



**Government of Nunavut
Department of Community Government
and Transportation**



Nunavut Air Services System Implementation Options





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Prepared for:

Government of Nunavut
Department of Community Government
& Transportation

March 2003

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1 The Challenge

1.1 Background

In 2001, the Government of Nunavut (GN) published the long-term Nunavut Transportation Strategy (NTS). The aim of the Strategy was to provide a strategic plan for the improvement for air, marine and surface passenger and cargo transportation in Nunavut over the next 20 years.

The Vision Statement that was presented relative to air transportation included the following as a statement of the fundamental beliefs of the GN:

“Nunavut should have safe, efficient, adequate air transportation services at reasonable prices to foster healthy communities, unity and self-reliance.”

Guiding Principles from the Vision Statement for Air Transportation include:

- increases in population and economic growth, and expectations of improvements in service, should be reflected in expanded air services that meet our needs more effectively;
- modernization of equipment and facilities is essential;
- modernization and improvements can only be funded by industry through establishment of a dominant carrier able to organize services in the most efficient manner;
- control of air transportation services by Nunavummiut will best serve the long term interests of territorial development;
- to achieve cost effective improvements in all elements of air transportation – air carrier, airport and air navigation facilities and services – must be co-ordinated; and,
- safety and regulatory standards deemed appropriate in southern Canada need to be reviewed to ensure their suitability for the unique arctic air transportation environment.

The Vision of air transportation in 2021 is that:

- Nunavut is served by **comfortable, efficient and daily** passenger and air cargo services **from southern Canada through several gateway airports**;

- all Nunavut communities receive **more frequent air services than today**, transporting passengers and delivering perishable goods with minimal delay;
- **seamless, essential airline services** to all communities are provided with **modern, efficient aircraft**;
- **helicopter services are available** in every geographic region to support mineral resource and tourism industries as well as search and rescue; and,
- Nunavut's **airports are safe, modern, cost-effective** facilities where courteous **bilingual services** are provided to travellers, shippers and the public by **well-trained personnel**, operating with the assistance of **adequate equipment and information management systems** tied directly to southern points of supply.

It has been estimated that from 60% to 80% (depending of the precise definitions used) of air travel and air cargo shipments in Nunavut are paid for either directly or indirectly by the Government of Nunavut or by the Federal Government. The implication is that the Government of Nunavut has considerable purchasing power that could be used to achieve many of the improvements identified in the NTS Vision. Any changes that were implemented through government purchasing influence would also have a direct impact on community and territorial travel that is not government-funded.

As a first step in moving toward the long term vision, a study of the procurement and contracting options has been undertaken. The study is to determine how to use the large purchasing power of the government to influence the future direction of air transportation to the benefit of Nunavummiut. An important aspect is the inclusion of Federal Government and Inuit organizations in the contracting strategy to increase its impact.

1.2 Historical Context

1.2.1 Origins

Scheduled air services in the arctic have developed largely from defence, mineral, oil and gas, and scientific exploration driven activities in the arctic. Many scheduled services developed originally from south-north resupply routes originating in western, central and eastern Canada.

In its heyday in July 1975, Resolute Bay Airport received three (3) different airline jet services from the west, central and eastern arctic. It was the second busiest airport in Canada (measured by movements). The large numbers of resident aircraft included a fleet of 18 Bradley Air Services aircraft, 12 Pacific Western aircraft, and many other operators and fleets. Activity was driven (85%) by mineral, oil and gas exploration in the high arctic. Return of this level of interest might occur if western arctic oil and gas production actually proceeds in the near future.

1.2.2 Western Nunavut

Historically Canadian Airways opened the western routes to the north, followed by CP Air, then Pacific Western Airlines into what is now Nunavut, then Northwest Territorial Airways and Canadian Airlines (which ultimately evolved into Air NorTerra in 1998). A variety of smaller air services grew up to serve the mining, oil and gas sectors with Wardair perhaps being the best known success story.

NWT Air was formed in 1961 and developed routes into Nunavut through the 1970's operating progressively larger DC-3, Electra and Hercules aircraft until sold in 1988 to Air Canada. Based on this sale, NWT Air was then able to acquire B-737 aircraft which were operated in part, in western and central portions of Nunavut. The airline lost large amounts of money (reportedly about \$100 million) by the time Air Canada sold the operation for a nominal amount to First Air in 1997. It's highest single year loss is said to have been some \$22 million. It has been said that the lesson learned from the NWT Air experience is that jets cannot be operated profitably east of Yellowknife across the arctic. Over the same period Ptarmigan Airways developed routes into the Kitikmeot out of Yellowknife using smaller DC-3 then pressurized G-1 aircraft.

1.2.3 Eastern Nunavut

Meanwhile in the eastern arctic air service development was driven more by the demands for construction and operation of the original DEW line military defence infrastructure, followed by high arctic research and exploration activities. Boreal Airways was one of the first to serve Iqaluit on a regular basis but following a major DC-4 crash in the early 1960's, the airline changed its name to Nordair. Nordair operated DC-4, Electra and Super Constellation aircraft into Nunavut and in the early 1970s introduced B-737 jet service from Montreal to Iqaluit, Nanisivik and Resolute Bay. Nordair's operations were underpinned by major charter contracts for ice patrol, and in support of the DEW Line. As the airline grew it became unable to operate a diverse fleet of small and large aircraft in different types of operations and spun-off its Baffin Island scheduled routes, along with its Iqaluit and Kuujuaq bases, to a former charter company, Survail.

Survair operated DHC-6 Twin Otter services throughout Baffin Island but was unable to survive financially on this limited basis and went bankrupt. Bradley Air Services purchased the assets and established First Air scheduled services in the eastern arctic in 1978.

First Air had a strong charter business and proceeded to stabilize and then expand its scheduled service market through careful route structuring, pricing and cost control activities. To fend off charter carriers attempting to capture some of the scheduled traffic market, First Air upgraded its fleet to the larger, pressurized HS-748 aircraft. First Air's operation was underpinned by operating charter contracts in support of the old DEW Line, new North Warning System (NWS), Food Mail, and the Polar Continental Shelf Project among others. Kenn Borek Air was a major charter competitor.

First Air undertook a DHC-6 demonstration of local air services in Greenland in the late 1970's. In the 1980's a market pooling agreement was established with Greenland Air, and First Air began operating scheduled services to Nuuk from Nunavut.

In 1986 the airline began acquiring B-727 jet aircraft, established a logistics base in Ottawa and linked its northern and southern services. Through aggressive pricing and cost control the airline gradually captured sufficient traffic from the Montreal-Iqaluit route for the incumbent (Nordair and its successor Canadian Airlines-owned Canadian North), to withdraw from serving the south-north route in the mid-1990s. Air

NorTerra-owned Canadian North returned to serving the eastern south-north market at the end of the 1990's, this time from Ottawa.

1.2.4 Central Nunavut

Central Nunavut has traditionally been a smaller and weaker market for south-north resupply. Transair was the first jet operator providing B-737 and F-28 services north from Winnipeg into what is now central Nunavut during the late 1970s. Hall Beach received jet service (from Nordair) during its heyday as a DEW Line logistics support point. As a result First Air used aircraft based there to offer scheduled services between Hall Beach, Igloodik, Pond Inlet and other communities.

Due to the weak market Transair went bankrupt and a number of smaller air carriers provided replacement airlift on the south-north route. The most notable of these was Calm Air which gradually expanded its fleet and operations to include service to Repulse Bay, Coral Harbour and other Kivalliq communities, eventually using HS-748 aircraft. NWT Air attempted to operate some Transair routes, including service to Thompson, Manitoba, but failed financially. Smaller operators which filled the void included Lam Air, Keewatin Air (now Kivalliq Air), Skyward and others. First Air provided cargo competition.

The amalgamation of White River Air Services and the growth of Austin Airways in Northern Ontario is significant to Nunavut. Following creation of the Food Mail program at northerly rail heads, Austin established bases, notably at Val d'or and other points, to serve the James Bay and Hudson's Bay regions. The airline subsequently expanded operations into Coral Harbour, Iqaluit and onwards to Nuuk in Greenland about 1980. These services came to an end when Austin Airways was purchased by Air Canada and Air Ontario emerged from the restructuring. Austin Airways provided the competitive incentive for First Air to upgrade to an HS-748 fleet and also demonstrated a different form of south-north "vertical" supply.

1.2.5 Beginnings of a Network

Some industry sources give credit to John Jamieson, President of First Air (1975-1990), as having the original vision of a pan-arctic air service network. The vision included vertical supply routes to the eastern and western arctic, linked with a local air service grid across what is now Nunavut, and including a trans-territorial trunk service.

Historically it can be noted that First Air progressively expanded its services from east to west adding Pelly Bay, Spence Bay, Gjoa Haven, Cambridge Bay and a great many other points to what had started out as a Baffin Island service feeding Iqaluit.

Ultimately this network growth ran head-on into competitors from the western arctic with contestants taking advantage of the bureaucratic slowness of the old Canadian Transport Commission to manoeuvre and fight fiercely for a share of a thin market, out of sight to southern Canadians. Once Rankin Inlet had been upgraded as a military Forward Operating Location, east-west trans-territorial service competition began in earnest. Originally opened by NWT Air with old, turboprop Lockheed Electra aircraft, the airline subsequently upgraded to B-737 jet service and First Air entered the competition using B-727 jets.

At the same time however, many traditional sources of revenue used to underpin air carriers were disappearing in the high arctic. Oil and gas exploration declined, the federal commitment to exploration and research declined, remote sensing began replacing ice and other reconnaissance missions, and the new generation military NWS system had been completed and was largely an unmanned system requiring far less support.

In 1995 First Air bought Yellowknife-based Ptarmigan Airways to increase its feed at the western end of its network. Air Canada tried a number of unsuccessful strategies to save NWT Air, then established a shut-down plan. NWT Air was sold to First Air in 1997 for a nominal amount. First Air integrated its' aircraft, routes, hangar and base facilities in Yellowknife into their network. Subsequently, and based on information released at recent Airline Finance Conferences, First Air has reported a respectable profit for the last few years. With the loss of several major international charter contracts in the wake of September 11th however, more recent results are expected to be poor.

In 1998 Air NorTerra took control of Canadian North with operations centred in the NWT and western arctic. Since then the carrier has developed and consolidated its routes and services, recently expanding services between Calgary and the Mackenzie Delta, and withdrawing from Hay River and Fort Smith.

Originally reliant upon Canadian Airlines for its aircraft, maintenance, operating personnel and facilities the airline has gradually assumed ownership and control of progressively more airline infrastructure and now operates under its own Transport Canada Operating

Certificate. In addition, Canadian North has developed marketing relationships with smaller air carriers such as Kenn Borek Air, Calm Air and Air Tindi to acquire feed in the east, central and western arctic. Canadian North does not release financial information however the airline is believed to be investing significantly to capture market share and in development.

A second competitive network may be seen emerging from this program of expansion.

1.3 Aviation Constraints and Opportunities

The aviation industry is subject to a number of constraints that are all based in the day-to-day economics of aircraft and airline operations. A number of these constraints are described in this section, particularly as they apply to aviation in Nunavut.

1.3.1 Over Capacity in the Passenger Market

The Nunavut passenger market has traditionally grown, over the long term, in approximate proportion to the growth in population. Nunavut's small population is distributed over 26 communities located at great distances from each other and from points of supply. This low demand situation is what 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. These are common complaints of Nunavummiut.

Nunavut does not have a conventional demand - supply air transportation market. In southern Canadian markets most travellers exercise discretion and choice with respect to when, where, and how they travel, as well as whether to travel by air and how much they are willing to pay for transportation. Carriers respond in a competitive way offering supply and pricing to meet different demands of the marketplace. In Nunavut, 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.

A common measure of supply in the air travel market is the number of daily or weekly flights, the number of seats offered in a market, and the number of seats which are available as a function of distance.

An analysis of the Nunavut situation was carried out as part of the Nunavut Transportation Strategy research. In Nunavut during 2000, an average of 162 weekly flights were offered on 52 routes. Approximately 8,748 seats were available each week, and the system had an estimated capacity of 20,128,000 ASK (available seat kilometres). These are important benchmark statistics for subsequent consideration.

By comparing, actual or estimated traffic levels to the supply of seats, the overall economic health of Nunavut's air transportation sector may be assessed. Given a mix of full and discounted fares, the average southern air carrier may require that at least 50% of an aircraft's seats be occupied in order to reach an economically sustainable yield on any particular route. Full service air carriers often have a break-even load factor between 60% and 70%. Applying a 50% load factor to the number of seats provided by Nunavut carriers, there would need to be 4,374 passengers carried in Nunavut each week for all routes currently offered to be self-sustaining. This would necessitate an annual traffic demand of some 227,448 passengers per year.

In contrast to the above, year 2000 estimates were that the number of passengers travelling in Nunavut were under 100,000 per year. This corresponds to about 2,000 passengers per average week. When compared to the availability of 8,748 seats each week, there is clearly a disproportionate number of seats available in a market that has little elasticity of discretionary travel. Typical aircraft seat pitch and configuration changes would have a marginal effect in reducing the number of seats available.

The Nunavut air transportation system currently has an over capacity of available seats and it may be assumed that the cost of this excess capacity is borne, at least in part, by the travelling public in the form of high ticket prices.

1.3.2 Cargo Market Characteristics

Air cargo includes air mail, air express and air freight shipments. By far the greatest of the three in Nunavut is air freight, which includes predominantly perishable foods and time sensitive commodities. The movement of air freight in Nunavut is firstly from south to north, and then from the gateway hubs to the regional communities. Aircraft usually travel back to their bases empty of freight. This unidirectional movement of northern air freight creates capacity challenges in one direction and low airline financial yields in the opposite direction. Ultimately, these constraints find expression in the freight rates charged to consumers where revenue earned on the outbound leg must also pay for the aircraft to return to its base. This is not the case in southern Canada, except for some specialized charters.

A common measure of supply in the scheduled air cargo industry is the cargo tonnage available on a weekly basis in a market, and the tonnage capacity available as a function of distance. An analysis of the flight and route frequencies was carried out for year 2000 traffic.

In Nunavut during 2000, an average of 162 scheduled weekly flights were offered which carried a combination of passengers and cargo. The mix assumptions are based on observations of commonly used seating and cargo configurations. A weekly air cargo capacity of 1,310 tonnes was estimated for 2000 and the system was estimated to have had an annual capacity of 1,857,000 ATK (available tonne kilometres).

Based on year 2000 population of 27,688 people, the break-even cargo tonnage (assumed 50% load factor) equates to 1.23 tonnes of air cargo per person per annum in Nunavut, or about 2,706 lb. per annum. Historically logisticians have used a figure of 10 lb. per person per day when estimating personnel support requirements for arctic projects. This equates to 3,650 lb. per year which compares favourably with the preceding figure, calculated for permanent residents.

It appears that the Nunavut air cargo system is likely operating at an economical level for air carriers as a group. This observation is supported by the fact that air carriers traditionally maximize the number of passengers on a combi flight, then carry as much cargo as possible within the remaining available payload capacity. If excess cargo accumulates at points of departure, then extra flights are operated on a non-

scheduled basis to carry the loads.

From the early days of flying in the north, air carriers have chosen to utilize combi aircraft to serve Nunavut due to the operational flexibility these aircraft offer and the ability to maximize payloads. As Nunavut grows however, increased demands for service frequencies and comfort made by the passenger market may not coincide with the requirements for moving freight. At the same time new aviation regulations are coming into force which require new equipment and procedures for fire detection, containment and suppression in aircraft carrying both passengers and cargo. These rules are anticipated by many in the industry as making potentially combi aircraft impractical from a cost and possibly operational point of view.

1.3.3 Competition

The healthiest form of competition exists where carriers of similar strength compete on the same routes using appropriate aircraft and service frequencies to suit demand, and to achieve adequate financial returns from their operations. This usually leads to market discipline with respect to reasonable fares, dependable services and good overall performance by the air carriers.

This situation exists to only a limited extent in Nunavut, namely on north-south services to Yellowknife and Ottawa, and on trans-territorial services between Yellowknife, Rankin Inlet and Iqaluit. In most other markets, one carrier is the principal carrier serving the largest share of the market, and other smaller carriers offer more specialized competition in areas of the market in which they can operate profitably. When choices are available to passengers, they are likely to be between a non-stop jet service, a slow milk-run service in an old aircraft, or a long flight in a small, single engine aircraft. These would not be considered to be acceptable choices by southern consumers.

The Nunavut air transportation system is actually a vertically integrated system, rather than a horizontally competitive system (in which several equal competitors offer customers a choice of similar products).

An example of this situation may be found in the south to north air cargo services offered to the Hudson Bay coast communities and to the Kivalliq region. Only one carrier offers non-stop jet cargo service from Winnipeg to Rankin Inlet with connecting service on line to regional destinations. The second largest competitor operates a multi-stop turboprop service northerly from

Winnipeg and Churchill through a number of communities as far as Rankin Inlet, and sometimes to one regional point beyond. A smaller carrier using an even smaller aircraft provides a smaller distribution service. While the system described may have the appearance of competition, customers have very little actual choice when they decide to ship a specific commodity to a specific destination, especially if it is perishable, fragile, time sensitive or large.

1.3.4 Barriers to Competition

There are three principal barriers to competition in Nunavut namely: the size of the market; the cost of entry; and the austere operating environment.

The small size of the market overall is not conducive to attracting larger air carriers to enter the market. Air travel demand on most Nunavut city-pairs is very low compared to southern cities and towns and the cargo flows are unidirectional. A total market of approximately 100,000 passengers per year, even if it doubles in the next 15 or 20 years, is still not sufficiently large to attract many carriers.

The cost of entry to the northern air service market is very high compared to southern markets. The cost of labour, together with the training and experience necessary to operate air services, is high and in short supply and the cost of recruiting the necessary workforce and retaining it in northern service is especially high. Acquisition, operation and maintenance of facilities in the Arctic is particularly expensive and new air regulations now require aircraft to be serviced and maintained in heated hangars. A high upfront investment must be made by a new carrier who must at the same time recognize the limitations in size of the market and therefore the future financial returns realizable by the new entrant.

The austere operating environment appears challenging to the uninitiated. The extremes of climate, topography and distance require an operator to be familiar with operating in an environment which includes gravel runways, limited navigation and landing aids, limited ground facilities and support services and equipment, prior to entering the Nunavut air transportation market. The vagaries and extremes of the Arctic weather can be particularly intimidating to an outside carrier considering new services in the Arctic. The extended distances between airports, time zone changes, passenger preference for daytime travel, and the unidirectional movement of cargo also limits overall aircraft utilization and productivity.

Consequently the likelihood of new air carriers entering the Nunavut market, especially on a widespread community service basis, may be considered to be generally low.

1.3.5 High Costs and Airfares

Residents of Nunavut comment frequently on high airfares and air freight costs. This issue may be understood by first considering the cost of operating aircraft in the north, and then by considering the market forces which may be affecting fares.

Aircraft Operating Costs

Aircraft total operating costs are divided into three categories:

- Direct Costs
- Indirect Costs (overheads)
- Ownership Costs

Aircraft operating costs consist primarily of seven main components. These include: crew costs, fuel and oil, direct maintenance, outside maintenance, landing navigation and terminal fees, ownership costs, and overheads. Industry information is available for actual operating cost experiences on a global basis for the first five components of operating costs and these may be adjusted for Nunavut conditions. These are referred to as operating data common to all carriers. The other two costs vary depending on the location and method of operations.

