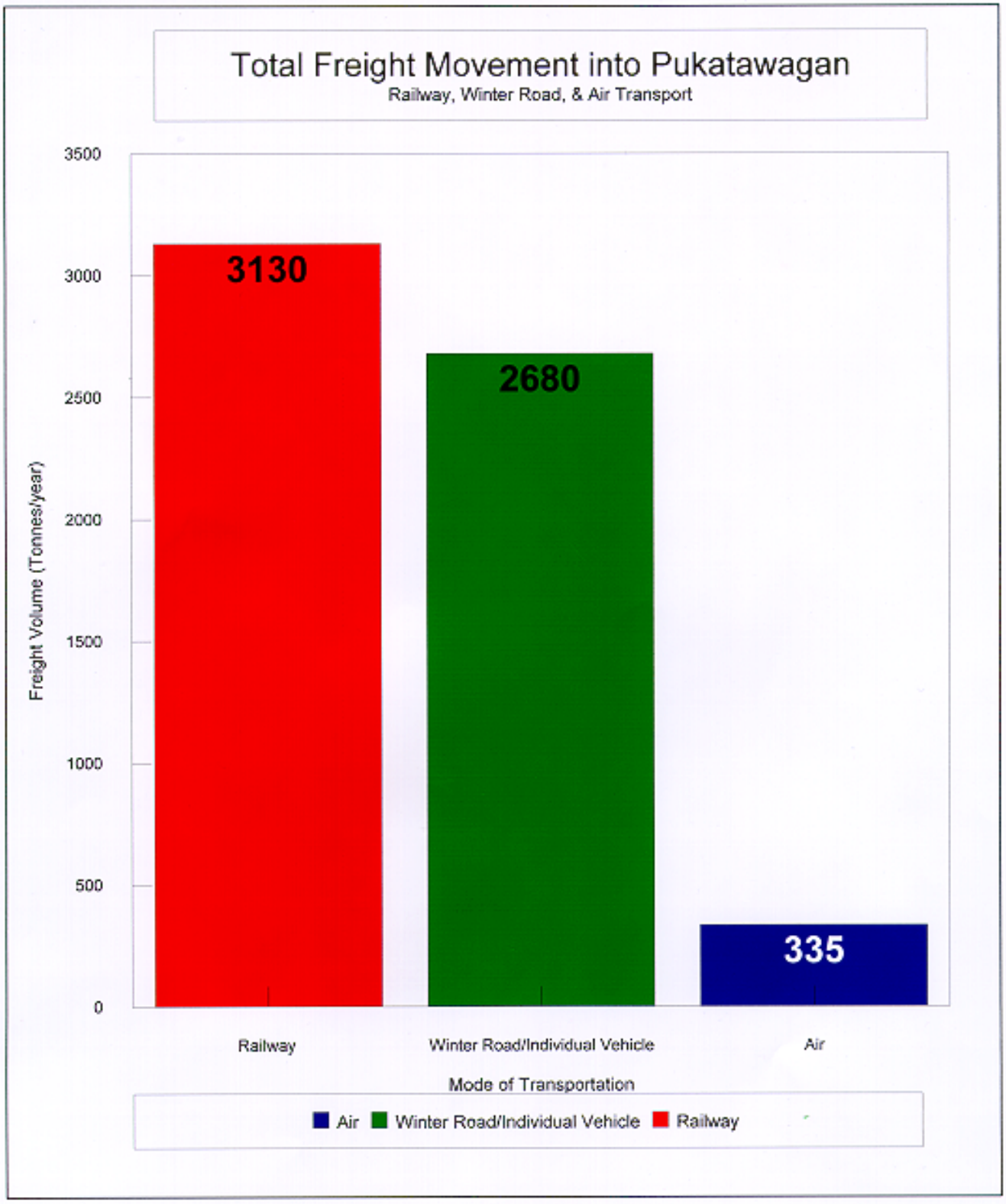

Total Freight Movement into Pukatawagan
Railway, Winter Road, & Air Transport
Freight Volume (Tonnes/year)
3500
3000
2500
2000
1500
1000
500
0
3130
2680
335
Railway
Winter Road/Individual Vehicle
Air
Mode of Transportation
Air
Winter Road/Individual Vehicle
Railway

