

THE NUNAVUT TRANSPORTATION SYSTEM — EVOLVING FOR NUNAVUMMIUT AND THEIR ECONOMY



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Abstract

This paper discusses the factors influencing the provision and improvement of transportation in Canada's newest and largest territory. It details specific modal and unique Nunavut factors that will affect how and when the transportation system evolves. Many of these factors were documented as part of the Nunavut Transportation Strategy, which was completed in 2001.

Improvements to the Nunavut transportation system will allow Nunavummiut (residents of Nunavut) to build a healthy and prosperous society and play their part in the day-to-day social and economic life of Canada. The proposed improvements to the Nunavut transportation system will also enable many more Canadians to see and realize the potential of this vast land and its people. These improvements will also bring some demonstrable proof of Canada's sovereignty and interest in Canada's north.

1.0 INTRODUCTION

Nunavut is a beautiful and largely unspoiled land. The benefits of a negotiated land claim settlement and a new political system have poised this culturally and naturally rich territory ready to build a healthy and prosperous society.

The establishment of Nunavut as the newest member of the Canadian Confederation has created new possibilities and new expectations —both for Nunavummiut and for all Canadians. Nunavummiut are anxious to play their part in the day-to-day social and economic life of Canada. Entry into the Canadian socio-economic mainstream will require the transportation system to evolve and overcome many and varying factors, which currently limit this system's efficiency and effectiveness.

2.0 BACKGROUND

On April 1, 1999, Nunavut became Canada's newest and largest territory. Covering about 1.9 million square kilometres of land and water it is home to about 27,000 people located in 28 scattered communities* (See Figure 1).

This landmass for comparison purposes is roughly one-fifth the landmass of Canada or approximately four times the size of Sweden. The population of Nunavut when profiled in terms of people per square kilometre shows as 0.01 person compared to an Ontario figure of 11.0 and 220.0 person per square kilometre in Germany.

Nunavut's geographic reach can be demonstrated in terms of community locations that range from approximately 57 degrees latitude North for Sanikiluaq to 77 degrees latitude North for Grise Fiord. More communities in Nunavut are above the Arctic Circle than below it.

Iqaluit the territorial capital is the largest community in Nunavut. It's more than 6200 residents live approximately 2,000 kilometres north of Ottawa. The average high temperature in February is -22 C and in July is 12C. Iqaluit experiences as much as 19 hours of daylight per day in June, and as little as 5 hours per day in December.

Grise Fiord is the northernmost community in Nunavut. It has a population of 163 people. The average forecast high in January is -27.2C and in July is 10C. Grise Fiord experiences 24-hour a day daylight for four months of the year, and round the clock darkness for four months of the year.