Ownership, or possession costs are a significant factor in operating costs and may vary significantly from operator to operator depending on such factors as the method of financing, the aircraft utilization and the cost of the aircraft.

Older aircraft cost less to purchase but the cost of operations is greater than for newer aircraft which offer efficiencies in fuel, maintenance and flight performance. Costs also include a profit element. The total costs of operating aircraft are usually converted into a seat kilometre (or seat mile) cost in order to arrive at a fare structure. The cost per seat kilometre is also based on an assumption of the number of seats that are occupied on a particular flight. This load factor is usually based on experience and is expressed as a percentage of the available capacity. For example, it is known that Air Canada Regionals have often operated on a 50% load factor as compared to the main line operations of Air Canada that have had a much higher load factor.

The yield is the revenue per seat kilometre and is affected by the fare structure which consists of a number of different fares with the mix on any particular flight being a yield management optimization issue.

Large carriers have the financial strength to acquire new aircraft with fixed long term financing commitments. Small air carriers with limited financial strength usually acquire older aircraft at low cost and recover the higher direct operating costs through the ongoing cash flow generated by ticket sales.

Actual operating costs may vary from operator to operator based on their method of accounting and their basic operating premise. The significance of operating costs in the north cannot be forgotten. The harsh environment, the unidirectional movement of freight and many other factors influence the operating costs for individual carriers.

Market Influence on Airfares

A problem frequently identified by Nunavummiut is that of high air fares and poor service. In fully competitive markets, competitive pressures moderate airfares. With a limited number of competitive routes in Nunavut, there is at best a limited opportunity for the marketplace to actually influence fare levels in many cases.

There is a lack of consistency and price discipline for airfares sampled from across Nunavut. Note that even within a single air carrier, the price per kilometre (or mile) appears to vary significantly between routes, and this variation does not always appear to have an obvious explanation (such as high local fuel costs for example).

Analysis indicates that some fares in eastern Nunavut compare favourably against those charged in southern Canada for a similar journey. Fares charged on other routes do not compare as favourably however, and fares in central Nunavut are noticeably higher.

The most significant cause of high airfares in Nunavut may be the circuitous routings needed to travel between distant communities and the service patterns which are currently in use. Nunavummiut believe they do not get good service for their money and, in comparison to southern air services, this is true.

Generally the volume of freight transported in combi (combined passenger / cargo) aircraft does not

significantly influence the level of passenger air fares. The usual airline practice is to carry the maximum number of passengers on each flight, and then to fill the remaining capacity of the aircraft with freight. Historically, the passenger yield has been much higher than the cargo yield for the amount of space / weight carried.

Frequency of scheduled service, and the type of aircraft, are both significantly affected by the combined passenger and freight volumes on a route. If few passengers travel on a given route then only small aircraft may be cost effectively operated, and possibly at a very low frequency, perhaps once per week. The same rule applies to the size of aircraft and frequency of freight service. If however, cargo and passengers can be carried on a single aircraft, then a larger aircraft may be employed, and a more frequent service may be provided cost-effectively on the route.

In the past, many Nunavut air routes have suffered from relatively low traffic demand with respect to both passenger and freight volumes. Use of combi aircraft such as the HS-748-2B and B-737-200C has occurred for over 20 years. With recent growth in both population and demand for air transportation, some routes may now be served with an acceptable frequency solely by passenger aircraft and cargo aircraft, operating independently of one another. This situation may, in some instances, result in smaller passenger aircraft operating on some routes, and in the use of specialized freighter aircraft (with interiors removed), providing scheduled freight services to communities. This is likely to occur in the short term on some Nunavut routes. Public consultations have revealed that the size of aircraft is less important to Nunavummiut than is the frequency of service to isolated communities.

1.4 Strategic Options - Air

The present air transport services in Nunavut are determined, to a very substantial degree, by market forces. Individual air carriers are free to decide what level and quality of service they are prepared to offer, and at what prices. It follows that improvements can only be achieved through one or more of the following means:

1. Moral suasion (the "sunny ways" often favoured by Prime Minister Wilfrid Laurier), under which the GN would try to persuade the carriers to improve their services voluntarily;

2. Direct subsidies, with which the GN would pay the carriers to make service improvements that they would not make voluntarily;
3. Re-regulation, under which the GN would seek the federal government's agreement to re-introduce the controls on entry and pricing that existed in Canada before deregulation of the air transport industry;
4. Public ownership, under which the GN would acquire majority ownership and control of at least one of the main carriers serving Nunavut, and would then require that carrier to make most or all of the service improvements desired; and
5. Contractual incentives, under which the GN would invite the air carrier industry to propose substantial, Nunavut-wide improvements in services and prices in return for a long-term contract for the carriage of all of the GN's business, and of the business of other major users of air transport within and to/from Nunavut whose cooperation the GN might be able to secure.

Each of the five strategic options is assessed in more detail in Chapter 5.

1.5 Study Organization

Selection of the most appropriate implementation option(s) for the improvement of air transport services is a multi-step process described herein.

Chapter 2 describes the characteristics of the current

system, the users of the system, the projected passenger and cargo volumes, and possible users of a consolidated purchasing process.

Chapter 3 identifies the problems and issues within the current air transportation system targeted for improvement through a government strategy.

Chapter 4 describes improvements to the air services system and discusses the use of an air services route analysis model to assess available statistics, industry measures of productivity, and a number of input variables to evaluate service options including those that may be proposed by industry. A technical description of the model is included in Appendix A.

Chapter 5 identifies and assesses the options potentially appropriate for improving Nunavut's air services. The contracting option recommended earlier in the Nunavut Transportation Strategy is assessed in more detail. Selection criteria are defined and are applied to candidate contracting strategies to determine a preferred procurement strategy for air transportation services in Nunavut.

Chapter 6 provides an overview of the recommended air services implementation option(s) which will be developed in greater detail in consultation with government and industry.

The provision of helicopter services is discussed in Appendix C and those services are not included in the options considerations in the body of the report.

2 Air Services Characteristics and Users

2.1 Current Status

The air transportation system of Nunavut is characterized by a long/ thin market, where distances between communities are great, and populations are small. Other barriers to entry include high operating costs, and an austere operating environment. Air travel is a lifeline to the outside world for each of the 26 communities scattered throughout the territory.

The current air transportation system in Nunavut continues to be plagued by overcapacity on the passenger side. Combi aircraft operations predominate in the territory, where carriers constantly strive to match capacity with demand. Aging jet aircraft remain in use, in part due to the fact that no comparable new generation aircraft can be operated in either a combi-configuration, or on gravel runways. The leading carrier has recently invested heavily in certifying a new generation turboprop as a combi-configured aircraft. The existence of many and different fleet types within the industry does not help in promote lower operating costs.

On the cargo side, supply more closely matches demand due to the use of combi aircraft. However, the air cargo system is plagued by slow and inefficient handling. A number of unnatural bottlenecks commonly delay time sensitive freight on its journey north, to the frustration of end users.

A general lack of competition exists within the system. Given the size of the market, this is not entirely surprising. However where competition does exist, similar schedules, low frequency, and different service offerings can create only the illusion of real competition. In fact, in the central part of the territory where most competition theoretically exists, air fares are actually the highest.

The relationship between price and demand is quite inelastic in Nunavut owing to the fact that air travel is an essential service. This means that a given fare increase will not generate a disproportionate decrease in demand, as it would in most southern markets. While there is no evidence to support the notion that airlines in Nunavut have taken advantage of this fact, government-sponsored travel accounts for a very large portion of all travel in the territory.

Despite the importance of connections within the territory and to the outside world, most of the air routes within Nunavut date from the period prior to the territory's creation. These routes in large part tend to favour links to regional centres, some outside Nunavut, rather than to the capital, Iqaluit, in the east. Surveys and consultations conducted by LPS illustrate that the existing route structure does not adequately support the new government's priorities of decentralisation with close ties to Iqaluit. Low flight frequency and lack of connectivity within the route network work against the new government and its mandate, force air travel budgets higher, and impose an inordinate travel time penalty on the economy.

To meet the objectives stated in the Nunavut Transportation Strategy document (LPS, 2000), improvements needed include:

- a) service improvements
- b) aircraft modernization
- c) air carrier rationalization
- d) aviation infrastructure improvements
- e) airport development
- f) food mail program improvements
- g) helicopter availability improvements
- h) provision of Nunavut-based SAR.

Passenger service improvements would include more direct and nonstop flights, shortened travel times, greater frequencies, and more *equitable* fares (less disparity across regions). Cargo service improvements would include lower and more equitable shipping costs, timely service, reduced damage and delays, and better customer service. These might be obtained through scheduled cargo service at specified frequencies to all communities, consolidation of traffic on trunk routes to support greater frequencies and larger / more efficient equipment, increased use of containers, increased flexibility of southern trans-shipment points to reduce supply chain costs, and unlimited access to competitive southern suppliers.

Infrastructure improvements, such as better airport facilities are best justified by air service improvements and system growth, since they are costly and are often funded by user charges. Infrastructure improvements will become increasingly important as trans-polar air routes are opened up between North America and Asia. In turn, infrastructure improvements should lead to reduced system operating costs.

The challenge in developing alternative models of fleet, route, and schedule planning for Nunavut centre on the lack of up-to-date data on travel habits. For this reason a survey of government employee travel, along with consultations with other Inuit organisations, was undertaken in order to gain a better picture of current air travel patterns in the north. The data obtained permit better origin/destination traffic forecasts by community. This data may be used to assess the viability of new routes, the appropriate frequencies, equipment, and fare levels. This data is entered into the Nunavut Air Services Model, which has been created especially for the Nunavut Air Services Study, to assess route profitability.

Early modelling results illustrate that smaller, more cost effective aircraft might be better suited to many of the Nunavut markets. These aircraft have lower direct hourly operating costs than many of the types currently in use. While operating newer and smaller aircraft increases cost per available seat-mile (CASM), introducing new fleet types "right-sized" for the market may help control other costs such as maintenance (a major expenditure), reduce asset amortization periods, and meet the objective of improving service frequency. It should however not be overlooked that newer and smaller aircraft will potentially require significant capital outlay on the part of the carriers, and not all are certified for gravel operations (which is a hallmark of Nunavut airports). These issues are weighed by the model.

Because aircraft productivity is quite low in Nunavut, aircraft unit costs are high. Since it is evident that Nunavummiut would be better served if flights were more frequent, service more direct, and flights were better timed to connect with one-another, even improvements to the existing route and fleet network in this regard can lower unit costs.

While efforts are focussed primarily on assessing origin/destination demand, little remains known about unconstrained demand, or those who want to travel but cannot, perhaps due to high airfares. Nevertheless, if improvements are made to the system, some demand

stimulation might be expected. Some survey respondents have indicated their travel patterns might change should more direct services be initiated.

In order to address many of the challenges of operating in Nunavut, point-to-point as well as hub- and-spoke type network models are evaluated. The current system is more characteristic of point-to-point service than of hub-and-spoke operations. The hub-and-spoke model promotes greater flight frequency, and may result in daily service in Nunavut markets currently served no more than three times per week. This structure also normally promotes higher load factors, higher yields, lower total costs, and takes advantage of existing infrastructure at airports such as Iqaluit, and Rankin Inlet.

2.2 Community Air Services

2.2.1 Route Structure

The present route structure does not serve the mobility and access needs of Nunavummiut within their own territory. The current structure, together with the existing service frequency, impose a significant cost on the territorial economy as businesses plan all trips around *weekly* airline service availability. The time spent travelling, compared to the actual time spent working in Nunavut, is comparable to some of the most remote parts of the developing world.

The scheduled air services from Nunavut communities for the spring of 2003 are summarized in the table in Appendix B and are illustrated in Figure 2-1. The table identifies only those destinations that can be reached from each community by a single segment direct flight. The table does not show destinations that are reached either by connecting flights or by multi-segment flights.

In comparing this data to that obtained in 2000 as part of the NTS study, it is evident that no major changes have occurred with regards to flight frequency, routes, or equipment types over the last few years. While a few new routes have opened up, more have been dropped than added. Over the last couple of years there has been a slight increase in capacity with fewer flights. Capacity is measured in available seat kilometres (ASKs).

2000- 166 weekly flights providing 20,128,000 ASKs.
2002- 155 weekly flights providing 20,706,000 ASKs.

As has long been the case, flight connections continue to be geared towards north-south travel (ie. to feed jet services). There are little or no same-day connecting opportunities for those seeking to travel intra-territory. While regional operators coordinate their flights to the arrivals and departures of the scheduled jets, there is

little regional interlining, either with regards to fares or schedule coordination.

Table 2.1 identifies changes between 2000 and 2002.

Table 2.1 - New or Discontinued Direct Air Links: 2000 - 2002

Carrier	Added / Terminated	Route	Aircraft	Services Retained or Replacement
Canadian North	Terminated	Cambridge Bay- Resolute	B737	Kenn Borek Air
First Air	Terminated	Iqaluit-Qikiqtarjuaq	HS748	via Pangnirtung
	Terminated	Qikiqtarjuaq-Clyde River-Pond Inlet	HS748	None
	Terminated	Kimmirut-Iqaluit	DHC 6	Unaalik Aviation
	Terminated	Taloyoak-Yellowknife	HS748	via Gjoa Haven
	Terminated	Iqaluit-Nuuk	HS748	None
	Terminated	Iqaluit-Sondre Stromfjord	B727	None
Kivalliq Air	Terminated	Kugaaruk-Taloyoak-Gjoa Haven-Cambridge Bay-Gjoa Haven-Baker Lake	PC12	None
	Terminated	Baker Lake-Arviat	PC12	None
Kenn Borek Air	Added	Cambridge Bay-Resolute	King Air	
	Added	Resolute-Pond Inlet-Igloolik-Iqaluit	King Air	

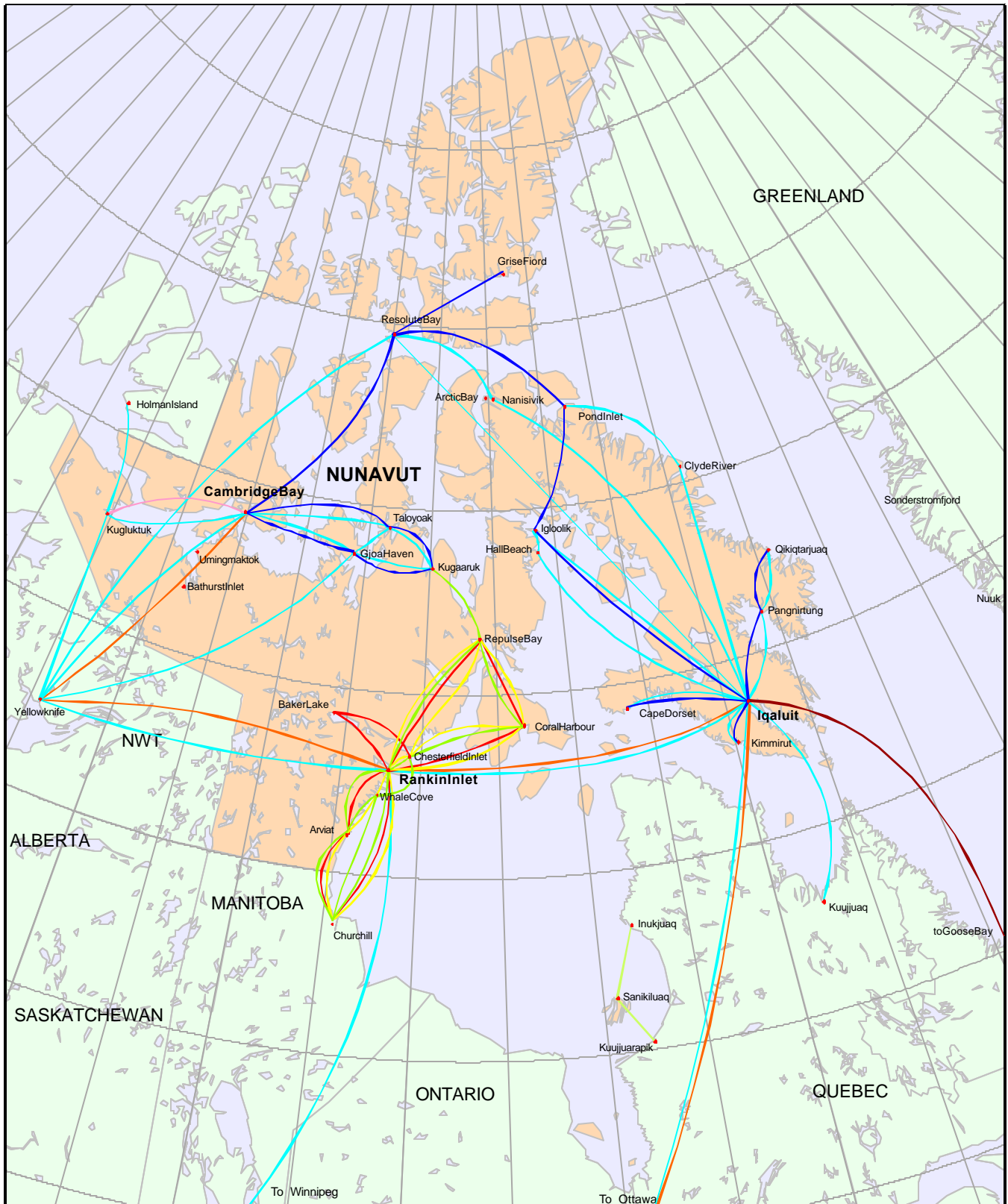
Routes are often dropped with little prior community consultation, to the annoyance of users. Furthermore, connectivity remains an issue. The only way for those in Pangnirtung to reach Pond Inlet is to now connect through Iqaluit. However, since inter-community connections are not timed accordingly at Iqaluit (due to long distances and limited demand) passengers must overnight in Iqaluit and often incur up to two night's stay. Similar cases may be found system-wide.

In terms of equipment developments, Calm Air and First Air have both been moving toward replacing 1960's vintage HS748 turboprop with newer equipment: Saab 340 in the case of Calm Air, ATR-42 in the case of First Air. These aircraft are faster and are more comfortable. However, technical and facility constraints in the latter's eastern network have so far precluded the introduction of newer turboprop equipment systemwide. First Air's hangar development plans are awaiting a decision by the Government of Nunavut on the possible redevelopment of Apron I and a new Air Terminal

Building at Iqaluit Airport. Further consultations with the major Nunavut carriers reveal that, despite the short to medium term need to replace aging jet aircraft in their fleets, little serious planning has yet to occur for this eventuality. These larger/heavier jet aircraft are also restricted at a number of locations, with Cambridge Bay's runway length and surface being the common issue raised.

Similar concerns exist at Pangnirtung, Kimmirut, and Grise Fjord for turboprop aircraft with respect to runway length and airport location. Such constraints place certain limitations on community air services, and in the short term at least, present the need for exploring alternative solutions.

Nunavut continues to suffer from the air service issues identified in 1999. The status quo is detrimental to users and may be stunting territorial growth. There are opportunities for change.