Figure 3.3

General Geology and Metallogeny of Manitoba

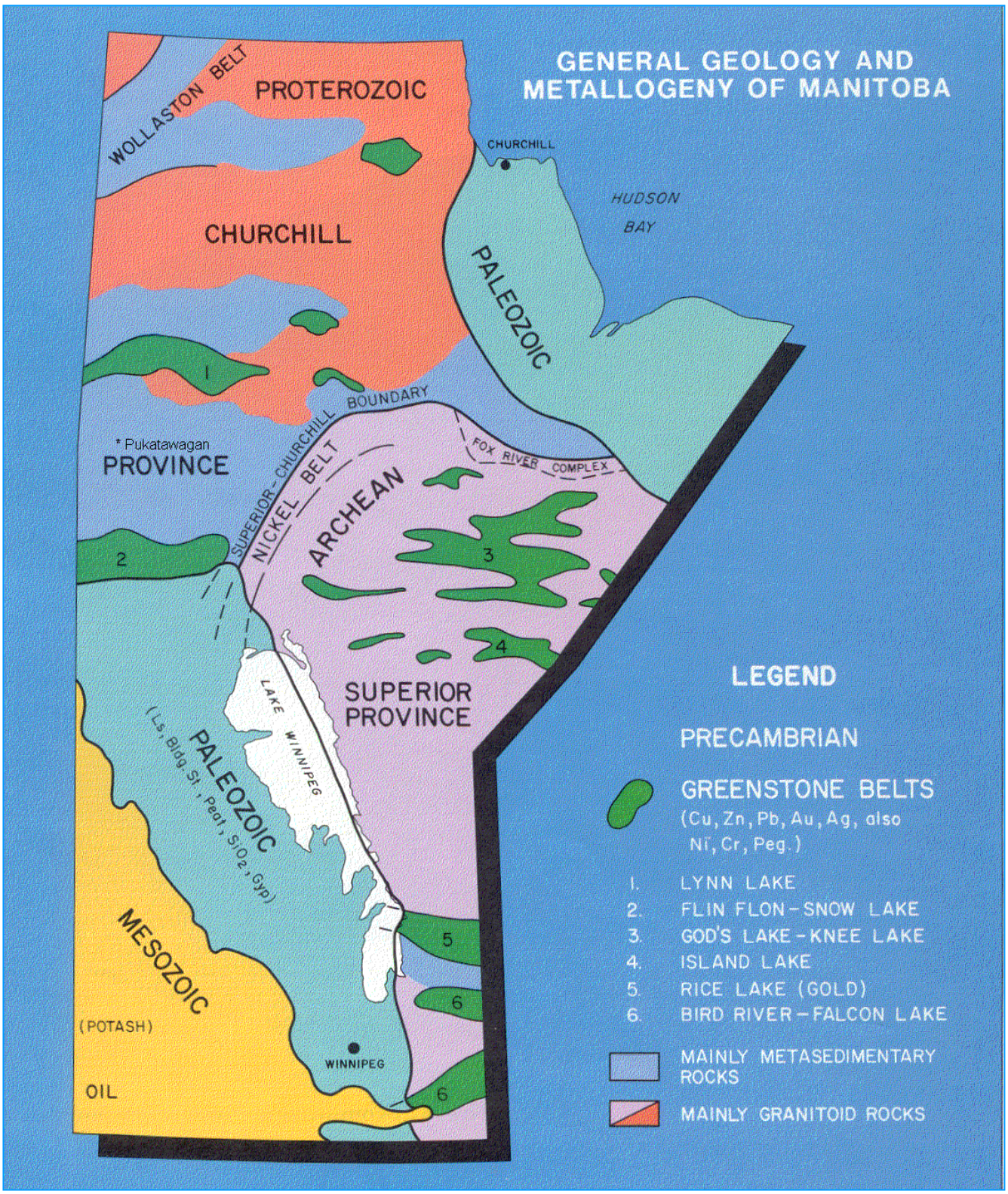


Figure 6.1

Highrock Forest Section

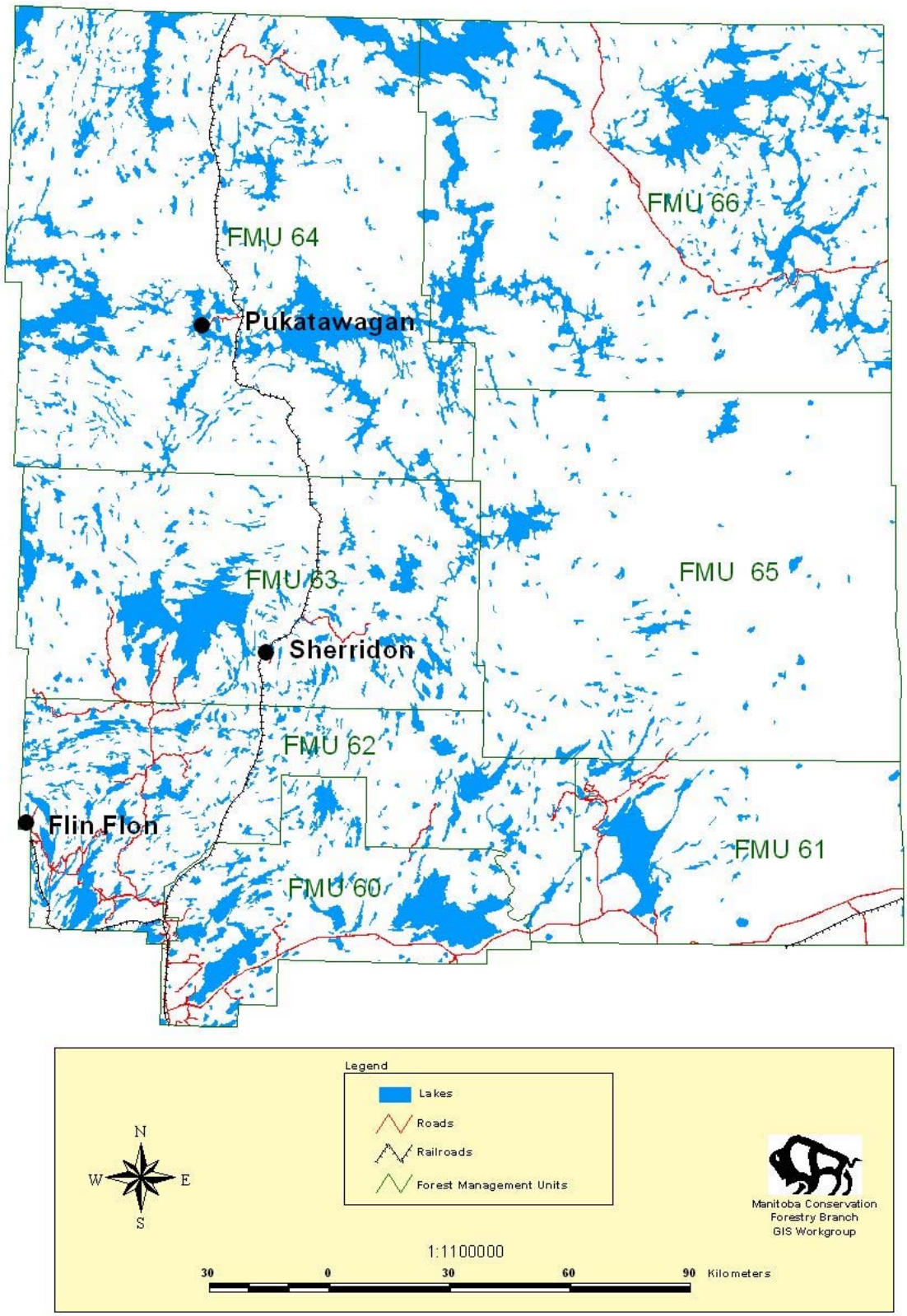


Figure 6.2

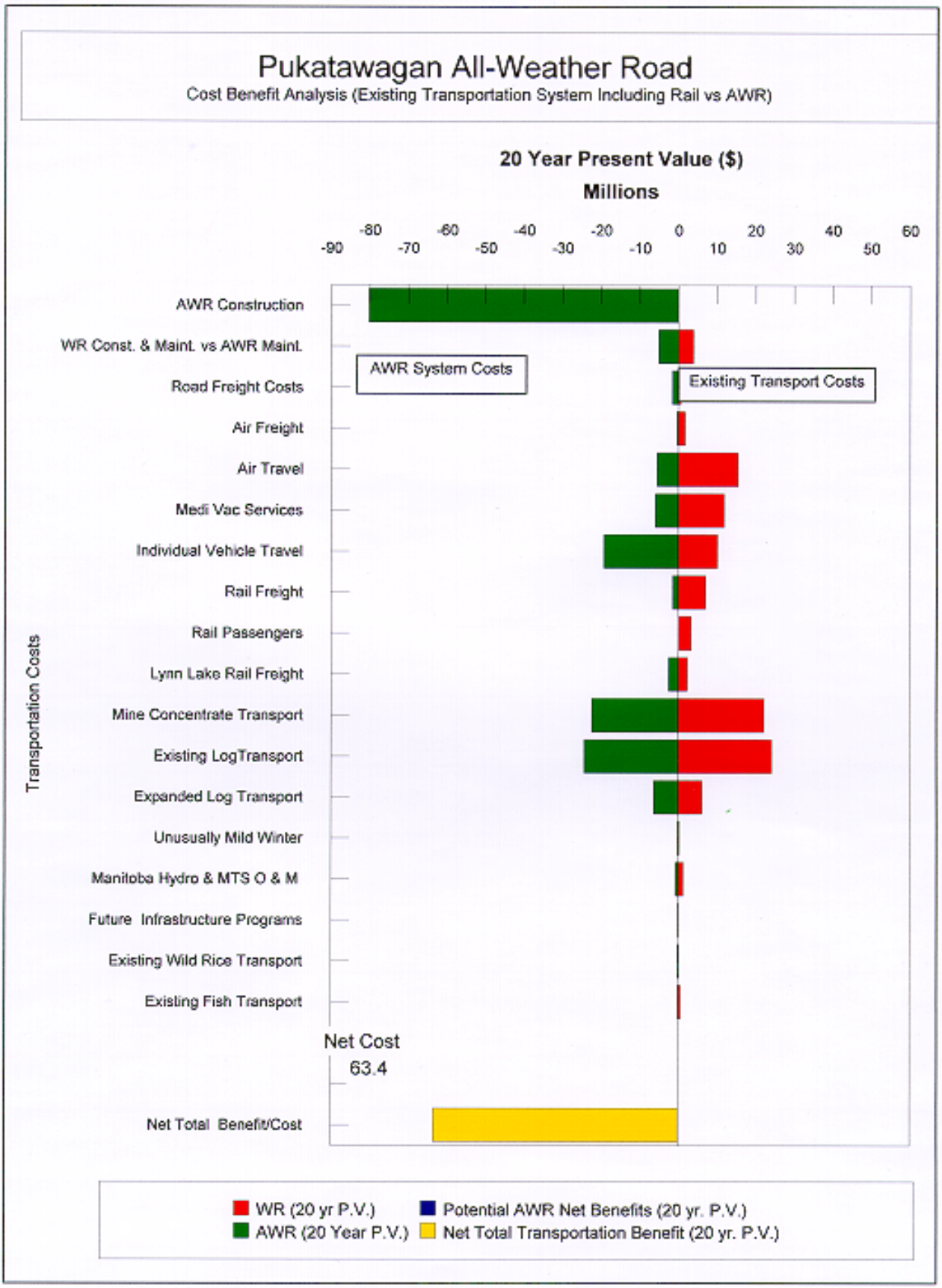

Pukatawagan All-Weather Road
Cost Benefit Analysis (Existing Transportation System Including Rail vs AWR)
20 Year Present Value ($)
Millions
-90
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
AWR System Costs
Existing Transport Costs
Transportation Costs
AWR Construction
WR Const. & Maint. vs AWR Maint.
Road Freight Costs
Air Freight
Air Travel
Medi Vac Services
Individual Vehicle Travel
Rail Freight
Rail Passengers
Lynn Lake Rail Freight
Mine Concentrate Transport
Existing LogTransport
Expanded Log Transport
Unusually Mild Winter
Manitoba Hydro & MTS O & M
Future Infrastructure Programs
Existing Wild Rice Transport
Existing Fish Transport
Net Cost
63.4
Net Total Benefit/Cost
WR (20 yr P.V.)
AWR (20 Year P.V.)
Potential AWR Net Benefits (20 yr. P.V.)
Net Total Transportation Benefit (20 yr. P.V.)