* Based on 2001 Canadian Census Data

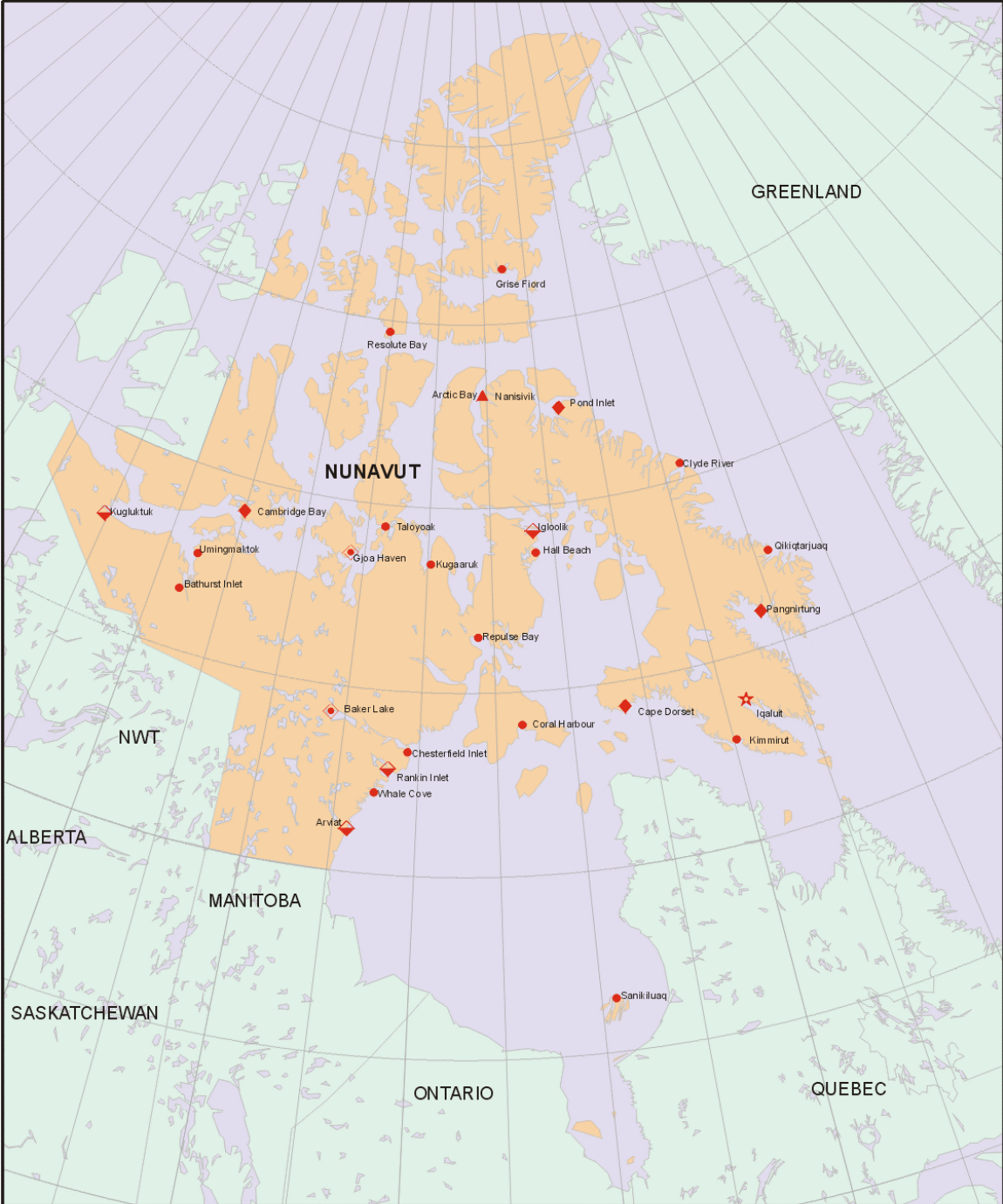


Figure 1: Nunavut

Nunavut is a unique territory and it has inherited both positive and negative economic characteristics from the Northwest Territories. Many typical northern region economic challenges still remain. High unemployment, low secondary school graduation rates, low literacy rates etc. make lead times long for the general population to take advantage of new economic initiatives.

The Nunavut economy is a mix of traditional land based economic activities and a more modern wage based economy. The wage-based economy has slowed recently due to the effects of the Polaris and Nanisivik mine closures. Only one mine, the Lupin gold mine remains in Nunavut although several other gold and diamond mines could develop in the next few years. Other than government related employment, economic activity is concentrated in small business activity, tourism, fishing, food processing and arts and crafts.

Following division from the Northwest Territories, Nunavut did not inherit any significant roads connected to towns or resource developments and became wholly dependent on air and sea transport. The short sea transport season for all Nunavut communities poses a significant challenge. Air transport is an extremely expensive mode of transport to rely on most of the year. This results in the price of 2 litres of milk being almost \$8.00 or three times as much as in a southern community such as Toronto. Exacerbating the inadequacies of the transportation system at time of division was the earlier retreat of the federal government in making any substantive investment in the system.

2.1 Air Transportation

With the exception of two communities, Bathurst Inlet and Umingmaktok, every community in Nunavut is served by a Transport Canada certified or registered airport. There are also several special purpose or private airstrips developed to serve the resource industry or national interests such as Eureka and Alert.

Two of Nunavut's airports, the only two with paved runways are considered gateways into the territory from the south. Iqaluit and Rankin Inlet both have regular Boeing 727 and 737 jet service and act as hubs for the eastern and western regions of Nunavut respectively. They are characterized by a high number of enplaned/deplaned passengers and air transport movements relative to their population.

The remainder of Nunavut's 21 government owned community airports are characterized by gravel airstrips from as short as 595m (1950 feet) in Grise Fiord to 1980m (6500 feet) in Resolute. Typical aircraft serving these airports range from DHC-6 Twin Otters for the shortest to Boeing 727 or 737 for the airstrips over 1525m (5000 feet). The most common aircraft used for design purposes is the ATR-42 and the S340. Both are twin-engine turbo prop aircraft carrying approximately 36-38 passengers or a combination of passengers and freight.

The current scheduled passenger route system in Nunavut is largely a product of the needs of the previous territorial government structure and the historical precedents and market presence of airlines that were created and regulated many years, and several owners, ago. Eight operators currently provide approximately 200 scheduled flights each week. Most of these carriers also provide air cargo services.

2.2 Marine Transportation

All Nunavut communities are located on or have access to tidewater and depend seasonally on the summer open-water access for their well-being, livelihood, regional links and resupply of goods and materials from the south. Marine related activities and services are thus critical to Nunavut residents.

The Eastern Arctic Sealift, Kivalliq Resupply and Western Arctic Resupply are the major shipping operations in Nunavut. Lack of proper dock facilities impacts the efficiency of resupply/sealift and increases the risk of losses in terms of damage to community goods. Similar problems and risks apply to ocean resources harvested by community residents. The lack of berthing facilities for tanker traffic increases the risk of environmental damage through potential oil spills with the use of floating lines and anchored vessels. Where infrastructure exists it can quickly deteriorate despite frequent maintenance and rehabilitation due to permafrost and harsh ice conditions and summer weather.

2.3 Surface Transportation

As previously highlighted, communities in Nunavut are remote, isolated and except for Arctic Bay to Nanisivik have no regional road connections. This makes Nunavut the only provincial/territorial jurisdiction in Canada that does not have roads linking its communities. Ground transportation outside of communities is generally limited to snowmobiles and all-terrain vehicles. Some communities have local access roads, which have been built to provide access to nearby attractions. These attractions may include recreational sites, historical sites, local resources and river portages. A community local access road may also provide access to open water in support of fishing, hunting and tourism opportunities.

The only significant overland commercial travel services at present occur in the Kivalliq region, and in the Slave Geologic Province of the Kitikmeot region. In the Kivalliq, cargo and passenger travel between communities occurs by Bombardier snow machine and other low ground pressure vehicles during the winter. In the Kitikmeot, resupply to mine properties and exploration camps occurs by winter road, connecting to Yellowknife and points further south.