Nunavut Air Services Study

Figure 2-1

Scheduled Passenger Services April 2003

- Airluit
- AirLabrador
- AklakAir
- CalmAir
- CanadianNorth
- FirstAir
- KennBorekAir
- KivalliqAir
- SkywardAviation
- ★ GatewayHub
- ◆ RegionalHub
- ▲ DecentralizedGov't
- CommunityAirport

2.2.2 Frequent Flier Programs

Currently, First Air, Canadian North, and Calm Air, along with certain Kenn Borek Air flights participate in Aeroplan. Carrier liability for free seats is an issue, but is mitigated by the long thin market and seasonal variance in travel demand. Nevertheless the residual liability is quantifiable and there is room to further reduce it.

Data obtained through consultation with northern and southern Canadian carriers which offer some form of frequent flier program, indicate that the programs cost the carriers roughly 7 to 10 cents per kilometre, and up to 10% of allocated seats per flight. On a Boeing 737 combi configured to approximately 60 seats, the figure is usually closer to 3% of capacity. The practice in the north of operating larger aircraft at reduced frequency enables traffic to be consolidated and offsets any revenue dilution that might otherwise be incurred as a result of higher capacity in the market. Given the large equipment types in use relative to the size of the market, any reward travel is distributed among a greater number of ASKs thus marginally impacting operating cost per ASK. However, a reduction in average aircraft size would increase program impact on air carriers.

Carriers which operate combi-aircraft, where seating configurations can be adjusted for any given flight, have

more flexibility in controlling the excess passenger capacity aspect. Under normal circumstances excess passenger capacity is minimized particularly when high value freight must travel. However, since there tends to be seasonal fluctuation in freight volumes, the carrier can adapt to seasonal trends and cater to travel demand as necessary. Consultations with a major northern carrier confirmed that even with the pressures of time-sensitive freight, the airline is able to sufficiently accommodate present demand for free seats without a noticeable financial penalty.

A few carriers in the north use revenue management software to control the allocation of free seats on flights. In so doing the software ensures that flight revenues are not diluted, and higher revenue generating opportunities are not lost, as a result of accommodating reward travel on a given flight.

Despite steps undertaken by the carriers to mitigate some of the burden of having to satisfy the demand for free seats, there are means by which this liability may be further reduced. Available evidence suggests that a major user of services may be able to obtain certain concessions from the air carrier in exchange for a further reduction in the carrier's reward liability

2.3 GN Air Travel Purchasing

2.3.1 Decentralization

In the 1990s, the biggest factor that affected transportation in Nunavut was the creation of the new territory and the adoption of a decentralized government structure. The decentralization plan of the Nunavut Government was initiated on May 3, 2000. The aim of the plan is to bring government services and employment opportunities to all communities throughout Nunavut. Local offices function administratively through three regional administration centres that report to the central Government. Many of Nunavut's air routes reflect mature traffic patterns that existed within the old Northwest Territories. Following the creation of Nunavut, the focus of government travel changed significantly. Decentralization increased the need for government travel, particularly between decentralized offices and Iqaluit. Many Nunavummiut have indirect and inconvenient routes to their capital,

including overnight stops in some cases. In addition, the three regional centres have no direct non-stop connection to each other.

The Annual report of the Decentralization Secretariat entitled "Towards a Representative Public Service" provides statistics on the numbers of government employees located in each community. The current staff levels in the communities are listed in Table 2.2. While these levels will continue to change until the decentralization process is complete, the future modifications are expected to be minimal. Travel patterns are becoming more clearly defined and government travel on the east-west route between Yellowknife and Iqaluit is expected to decrease gradually as Nunavut takes on the administration of more of its programs and operations internally. The GN Employee Travel Survey (see Section 2.4) assists in identifying the important linkages between communities under the new decentralized organization.

Table 2.2 - Nunavut Government Offices & Staff

Headquarters or Regional Operations				Other Government Offices			
Iqaluit + outside the Territory	1127			Bathurst Inlet	1	Qikiqtarjuaq	26
Gjoa Haven	67	Arviat	145	Kugaaruk	31	Clyde River	39
Kugluktuk	116	Baker Lake	92	Umingmaktok	1	Resolute Bay	19
Igloolik	127	Rankin Inlet	278	Taloyoak	35	Chesterfield Inlet	23
Pangnirtung	95	Cape Dorset	84	Arctic Bay	36	Coral Harbour	35
Pond Inlet	104	Cambridge Bay	192	Grise Fjord	13	Repulse Bay	26
				Hall Beach	31	Sanikiluaq	38
				Kimmirut	30	Whale Cove	18
Total Staff = 2,840							

Source: GN, Human Resources, September, 2001

The travel survey responses show that most government employees who responded travel at least once per year to a departmental meeting. One respondent pointed out, however, that if the air connections were different, it is possible that the travel patterns would change. His example was that several meetings of his staff are only held in Rankin Inlet because that is the least disruptive location for fly-in connections. The office would prefer to hold the meetings in Cambridge Bay but cannot do so economically with the current airline network structure.

As the decentralization initiative is completed, the next requirement will be to identify and improve those necessary travel links between communities to minimize travel time and maximize employee productivity.

2.3.2 Air Transportation Requirements

The Government of Nunavut purchases a wide variety of passenger transportation services, few of which are procured in a co-ordinated bulk-purchase form. The overall travel budget, which includes hotel and meal costs as well as airfares, is some \$54 million per year including employee travel, medical travel and specialty travel such as social services and corrections travel. Beyond this budget, GN travel expenditures include portions of project-related budgets and special events. While it is difficult to arrive at precise values, estimates indicate that the Government of Nunavut or the Federal Government pays, either directly or indirectly, for 60% to 80% of the total travel in Nunavut.

The GN is not a significant direct user of air cargo purchases as the budget figure is approximately \$1.5 million per year. At an average air cargo rate of \$6 per kilogram (as taken from suppliers' tariff sheets) this represents about 250 tonnes per year. However, the NTS estimated the total cargo volume at 21,000 tonnes, of which a considerable portion is paid indirectly by government, for example through building or development contracts.

Comprehensive travel statistics are not collected routinely within the GN so the determination of travel or cargo demand and particularly of origin and destination is difficult. Several techniques have been used to arrive at estimates that may be used in the further analysis and contracting process. These methods are described in later sections of this chapter. In summary, GN air transportation services requirements include the

following:

- GN employee travel - scheduled
- GN employee travel - charter
- medical travel - scheduled
- medical travel - charter
- air cargo - regular
- air cargo - charter
- social services and other specialty travel
- special events travel (e.g Arctic Winter Games)
- helicopter charter

2.3.3 Medical Travel

Statistics on total medical travel within Nunavut and from Nunavut to southern destinations were analysed. The statistics covered a full year period in central and western Nunavut and a 9 month period from October, 2001 through July 2002 in eastern Nunavut. The eastern figures were extrapolated linearly to provide an estimate of a full year of medical travel. Using assumptions concerning enplanement / deplanement (e/d) counts for the various types of trips, medical travel accounts for approximately 29,000 trips per year. In a normal year, about 28% of the total government procurement or 8,200 would be charter flights and the remainder would be on scheduled flights. The budget estimate for all medical travel, including GN employee travel is approximately \$30 million per year, more than half of the direct travel purchases by the Government of Nunavut.

2.3.4 Chief Electoral Officer, Nunavut

The Chief Electoral Officer for Nunavut has expressed the opinion that it is currently very difficult to conduct an election within the statutory period of 38 days given the air service frequencies and connections in Nunavut. This impacts both on travel of candidates and officials, and on the transport of ballot boxes, ballots and forms by air cargo. Changes to the Elections Act (October 2002) will not improve the situation as the new statutory time allocations have been reduced.

It is apparent that air travel issues can impact on the proper implementation of democratic government principals in Nunavut if election procedures are potentially compromised.

2.4 GN Employee Consultation

Origin / destination statistics for GN employee travel are not currently assembled as a matter of course. The decentralization process has increased requirements for employee travel but the identification of the primary routes and connections is problematic. A sample survey of GN employees was employed to collect the necessary statistical data to identify the most important inter-community linkages and to arrive at a preliminary estimate of the annual travel demand. The survey and its results are described in the following section.

2.4.1 Survey Structure

The Air Services Study is in part targeted at Government of Nunavut procurement of air travel services, both passenger and cargo, and a very significant portion of this travel is on-the-job travel by government employees.

A survey GN employees was carried out by e-mail. The survey requested information on the number of business-related air trips (and destinations) that were made each year by the employee and the number of personal trips made per year. As well, the survey offered an opportunity for employees to describe their particular problems and issues with air travel and cargo shipments in Nunavut.

In total, 248 requests were sent to a random selection from the GN Staff List, or about 11.6% of GN employees in the list. A reminder e-mail was sent 3 weeks later.

2.4.2 Survey Results

A total of 105 responses were returned. This represents about 5.3% of GN employees in the staff list. Responses were received from 14 communities

including the 12 communities with the largest number of GN employees. The response rate of over 43% of surveys sent out is excellent and indicates a strong interest among the respondents in the subject matter.

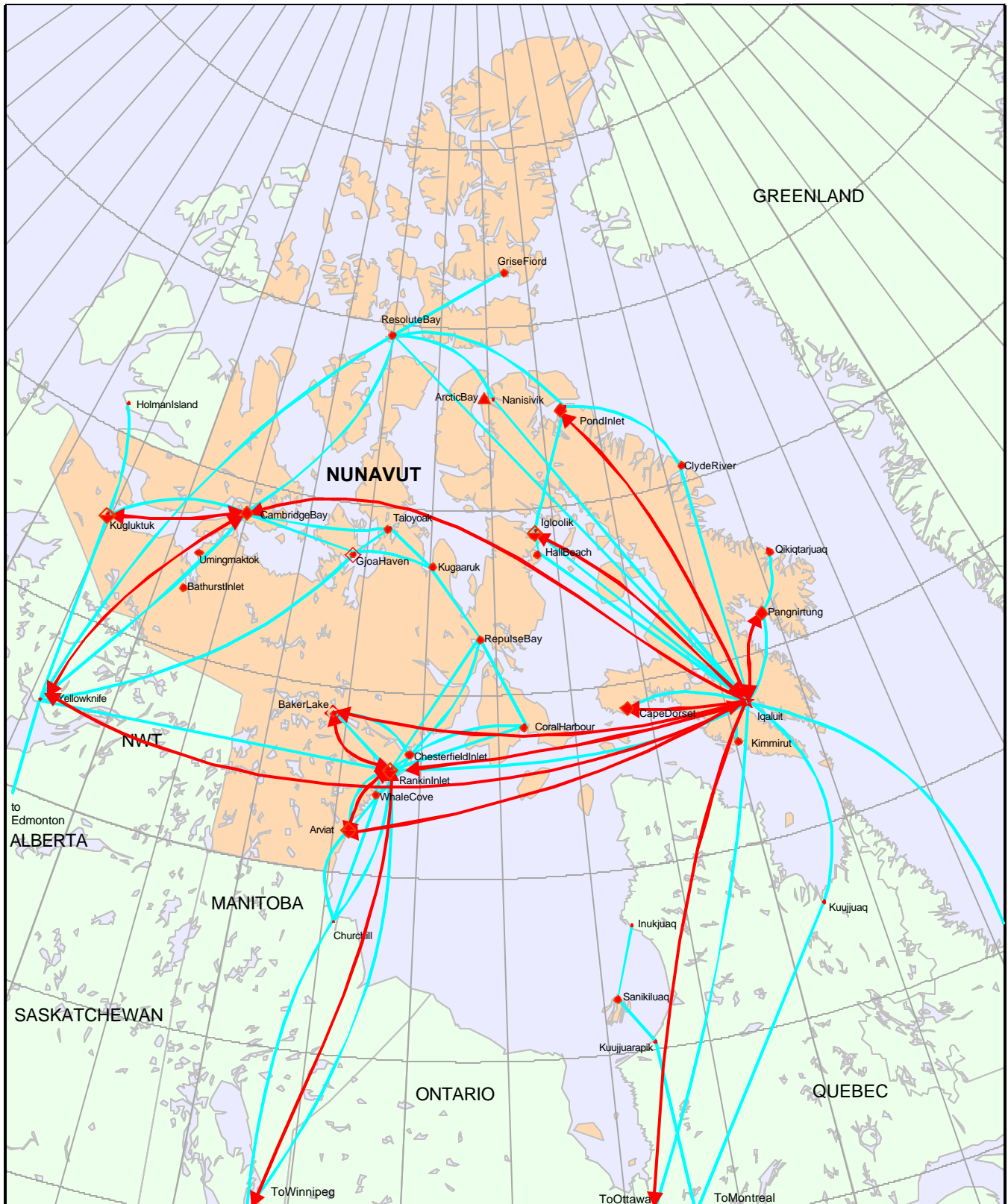
The 105 respondents reported 917 trips per year on government business and approximately 285 personal trips. The government travel reported ranged from 0 trips per year to a high value of 46. The median value was 7 trips per year. As a cross check, a complete count was made of all travel authorizations within the Department of Community Government and Transportation headquarters for the 2001/2002 fiscal year. There were 1,129 reported trips for a staff complement of approximately 144 for a mean of 7.8 trips per person which compares well with the median from the survey and the nature of business conducted by the department.

As a further cross check, the number of government and personal trips were extrapolated across the government staff total and the population as a whole. The calculated territorial E/D value was 204,000 which compared favourably with the actual 235,000 E/Ds recorded in 2000. This allows for approximately 15,000 return trips originating in the south, a not unlikely figure.

2.4.3 Extrapolations

The survey results were extrapolated to the full GN staff numbers to indicate that the projected air travel demand is approximately 19,000 trips per year. Community by community estimates of origin - destination demand were also extrapolated from the detailed breakout of response data. All inter-community connections with an estimated demand of greater than 240 return trips per year were identified from the extrapolated data.

Figure 2-2 shows the identified connections and compares them to the current air service schedules to highlight any requirements for new routes. This is an update of the NTS route map with current (2002) routes and the GN demand projections of more than 240 per year. (1 per working day)



Nunavut Air Services Study

Figure 2-2

Government of Nunavut Offices and Transportation Patterns

- ★ Territorial Capital
 - ◊ Decentralized Community (Headquarters Operations)
 - ◆ Decentralized Community (Regional Operations)
 - Non-decentralized Communities
 - Scheduled Routes
 - ↔ Projected Government Demand
- Legend**

2.5 Traffic Statistics

Most enplane/deplane (E/D) passenger statistics for Nunavut are considered by Transport Canada and Statistics Canada to be confidential.. The Canada Statistics Act provides that in the case where the publication of statistics would put a commercial entity at a competitive disadvantage, such as where there is only one reporting airline serving a community, the statistics shall remain confidential. From available E/D figures, however, certain statistical measures and summaries can be presented.

Total annual E/D figures for Nunavut for 2000 were 235,000 passengers. Previous statistics reported the number to be 218,000 for 1998 and had estimated growth to 228,500 E/D passengers per year by 2000 (at a growth rate equivalent to the 2.4% per year projected for the population of Nunavut). Growth has been somewhat greater than projected.

A Propensity to Travel is a statistical measure for a community of the average number of trips per person that might be expected in a year. This measure is more statistically accurate for large community populations such as typical airport catchment areas in the south, however it still serves as a useful indicator in the north. Calculations based on available E/D data for the year 2000 and corresponding populations of the communities indicate that the propensity to travel in 2000 varied between communities over a range from 0.3 to 18. If, however, one removes the airports that serve the major mine sites (Resolute and Nanisivik) as well as Iqaluit (as hub) from the totals, the average propensity to travel for the remaining communities becomes 3.0.

It should be noted, however, that these figures are from 2000 statistics and are therefore from before extensive government employee decentralization took place. To more comprehensively include all government travel, one should include Iqaluit in the calculations which leads to an average propensity to travel of approximately 4.1. With the total population forecast for 2005 (see Table 2.3) of 32,967 and using this propensity figure for the entire population, the estimated number of trips per year by 2005 is 135,160 or an equivalent E/D figure of 270,320.

The projections for government travel can be used in the travel propensity analysis as well. The average propensity for government travel alone in communities is 0.8. In those communities that have provided responses to the Government Travel Survey (the 12 largest employee contingents), the extrapolations show that GN employee travel represents about 20% to 25% of propensity to travel in the community.

2.6 Community Population and Travel Forecasts

The population statistics for the communities in Nunavut were determined during the May 2001 Census of Canada. Table 2.3 indicates the 2001 census figures and population growth rates and forecasts for communities in Nunavut as derived by the Nunavut Bureau of Statistics in March 2000. Forecast updates based on the 2001 census have not yet been compiled. The community population is an indicator of the air travel demand for the whole community and the estimated demand is based on the average propensity to travel of 4.1 derived in Section 2.5.

**Table 2.3 - Community Population and Travel Forecasts
Territory of Nunavut**

Community	Census	Estimate	Growth	Forecast				Est. Demand
	2001	2000	Annual	2005	2010	2015	2020	2020
Arctic Bay	646	730	2%	819	916	1,019	1,094	4,485
Arviat	1,900	1,690	2.7%	1,929	2,198	2,517	2,855	11,705
Baker Lake	1,507	1,470	1.9%	1,624	1,777	1,957	2,148	8,807
Cambridge Bay	1,309	1,418	2.1%	1,581	1,752	1,939	2,137	8,762
Cape Dorset	1,148	1,213	2.1%	1,354	1,501	1,662	1,829	7,499
Chesterfield Inlet	345	372	2.3%	420	476	528	583	2,390
Clyde River	785	771	2.3%	867	982	1,095	1,214	4,977
Coral Harbour	712	845	2.5%	955	1,078	1,219	1,376	5,642
Gjoa Haven	960	984	1.9%	1,084	1,173	1,290	1,435	5,883
Grise Fiord	163	145	0.9%	147	155	165	173	709
Hall Beach	609	635	2.6%	734	829	934	1,052	4,313
Igloolik	1,286	1,379	2.2%	1,562	1,736	1,922	2,131	8,737
Iqaluit	5,236	4,762	2.9%	5,606	6,477	7,456	8,391	34,403
Kimmirut	433	450	0.4%	506	573	636	706	2,895
Kinggauk	5							0
Kugaaruk	605	582	2.7%	664	756	867	979	4,014
Kugluktuk	1,212	1,389	2.0%	1,556	1,720	189	2,076	8,512
Nanisivik	77	230	-0.9%	*	*	*	*	0
Pangnirtung	1,276	1,506	2.1%	1,667	1,870	2,074	2,280	9,348
Pond Inlet	1,220	1,314	2.7%	1,532	1,761	1,999	2,233	9,155
Qikiqtarjuaq	519	522	2.2%	599	668	737	811	3,325
Rankin Inlet	2,177	2,277	2.4%	2,527	2,791	3,120	3,633	14,895
Repulse Bay	612	625	2.6%	702	797	903	1,012	4,149
Resolute Bay	215	243	0.9%	253	263	275	288	1,181
Sanikiluaq	684	702	2/3%	796	896	1,008	1,108	4,543
Taloyoak	720	804	2.4%	904	1,016	1,147	1,294	5,305
Umingmaktok	5							0
Whale Cove	305	312	2.3%	351	397	442	491	2,013
Totals	28,672	29,370		32,744	36,568	39,115	45,349	178,430

* Note: Population for Nanisivik reflects mine closure before 2005.