Figure 7.1

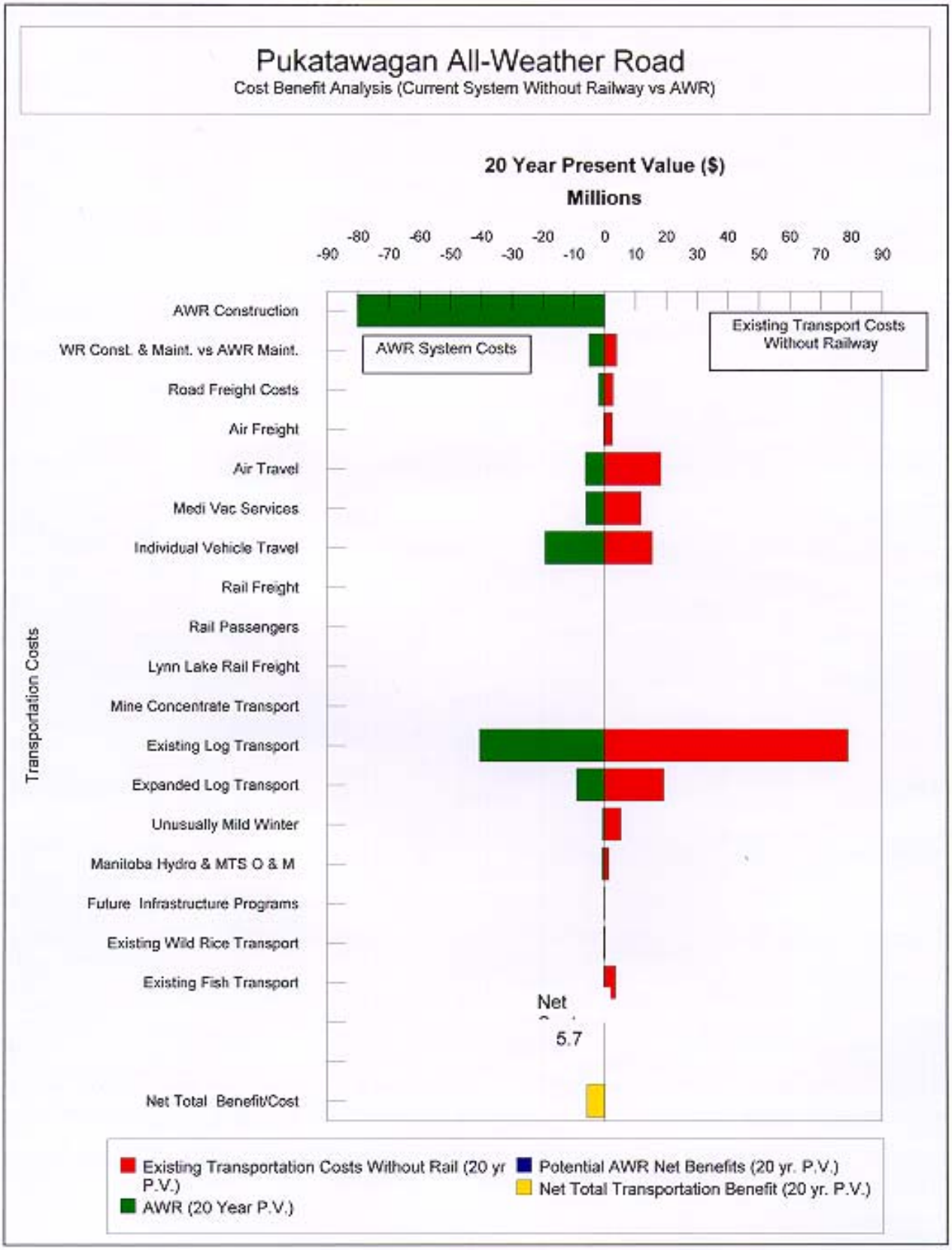

Pukatawagan All-Weather Road
Cost Benefit Analysis (Current System Without Railway vs AWR)
20 Year Present Value ($)
Millions
-90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90
AWR Construction
WR Const. & Maint. vs AWR Maint.
Road Freight Costs
Air Freight
Air Travel
Medi Vac Services
Individual Vehicle Travel
Rail Freight
Rail Passengers
Lynn Lake Rail Freight
Mine Concentrate Transport
Existing Log Transport
Expanded Log Transport
Unusually Mild Winter
Manitoba Hydro & MTS O & M
Future Infrastructure Programs
Existing Wild Rice Transport
Existing Fish Transport
Net
5.7
Net Total Benefit/Cost
Transportation Costs
AWR System Costs
Existing Transport Costs Without Railway
Existing Transportation Costs Without Rail (20 yr P.V.)
AWR (20 Year P.V.)
Potential AWR Net Benefits (20 yr. P.V.)
Net Total Transportation Benefit (20 yr. P.V.)