Although there is no actual rail infrastructure in Nunavut, rail service to the Port of Churchill is an important link in the Nunavut supply chain. Up until 2003, the annual resupply of dry cargo to the Kivalliq region was largely accommodated by the Kivalliq

tug/barge resupply operated by the Northern Transportation Company Limited (NTCL). In 2001 approximately 15,000 tonnes of dry cargo were delivered. Most of this cargo was delivered to the Port of Churchill via the Hudson Bay Railway operated by OmniTRAX Inc. In 2003 the Nunavut Sealink and Supply Inc (NNSI) will move a large percentage of this freight out of the Port of Montreal. Montreal based NNSI recently won the contract for delivery of Kivalliq dry cargo from NTCL.

3.0 MODAL FACTORS

3.1 Air Transportation

Unidirectional movement of freight

Air cargo services carry a significant volume of Nunavut's total freight needs. It is characterized by a predominantly north oriented, unidirectional flow. During the winter and spring months it is the only supply link available to territorial people and businesses.

The relatively high cost of airfreight has been a socio-economic and political concern for several years. Given that Nunavummiut are dependent on air cargo exclusively during significant portions of the year and for all their perishable goods year round the state of this supply line is extremely important. The fact that shipments must pay for both the outbound and return leg of the flight, unlike freight shipped in most other areas of the country increases the cost to consumers substantially.

Long, thin supply lines

Although the propensity to travel by air is high in Nunavut, the small population is distributed over 28 communities located at great distances from each other, and from points of supply. This low demand situation is referred to in the aviation industry as a very long, thin market where carriers must transport small numbers of people and low volumes of cargo over long distances. Airline service strategies in long thin markets usually include high airfares and low flight frequencies to achieve financial viability on each route.

Nunavut does not have a conventional demand-supply air transportation market. Most travel is sponsored usually directly or indirectly through government funding of some kind or through industry. The long, thin market precludes much choice of carriers and schedules with the result that most people in Nunavut plan their travel around the availability of air services, rather than the air services attempting to meet the optimum needs of the traveller. Sponsored travel, on available aircraft and schedules in a limited market, does not foster demand responsive behaviour on the part of air carriers. Rather, it may lead to complacency and may constrain any motivation to change

Current statistical information points to an estimated 225,000 persons per year travelling by air in Nunavut. This corresponds to about 4,000 passengers per average week. As approximately 8,000 seats are estimated to be available on the current approximately 200 weekly flights, there is clearly a disproportion of seats available to a market that has little elasticity of discretionary travel.

Obsolescence of current combi-type aircraft

Traditionally the north has been served by older model jet and turboprop aircraft having significant main deck, as well as passenger accommodation capability. In particular, the B-737-200 combi has served both the eastern and western arctic for nearly 30 years. A slightly older aircraft, the B-727 has served the eastern arctic for some 15 years. These aircraft are unlikely to remain in service for the 20 year planning horizon. Few jet aircraft newer than the B-727/B-737 family exist on used aircraft markets today having both main deck cargo and passenger capabilities similar to the aircraft requiring replacement. New regulations being brought forward pertaining to cargo fire containment and suppression are anticipated to threaten the viability and indeed the existence of passenger/cargo combi aircraft in the near future.

Replacement aircraft, necessary for modernization will likely have different technical capabilities, possibly forcing a change in operations concepts for the existing northern carriers in Nunavut. The most likely change will eventually be to provide passenger and cargo services on separate aircraft. This will have a major impact on service frequency to small communities as daily service for either passengers, or cargo might then become uneconomical. In addition most potential replacement jet aircraft types are not certified for gravel operations.

Cost of Entry

The cost of entry to the northern air service market is very high compared to southern markets. Carriers must make a high upfront investment.

Civil Air Regulations

In 1995, Transport Canada introduced the Civil Air Regulations, a major rewrite and re-organization of the regulations affecting aviation. Transport Canada also initiated the CARAC process for seeking stakeholder advice and consultation. Although this approach was initially well received it has been somewhat minimized by recent Transport Canada knee jerk reactions and a general trend to introduce additional regulations without any risk analysis. Two examples of this include Aircraft Emergency Intervention Services (CAR 308) and Gravel Runways and Approach Ban (CAR 602). Meeting these regulations may require the Government of Nunavut to use funding previously earmarked for improving other elements of the transportation system.

Polar Air Routes

Polar flights, unheard of 10 years ago, are becoming routine thanks to longer-range planes and the easing of Cold War tensions. Flying over the globe, instead of around it offers significant savings i.e. on a typical flight between Toronto and Hong Kong an Arctic routing could cut down travel time by about five hours. Prior to large-scale use of Polar routes, over-flown countries such as Russia and Canada will have to make additional investments in civil aviation services especially in the area of voice communications.

Besides the requirement to upgrade civil aviation services, concerns have been registered that current northern airport infrastructure that would be used for alternate landing sites in the event of an emergency and related search and rescue capacity is inadequate. Improving this infrastructure and maintaining emergency response services at all possible alternate sites is well beyond the fiscal capability of the Government of Nunavut.