2.7 Industry Consultation

2.7.1 Air Carriers

Consultations were carried out with air carrier representatives from a number of airlines and at a number of venues. In most cases, the consultation comments were not for public distribution. The opinions and proffered data are presented so that no individual air carrier is identifiable. Consultations were carried out in individual meetings and in particular at the Annual General Meeting of the Air Transport Association of Canada (ATAC) in Calgary, November, 2002. Consultations are continuing and the air carriers all expressed a strong interest in future consultations, particularly concerning any draft RFP that may be developed.

Air carrier consultations included:

- Northern Air Transport Association
- First Air
- Canadian North
- Unalliq Aviation
- Air Tindi
- Calm Air
- Kivallik Air
- Skyward Aviation

Related discussions were held with:

- Nav Canada
- Air Transport Association of Canada
- Canadian Transportation Agency
- Transportation Safety Board
- Canadian Air Transportation Security Agency
- Bombardier Aerospace
- Airbus Industries
- ATR Aircraft
- Saab Aircraft Leasing
- Boeing Commercial Airplane Company
- Rotary and fixed-wing operator groups

Comments received from industry consultations are not identified with any particular air carrier.

1. Some air carriers believe that the Nunavut passenger market is sufficiently large to sustain competition, however they are unable to quantitatively substantiate this opinion.
2. Other air carriers believe the market is too small to sustain more than one carrier on many routes, and carrier instability will continue where more than one

carrier operates in thin markets.

3. The concept of a single large contract for procurement of all services (eg. fixed wing and rotary-wing) is felt to be unworkable as no single supplier can currently provide all the services required.
4. Some are worried about being excluded in a large government contract, while others see the contracting process as an excellent opportunity.
5. Different regulatory regimes for different aircraft types and sizes make it very difficult for any one company to operate more than one type of commercial air carrier operation.
6. Many carriers expressed strong views that the current system is fine as it is. They just need more support from the GN in forcing employees to take the lower cost routings when they are offered by carriers.
7. Nunavumiut are reasonably well served and expectations of significant improvements are impractical. The realities of airline economics should be better communicated to communities.
8. Several air carriers are using aircraft types that are reaching the end of their useful life and are assessing replacements. This is a good time for changes in the system structure in Nunavut as it will impact on their equipment selection.
9. Other air carriers believe current equipment is sufficiently modern for the required services and that modernization should not be a justification for a government improvement initiative.
10. Combi operations are often still necessary on thin routes to ensure financial viability.
11. Replacement equipment is difficult to find as regulations and market forces are reducing the availability of gravel-certified, or combi-configured, aircraft.
12. Air carriers are very interested in reviewing the air services model to help ensure that the inputs and assumptions are reasonable and that the outputs correlate with industry experience. Some cost data was provided by several carriers.

13. Crew costs and other logistics costs in the north can be twice the cost of similar items in the south.
14. No carrier is willing to adjust their schedules in a financially detrimental way, in order to offer Nunavumiut improved travel itineraries (e.g. adjusting schedules on the Iqaluit - Rankin Inlet - Yellowknife route).
15. Air carriers had copies of the Nunavut Transportation Strategy documents and were generally familiar with the contents, as they applied to air services.
16. Air carriers were in general not familiar with the goals of the Nunavut Air Services Study and were pleased to have been approached with explanatory materials.

2.7.2 NavCanada

Several items relating to increased Nav Canada services in Nunavut have been raised with representatives of Nav Canada, namely development of a Nunavut Flight Information Centre (FIC) in Iqaluit and the reactivation of a control tower at Iqaluit Airport. The concept of locating the Flight Information Centre (FIC) that provides services to Nunavut communities from North Bay to Iqaluit has been discussed previously and Nav Canada have stated that there would have to be a significant change in operational factors to force a reconsideration. The North Bay FIC is mostly functional now but the final implementation is dependant upon DND plans for renovation of the Regional Operational Control Centre in North Bay where the FIC is located. The previously defined FICs in the NWT and Yukon Territorial capitals of Yellowknife and Whitehorse are the last scheduled to be implemented in the north (2004). In general, according to Nav Canada representatives, the FIC implementation program is proceeding well with good feedback from pilots and there is no reason to change existing plans.

The Nav Canada facilities at Iqaluit include a Flight Service Station (FSS) in the terminal building. There are currently about 16,000 aircraft movements a year at Iqaluit and the published criteria for the implementation of a control tower is 40,000 per year. Nav Canada do not accept that apron congestion is a criterion for re-opening the Iqaluit tower as controllers do not necessarily carry out ground control duties. The only appropriate step to reduce apron congestion is to

reopen Apron I as planned in the outstanding ACAP proposal.

Nav Canada has installed a new radar in Nunavut at Iqaluit that provides coverage of North Atlantic traffic for the southern control centres in Montreal and Edmonton. The radar data is not used locally by the FSS, however a viewing position is planned for the FSS for use only in emergencies and for Search and Rescue (SAR) purposes.

Nav Canada is not a large user, in a normal year, of air transport services, either passenger or cargo but informal discussions at senior levels indicate that they are willing to discuss the possibilities of co-operation with the GN on bulk procurement. There is a concern, however, that Nav Canada participation may be seen as a conflict of interest as Nav Canada is a supplier of services to the air carriers. They do however use commercial air carriers in general. Further discussions will be required once contracting strategy details are defined and approved.

2.8 Other Government and Related Users

2.8.1 Polar Continental Shelf Project (PCSP)

A consultation meeting was held with representatives of the Polar Continental Shelf Project (PCSP) in Ottawa to discuss their total aviation services requirements and future plans. The primary role of PCSP in past years has been the provision of logistics support, including passenger and cargo, fixed and rotary wing services, to qualifying scientific research projects in the north. Over the past 10 years or so, the requirements have dropped considerably as federal funding of scientific research has been cut. The type of research has changed from geological to social sciences and the resulting requirement for charter air services has been reduced. The simple movement of researchers between communities is funded directly by the research projects and uses scheduled carriers. Two significant geological mapping projects are complete this year and will not be renewed. Outside these two projects, PCSP flew approximately 900 to 1,000 hours in 2002.

The charter aircraft are in use, during the season, 7 days a week and there are no available hours for other charter purposes. PCSP is very careful not to be seen to be competing with the private sector so subleasing activities by the aircraft owners are not allowed. Exclusive lease aircraft are guaranteed 4 hours per day

minimum over the season. Currently PCSP procures \$3.5 million in logistics services (not all of which are aviation services) for free distribution to clients, and procure a further \$2 million on a cost recovery basis.

In the past, rotary wing contracts have been let annually and included large repositioning costs for ferrying the helicopters from the south for a short 3 month season. PCSP commented that if there were helicopters based in the communities they would use them but currently they must bring them in from the south. Fixed wing charters have been on a three year contract, of which there is one year remaining in the current contract. PCSP would be pleased to participate in bulk purchasing if it works out to be less expensive for them but cannot guarantee a fixed number of hours per year in advance as future Federal Government budgets and research priorities are unknown.

The PCSP has particular significance to Nunavut because it has successfully demonstrated that remote and diverse air transportation needs can be consolidated into a large, well-directed and competitively bid contract where air carriers have met equipment, service and performance standards unique to the high Arctic and the territory on a commercially successful basis.

2.8.2 Food Mail

The Food Mail program is the single largest, multi-year air cargo contract that utilizes both scheduled and charter air services. Because this program has a significant influence on the operating strategies, efficiencies and equipment used by Nunavut's largest air carriers it deserves careful consideration.

After the Food Mail program, the two largest year-round, multi-year users of commercial air cargo services are the North West Company and Arctic Cooperatives. Air cargo quantities shipped by these two customers are equal to approximately 30% to 40% of the food mail volumes.

Volume

The Northern Air Stage Program, better known as "Food Mail", is a 30 year old federal government program subsidizing the air shipment of specified essential food and non-perishable items to approximately 150 communities in northern and isolated regions of Canada.

The program serves approximately 90,000 people with

some 28,000 (31%) located in Nunavut. The program has been funded by the Department of Indian Affairs and Northern Development (DIAND) since 1986 (now Indian and Northern Affairs Canada - INAC), although full responsibility was only assumed in 1991. The program is administered by Canada Post Corporation through its Air Stage Freight parcel distribution service.

Food of a defined nutritious nature, such as perishable vegetables, fruit, bread, milk, and meat, make up the majority of shipments. Perishable food can be shipped for \$0.80 per kilogram plus an additional handling charge of \$0.75 per parcel. Non-perishable nutritious foods and non-food items, such as parts for snowmobiles and ATVs, may also be shipped at specified higher rates. There have been no rate increases since 1993/1994.

Table 2.4 below shows the distribution of Food Mail shipments to Nunavut in 1999-00. Reports show that approximately 10,400 tonnes were shipped to all areas under the food mail program in 2000/01.

Every destination is scheduled for, at minimum, one Food Mail delivery per week. Currently, Canada Post is exceeding that level of service by delivering most shipments within 48 to 72 hours.

The Food Mail program operates similarly to an air mail service. Shipments are charged a flat rate based on weight and dimensions, not on the distance travelled within each shipping region. The amount of subsidization per shipment, therefore, increases with the distance from the staging point.

Table 2.4 - Annual Food Mail Volumes (Tonnes)

Nunavut Areas	April 97 - March 98	April 98 - March 99	April 99 - March 00
Eastern	–	3,330	3,684
Central	–	192	333
Western	–	578	581
TOTAL	4,661*	4,100	4,597

Source: Department of Indian and Northern Affairs Canada.

* Note: ProLog Manitoba-Nunavut Road 2000 study figure.

Data may be approximated from North West Territories aggregate totals.

Air carriers bid, on a regular basis, to provide Canada Post with cargo services for the Food Mail program. Program funding for the Northern Air Stage Program had been capped from 1996 to 1999 at \$15.6 million.

Although the cap has since been lifted, any funding above the old cap amount must come out of INAC's budget for other programs. The 2000-2001 Food Mail final cost was \$22.5 million, up from \$17.9 million in 1999. This higher amount can be attributed to several factors including new NavCanada fees and higher

energy prices.

Table 2.5 below shows the comparison of Nunavut funding to other regions receiving Food Mail.

Table 2.5 - Distribution of Northern Air Stage Program Funding 2000 2001

Province or Territory	2000-01 Funding (\$millions)	2000-01 of Total Funding	2001-02 Funding (\$millions)	2001-02 of Total Funding
Nunavut	\$13.7	61%	\$14.9	59%
Quebec	\$7.0	31%	\$7.0	31%
Other locations	\$1.8	8%	\$3.2	10%
TOTAL	\$22.5	100%	\$25.1	100%

Source: INAC.

The above statistics indicate that the projected volume for Food Mail shipments in Nunavut by 2002 may total some 5,000 tonnes per year with a funding budget of some \$14.9 million per year. This suggests that any changes initiated by Nunavut would have a major impact on the national program.

Access to the Program

Most Northern Air Stage Program shipments are made by southern wholesalers to northern retailers. Although individuals may use the service, they are in the minority. DIAND conducted a survey of users as part of its 1996 study of the Northern Air Stage Program. The survey found that the typical profile of private households that had received Food Mail shipments were non-Aboriginal, higher income, and better educated people often employed by Government with isolated post and cargo allowances. This profile of the typical Food Mail consumer is consistent with the findings of the public consultations conducted as part of the NTS. Most participants, particularly those whose first language was Inuktitut, were unaware that the program was available to individuals, or could not read the forms in English or French.

DIAND's conclusions were that continuing to allow individuals to access the Food Mail Program would only subsidize the consumers profiled above in the short term while undermining northern retailers and thus indirectly contributing to higher costs for supplies in the north. DIAND's report states that most permanent

residents of northern communities depend on local retailers for their supplies. It suggests that the quality and variety of food in northern stores may improve if shipments made directly to households were not permitted under the Food Mail Program. If individuals were prohibited from using the service, DIAND proposed more careful scrutiny of northern retailers to ensure that shipping cost savings were being passed on to consumers. The cost of a "basket" of nutritious foods would be established and monitored. Retailers that unjustifiably raised the price of these goods would be removed from the Food Mail Program.

Staging Points

The delivery process is also of concern. Central points are used for collection of supplies to be forwarded under the program (Val d'Or in the east, Churchill in central Canada and Yellowknife in the west). These staging points are not necessarily the shortest flying distances to some of the communities served under the Food Mail Program. Val d'Or, for example, is the staging point for the vast majority (90%) of the perishable food shipped via the Northern Stage Mail program. In some cases other staging points would be closer, such as Churchill for the communities of Igloolik, Hall Beach, Kugaaruk, Taloyoak, and Gjoa Haven. In addition, some major centres that act as airline cargo hubs, such as Ottawa, Winnipeg or Montreal, would be more efficient points of origin.

Although the location of the mandatory staging points

was a common issue in consultations with some stakeholders, DIAND's published documents state that no written request for a change to, or addition of, staging points has been received since 1996. DIAND records that an oral request for designating Yellowknife as a food entry point for Rankin Inlet was turned down due to increased cost.

Program Benefit & Dependency

Currently, only 7% of Food Mail volume is sent to central Nunavut and 13% to western Nunavut. Analysis of the freight rates for central Nunavut and western Nunavut indicate that this is because there is no advantage for these areas to avail themselves of the benefits of the Food Mail Program.

Among the Nunavut communities, Sanikiluaq is unique. The experience of persons living there is that the Food Mail Program is more expensive than air freight for their typical shipments. Communities in Quebec, including many that are much further north than Sanikiluaq, pay only \$1.00 per kilogram by Food Mail for non-perishable and non-food items. As Sanikiluaq is considered to be part of shipments to Nunavut, the price to ship the same type of goods by Food Mail to Sanikiluaq is more than double at \$2.15 per kilogram despite its relatively close proximity to the distribution point at Val d'Or. Normal air cargo is less expensive for Nunavummiut in Sanikiluaq but several times the cost paid to ship food to nearby Quebec communities.

Future of the Program

The Federal Government has stated its commitment to the program as a means of achieving long-term food security in isolated and northern regions. Following the capping of federal funding in 1996, DIAND invited provincial and territorial Governments to contribute financially to the program.

While much of the Food Mail cargo traffic is carried on dedicated freighters from the south, particularly in the east, all of the freight is carried under contract to Canada Post. Indian and Northern Affairs Canada has previously expressed interest in discussing transfer of the management of the food mail budget to the GN.

2.8.3 Federal Government

A number of Federal Government departments have been identified as having a presence in Nunavut including staff that would have air travel and cargo requirements. The following departments were identified. Specific demand figures are difficult to obtain and the determination of total quantities will take place during department by department consultation with respect to participation which will occur when the preferred contracting strategy is approved for discussion outside the GN. An overall transportation purchase policy issue may have to be discussed with the central travel policy organization in Ottawa, namely the Treasury Board.

Table 2.6 - Federal Government Presence in Nunavut

Department/Organization	Locations
Customs & Revenue - Immigration - GST - Customs/Border Services	Iqaluit
Parks Canada	Iqaluit, Pangnirtung
Canada Post Corporation	various
Canadian Broadcasting Corporation	Iqaluit, Rankin Inlet
Human Resource Development	Iqaluit
Citizenship & Immigration	Iqaluit
Correctional Services Canada	
Environment Canada - Canadian Ice Service	Iqaluit
Federal Courts of Canada	Iqaluit
Fisheries & Oceans - Canadian Coast Guard - Fisheries Management	Iqaluit, Rankin Inlet, Cambridge Bay
Health Canada - First Nations & Inuit Health Branch	
Indian and Northern Affairs	Iqaluit, Rankin Inlet, Kugluktuk
Industry Canada - Aboriginal Business Canada	
Justice Canada Crown Attorney	Iqaluit
Members of Parliament	
National Defence - Marine/Air Search & Rescue - Northern Command - Air Command (FOL) - North Warning System (NWS)	Various
Natural Resources Canada - Geomatics Canada	Iqaluit
Public Works and Government Services Canada	Iqaluit
Senate of Canada - Senator	
Royal Canadian Mounted Police	Various

2.8.4 Inuit Organizations

Inuit organizations were approached to request information on the number of trips that are taken and quantities of cargo that are shipped in a year to serve as an indication of the possible benefits if the organizations were to pool purchasing with the GN. Those that have responded to requests indicate a relatively low level of air travel and reported only travel for regular meetings of the organization.

Once the specific contracting strategy is defined and the benefits quantified, it is probable that these

organizations would then be more amenable to participation in the contracting process. Presentations and negotiations are, therefore, a later step in the contracting strategy.

2.9 Total Demand

Based on the preceding assessment, the estimated demand within Nunavut for passenger and cargo services is as follows:

Table 2.7 - Annual Demand Summary

User	Passenger scheduled round trips	Passenger charter hours	Cargo tonnes
Government of Nunavut (direct)	24,000	unknown	150
Food Mail	0	0	5,000
Polar Continental Shelf Project	0	1000 rotary/fixed	TBD
General population	82,000 (not incl GN or medical)	negligible	5,500
Medical travel	20,800	8,200 trips	0
Federal Government	TBD	TBD	TBD
Inuit Organizations	TBD	TBD	TBD
Totals	126,800		10,650

3 Air Services Issues

3.1 Community Consultations 1999 - 2000

Consultations were held with community representatives and with the public as part of the research for the Nunavut Transportation Strategy in 1999 and 2000. All communities were consulted using a community-based facilitator process. Reports were submitted from 18 communities, 2 high school classes and the Nunavut Organization of Municipalities.

The consultations covered all modes of travel: air; marine and surface. The air mode of transportation received more attention than any other. The consultation comments on air transportation are summarized below.

From the received comments, most communities agreed that:

- air and sea transport is too costly (16 communities commented);
- staff in all transportation facilities should be able to communicate in Inuktitut (14).

Several communities agreed that:

- some airports should be relocated (9);
- sympathy travel should receive greater consideration (9);
- some runways should be extended (7).

The principal matters regarding air transport raised in meetings are summarized below.

Cost

Cargo and airfare costs are too expensive. There were many suggestions made at the meetings regarding how to reduce costs including increasing the subsidies on fuel, using newer and bigger aircraft, separating cargo and passenger flights, encouraging more competition, and having a government owned airline.

Language

The lack of Inuktitut speaking staff was raised in 14 consultations. The language problem, in particular, appears to be a primary concern in air transportation in

comparison with the other modes of transport. It was requested that airline representatives should be able to communicate with their clients and passengers in the language of the passenger including written material. Airport signs and general airline information in the terminal and on the aircraft including safety information should also be available in Inuktitut. It was noted by those present at the meetings that some unilingual Inuit were unaware of alternatives while travelling because of communications barriers.

Compassionate and Medical Travel

Travel in the event of death in the family or necessitated to accompany or attend a sick relative travelling to a hospital for treatment was raised frequently. The main complaint was cost, although it was acknowledged that both major airlines serving Nunavut offer at least a 50 percent reduction in such fares.

Jet Service

Only five communities requested jet service. Newer aircraft and more frequent service were more common requests.

Direct Flights

Improved east-west connections, particularly when flying to Iqaluit, were requested in 5 communities. Few and inconveniently timed connecting flights between communities necessitating stop-overs add considerably to the expense of trips to and from the capital.