Figure 7.2

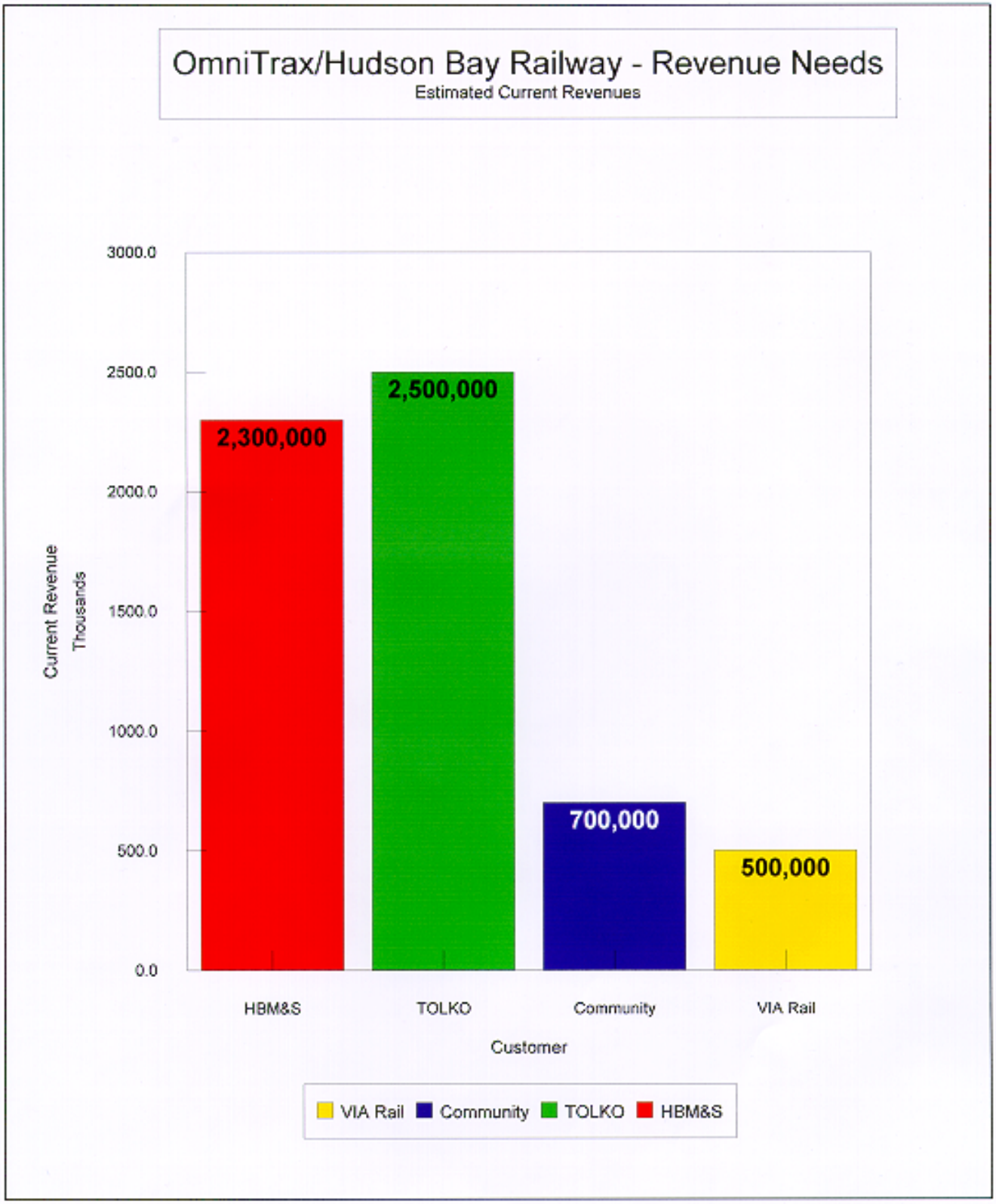

OmniTrax/Hudson Bay Railway - Revenue Needs
Estimated Current Revenues
3000.0
2500.0
2000.0
1500.0
1000.0
500.0
0.0
Current Revenue
Thousands
2,300,000
2,500,000
700,000
500,000
HBM&S
TOLKO
Community
VIA Rail
Customer
VIA Rail
Community
TOLKO
HBM&S

Figure 8.1