3.2 Marine Transportation

Port Infrastructure

In many Nunavut communities only the beach or shore is available for offloading community resupply or harvested fish/mammals. A common theme in discussions both with communities and the marine industry that provides service to the Eastern Arctic is the need for port facilities. However, there are substantial problems associated with undertaking such infrastructure development. These relate to:

- Low cargo volumes
- Short season
- Ice Action, and
- Extreme tidal ranges (in some places)

Based on recent design exercises the cost of a simple tug/barge crib docking face with a breakwater is likely to cost \$1-1.5 million to over \$7.0 million for a conventional dock structure.

Icebreaking

Currently Canadian Coast Guard deploys five icebreakers to the Arctic (including one for the Western Arctic) in support to the various Arctic activities. These icebreakers ensure that the annual resupply of petroleum products and dry cargo to Nunavut communities in both the eastern and western Arctic continues in a safe, timely and cost effective manner.

The potential development of several large-scale gold and base-metal projects in the Nunavut portion of the Slave Geological province that will be serviced by marine

transportation using the Coronation Gulf/Bathurst Inlet also reinforces the need to maintain or supplement icebreaking services.

Hydrographic Charting

The Canadian Hydrographic Service estimates that about 20% of its marine navigation charts relate to Arctic waters and only 10% of these actually meet modern standards. Much of the charting in the Arctic is based on reconnaissance or track type surveys using primitive positioning systems. Many of these charts have been found, because of the large grid on which they were conducted, to miss key shallow draft features. Large-scale charts covering community access and anchorage areas are available for only 7 out of 28 Nunavut communities. This is hazardous for direct delivery by tanker to communities such as Hall Beach, Grise Fiord, and Igloolik among others. Old and outdated charting prevents the tankers from lying close to the community, which in turn requires the need to use long (vulnerable) floater hoses to connect to shore manifolds. Besides the reduction in spill risk offered by shorter hose lengths, the ability to have updated charting ultimately reduces the risk of vessel grounding, damage and potential fuel spills. Currently no major hydrographic charting program for Arctic waters is in place. Any new Canadian Hydrographic Services (CHS) marine surveys are conducted by using the Canadian Coast Guard (CCG) and CHS on an opportunity basis, subject to the deployment schedule timeline, location of the vessel and workload of the CCG icebreakers.

Regulatory Initiatives

Currently two regulatory initiatives are being considered that could impact marine transportation services and costs in Nunavut. These include:

- a) Ice Regime System -this system is intended to eventually replace the zone date system for navigation North of 60 degrees. It would impose a more restrictive system on ships entering Arctic waters.
- b) Polar Code -this is a proposed international code intended to apply to all ships intending to trade in Arctic and Antarctic waters. There are some costly implications inherent in the code that cannot be justified by the benefits.

The Coasting Trade Act of 1992

This act reserves trade between Canadian points (cabotage) to Canadian flag vessels. Foreign vessels may be permitted to operate, but each request is evaluated on a case by case basis, and duty must be paid at 1/120th of 25% of the fair market value for the ship per month of operation.

If a ship is imported to the Canadian Flag it may be brought in at a duty level of 25% from a non-NAFTA partner. An additional requirement is that when a ship is brought into

Canadian flag it must be upgraded to current Canadian requirements relative to international convention. Apparently, Canada is the only country that has this provision. For an older ship, even in good condition, such upgrades can be costly. The duty provision relative to importation has quite serious financial implications for any shipping venture, but are particularly onerous in the North where ships have to have a high ice capability and are thus more expensive, and operations have to be conducted over a very short season. A recent example is the offshore purchase by Nunavut Eastern Arctic Shipping Inc. of the ice class vessel Umiavut . The several million dollars of duty paid on this vessel is ultimately carried on the backs of the end users, Nunavummiut who now pay a high cost for their annual resupply of dry cargo and petroleum products.

3.3 Surface Transportation

There are five fundamental factors that are evident in any consideration of land transportation in Nunavut. These 5 include; the poor quality of existing roads; the lack of inter-community and territorial roads, public safety, mapping for surface transportation initiatives; and expanded rail access for carriers delivering to the Port of Churchill

Poor Quality

The poor quality of roads in Nunavut communities was found during public consultations for the Nunavut Transportation Strategy to be an almost universal complaint expressed by residents. This problem stems from two sources, namely: a lack of territorial standards for road design, construction and maintenance: and a lack of regular maintenance activity by skilled personnel using appropriate equipment.

Lack of Inter-community and territorial Roads

Improved inter-community roads would promote employment, resource sharing and tourism, reduce isolation by bringing families together more often, and potentially reduce the high cost of perishable food resupply.

New inter-community road improvements could be phased in without the high costs of geometric design. Instead, design could be determined based on the intended vehicle and season of use. Established winter trails could be formalized and upgraded. The next step would be gravel trails, upgraded as use demands. Seasonal ferries may cost-effectively replace bridges in the short term and provide employment and training opportunities for Nunavut residents.

Completion of any major new roads will require funding participation by the federal government. Currently, there are no roadway links to or within Nunavut identified under the National Highway Policy Study of 1992.

Public Safety

A current issue in all communities is that of safety of individuals travelling on the land and over the ice, winter and summer. The search and rescue capacity of Nunavut communities and related safety training is supported in part and in some cases by federal resources from the Department of National Defence, RCMP among others. These resources are at times not available in the north or not adjusted for unique environment and language (Inuktitut) considerations. Other problems related to the responsiveness and depth of federal resources can also occur.

Mapping for Surface Transportation Initiatives

Topographic maps at the 1:50,000 scale is a basic requirement for a wide range of land-based transportation planning/development activities. For GIS applications, digitized maps are used as the basic background upon which to layer other information. Currently less than a third of Nunavut is covered by 1:50,000 scale topographic maps and of these only 5% are digitized.