Technical Issues

Some participants and respondents showed particular interest or expertise in technical matters relating to the provision of air services and facilities. The state of airport and runway conditions was discussed at 11 meetings. Issues included the desire for longer, wider, and relocated runways, improved safety facilities, increased staff training at airports, improved landing aids, and compliance with restrictions of Nav Canada regulations.

Emergency Services

Concern was expressed with regard to access to emergency transportation search and rescue. Although an issue relevant to all modes, it was most commonly associated with air transportation. Participants recommended that vehicles, ranging from aircraft to

boats, be based in the communities for emergency use.

Service Issues

Listed below are select quotes from anecdotal experience recounted at the public meetings. Most of these are service related issues:

- "Mail is bumped due to lack of space on aircraft (Pangnirtung and Grise Fiord);
- Runway is in a dangerous location in community (Pangnirtung);
- Fresh produce arrives late (7 communities);
- Intoxicated passengers (Igloolik);
- Hazardous materials on passenger flights (Igloolik);
- Emergency action plan lacking in airport personnel (Igloolik);
- New employees not qualified for emergency preparedness (Igloolik);
- Arrival times changed without notice to community (Igloolik);
- Too cold on air planes in winter (Taloyoak);
- Holding food cargo in Iqaluit too long (Qikiqtarjuaq);
- Landing area needs improvement to meet safety standard (Qikiqtarjuaq);
- Treat Inuit and others equally regarding reservations (Cape Dorset);
- Not enough safety gear on board aircraft (Dorset school);
- Pilots hardly explain safety procedures to passengers (Dorset school);
- Not trusting the airlines when they say aircraft fully booked (Grise Fiord);
- Overloaded planes (Grise Fiord);

- Why does food mail cost more for Sanikiluaq than northern Quebec;
- Airline does not handle dangerous goods and medical lab samples with enough care, e.g. blood samples destroyed sitting in cargo warehouse (Kugluktuk);
- Safety messages in flight are not in language of local people (Kugluktuk);
- Cargo is quite often bumped in favour of alcohol (Kugluktuk);
- Local airline agent does not notify you when goods arrive (Kugluktuk); and,
- Airport safety equipment in communities is inadequate (Mayors).

Results from the recent 10% sample of all Government of Nunavut employees reaffirm the key issues with the current commercial air transport system that were raised during the NTS consultations. Consistently expressed concerns include:

- costs of air travel are too high given the distance travelled;
- a large disparity in air fares exists between regions of Nunavut;
- service frequency is also a major problem with most communities lacking daily service;
- the inability to reach Iqaluit without an overnight stay at some point enroute;
- baggage and freight are bumped far too often;
- training of staff and language skills need to improve;
- poor customer service for air cargo;
- overly expensive air cargo rates .

3.2 Community Consultations 2002

Consultation visits were undertaken in November 2002 to seven communities including two that had not returned 1999 consultation results.

Table 3.1 shows the consultation status as of the end

of 2002. Efforts continue to obtain community comments from the remaining communities.

Summary comments from the communities visited in 2002 follow.

Table 3.1 - Community Consultations

Community	1999	2002	Community	1999	2002
Arctic Bay / Nanisivik	•		Kinggauk		
Arviat		•	Kugaaruk		
Baker Lake			Kugluktuk	•	
Cambridge Bay		•	Pangnirtung	•	•
Cape Dorset, Cape Dorset Youth	•		Pond Inlet	•	•
Chesterfield Inlet			Qikiqtarjuaq	•	•
Clyde River	•		Rankin Inlet	•	
Coral Harbour	•		Repulse Bay		
Gjoa Haven		•	Resolute Bay	•	
Grise Fiord	•		Sanikiluaq	•	
Hall Beach			Taloyoak	•	•
Igloodik	•	•	Umingmaktok		
Iqaluit	•		Whale Cove		
Kimmirut, Kimmirut Youth	•		Nunavut Association of Municipalities	•	

Pond Inlet

There are community plans to build a destination resort hotel and conference centre in Pond inlet and the community leaders are pressing for improvements to the airport infrastructure to support jet aircraft using a paved runway. The 20 year vision for the community includes a proposal that Pond Inlet, rather than Resolute Bay should be the most northerly strategic airport to support polar air traffic. Pond Inlet residents are related to residents in many other communities on Baffin Island and in Greenland and travel for visits or bereavement is becoming more difficult as connections are deleted. Residents feel that there should be ways of financing air tickets, especially for bereavement travel, on a down payment now, pay the rest later basis. A biweekly circle route was suggested that

would stop at Cambridge Bay, Resolute Bay, Pond Inlet, Rankin Inlet and Iqaluit. A study is currently under way to identify airport requirements for the community.

Pangnirtung

The community wishes to relocate the airport to reduce municipal planning problems and to improve the airport capability in hopes of allowing service by newer, more comfortable aircraft. Community members complained that removal of services beyond Qikiqtarjuaq has made it very difficult and expensive to make trips to Pond Inlet, Arctic Bay and Resolute that are desired by residents. A study is currently under way to identify a new airport location for the community.

Qikiqtarjuaq

Recent schedule changes prevent Inuit in this community from trading effectively with their northern neighbours, or visiting relatives in Pond Inlet, only 400 kilometres away. The scheduling of flights to the community via Pangnirtung puts the community at the mercy of the weather and operational restrictions at this more restricted airport further south. The community would also like to see new air routes to Greenland opened up. Due to contract difficulties in negotiations with Community Government and Transportation, local maintenance and CARS contracts were released, citing pay rates and lack of infrastructure investment, particularly with regards to the need for airfield fencing.

Igloolik

The community's biggest concern is the lack of air links to Kivalliq and Kitikmeot, and the high cost and complexity of air travel to reach relatives in Repulse Bay just to the south. Charter services are no longer based close enough to the community to warrant using them. Nunavummiut often turn to overland routes. Kenn Borek Air's new route linking Igloolik to Pond Inlet should be extended to Arctic Bay, but the aircraft's limited size hampers the carriage of cargo. Nunavummiut cannot afford the excess baggage charges. Community concerns also centre on the increasing ticket prices on the major airline and ineffective scheduling. They would like to see an overnight aircraft stay that would enable an early flight out with better connecting opportunities, particularly for medical patients.

The community would also like to see a longer runway and larger terminal, in order for the airport to be better positioned within the territory, particularly as it has become a regional centre of government.

Gjoa Haven

Problems faced by the community stem largely from the lack of non-stop service to Iqaluit. It takes 2-3 days to reach the capital from Gjoa Haven and costs upwards of \$5,000 per person. Chartering costs should be shared by the government and the community when meetings in Iqaluit are required. There should be a direct link to Igloolik from which flights to the capital are available. There are no direct links with Kivalliq where many residents have relatives, requiring connections in Yellowknife at great time and expense. A common thread in these community discussions is that the local residents feel they are at the mercy of the major carrier

and its priorities further south. Weather and mechanical delays and frozen cargo are major headaches. The annual sea-lift is too limiting and air cargo is too cumbersome and costly. Cargo has to be prepaid as there is no warehouse or receiving facility. Last minute medical patients are often bumped by those with reservations or by cargo. Suggestions were made to provide separate cargo and passenger flights. The terminal building needs replacement while it was felt that a longer runway would enable larger aircraft and even overflight diversions.

Taloyoak

The loss of connections to Kivalliq with Kivalliq Air's recent schedule change is disheartening. The Nunavummiut will have to revert to travelling overland to reach relatives to the south. To reach Iqaluit a connection via Yellowknife is the most feasible. There are other connection possibilities but they may require either one or two additional overnight stays enroute. It was suggested that a route be opened up to Igloolik in order to permit connections from there to points further south and east. Lack of infrastructure, particularly a longer runway, is seen as a key limitation to economic development. The community feels it is at the mercy of an airline whose management is located outside the territory.

Cambridge Bay

The community's main desire is to see the runway lengthened and paved, and the installation of proper landing aids. There is no airfield emergency response service which prevents the airport from handling emergencies. A new community emergency response vehicle capable of also handling airport emergencies, along with proper training, would alleviate the present limitations.

Arviat

The community has recently completed a study and preliminary feasibility study for the extension of the runway at Arviat from 4,000 to 5,500 feet to support 737-200 jet aircraft operations. The goal is to improve the capabilities of the airport to attract more frequent operations with larger aircraft and hence to improve the attractiveness of the community for further commercial development. Arviat is on the route between Kivalliq communities and the south and currently has high frequency service but by smaller aircraft. The community wants larger aircraft services.

3.3 Medical Travel Contracting

The recently issued Request for Proposals (RFP) for the provision of medical travel services within Nunavut and to the south includes a number of specific social issues improvement goals that are very similar to the NAS goals.

The Nunavut Air Services (NAS) study has broad goals for social issues improvement through implementing air services bulk purchasing within Nunavut. These goals are directed towards improvements in government-funded travel and also towards improvements in air travel for the general population of Nunavut. The majority of these high level goals flow directly from the Bathurst Mandate and from the Nunavut Transportation Strategy.

The following table provides a comparison of the goals that have been defined for the NAS and for the medical travel RFP. There is considerable overlap between the two initiatives. The NAS goals are generally more strategic, however very specific service level goals similar to those in the Medical Travel Services RFP may be specified in the NAS RFP documents where appropriate.

3.4 Strategic Issues for Resolution

Many problems and issues with respect to air services were identified in the Nunavut Transportation Strategy (NTS) and have been re-confirmed during consultations on the air transportation contracting strategy.

Approximately 70 opportunities for improving the on-going situation were described in the NTS. Table 3.3 identifies those most suitable for further consideration in the air transportation contracting process:

A number of options exist to resolve the identified issues and to make improvements in the air services system in Nunavut. The following chapters identify these options.

Table 3.2 - Comparison of Social Goals

Medical Travel RFP	Nunavut Air Services Objective
Improving scheduled airline services throughout Nunavut and in particular, points between Nunavut communities:	Nunavut should have safe, efficient, adequate air transportation services at reasonable prices to foster healthy communities, unity and self-reliance.
	<ul style="list-style-type: none"> - Reach Iqaluit in 1 day from any community - Shortened travel times
	Seamless, essential airline services to all communities
Reduced ticket prices	More equitable fares (less disparity across regions).
Staff and agents must be professional and demonstrate a caring and helpful attitude toward people with disabilities	Better customer services
Hot meals on flights over 2 hours	
Multi-lingual services	Courteous bilingual services
Washrooms on flights over 1 hour	Modern, efficient aircraft
Aircraft proposed must be easy for people with disabilities to board	
	More direct and nonstop flights,
Reduced “bumping” of passengers	More frequent air services than today
Support local businesses and Inuit employment	Increased Inuit employment and training
Scheduled medical travel services from Nunavut south	Comfortable, efficient and daily passenger and air cargo services from southern Canada through several gateway airports
	Cargo service improvements would include: <ul style="list-style-type: none"> - lower and more equitable shipping costs, - timely service, - reduced damage and delays, - better customer service.
	Helicopter services are available in every geographic region all year
Proponents are encouraged to offer solutions that may not be identified in the Request For Proposal	Proponents will be encouraged to offer innovative proposals that will result in service improvements

**Table 3.3 - Opportunities for Improvements
Nunavut Air Services Strategy**

1. There are opportunities to improve transportation system service access, frequency and comfort for Nunavummiut.
2. There is an opportunity to increase employment of Nunavummiut in the transportation sector.
3. There is an opportunity to ensure that transportation service offerings are fully bilingual.
4. There is an opportunity to ensure that all transportation projects include a training element.
5. An opportunity exists to potentially lower air travel costs through a more appropriate matching of capacity to the actual level of territorial demand. This may be difficult to achieve with seven privately owned air carriers operating in a largely sponsored travel market.
6. An opportunity exists to offer separate passenger and cargo flights and services in Nunavut in the future. Consequently, different aircraft types could be used for passenger and cargo services facilitating improvements in the types of aircraft currently serving the travelling public as well as the employment of cargo aircraft more specifically adapted to that role.
7. An opportunity exists to improve service standards and levels through rationalization of the number of carriers operating in a series of niche markets.
8. There may be an opportunity to positively influence aircraft costs and achieve more equitable airfares in Nunavut through the rationalization of the number of carriers serving niche markets with diverse fare structures.
9. There is an opportunity to take advantage of fleet replacement needs to improve air services in Nunavut.
10. Changes in helicopter contracting procedures and improvements in support facilities provide an opportunity to increase the number of helicopters available year-round in Nunavut
11. An opportunity exists to upgrade air service throughout an entire region, by selectively improving the most restrictive airports allowing newer aircraft to serve the entire system economically.
12. An opportunity exists to improve safety at many of Nunavut's airports by investing in physical infrastructure developments, such as widening runways and aprons, which will alleviate some of the current hazards.
13. Despite the benefits of gravel runways, an opportunity to facilitate air service improvement exists if a greater number of runways were paved, especially at the hub airports such as Cambridge Bay and Resolute Bay.
14. The Food Mail Program provides an opportunity for the Government to encourage air carrier rationalization in Nunavut.
15. An opportunity exists for the Government of Nunavut to assume responsibility for the majority of the Food Mail Program.
16. There is an opportunity to facilitate air carrier modernization by reducing unnecessary steps in the Food Mail process.
17. The Transportation Strategy provides an opportunity to improve accessibility and usefulness of the food mail program in Nunavut.
18. There are opportunities to improve access to transportation services by travellers with disabilities. Barrier-free access should be a design criterion wherever there is demonstrated need in new facilities.
19. Location of decentralized government centres may present opportunities in using government travel and related budgets to influence the service providers in the policy directions preferred by the Nunavut Government.
20. There are opportunities for public/private partnerships and other negotiated approaches to allow for public use and or more efficient location of transportation infrastructure ensuring maximum benefit for local residents.

4 Proposed Air Service System

As described in Chapter 1, there are a number of options for effecting improvements in Nunavut air services. Whichever strategy is used, there are trade-off considerations including the impact of air carrier business economics decisions.

Improvements to Nunavut's air services which may be triggered by the GN may lead to partial restructuring of the current system.

Competing air carriers will be encouraged to address different approaches to delivering air services which will involve trade-off decisions with respect to:

- service patterns and routings,
- number of stops,
- passenger and cargo payload combinations,
- aircraft size and propulsion,
- flight frequency,
- fare structures and
- the ability to provide essential air services in uneconomical markets.

These service options, along with techniques for assessing the impacts of various air carrier response strategies are considered in the following sections.

4.1 Service Options

4.1.1 Service Patterns

In widespread use today, the hub and spoke system was devised because it presented airlines, operating in a deregulated environment, the opportunity to reduce operating costs. Hubs enable airlines to consolidate origin and destination traffic on a single hub to spoke flight. The resulting benefits include higher load factors, the same number of destinations served with fewer flights (therefore fewer ASKs), lower total costs, higher frequency of service or larger aircraft, and lower unit costs (with larger aircraft).

Operationally, hubs enable airlines to operate centralized facilities thus consolidating, and, in theory, reducing systemwide expenditures. Airlines benefit from centralized crew and maintenance bases, simpler scheduling and aircraft rotations, the operational flexibility to swap aircraft or crews, and economies of scale.

From a marketing standpoint, hubs permit greater network coverage (ie. more connections to destinations), since one flight actually serves a number of destinations via the hub. The hub itself creates high visibility for the carrier, while permitting higher fare yields on hub to spoke flights.

Hubs do, however, present other challenges for an airline which should not be ignored. Operationally, weather and delays at the hub can create a domino affect throughout an entire network. Congestion can be an issue compared to decentralized operations putting significant demand on airport infrastructure. Aircraft utilization tends to be lower in a hub and spoke model. All of these factors can negatively affect revenues. From a marketing standpoint, passengers prefer to avoid hubs unless of course the hub is a prime destination unto itself. For the above reasons the world's second largest airline, American Airlines, recently began experimenting with a "de-hubbing" network model in the United States. Prompted by chronic congestion, delays, and inefficient "banking" of large numbers of flights each day at Chicago and several other large hubs, the airline is claiming improved operating benefits as a result of "de-hubbing."

The unique operating environment of Nunavut, with its long, thin network, presents both an economic and operating challenge to the hub and spoke concept. Route maps may suggest that Iqaluit, Rankin Inlet and Cambridge Bay are hubs, although they are merely focal points in the Nunavut air transportation system. Flights that merge at these centres offer only limited same-day connections to other communities. It has become commonplace for travelers desiring connections to other destinations throughout the territory to endure an overnight stay at the intermediate point, in addition to requiring a change of airline. The lack of connectivity and the lack of through fares in many markets creates poor trip quality and increases the costs and delays associated with travel. Nunavut's airlines therefore do not benefit from the higher load factors, high network connectivity, lower total costs, nor higher frequency of service which are hallmarks of this model.

Given the long, thin nature of Nunavut markets, adopting a pure hub model with complete connectivity on a daily basis may appear unrealistic. In theory, an

enhanced hub concept will improve Nunavut's air services. By re-examining the way in which aircraft are scheduled, and the fleet types employed, more connections become possible in a given day. This might apply for south to north traffic, as well as north to south, and even intra-territory demand (the latter being virtually impossible at present). A similar strategy might be adopted for air cargo, irregardless of whether or not it travels on the same aircraft as passengers. Militating against the hub strategy, however, are the long distances to be traveled to spoke destinations, and the low demand for travel to each destination.

At present, under the quasi point-to-point route structure in Nunavut, aircraft productivity is low which in turn drives up operating costs. High productivity is difficult to maintain in an extended network, where communities are separated by great distances, low flight frequency exists, and passengers are reluctant to travel outside weekday business hours. Low aircraft utilization means aircraft ownership (or leasing costs) must be amortized over longer periods. More efficient use of aircraft equipment, and people, will lower unit costs.

A unique "made for the north" solution will be sought from industry that accomplishes a number of goals:

- a) Delivers greater network connectivity for passengers and cargo leading to better customer service
- b) Offers more equitable fares which airlines can afford to charge
- c) Takes advantage of existing infrastructure, while minimizing capital outlays on new equipment
- c) Improves aircraft productivity.

An improved service pattern will be request from the industry.

4.1.2 More direct flights with fewer legs

At present, the vast majority of routes in Nunavut are operated as multi-stop itineraries, owing largely to the fact that aircraft capacity exceeds that of the market. Since an aircraft often cannot be filled at one point along the route, it must make a number of enroute stops in order to justify the service. This places a considerable financial burden on the airline. Furthermore, wear and tear on aircraft, through increased numbers of cycles (takeoffs and landings) increases maintenance costs. These costs are passed on to the consumer.

From a passenger service standpoint, multi-stop itineraries cost time and money. They also increase the route travel time, and limit connection opportunities in a given day.

They are however usually an initial point of entry for airlines attempting to open, or expand, service to a particular destination. As traffic on the multi-stop route increases, airlines begin converting some services to non-stop flights to a larger point or to a hub. This situation may be observed on Baffin Island. First served by a circuitous scheduled Twin Otter service operated by Nordair, then Survail, the route grew under First Air with the introduction of the larger HS-748. The single-circuit route was first divided into two separate services originating from Iqaluit, and the airline is now considering direct, non-stop service to points like Pond Inlet if traffic continues to grow at current rates. While improvements might be sought to eliminate certain multi-stop itineraries, certain routes may simply not justify direct service, even with smaller aircraft, given the desire to improve flight frequency.

