4.0 FUTURE SYSTEM FORECASTS AND COSTS

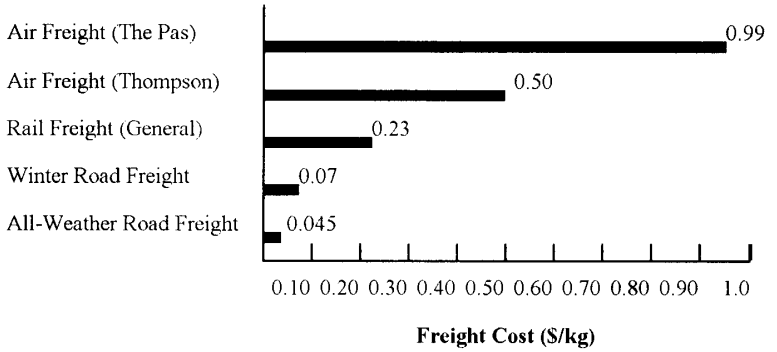
The future traffic and freight volumes into the Pukatawagan area are directly related to the annual population growth rate of 2.5 percent in the community. The population of Pukatawagan is expected to double within the next thirty years. The demand for freight and passenger services is expected to increase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