Rail Access to the Port of Churchill

Improved access to western Canada for the Hudson Bay Railway could increase supplier options and lead to lower costs for Kivalliq residents or businesses now buying in southern Canada. This access could be facilitated by using existing lines owned by CN and CP. The operator of this service would have the same rights and obligations as the owning carrier while providing a return to the owner. This access would be provided for a fee determined either through commercially negotiated terms or by rates stipulated by the Canadian Transportation Agency.

4.0 UNIQUE NUNAVUT FACTORS

Bathurst Mandate

In 1999, during its first year of existence, the Nunavut Government, under the leadership of Cabinet, developed a strategy document known as the "Bathurst Mandate". It sets the tone for all Government of Nunavut policy development, and reflects the Territory's needs and values, which guide policy and lawmakers in Nunavut. The Bathurst Mandate is an attempt to infuse governance in Nunavut with traditional Inuit values.

There are four basic principles that make up the Bathurst Mandate. Each one of these principles must be clearly adhered to, must be considered carefully, and must be related to each new policy and program development.

The four principles are:

- Healthy Communities
- Simplicity and Unity
- Self-Reliance, and

- Continuing Learning

Decentralization

The decentralization plan of the Nunavut Government was implemented on May 3, 2000. The aim of the plan is to bring government services and employment opportunities to ten communities, other than Iqaluit throughout Nunavut's three regions. Seven auxiliary offices will be organized through three regional centres that report back to the central government.

Currently government employees travelling from auxiliary offices must take inconvenient routes, or in some cases add an extra day or overnight stop enroute to their itineraries, to reach the central offices in Iqaluit. Most other provinces and territories in Canada enjoy the convenience of being able to reach their capital in one day and return in one day. Currently the three regional centres have no direct non-stop connections to each other.

Operating Environment

The extremes of climate, topography and distance requires air operators to be familiar with operating in an austere environment which includes gravel runways, limited navigation and landing aids, limited ground facilities and support services and equipment.

It is a similar situation for marine transportation operators who are faced with ice infested waters, high tidal ranges, short operating seasons, limited infrastructure and the need for specialized ice capable vessels and equipment.

Climate, topography, distance and condition of infrastructure will also have to be considered by any surface transportation operators at such time an inter-regional or community road system is developed.

The vagaries and extremes of the Arctic weather are also particularly intimidating to any outside carrier considering new transportation services in the Arctic.

Nunavut's physical environment is among the most sensitive to disturbance of any in Canada requiring unique consideration, protection and mitigation procedures. From the land, Nunavummiut find resources and amenities that support activities in areas such as harvesting for food: fisheries, arts and craft production, environmental tourism, oil and gas exploration and production.

Road, bridge or dock construction will involve the disturbance of rock, sediment and soil. Increased sedimentary materials will be released into the watershed. Construction over permafrost poses additional special considerations. Permafrost often exists in delicate equilibrium with local conditions. Surface disturbance may upset this

equilibrium and trigger either the aggradation or degradation of permafrost that may adversely affect the integrity of engineered works, as well as result in adverse effects on downstream water bodies in the watershed.

Cultural Traditions

Nunavummiut have benefited from the vast size of their territory and its distance from the world centres of production. The result of this is a people who have managed to preserve their language and their way of life despite the constant cultural and commercial pressures of assimilation. From this culture Nunavummiut draw the knowledge, resourcefulness and resilience that brought them from the land, to new settlements, to the creation of Nunavut, in just one generation. This culture allows Nunavummiut to produce food from land and sea-based harvesting activities.

Inuktitut is the dominant language in the home in Nunavut, with 60% speaking Inuktitut compared with 35% speaking English. In order to support the continued use of Inuktitut the availability of bilingual services must be expanded. Forms must be translated and bilingual personnel must be available for all stages of any person's journey

5.0 HOW THE TRANSPORTATION SYSTEM MAY EVOLVE

For the Nunavut Transportation System to evolve and help develop the Nunavut economy, it will likely require a combination of smaller incremental system wide improvements and some major infrastructure or service changes. The following highlights 3 transportation system changes that could have significant impacts for Nunavummiut and their economy.

5.1 Bathurst Inlet Port & Road Project

The Slave Geological Province (SGP) is one of the most widely known mineral exploration and development regions in the world. The SGP is generally rich in mineral deposits and is recognized as having significant potential for gold, base metals and diamonds.

The development of the SGP has been somewhat hindered by the remoteness and lack of transportation infrastructure. The lack of road infrastructure results in inefficiencies for existing developments, and increased uncertainty and costs in the exploration of new deposits. The development of the Bathurst Inlet Port and Road transportation system would remove most of the uncertainty and inefficiencies of the current situation in the SGP (See Figure 2).

The Bathurst Inlet Port and Road Project will initially consist of:

- A port at the southern end of Bathurst Inlet capable of handling 50,000 t vessels and smaller barges serving western Nunavut (Kitikmeot) communities; and
- 211 km of all-weather gravel roads;

Eventually and subject to an increase in base metal prices this system would be joined by a 69 km joint barge/road link to a proposed Izok Lake base metal mine.

This transportation system would connect operating mining projects in the Slave Geological Province and Nunavut communities to the economic benefits of Arctic Ocean shipping routes. It would also allow other potential mineral developments this same advantage.