4.1.3 Cargo / passenger mix

Since airlines act as the primary means for re-supplying Nunavut communities with the necessities of life, the smooth flow of goods from south to north is essential. The Nunavut Transportation Strategy identified the challenges of the current combi aircraft operation. Lengthy shipping schedules, in-transit delays due to poor schedule coordination, and bumped freight create headaches for shippers, and result in inferior quality products to end-users.

Much of the freight that flows into Nunavut from the south is basic commodity type goods. As such, they have a relatively low value as compared to freight which commonly travels by air elsewhere on the continent, for example computer equipment, exotic flowers, important documents, etc. Low value northern shipments are by and large sent via general cargo rates and hence command low yields for the airlines. Since the airlines recognize that passenger yield will be higher than freight yield they will seek to fill aircraft with as many people as possible before fixing the divider between the cargo and passenger compartments. While this provides a degree of flexibility to the airline, it does not leave much room for last minute freight shipments, and can on occasion result in freight being displaced from flights.

Since cargo cannot be transported to Nunavut by sea during the winter months, cargo shipped by air is ever

the more vital, requiring a high degree of reliability. Surveys of Nunavummiut have indicated that freight service reliability must be improved.

A number of optional strategies may be identified. These include separating cargo from passenger flights, employing the use of quick-change aircraft and increased overnight cargo shipments, and increasing frequency of service. Any of these alone may bring improvements in aircraft utilization.

Containerized handling systems which are compatible between larger and smaller aircraft is another possibility. The goal under any scenario would be to shorten handling times and lessen the chance of time-sensitive freight being bumped from flights. Improving cargo flows to communities in theory would help spur economic development that could lead to higher return (north-south) freight volumes. Under the status quo this is unlikely.

One of the challenges identified in putting replacement jet combi aircraft into service is the issue of federal government certification. Newer more stringent legislation surrounding the certification of new combi aircraft relates to cargo fire suppression in the cabin. This new legislation poses a serious challenge to manufacturers such as Boeing and Airbus, which are currently unable to offer a profitable design that would suitably replace the Boeing 737-200 and 727-100 / -200 combi aircraft. A B757 combi model has been produced and two are currently operating in China. A B737-700 combi is offered by Boeing, but there have been no commercial orders for the jet as yet (only military), owing primarily to the fact that airlines would have to install costly fire-suppression equipment and carry a third front-end crew-member whose sole purpose would be to extinguish a fire, according to new regulations.

The designation of Iqaluit and Rankin as central freight distribution hubs, particularly for the Northern Air Stage Program, should be explored. In so doing, advantages may be gained through economies of scale and increased employment for Nunavummiut. Serious consideration should be given to staging out of southern hubs instead of Val d'Or and Churchill. Since food mail represents 25-30% of all air cargo destined for the north, consolidating it with the remainder of northern cargo could help justify larger, newer, more efficient aircraft. Also, fewer stops enroute will reduce add-on fees and fuel charges.

4.1.4 Aircraft Propulsion and Size

The current pattern of equipment use in Nunavut centres on combi-configured jet aircraft of B727/ 737 size plying

long south-north trunk routes, and selected medium haul routes out of Iqaluit, Rankin Inlet, and Cambridge Bay. The major limiting factor for these jet aircraft operations within Nunavut is airport facilities. Only runways at Iqaluit and Rankin Inlet are paved, and jet operations are subject to restrictions at Rankin Inlet and Cambridge Bay, owing to runway length. Other gravel airports that support jet aircraft include Resolute and Nanisivik. A limited number of jet aircraft types are certified for gravel operations, and this limits the introduction of other main-line types as replacements, as well as regional jets.

Most jet aircraft certified for operation at Nunavut airports includes earlier generation models with higher operating costs than their younger brethren. As such, airlines limit jet flight schedules, preferring to operate them only a handful of days per week when demand can be consolidated onto a given flight. This is to the detriment of customer service. Turboprop aircraft, while more cost effective on long, thin routes, often face payload/ range penalties when operating on longer stage lengths. Single engine turboprop equipment, although potentially the most cost effective solution on many routes, face further constraints due to limitations of operating under single engine instrument flight rules, as well as safety concerns.

Note: The operational modelling contained herein uses cost and demand assumptions, derived from a various industry sources, commercial databases and published norms for the North American industry. These assumptions and their degree of applicability to Nunavut's unique operating conditions have been and are continuing to be confirmed during northern air carrier consultations. However individual airline operating costs may be subject to differing

A sample comparison of hourly operating costs for a number of aircraft operating in Nunavut is given below (in \$Canadian):

Jets	
B727-200:	\$8,779
B737-200:	\$8,241
Turboprops	
HS-748:	\$3,918
ATR-42:	\$3,090
Saab 340:	\$2,324

One of the major challenges of operating large aircraft in Nunavut, jet or turboprop, is that available seat kilometres-ASKs (the measure of capacity in the market) tend to outpace revenue seat kilometres- RSKs (the measure of demand in the market) due to limited demand. This commonly results in thin operating margins. As such, the problem of jets vs turboprops must also consider aircraft size. However, larger aircraft do promote lower unit costs, which are more desirable.

While newer generation jet aircraft are available, and some are right-sized for the Nunavut market, most are not suited to gravel runway operations which predominate in the territory. There are exceptions, however, and their suitability for the market can be demonstrated. For example, the BAE-146 combi, for which a number of examples were produced and used in remote parts of the world including Alaska and the Aleutian Islands. Furthermore, some routes in Nunavut currently served with jets may in fact be more efficiently served with turboprop equipment, especially if this were to result in greater flight frequency.

Whilst not always practical for passenger operations over longer distances, single engine turboprop aircraft may be effective in operating very short flights as well as selected cargo runs to communities due to their economics.

The Nunavut Transportation Strategy pointed out that current jet aircraft serving the territory would have to be phased out of service over the next decade. Surveys of Nunavut air travellers have tended to indicate that they do not have a preference between jets and turboprops so long as service levels are improved overall.

Implementation of the Nunavut Air Services Strategy is an opportunity to propose and develop the use of different

aircraft types, with the aim of improving service for all users.

4.1.5 Schedule frequency

One of the key issues in air service improvement in Nunavut is that of flight frequency. Due to low demand, and given the aircraft types operating the routes, airlines generally pool demand by operating a handful of flights per week. In a purely competitive market, market share is determined by frequency share. In Nunavut, where more than one carrier operates a route, flights tend to be scheduled at similar times on the same days. This gives the illusion of real competition since no carrier is willing to provide service on off-peak travel days.

A combination of the right-sized aircraft and greater frequency where appropriate is desirable in order to achieve some of the aims of the Nunavut Air Services Study. Increased flight frequency will permit same-day connections, and achieve the stated goal of being able to reach Iqaluit in a day from anywhere in the territory. Decreased frequency means either a reduction in aircraft size, a reduction in the number of carriers, or both.

4.1.6 Fare structure

For many of the reasons previously noted, the cost of air travel in Nunavut is much higher than in southern Canada. These operational realities weigh heavily on the airlines ability to offer the kinds of discount airfares commonplace in other parts of the country. A number of issues regarding airfares in Nunavut are worth considering.

Where real competition does exist, fares are virtually identical. However, service levels (eg. aircraft size) may vary widely between carriers and serve only to add to travellers' general frustration.

The costs of travelling within the territory currently vary greatly between regions. The figures below demonstrate the disparity in average fares charged per kilometre across the territory.

Region	\$/Km
East (Qikiqtaaluk)	0.65
Central (Kivalliq)	1.13
West (Kitikmeot)	0.87

Ironically, while the communities of Kivalliq enjoy more

frequent service by up to three different air carriers, average airfares in the region are by far the highest in Nunavut. Among the controllable factors that may account for this disparity are such things as differing average stage lengths amongst the three regions and the types of equipment used. In Kivalliq, because distances between communities are shorter and average aircraft size is smaller, costs per available seat mile are higher. In the east the average stage length is longer while aircraft size is larger, thus resulting in lower unit costs and lower average fares per kilometre. However, on directly comparable routes, air carriers in Kivalliq were found to be charging more than other carriers in Qikiqtaalik.

In order to eliminate some of the disparity in fares, longer stage lengths should be explored for Kivalliq as well as consolidation of services into a single regional fleet-type and carrier. One possible solution would be to operate more direct routings and fewer short community hops. In Nunavut, one carrier recently established a new simple fare structure, while another two have simplified fare structures in order to compete. The remainder have more complex fare structures.

Unlike goods sold at retail, airline seats are subject to spoilage the moment they leave the gate empty. This is lost revenue that cannot be recaptured another day. Most airlines practise revenue management, by which they offer a range of fare products in order to appeal to various propensities to pay. Different travellers place different value on a seat, depending upon whether or not they reserve in advance or not, are travelling for business and require flexibility, or are travelling for leisure. By offering a range of fare products with different restrictions, airlines have found that they can fill a greater number of seats on an aircraft. It is not unusual, therefore, for two people travelling in the same class of service to have paid vastly different sums for their seats.

Because this practise has often lead to airlines being accused of price discrimination, a number of carriers have begun exploring new initiatives that, while reducing the number of fare types offered, still prevent revenue erosion. The outcome of these initiatives is still being weighed. Complex fare structures should not necessarily be viewed in a negative light. Rather, they may be necessary in order to cater to different sectors of the travelling public, and act as a marketing tool, especially on such long/thin routes. Modern revenue management techniques are recommended in order for Nunavut carriers to cater to the various sectors of the travelling public more effectively.

It is evident that some of the carriers in Nunavut do not use revenue management techniques. There may be a

hesitancy among smaller operators to adopt revenue management systems, since the revenue benefits they bring may be overshadowed by perceptions of high acquisition and training costs. Another factor dissuading some carriers may be that because air travel is an essential service, passengers simply put up with high fares because they have little choice. This logic is no longer acceptable.

Any proposed changes to the existing fare structure in Nunavut should take into account the current disparity between fares across the three regions of the territory, the current cost of operation, proposed changes to fleet planning, route planning, and scheduling, as well as what may be deemed an acceptable or necessary rate of return under any contracting option (if applicable).

4.1.7 Essential Services

The United States Essential Air Services Program (EAS) serves as a potentially useful model in addressing some of the key impediments of the present Nunavut air service network. The interests of communities which require regular links to the outside world, but which owing to economics cannot be justified on their own, are protected against loss of, or poor levels of service under the U.S. Essential Air Service Program. Carriers which operate EAS flights must adhere to government regulation, in the form of controls on frequency and equipment type, as well acceptable fare levels and profitability. As such EAS was conceived for a post deregulation world where regional inequities are often overlooked by the free market.

A number of routes in Nunavut which have either been dropped by air carriers, or are presently not served, might qualify as essential air services. In the sections that follow, selected routes are analysed in order to determine their viability. Routes were selected based on community consultations and the Government's decentralized operations.

Some stem in large part from the Government's decentralisation drive. These routes may include, but not limited to, direct flights from Iqaluit to Cambridge Bay, Yellowknife, Sanikiluaq, and Greenland, as well as more service along portions of Baffin Island.

A full EAS program for Nunavut similar to the US would be subject to federal government regulation. Currently Ottawa has indicated its reluctance to become involved in air service development. However, many of the caveats apparent in the EAS regime might be adopted by the Nunavut Government in contracting for one or

more types of air services. Transport Canada has indicated that in principle it would not object to such measures. Furthermore the recent agreement signed between the Quebec Government and Air Canada Jazz, guaranteeing service to smaller communities in that province, is worthy of analysis.

4.1.8 The Quebec Government/Air Canada Jazz Agreement

Certain elements of a recently concluded agreement between the Quebec Government and Air Canada Jazz serve as a potential model for Nunavut. They include lower fares in return for increased government patronage, provision of services deemed “essential”, and steps to improve language services. Among the issues demonstrated by this initiative are the following:

- Willingness of air carriers to conclude a route/service/fares agreement with a government
- Willingness to extend the agreement beyond government employees to the general public
- Ability of government to ensure services to thin potentially unprofitable markets
- Ability of government to achieve fare savings over a route network, through negotiation

Signed for a duration of 3 years, the Quebec-Air Canada Jazz agreement seeks to offer lower-priced air travel across all regions of Quebec and to guarantee the continuation of service to remote regions. Details include reductions of up to 70% off the full fare on half the seats available on intra-Quebec flights offered by the carrier. Distribution costs are lowered by the development of a simple-to-use fare table, available on the internet. Under the agreement, 50% of all seats on the flights will fall into one of four new discount levels. One-way purchases will be permitted and surcharges and taxes will be included in the ticket price in order to restrict the use of “fine print.” The agreement also provides for the maintenance of service at remote locations which were threatened with a loss of all scheduled service. In the event of a major decrease in the level of demand, Air Canada Jazz will have the right to conclude commercial agreements in partnership with other carriers. Among the selection criteria for such partnerships would be the carrier’s ability to offer discounts similar to those offered by Air Canada.

The Quebec Government and Air Canada Jazz also agreed to implement a plan of action designed to improve French language services in the province. In return for the

airline’s commitments, Quebec will indirectly assume part of Air Canada’s financial risk for undertaking the services by assuring it additional revenue to the order of \$2.5 million annually. This will be achieved mainly through increased patronage by Government employees. It will subsidize Air Canada Jazz for maintaining services at certain locations, while agreeing not to subsidize a competing regional carrier. The government also agreed to minimize its purchase of the new discount fares in order to ensure their maximum availability for regional users.

4.2 Options Analysis Approach

Options analysis is undertaken for four purposes:

1. to assess the impact of proposed changes on route feasibility;
2. to assist in determination of the appropriate clauses to be included in RFP documentation;
3. to assist the GN in negotiations with air carriers on service improvements; and
4. to assist in evaluation of proposals received from bidders.

A number of analysis techniques are used to accomplish these purposes but the most significant is the Nunavut Air Services Model (NASM). Developed in order to analyse the air transportation system in Nunavut and evaluate solutions from a network standpoint, the NASM is a comprehensive numerical spreadsheet designed to illustrate the feasibility of employing various air service strategies, given the current realities of operating in the territory.

As the number of variables in the model are essentially infinite, it is not possible to evaluate every possibility. Its major usefulness is in specific comparison of a proposed alternative to the status quo with a restricted set of input variable changes. The following sections illustrate that type of usage, demonstrate the possibilities in the use of the model and demonstrate a practical set of analysis conclusions.

Technical details on the internal operation of the model are included in Appendix A.

4.3 Viability Analysis

The Nunavut Air Services Model was used to analyse the air transportation system in the territory and develop market-specific solutions that promote better service and lower costs. Additional considerations included taking the steps deemed necessary in order to promote superior connectivity across regions.

At the heart of the model are tradeoffs between various forces; demand, cost, service level, fares, financial return and operational issues. It is through analysis of the interplay between these factors that one is able to determine an effective alternative to the status quo. The model can assess solutions that are demonstrably effective for a given route.

A demonstration of the model on a number of options for an existing route is presented below.

The route illustrated is the passenger/cargo operation from Ottawa to Qikiqtarjuaq via Iqaluit and Pangnirtung. The overall conclusion is that employing aircraft with better economics, despite reduced aircraft size, enables better service to the customer in the form of greater flight frequency, potentially lower fares, and the opportunity for

more flexible scheduling and same-day territory-wide flight connections. The examples assume all demand is carried by one airline or business organization.

For the example illustrated in the table that follows, the north-south and intra-territory route legs are evaluated given a selection of possible options. Load factor pertains to the average number of passenger seats filled on the flight, except where a passenger cargo split operation is illustrated. Frequency refers to weekly number of flights.

In order to calculate route profitability, fares or rates used in calculating passenger and freight revenue respectively were averages taken on a leg by leg basis. Passenger fares were broken down by flight leg and estimated at \$816 one way between Ottawa and Iqaluit, \$195 one way between Iqaluit and Pangnirtung, and \$132 between Pangnirtung and Qikiqtarjuaq. Similarly, for freight, average rates per kilo were used based on general cargo rates and were \$4.70 between Ottawa and Iqaluit, \$2.60 between Iqaluit and Pangnirtung, and \$4.10 between Iqaluit and Qikiqtarjuaq. The data was accurate to August 2002.

**Table 4.1 - Options Analysis Summary
Ottawa - Iqaluit - Pangnirtung - Qikiqtarjuaq**

Example	Route	Equip-ment	Freq-ency	Hourly Cost \$	Net Income \$	Load Factor %
Combi operation						
Status Quo	Ottawa-Iqaluit, round trip	B727	7	\$ 8,779	\$ 100,981	86%
	Iqaluit-Pang-(Qikiqtarjuaq), round trip	HS748	7 (5)	\$ 3,944	\$ 3,117	82% (31%)
Alternate aircraft	Ottawa-Iqaluit, round trip	B73G	7	\$ 5,284	\$ 119,430	86%
	Iqaluit-Pang-(Qikiqtarjuaq), round trip	DHC8	7 (5)	\$ 2,990	\$ 7,147	94% (36%)
Alt. aircraft/ freq.	Ottawa-Iqaluit, round trip	B757	7	\$ 8,591	\$ 101,765	40%
	Iqaluit-Pang-(Qikiqtarjuaq), round trip	CVAN	20 (7)	\$ 1,318	\$ 2,121	77% (59%)
Pax/ freight split						
1.Passenger only	Ottawa-Iqaluit, round trip	RJ70	8	\$ 5,149	\$ 57,256	76%
	Iqaluit-Pang-(Qikiqtarjuaq), round trip	B1900	9 (5)	\$ 1,955	\$ 1,766	81% (39%)
2. Freight only	Ottawa-Iqaluit, round trip	B727	7	\$ 8,779	\$ 6,935	39%*
	Iqaluit-Pang-(Qikiqtarjuaq), round trip	SF340	5	\$ 2,369	\$ 1,238	61%* (18%)

* Indicates one way load factors, since freight haul south is assumed to be negligible.

-numbers in brackets pertain to Pangnirtung-Qikiqtarjuaq flights

The alternate aircraft used includes a new generation of Boeing 737 available on the market. The aircraft's hourly operating costs are nearly half that of the Boeing 727-200 combi commonly used on the trunk route between Ottawa and Iqaluit. The Dash 8-100/200 combi demonstrated is roughly 25% less costly to operate per hour than the present HS-748. The superior economics of newer aircraft clearly produce a better bottom line. The Dash 8 combi seats slightly fewer passengers than the current HS-748 or ATR-2 and therefore some of the load factors may be marginally high. Normally this will result in denied boardings.

In the alternate aircraft / alternate frequency iteration, one notes the following. A lower load factor on the Ottawa-Iqaluit route results from the use of larger equipment, which might normally dictate lower frequency. However it is still economically viable with the existing daily frequency. The Cessna Caravan is the

low-cost leader in short haul operations to remote locations. It is a highly versatile turbo-prop capable of rugged short field takeoffs and landings. However a key trade-off here is the aircraft's single engine which is an issue given the operating environment in the territory.

Another possible means for improving air service in Nunavut worthy of consideration is to offer separate passenger and cargo flights to better suit the individual needs of the market. In this regard, freight can be flown in at night or early in the morning while the greater frequency of passenger flights enable better connections at Iqaluit. Carriers can also lower ownership costs and improve utilization by using convertible aircraft that can handle both passenger and freight roles separately.

The final iteration illustrates a split passenger/ freight operation. The Avro RJ70 is a newer version of the

popular BAe-146 quad-jet and features a B-737-like cabin. The aircraft is also suitable for gravel operations and therefore could have some practical applications beyond Iqaluit. The routes achieve profitability, but just. The main issue here is that the aircraft return southbound with little or no freight, thus affecting the bottom line. Nevertheless, fuel savings owing to lower takeoff weights (not illustrated here) should somewhat reduce hourly operating costs on these legs.

One should note that due to operational restrictions at

Pangnirtung, some of the aircraft in the above examples, such as the Saab 340 and Dash 8, if operated at maximum takeoff weight, might not be able to depart the community's current short runway. Furthermore, jets suited to gravel runways such as the BAe 146 or RJ70 cannot operate out of Pangnirtung (at present) and could therefore not be considered in the examples.

4.4 Modelling Viability of New Routes

Community consultations, government strategy, and network connectivity issues reveal a number of additional direct links are desirable. Given the operational, financial viability, and projected level of service analysis, and an understanding of fare sensitivity to equipment type, distance, and frequency, one can use the model to ascertain the viability of new routes.

Again, it should be noted that fares shown are averages. In practice, flight revenue is derived from a mix of fares owing to airline revenue management practices, and may vary from flight to flight. As such, break-even loads may be slightly understated in the following examples. Nevertheless, differences in the order of magnitude between aircraft are helpful in illustrating how some aircraft have superior operating economics over others.

4.4.1 Qikiqtarjuaq-Iqaluit

Below, a Qikiqtarjuaq / Iqaluit nonstop route is evaluated through a number of model iterations, each with different combinations of equipment and frequency. While such a route would not resolve directly the issue of linking Qikiqtarjuaq with Clyde River and Pond Inlet, by providing better service to the capital, flights could be better timed to offer same-day connecting intra-territory opportunities at less cost to Nunavummiut. Existing connections to southern points might, however, be compromised. Such a solution would provide a dedicated aircraft to the community, alleviate problems encountered with the present stop at Pangnirtung, and help promote economic development. Note for the purpose of these calculations the present average one-way fare of \$318 between Iqaluit and Qikiqtarjuaq is used (this is an average based on one-way travel and does not take into consideration proportion and seat sales).

Table 4.2 - Analysis Summary Iqaluit - Qikiqtarjuaq

Example	Route	Equipment	Freq	Hourly Cost	Net Income	Load Factor*
Combi operation	Iqaluit-Qikiqtarjuaq, round trip	Dash 8	5	2990	-118	36%
	Iqaluit-Qikiqtarjuaq, round trip	Dash 8	4	2990	1762	45%
	Iqaluit-Qikiqtarjuaq, round trip	King Air	5	1930	2260	62%
	Iqaluit-Qikiqtarjuaq, round trip	King Air	7	1930	112	45%
Passenger only	Iqaluit-Qikiqtarjuaq, round trip	Jetstream 31	5	1823	-354	42%
	Iqaluit-Qikiqtarjuaq, round trip	Jetstream 31	4	1823	836	52%
	Iqaluit-Qikiqtarjuaq, round trip	Metro III	5	1441	1326	39%
	Iqaluit-Qikiqtarjuaq, round trip	Metro III	6	1441	474	33%
Freight only	Iqaluit-Qikiqtarjuaq, round trip	Caravan	5	1318	-1802	42%
	Iqaluit-Qikiqtarjuaq, round trip	Caravan	3	1318	42	70%
	Iqaluit-Qikiqtarjuaq, round trip	Saab 340 C	3	2369	-1424	29%
	Iqaluit-Qikiqtarjuaq, round trip	Saab 340 C	2	2369	881	44%

* Load factor refers to passenger load factor only, except where a passenger/ freight split is evaluated. Freight load factor is based on a one-way movement of freight northward.

Findings:

Each aircraft type chosen is evaluated twice, in order to illustrate the sensitivity of the type to schedule frequency. The route is nearly at break even and slightly in the red with a Dash 8 combi, 21 seats, operating at an existing level of frequency. One weekly frequency might have to be sacrificed in order for the route to achieve profitability.

The Beechcraft King Air appears better suited economically to the route. Five, six, or seven frequencies would likely be profitable. Although not shown here, the freight load factor would be in the magnitude of 135% meaning this aircraft alone would not serve the community's needs and it may not be sufficiently robust to haul freight in this market.

In a split passenger/ freight operation, 4 alternative lower-cost fleet types are evaluated; Jetstream 31, Fairchild Metro III, Cessna Caravan, and Saab 340. For passengers, frequency must be sacrificed for comfort. The quieter, galley and lavatory-equipped Jetstream 31 would break even at 4 weekly frequencies, where as the Metro III would break even at 6 weekly frequencies. On the freight side, owing to little or no southbound revenue, profitability is more elusive. The Cessna Caravan, among the lowest-cost producers, breaks even with 3 weekly flights.

Meanwhile, the larger, faster and better equipped Saab 340 could be justified only twice a week. Should additional freight revenue not be generated, the community would likely see a loss of freight uplift.

Conclusions:

One would conclude from this exercise that given the right equipment and frequency, a nonstop service between Iqaluit and Qikiqtarjuaq may be viable. However analysis suggests that a split passenger and freight operation on this route is not particularly viable.

Additional factors might have to be weighed in operating such a route profitably (particularly with a passenger/freight split), including the provision of subsidies to the operator. Contractual negotiations might also include seat guarantees as a means for encouraging and maintaining service.

4.4.2 Cambridge Bay-Iqaluit

Consultations with various stakeholders within the Nunavut government as well as within Kitikmeot have questioned the present round-about-routing to Iqaluit by way of Yellowknife. The travel time is lengthy, involves an overnight stay, and is very costly. Two one-way flights, Cambridge Bay-Yellowknife, and Yellowknife-Iqaluit, together cost over \$1,000.

Findings:

Sensitivity analysis using the model enables assessment of the viability of such a route. The figures are for a single one-way flight. Fares selected to illustrate break-even points are average per-person rates based on Summer 2002 offerings by the two major carriers. The aircraft chosen are based on Cambridge Bay's present runway capability.

Table 4.3a - Analysis Summary Iqaluit - Cambridge Bay

Route	Equipment	Trip length (hours)	Hourly Cost \$	Break-even load	Break-even fare	Load Factor*
Cambridge Bay-Iqaluit	B737-200 combi	2.2	8,241	22	\$845	35%
	B737-200 combi	2.2	8,241	19	\$970	32%
	B737-200 combi	2.2	8,241	17	\$1,095	28%
Cambridge Bay-Iqaluit	BAe 146	2.2	7,010	18	\$845	18%
	BAe 146	2.2	7,010	16	\$970	16%
	BAe 146	2.2	7,010	14	\$1,095	14%
Cambridge Bay-Iqaluit	Fokker 28	2.2	5,356	14	\$845	23%
	Fokker 28	2.2	5,356	12	\$970	20%
	Fokker 28	2.2	5,356	11	\$1,095	18%

* passenger load factor

Should the Cambridge Bay runway be paved and lengthened to 6,000 feet, regional jet aircraft may be introduced on such a route. The aircraft are far more economical to operate on such long-thin routes as Cambridge Bay-Iqaluit.

Table 4.3b - Analysis Summary Iqaluit - Cambridge Bay

Route	Equipment	Trip length (hours)	Hourly Cost \$	Break-even load	Break-even fare	Load Factor*
Cambridge Bay-Iqaluit	Canadair RJ	2	3,392	8	\$845	16%
	Canadair RJ	2	3,392	7	\$970	14%
	Canadair RJ	2	3,392	7	\$1,095	14%

Conclusions

Since demand will be a major issue, the viability of this service will clearly depend on aircraft economics. The Fokker F28 is clearly the best choice in that it is presently in service in the north and can operate out of Cambridge Bay. One drawback of the aircraft is its limited cargo capability likely needed on network services using this aircraft and leading to its positioning at Cambridge Bay. However, given that most Cambridge Bay destined freight currently flows through Yellowknife and Edmonton, this might not be of major

impact. Since the present connection through Yellowknife is a two-day trip and service is offered twice a week, a nonstop flight should be offered at least twice a week, in order to fit into a traveller's decision window. In the future, should the runway at Cambridge Bay be paved and lengthened, lower-cost regional jets might be employed.

Given their superior economics, the aircraft would break-even with fewer people and therefore service might be justified more frequently.

4.4.3 Yellowknife-Iqaluit

The viability of a nonstop flight between the two territorial capitals must consider the potential effect on existing service between Yellowknife and Rankin Inlet, as well as between Iqaluit and Rankin Inlet. Freight flows between Yellowknife and Rankin Inlet, as well as between Iqaluit and Rankin Inlet remain viable, and passenger traffic was showing signs of growth between Rankin Inlet and Yellowknife through the late 1990s. However, there is little freight and less passenger flow between Yellowknife and Iqaluit.

Findings:

The average demand between Yellowknife and Iqaluit in 1999 (the last year for which statistics are available) was only 9 passengers per flight . A direct passenger route might only be justifiable with smaller regional jet types. However, the capability and overall attractiveness of such a small aircraft on what would be a 3-hour flight, must be called into question. At this time, freight sustains the viability of this passenger route.

Table 4.4 - Analysis Summary Iqaluit - Yellowknife

Route	Equipment	Trip length (hours)	Hourly Cost \$	Break-even load	Fare	Load Factor*
Yellowknife-Iqaluit	BAe 146-200	2.9	7,010	35	\$595	35%
	BAe 146-200	2.9	7,010	29	\$720	29%
	BAe 146-200	2.9	7,010	24	\$845	24%
Rankin Inlet-Iqaluit	B737-200 combi	2.2	8,241	31	\$395	52%
	B737-200 combi	2.2	8,241	24	\$520	40%
	B737-200 combi	2.2	8,241	19	\$645	32%
Rankin Inlet-Yellowknife	B737-200 combi	2.2	8,241	31	\$395	52%
	B737-200 combi	2.2	8,241	24	\$520	40%
	B737-200 combi	2.2	8,241	19	\$645	32%

Conclusion:

Preliminary analysis reveals the following factors that make a nonstop service to Iqaluit from Yellowknife unattractive to an air carrier:

- Yellowknife-Iqaluit is no longer a heavily frequented route, owing to the creation of Nunavut and the transfer of government.
- The thrice weekly service along the Yellowknife-Rankin-Iqaluit route witnessed a decrease in passenger demand in the years leading up to 1999. Flows that year were disproportionately favouring Yellowknife to Iqaluit, owing to the transfer of government employees.
- Yellowknife-Iqaluit flights would likely have a negative impact on the viability of service between

Rankin Inlet and Iqaluit, as well as that between Rankin Inlet and Yellowknife.

- A nonstop link between Yellowknife and Iqaluit would negatively impact Rankin Inlet's current role as a regional connecting hub and discourage additional services at this Hudson's Bay community.

Given likely demand as well as the break-even numbers above, operating Yellowknife-Rankin Inlet, Rankin Inlet - Iqaluit, as well as a Yellowknife - Iqaluit route concurrently, would not be viable. Dropping Yellowknife-Rankin entirely and substituting it for Yellowknife-Iqaluit, would yield minimal improvement in the overall passenger demand numbers, create freight distribution issues, and likely harm Rankin Inlet's viability as a hub. This would also result in both fewer flights as well as less jet-service at the community.

4.4.4 Greenland - Iqaluit

Since its suspension in 2001, calls have been made for reinstating service between Iqaluit, Nuuk, and Sondre-Stromfjord, Greenland. The route was operated jointly by First Air and Greenlandair, with the latter's input subsidized by the Greenland Government. In later years only service to Sondre-Stromfjord was maintained. Flights acted as an air-bridge between the continents, with B727 aircraft departing Sondre-Stromfjord and terminating in Ottawa with a stop in Iqaluit. When funding was withdrawn for the service, and Greenlandair pulled out, the route was deemed to be uneconomical. Additional challenges included the high cost of ground handling an aircraft in Greenland, with a typical charge per B727 at close to \$15,000 (this compares to \$900 in Ottawa). Community consultations as well as those with the Government of Nunavut suggest that such an international service at Iqaluit is highly desirable. Nunavummiut have relatives in Greenland and affordable air service would promote trade and cultural ties. The

territory would like to see service reinstated if it were viable. Some charter operations have been carried out during the summer season but scheduled flights have not resumed.

In addition to business people and tourists, the Greenland connection has the potential to become an attractive alternate route for military service and base support workers heading for US military installations at Sondre Stromfjord and eventually Thule.

Reinstating service to both Nuuk and Sondre Stromfjord may be uneconomical in the absence of stronger demand. However, initiating service solely to Sondre Stromfjord provides greater flexibility to a carrier owing to that airport's long runway which can accommodate jet aircraft and larger freight volumes (Nuuk's runway is only 3,100 feet). The following is an analysis of the potential break-even point for a given flight.

Table 4.5 - Analysis Summary Iqaluit - Greenland

Route	Equipment	Trip length (hours)	Hourly Cost \$	Break-even load	Fare	Load Factor*
Iqaluit-Sondre Stromfjord	B727-200 combi	1	8,780	24	\$399	34%
	B727-200 combi	1	8,780	18	\$525	26%
	B727-200 combi	1	8,780	15	\$650	21%
Iqaluit-Sondre Stromfjord	BAe 146-200	1.1	7,010	21	\$399	21%
	BAe 146-200	1.1	7,010	16	\$525	16%
	BAe 146-200	1.1	7,010	13	\$650	13%
Iqaluit-Sondre Stromfjord	Boeing 737-700	1	5,283	15	\$399	25%
	Boeing 737-700	1	5,283	11	\$525	18%
	Boeing 737-700	1	5,283	9	\$650	15%

4.4.5 Sanikiluaq-Iqaluit

The most challenging destination for Nunavummiut is Sanikiluaq, situated in the Belcher Islands, in the southernmost part of Hudson's Bay. Currently there are three weekly flights into the isolated community, linking it with Cree and Inuit communities in Quebec. The existing routings and frequency of service make connections with Iqaluit as well as other Nunavut

communities costly and time-consuming. Presently, travellers heading for Sanikiluaq from Nunavut must first travel south through Montreal, overnight, and then connect to a multi-segment turboprop service before reaching the community.

While the runway at Sanikiluaq is not paved, at 3,800 feet it is sufficiently long to support small to medium-sized turbo-prop equipment at maximum takeoff weight

(including Saab 340 and ATR-42) for direct flights into Nunavut. For the purposes of the analysis Iqaluit has been selected, however it should be noted that Iqaluit and Rankin Inlet are roughly equidistant from Sanikiluaq. Flying time to the community from either Rankin or Iqaluit would be roughly 2 hours. The greatest challenge in operating such a long/thin route will be demand. The route would be essentially an administrative one, likely consisting mostly of government-sponsored travel. Therefore the provision of newer aircraft with longer range and superior operating

economics would be essential.

The Government in Iqaluit, as part of its continuing mission to enhance links with all communities, desires a direct service into the territory. Airfares selected for analysis are based on routes of similar stage-lengths in the territory, adjusted downward slightly due to less costly equipment and to encourage use of the route over existing service through Quebec.

Table 4.6 - Analysis Summary Iqaluit - Sanikiluaq

Route	Equipment	Trip length (hours)	Hourly Cost	Break-even load	Fare	Load Factor*
Iqaluit-Sanikiluaq	ATR-42 combi	2	3,090	17	\$385	71%
	ATR-42 combi	2	3,090	13	\$510	54%
	ATR-42 combi	2	3,090	10	\$635	42%
Iqaluit-Sanikiluaq	Dash 8 combi	2	2,989	16	\$385	76%
	Dash 8 combi	2	2,989	12	\$510	57%
	Dash 8 combi	2	2,989	10	\$635	48%
Iqaluit-Sanikiluaq	Saab 340	2	2,323	12	\$385	36%
	Saab 340	2	2,323	10	\$510	30%
	Saab 340	2	2,323	8	\$635	24%
Iqaluit-Sanikiluaq	Beech King Air	2.2	1,930	11	\$385	92%
	Beech King Air	2.2	1,930	9	\$510	75%
	Beech King Air	2.2	1,930	7	\$635	58%

Findings:

Given the operating characteristics of the aircraft analysed, any of the above aircraft might be suitable for the route, with particular emphasis on either the Beechcraft King Air or the Saab 340. While the Beechcraft is slightly less costly to operate per hour than a Saab, given that the Saab has a higher cruising speed, the two aircraft have similar economics over this stage-length. The advantage of the Saab is that it has a lower break-even point given its capacity, cargo capability, and a higher standard of comfort which the smaller Beechcraft cannot offer.

Owing to the difference in commercial air service

category between the Beechcraft King Air (Subpart 704 -Commuter), and the other aircraft evaluated (Subpart 705-Airline), there would be less overhead on the operator of the Beechcraft. Therefore, a Beechcraft King Air operator might be able to operate the service more economically over the long run and this might permit lower airfares.

Regardless of the aircraft chosen, it is unlikely that service of more than one flight a week would be viable given the size of the community. Southbound travellers would likely continue to use the Air Inuit service through Quebec leaving government travel to account for the majority of users of the new service.

5 Implementation Options

5.1 Options Overview

There are several methods of implementing system improvements in identified problem areas. Those options were outlined as follows:

1. Moral suasion, under which the GN would try to persuade the carriers to improve their services voluntarily;
2. Direct subsidies, with which the GN would pay the carriers to make service improvements that they would not make voluntarily;
3. Re-regulation, under which the GN would seek the federal government's agreement to re-introduce the controls on entry and pricing that existed in Canada before deregulation of the air transport industry;
4. Public ownership, under which the GN would acquire majority ownership and control of at least one of the main carriers serving Nunavut, and would then require that carrier to make most or all of the service improvements desired; and
5. Contractual incentives, under which the GN would invite the air carrier industry to propose substantial, Nunavut-wide improvements in services and prices in return for a long-term contract for the carriage of all of the GN's business, and of the business of other major users of air transport within and to/from Nunavut whose cooperation the GN might be able to secure.

These options were discussed in the 2001 Nunavut Transportation Strategy in greater detail. That analysis is repeated in the following sections and is updated to the year 2003 realities. There is a concentration on the "pros and cons" of the options with particular emphasis on their application in Nunavut.

5.1.1 Moral Suasion

Under this approach, the GN would seek the airlines' cooperation in providing far more information on their

traffic, costs and revenues than they do today, as the essential basis for a collaborative exploration of the practical scope for improvements in their services, the equipment used and the prices charged.

This approach would plainly represent the minimum-intervention option, in line with the very weak powers of economic regulation presently available. It might achieve some modest improvements, but in the absence of greater powers of coercion it is very doubtful that the results would come anywhere near meeting Nunavut's needs in today's operational environment.

However some may consider using a "carrot and stick" approach, namely attempting the moral suasion approach as a first step, to be followed by one of the more interventionist approaches in the event that the service improvements attained were not adequate.

5.1.2 Direct Subsidies

If substantial funds were available, this approach could be quite effective in achieving important service improvements, or pricing adjustments. But the administrative difficulties would be very substantial, if only because of the large number of controversial decisions required (about the nature and distribution of the specific improvements to be funded). In addition, it would be very difficult, if not almost impossible, to ensure that subsidy payments to the carriers were justified (i.e., that the subsidized services were being operated as efficiently as possible).