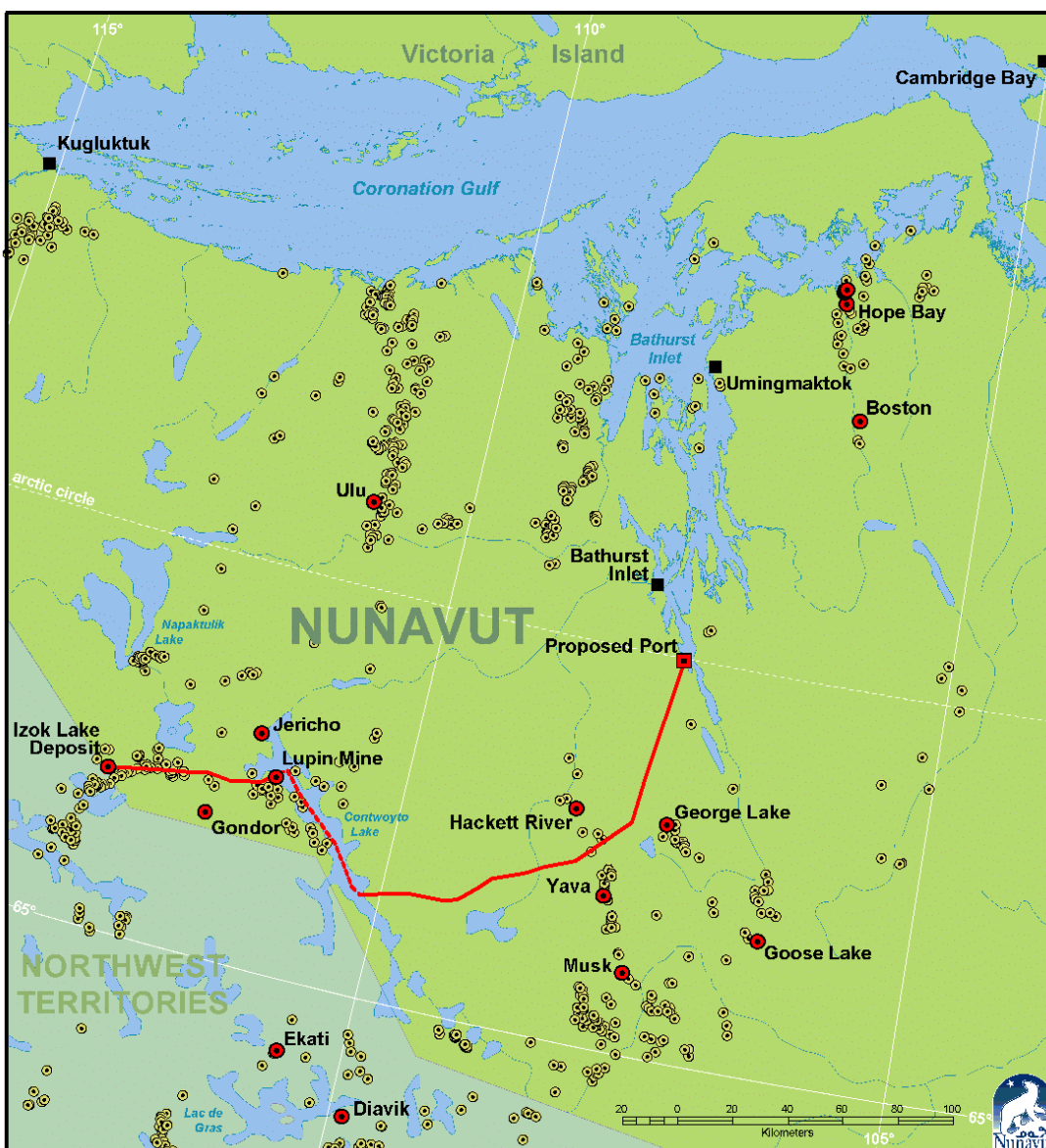


Figure 2: Bathurst Inlet Port & Road Project

The concept is to transport mineral concentrates to and fuel/operating supplies from the port on Bathurst Inlet to the operating mines and Nunavut communities. The mineral concentrates will be stored at the port and at the mines to suit the 100 ice-free days ocean-shipping season. The concentrate, fuel and operating supplies transported over the roadways and shipped through the port will be tolled on a per tonne basis to pay for capital and operating costs of the transportation network. With an Izok Lake base metal mine in operation this project, which has an estimated capital construction cost of \$164 million for the first stage, largely becomes self-financing.

Development of this infrastructure could result in bringing existing mineral deposits along the transportation corridor (e.g. Izok, George Lake, Goose Lake, Jericho, Hope Bay, Gondor and Hackett River among others) into production. The new transportation system would attract mineral exploration, with the potential result being the discovery of new deposits. Also, renewed interest in several known deposits may be heightened by the economic benefits a dependable cost-effective transportation system transportation system would offer, all of which would tend to enhance revenue to the toll transportation system in the future.

It is estimated that the construction of the port and road along with the development of the Izok deposit will create some 1,100 jobs of which 40% or 440 would be available to Nunavummiut. This percentage and jobs number would increase if additional training and education opportunities were provided in parallel to the startup and operation of project components. With 45% of the positions filled by Nunavummiut it is estimated (Arthur Andersen 1999) that over \$100 million in salaries and benefits would flow to residents of Nunavut over the life of the mine.

Overall, the Conference Board of Canada has estimated the economic impacts of mining development in the SGP as follows, based on the assumption of one base metal mine, two gold mines, and two diamond mines. It was projected that over a twenty year period, this development could generate:

- \$32 billion in new Canadian GDP;
- \$25 billion in new mineral development;
- 212,000 person years of employment;
- \$8 billion in employment income;
- 30% of the GDP and over 70% of employment benefits would accrue to other regions of Canada.

Next Steps

All feasibility and environmental studies related to this project have been completed. On May 12, 2003 a Project Description was filed with the Nunavut Impact Review Board. This Board will be requesting the Minister of Indian and Northern Affairs Canada for a decision on the type of environmental review process. Subject to required environmental assessment work and hearings, construction of this project could begin in the summer of 2005 and finish in the summer of 2007.

5.2 Nunavut to Manitoba Road

The Governments of Nunavut and Manitoba undertook the *Manitoba-Nunavut Transportation Assessment* jointly throughout 1999-2000. This study established that a road connection between Manitoba and Nunavut is a requirement for large-scale resource development in the areas of mining and tourism and is needed to provide additional region-wide benefits such as improvements to Inuit employment, small business development and standard of living. Inuit comprise approximately 90 % of Kivalliq residents and currently experience over 20% unemployment rates.

The Manitoba-Nunavut Transportation Assessment established five potential Manitoba-Kivalliq overland corridor concepts as follows and shown on the map (See Figure 3):

1. Churchill - Arviat - Whale Cove- Rankin Inlet
2. Gillam - Churchill - Arviat - Whale Cove –Rankin Inlet
3. Lynn Lake - Tadoule Lake - Arviat - Whale Cove –Rankin Inlet
4. Lynn Lake –Arviat - Whale Cove –Rankin Inlet
5. Lynn Lake –Brochet –Lac Brochet - Arviat - Whale Cove - Rankin Inlet

The Nunavut Transportation Strategy (NTS) completed in 2001 also identified the need for a road between Manitoba and the Kivalliq region, This road is envisaged to start as a winter road/seasonal trail and progressively develop from a single lane to an eventual two-lane all-weather road. It is intended that the viability, economics and benefits of an all-weather road could be demonstrated through a multi-year year test of a winter road.

The NTS concluded that improved road connections and/or community access roads would have the following direct benefits to Nunavummiut:

- Employment, training and contracting opportunities during both the construction and maintenance phases;
- Improved opportunities for developing tourism based on visiting local attractions;
- Improved access for subsistence harvesting and less dependence on imported southern foods;
- Lower costs for most dry cargo/resupply from the south;
- Improved access to granular materials;
- Road development would serve to open mining resources to exploration and possible extraction and may permit mines to reduce transportation related costs

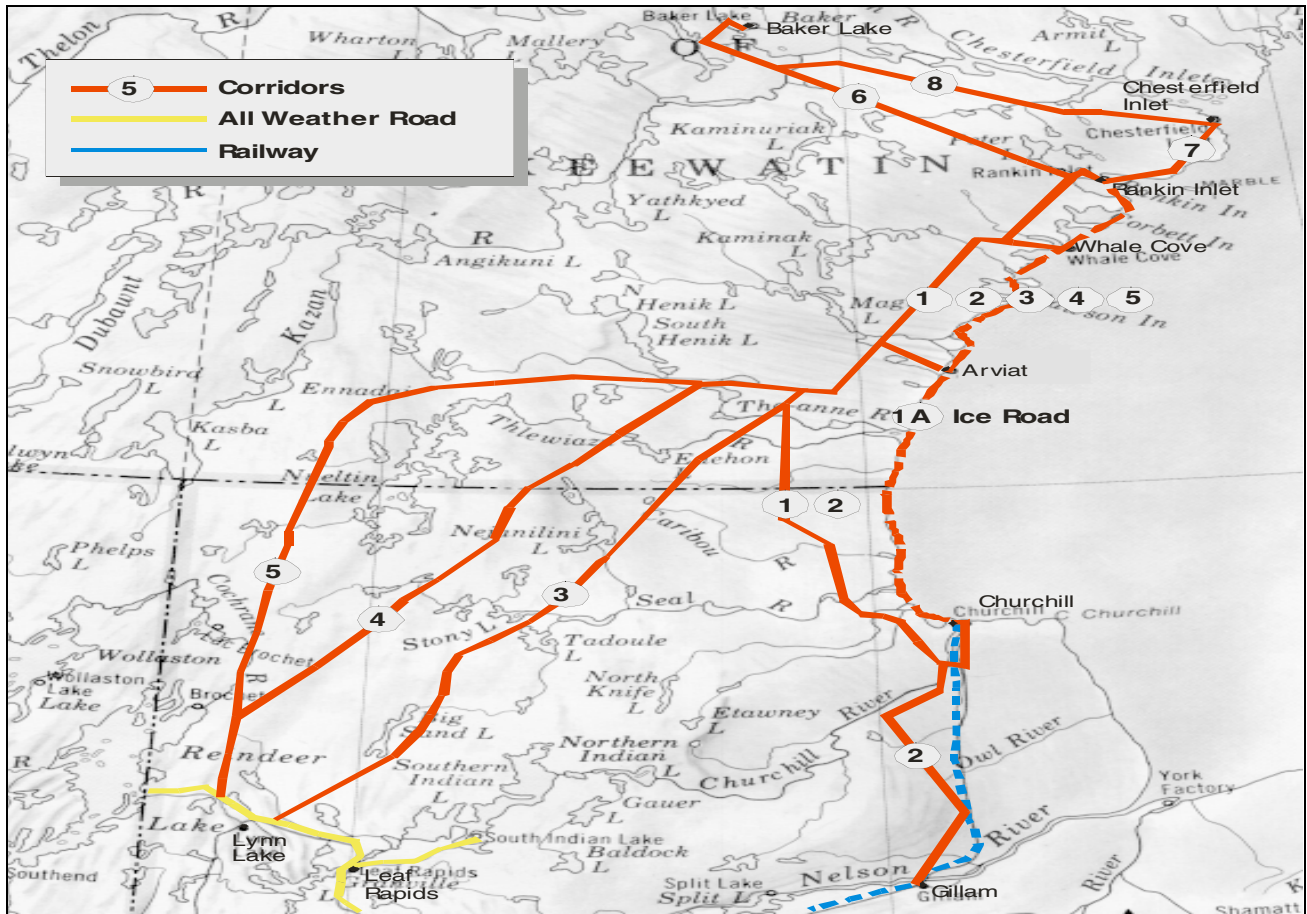


Figure 3: Manitoba-Nunavut Transportation Assessment Corridors

- Reduced environmental impacts when traveling out on the land in the summer months;
- Improved transportation links for medical emergencies, servicing of area exploration camps and other activities outside of the communities; and
- Improved options for air transportation afforded by access to inland lakes that can be used by floatplanes.

The NTS also noted that in certain situations local access roads could provide the basis for road connections between communities.

Next Steps

A detailed multi-disciplinary route selection study is required, in which the broader social, economic, environmental impacts and estimates of costs of each of the five alternatives corridors would have to be ascertained in order to provide an objective basis upon which to choose the preferred route. Issues such as community service requirements, resource development requirements, and a general bio-physical environmental impact analysis would form part of this step. Extensive community consultation would accompany this effort.

Currently the Government of Nunavut, Province of Manitoba and the Kivalliq Inuit Association are working to fund and complete this study through 2003/04.

5.3 Nunavut Air Services Study

The Nunavut air system today largely reflects a system that was molded to accommodate the needs and structure of the former Government of the Northwest Territories and not the newer decentralized model of the GN. Nunavummiut have played a very small role in shaping the current air transportation system.

Extensive consultations and research undertaken for the Nunavut Transportation Strategy (NTS) found that Nunavut was not enjoying a truly competitive air service market, and that a great many small communities lacked choice, equity, fair prices, good levels of service, and access to the territorial and national transportation system. The issues of air passenger flight schedules and the cost of travel appear to be the predominant focus of concern and dissatisfaction with existing air passenger services. The NTS recommended that resolution of these issues will require a significant rework of the current air transportation system and GN approach to purchase of air services.

The Nunavut Air Services Study (NASS), which is being completed through 2003, has recommended changes to the air system structure to make it more accessible and affordable to all Nunavummiut and also how GN use of the system could be made more efficient and effective.

A range of options to effect fare, route and schedule changes has been examined as part of the NASS. The options not only include the recommendation from the NTS to consolidate GN staff travel with one airline (preferred carrier concept), but also other options such as tendering major trunk routes, regional routes, passenger and freight services separately. All options have been put through a thorough operational and financial viability test to establish a short list of alternatives. Short-term service improvements that are being recommended include the following:

- same-day service from Sanikiluaq to Iqaluit;
- same-day service from Cambridge Bay to Iqaluit;
- regular service from Iqaluit to Greenland;

- a direct route from Qikiqtarjuaq to Iqaluit;
- adjusted community connections such as Qikiqtarjuaq north to Baffin Island destinations; and Pond Inlet to Igloolik;
- same-day connections for Kivalliq residents with trans-territorial services;
- reduction in route duplication where excess capacity is extreme (Iqaluit to Rankin-Yellowknife);
- other new, or modified services depending on airline equipment capability and fare economics;

Next Steps

To gauge air carrier interest in effecting certain initial improvements in service patterns and flight frequencies in return for a negotiated level of government passenger and cargo traffic an Expression of Interest (EOI) is being prepared for release to Nunavut air carriers.

Submissions would require carriers to provide an indication of the flight frequencies, aircraft types, schedules, projected airfares (public and government) and the minimum level of government traffic required to undertake the service improvements requested in the EOI.

Submissions would also where appropriate detail related improvements in areas such as safety, comfort, in-flight service, ground services, provision of multi-lingual staff, computer reservation systems, local personnel employment and training among others which may accompany proposed improvements in service patterns and flight frequencies.

6.0 Conclusion

The Nunavut Transportation System's effectiveness and efficiency is influenced by a variety of modal and unique Nunavut factors. Consideration and mitigation of these factors through changes in transportation infrastructure or services as represented by the Bathurst Inlet Port and Road Project, Nunavut to Manitoba Road and the Nunavut Air Services Study will enable the transportation system to stimulate and service future economic growth.

In addition to the direct benefits that will be realized by the Nunavut economy, these initiatives will enable many more Canadians to see and realize the potential of this vast land and its people and bring some demonstrable proof of Canada's sovereignty and interest in Canada's north.

REFERENCES

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3. LPS Aviation Inc., ***Nunavut Air Services System Implementation Options***, Iqaluit, Nunavut, May 2003