These drawbacks of direct subsidies, when added to the absence of the required funding, eliminated this option from further consideration in the 2001 analysis. It may be feasible, however, to include some form of direct or indirect subsidy as a component of a contractual incentives approach. This possibility is discussed in more detail in section 5.2. It should also be noted that the federal government may undertake a remote air services policy review in the near future, which might, conceivably, explore any number of future forms of assistance or regulatory changes.

5.1.3 Re-regulation

An assessment of the merits of this option requires a brief review of the ways in which air transport used to be regulated in Canada, before the advent of deregulation. At that time, the market for air transport in Canada was much less mature and much tighter regulation was deemed to be in the public interest. Indeed, Canada still considers many markets for air transport, between Canada and other countries, to require tight regulation with respect to access (with only one Canadian carrier being licensed to provide direct services) and pricing (with carrier tariffs requiring regulatory review). It almost goes without saying that the market for air transport within and to and from Nunavut is far less mature than the market in the rest of Canada before deregulation, and than the international markets that are still tightly regulated.

Until Canada's first explicit shift to economic deregulation of domestic air transport, in 1984, every commercial air service required a licence that was only granted if it had been determined, through often lengthy and heavily contested regulatory proceedings, that the proposed services were indeed required by "the present and future public convenience and necessity." Until the mid-1960s, applications for the right to offer scheduled services were only considered for local and regional routes with limited demand, as the exclusive right to serve all other routes had been granted to Trans-Canada Airlines (later renamed Air Canada)(TCA/AC), as a matter of government policy. Thereafter, these restrictions on competition were only gradually cut back, under very specific policy decisions. Throughout the regulatory period, all air tariffs had to be filed with the regulatory agency (the Board of Transport Commissioners, later renamed the Canadian Transport Commission), for review and possible disapproval.

To reduce the price of air transport to and from the smaller and more remote communities served by TCA/AC, the national airline's fares were based on a formula that charged everyone the same price per mile travelled, on all routes, plus a standard basic amount (like the start-up fee on a taxi metre). This "Air Canada fare formula," which ignored substantial differences between routes in the unit-cost of services (those operating over longer distances with larger aircraft being lower in cost per available ton-mile or seat-mile), was explicitly sanctioned by government policy as more equitable and nationally integrative than a more directly cost-based approach.

The justification for applying tight controls on "entry"

(the right to start new or additional scheduled services on particular routes) was based in part on the characteristics of the air transport industry (with its highly mobile assets and non-storable product), which led to a belief that entry controls were required to prevent over-competition in markets with too little traffic to allow more than one carrier to achieve financial viability. It was thought that a carrier could not be expected to provide regular scheduled services throughout the year, while traffic fluctuated considerably within and between seasons, unless it were protected against competitors operating only during the peaks. It was also believed that undue competition would lead to uneconomic tariff reductions that could ultimately result in financial instability and withdrawals of essential services. There was no confidence that these consequences could be prevented by suitable price controls, which were primarily used as an inherently blunt and crude tool to prevent monopoly operators from gouging their clients.

There was a worldwide consensus, one that also included the United States until 1978, that these or similar regulatory measures were appropriate for scheduled air transport. It was only after markets reached maturity (a size large enough to permit open competition without fears of resulting disruptions of service) that economic deregulation became the norm in developed economies. It is still not the norm in underdeveloped economies, and in many international markets with a small demand for service.

The present approach to economic regulation of domestic air transport in Canada, and in most other economically developed countries, is very different. Starting in the early 1980s, full economic deregulation has gradually become the norm.

In Canada, this change was initially limited to Southern Canada. There, any air carrier able to meet certain basic safety and financial "fitness" requirements was henceforth allowed to start operating domestic commercial air services, at any fare, with only minor constraints and subject to the restrictions of the Competition Act. In Northern Canada, some regulatory restrictions were retained at first, in view of its market immaturity.

In 1996, this remaining restriction on competition in domestic air transport was eliminated as well, in the belief that it was no longer necessary. As a result, any licenced Canadian air carrier is free to operate scheduled and charter services within and to and from Nunavut, and to charge whatever price it wishes, even

on routes where it is the sole service provider, subject to only minor controls.¹ This new hands-off approach is based on a belief that market forces (competition or the threat of competition) will ensure that services are roughly consistent with demand and are priced to provide operators with a reasonable financial return, and not more. The traditional concern that open competition in low-density markets might lead to instability of essential services has been abandoned, at least in Ottawa (but not in the U.S. which retains a subsidy program for air services to smaller communities).

If the effects of deregulation in Nunavut were to be judged by the standards that justified the tight economic regulation of the past, deregulation could easily be presented as a success. After all, there appears to be no special instability of essential services and, although air fares and tariffs are relatively high, it is not obvious that they are higher than is justified by the relatively high costs of operating in Nunavut. Although the services being provided are presumably profitable, overall, the absence of new entrants could be interpreted as meaning that those profits are not excessive.

Nevertheless, the present total reliance on market forces has major drawbacks for Nunavut, in that it offers:

- No assurance that competing services, where possible, will be scheduled at different times, for greater public convenience. Indeed, competing departures at similar times are common;
- No assurance of reasonably convenient services between all points with a significant community of interest. Indeed, there are several such pairs of points in Nunavut that have only the most indirect of service connections; and
- No scope for a pan-Territorial pricing regime like the Air Canada fare formula, which was deemed to be in the public interest by the Government of Canada when the Canadian market for air transport was less mature (yet much more mature than the Nunavut market is today). Use of the Air Canada formula in setting air tariffs throughout Nunavut

¹ Although sec. 66 of the [Canada Transportation Act](#) allows the Canadian Transportation Agency to disallow the "basic" (or regular) fare on routes without competing services, the practical difficulties of assessing the "reasonableness" of such fares nullify the practical significance of this control.

would reduce existing inequalities in air fares within the region, beyond those related solely to differences in the distances flown.

While these drawbacks of airline deregulation for Nunavut do not make an adequate case for economic re-regulation, they do constitute a basis for looking at other possible forms of government intervention, including the two options mentioned above.

5.1.4 Public Ownership

Under this option the GN would buy control of at least one of the major airlines serving Nunavut, with the aim of obliging it to serve the Territory's social and economic objectives -- much as the Government of Canada tried to do (albeit none too successfully) through ownership and control of Trans-Canada Airlines/Air Canada (TCA/AC).

This option would be very expensive, particularly if the new GN-owned airline were in fact required to operate on a less than purely commercial basis. In that case, the initial purchase price could be the least of the costs involved. Intractable problems would also arise in managing the relationship between the publicly-owner carrier and its privately-owned competitors, assuming that the latter would not withdraw from the market altogether. In the end, it is very doubtful that air transport in Nunavut would improve sufficiently to justify the costs involved.

5.1.5 Contractual Incentives

Under this approach, the GN would pursue a service contract with one of the major air carriers, or (potentially) with a new carrier created by a merger between the existing carriers, under which the GN would guarantee that carrier all of its business for (say) five years in return for contractually stipulated improvements in services and prices. Other major users of air transport within and to/from Nunavut, including the Federal Government, would be asked to cooperate by funnelling all of their Nunavut-related air transport requirements (including those of the Food-Mail program) through the GN's contract carrier.

This strategic option appears to have great potential as a practical and effective option for the following reasons:

- It would give the GN a substantial capability to influence the supply of air services in the Territory,

much greater than it would have under re-regulation and without the many drawbacks associated with the ownership option. For example, it would allow the GN to press for certain improvements in service and equipment, as part of the terms of contract. And it would allow the GN to insist on adoption of the air fare formula used by TCA/AC before deregulation, to produce greater equity in the air fares and rates payable by Nunavummiut, whatever their community of residence;

- In the absence of a prior merger between the principal carriers serving Nunavut, it would allow the GN to choose between competing responses to its Request for Proposals. If this choice between competing bids were to be removed by a prior merger between the principal carriers, the GN could reasonably promote a supportive approach by the new carrier by insisting, as a contractual condition, that at least 51 percent of its ownership and control be held by Nunavut birthright organizations;
- It would offer the successful carrier a relatively low-risk opportunity to make reasonable profits over a substantial period, sufficient to justify the acquisition of new and/or better aircraft;
- It would create no non-commercial barriers to operations by other scheduled carriers who might wish to compete with the new, preferred carrier, or to the operations of charter carriers able to meet the demand for on-demand or emergency services; and
- It appears, subject to further inquiry, not to be open to serious objections on legal or policy grounds.

Having permitted Air Canada to become the dominant carrier in Southern Canada, the Federal Government could not credibly object to an effort by the GN to pursue the emergence of a similarly dominant carrier in Nunavut.

For voluntary observance by the carrier of the service contract envisaged under this option, the GN might look in the first instance to the goodwill and cooperation of the carrier's owners, if those should include one or more of Nunavut's birthright organizations. For enforcement, if needed, it would rely on contractually stipulated financial penalties and termination clauses, and possibly on a contractual provision allowing the GN to offer all or part of its traffic to and from Southern Canada to other Canadian carriers, in response to specified performance failures.

5.1.6 Conclusion

Assessment of Nunavut's strategic options suggests very strongly that the medium intervention, service-contract option represents the most promising avenue to making significant improvements in the provision of air transport services in Nunavut.

While use of the "moral suasion" option is at a minimum risk, the payoff may also be minimal. If however, air carriers are prepared to negotiate improvements, it might be feasible to try this option before proceeding to the more complex, but more productive options.

5.2 Types of Contract

If the situation in Nunavut proceeds through the moral suasion option to a contractual incentives approach, there are several contracting approaches that could be employed.

This section considers the possible contracting options and provides recommendations on the most effective options in the Nunavut context.

5.2.1 Scope

The options for contracting air transportation services can be considered under four categories:

- Master Contract
- Prime + Subcontracts
- Multiple Structured Contracts
- Bundled Contracts

The four categories may apply to both aeroplanes and helicopters collectively, or as separate contracts for each of the four categories. The following analysis considers only airplane services, as scheduled helicopter (cargo or passenger) services are not now a feature of Nunavut's air transportation system. Helicopter options are considered separately in Appendix C.

The four option categories may include scheduled and / or charter services.

These categories may include passenger and / or cargo services.

These categories may be subdivided in various ways, for instance by geographical region.

The four types of contract are briefly introduced below.

Table 5-1 subsequently illustrates various contract combinations and inclusions which have been given initial consideration for Nunavut. The table describes each contract option briefly, and provides one recent example of the use of this type of contract in Nunavut.

Part VII of the Canadian Aviation Regulations (CAR) specifically regulates commercial air services according to three categories based on the size of aircraft. These

include: Subpart 703 - Air Taxi (1-9 seats); Subpart 704 - Commuter (10-19 seats); and Subpart 705 - Airline (20+ seats). Table 5-1 shows the category of commercial air service which would be required for each contract type. The practicality of combining air service categories is analysed subsequently in Section 5.3.1.

5.2.2 Master Contract

Master Territorial Contract - Aeroplane

This is a single purchase contract that would provide for purchase of all fixed wing services, airline/ commuter/air taxi, passenger and cargo, scheduled and charter, from a single supplier providing defined prices and service levels throughout the territory. The contractor would provide all aircraft, maintenance, hangar and ground support infrastructure, air terminal service staff, cargo facilities and staff.

5.2.3 Prime Contractor + Subcontracts

Prime + Subs, Territorial

This is a single contract which would provide for purchase of all fixed wing services, airline / commuter / air taxi, passenger and cargo, scheduled and charter, jet and turboprop from a single prime contractor in exchange for defined prices and service levels throughout the territory. The contractor (or sub-contractor) would provide all aircraft, maintenance, hangar and ground support infrastructure, air terminal service staff, cargo facilities and staff. The contractor would be free to enter into subcontract agreements or teaming arrangements for provision of some services however the overall responsibility for quality of services would rest with the prime contractor.

Prime + Subs, Regional

Up to three regional contracts would provide for purchase of all fixed wing services, airline/ commuter / air taxi, passenger and cargo, scheduled and charter, jet and turboprop from a single prime contractor in exchange for defined prices and service levels in specific regions of Nunavut. A maximum of three regions is recommended due to the small market size. The contractor (or sub-contractor) would provide all aircraft, maintenance, hangar and ground support infrastructure, air terminal service staff, cargo facilities and staff. The contractor would be free to enter into subcontract agreements or teaming arrangements for provision of some services however the overall responsibility for quality of services would rest with the prime contractor.

5.2.4 Structured Contracts

Structured contracts address requirements defined by the GN but which may be met by several, possibly non-exclusive suppliers. Structured contracts may demonstrate many of the same characteristics as the Prime + subcontracts option but would not have the overall integrated system approach available through one contact point in one Prime Contractor organization.

The major characteristic of all options under this sub-heading is that the contracts are independent and are controlled and managed separately. Management feedback on performance is separately provided. Rebidding may be simplified as there may be multiple suppliers operating in Nunavut.

The structured requirements would be common across the territory to ensure equitable fares and level of service. The contracts could be structured in a number of ways to allow for commonality of purchasing requirements or for commonality of supplier capability. The structure could also provide for a common method of collecting transportation statistics for future planning purposes. The most significant groupings are described below.

Territorial Trunk Service

This option would address trunk route requirements so that the services would be delivered at principal gateway airports in the territory (Iqaluit, Rankin Inlet, Cambridge Bay) by a single supplier. Services would include airline operations using jet or possibly turboprop aircraft carrying passengers and/or cargo in charter and/or scheduled services.

Regional / Local Feeder Services

This option is broadly similar to the above option with the exception of the geographical orientation of the contracts and the likely size of aircraft used. This option would require the GN to manage a number of contracts in several service regimes. All users would make use of the defined contracts in the appropriate region for the purchase of services. A single contractor may provide similar services under separate contracts in various geographical areas.

User Group

This option would meet requirements of specific users, rather than providing a general service. The geographical nature of each contract would be dependant on the buyer's detailed requirements or mission. Separate decisions are made on the contracting requirements of each user and on whether to contract a specific service or not. This is the minimal level of contracting with only those services that are easily defined as a separate entity being contracted. Contracting is carried out through normal GN contracting procedures and all requirements and purchases are funded independently by the individual user. This is essentially the way the overall system operates today. Current medical charter contracts by the GN are illustrative of this type of contract.

5.2.5 Bundling

Bundling allows for grouping of like requirements from several users, governments or departments for bulk purchasing. Bundling would also allow for the combining of requirements for different types of services into one contract if the co-ordination can be carried out effectively. The Federal Government has long practised this contracting approach in the arctic with the Polar Continental Shelf Project (PCSP) which combines all arctic scientific and research activities under a single, multi-year, competitively bid, air transportation contract.

**Table 5.1 - Contract Options - Definition
Nunavut Air Services**

Contract Type	Aircraft	Service Area	Service Type		Payload		Canadian Aviation Regulations Part VII Commercial Air Services **			Description	Recent Example
			Sched.	Charter	Pax	Cargo	Sub. 705 Airline 20+ seats	Sub. 704 Commuter 10-19 seat	Sub. 703 Air Taxi 1-9 seats		
Master Contract	Aeroplane	Territorial	•	•	•	•	•	•	(•)	Single contract Single supplier	Greenlandair Domestic Service
Prime + Subcontracts	Aeroplane	Territorial	•	•	•	•	•	•	•	Single contract Lead supplier responsible for fares and performance of subcontractors	DND - NWS Air Support Helicopter
	Aeroplane	Regional	•	•	•	•	•	•	•		
Multiple Structured Contracts	Aeroplane	Territorial Trunk	•	•	•	•	•			Multiple contracts by Mission Multiple suppliers	Northern Stores, Co-op
	Aeroplane	Regional Feeder*	•	•	•	•	•	•	•	Multiple contracts by Region and Mission Multiple suppliers	Essential Air Services Prog.- U.S.
	Aeroplane	Local Feeder*	•	•	•	•		•	•	Multiple contracts by Locality and Mission Multiple suppliers	GN links to Greenland, Saniqiluaq
	Aeroplane	User & Mission		•	•	•		•	•	Multiple contracts by User and Mission Multiple suppliers	Nunavut Health Board
Bundling	Aeroplane	User & Mission	•	•	•	•		•	•	Multiple contracts by Groups of Users for Defined Missions Multiple suppliers	Polar Continental Shelf Project

* Feeder services assume that air carriers will utilize a hub-and-spoke strategy due to the long distances and small market for point-to-point services.

** Significantly different Canadian Aviation Regulations (and costs) apply to air carriers depending on their operational classification, type of aircraft and nature of operations. Regulations effectively preclude operation in more than 2 adjacent categories due to the high costs of compliance in small markets.

5.3 Implementation Mechanisms

The foregoing options can be implemented in several different ways that have advantages and disadvantages that will impact on their overall feasibility. These are identified below.

5.3.1 Service Contracts

Service contracts are structured as an agreement between the GN and the supplier that features commitments by the supplier in terms of service quality and price in exchange for GN commitments in terms of minimum quantity of services to be purchased and payment terms.

The significant feature of a service contract is a government commitment to purchase a given minimum number of seats or cargo space over the term of the contract. This is sometimes referred to as a “take-or-pay” strategy. Over a long enough period, this commitment provides assurances to the suppliers upon which they and their financial backers can base investments in personnel, equipment and infrastructure.

Individual requirements for services are consolidated by the contracting authority for purchase. Controlled distribution, allocation or use of the services is then enforced through procurement procedures. Performance can be monitored, and enforced if necessary, through contractual arrangements such as financial penalties, performance bonds, and other remedies.

The principal advantage of service contracts is the flexibility they provide to government in periodically acquiring, upgrading and, if necessary, replacing a particular service.

The principal disadvantage is the length of time needed for replacement of an unsatisfactory service provider, which requires rebidding, mobilization and a complex transition to a new provider.

5.3.2 Standing Offers

Standing offers are negotiated contracts between the GN and one or more suppliers that include agreements on service terms and price, but normally exclude commitments as to the minimum quantities of services to be purchased. The normal contract structure identifies the particular services covered by

the agreement and the prices to be charged. The government purchasers are then encouraged to use the standing offer supplier because ordering processes are simplified, prices are known, and are expected to be the best available.

Individual requirements for services are identified and procured by the immediate user.

The principal advantage of a standing offer is the known price and quality of the product or service purchased.

The principal disadvantage is the lack of long term stability and expectation of volume accorded the supplier which considerably increases the risks of financing significant investments in improving an existing product or service.

5.3.3 Partnerships

Any of the contracting strategies identified in Section 5.1 can be implemented using a Partnership structure although many would prove impractical due to their small size and restricted scope. Three forms of partnership are identified below.

Public - Private Partnerships

Public Private Partnerships (PPP or P3) are frequently considered where a major improvement in delivered service is desired by government but the government lacks the financial resources, operational flexibility or capability, or other prerequisites necessary to implement the service changes on a timely and politically acceptable basis.

A Public Private Partnership to improve air services in Nunavut would require government participation in one or more of the following:

- airline ownership;
- investment in air carrier equipment;
- air service financial operations; and
- other forms of participation.

All activities involve the assumption by GN of some level of risk, political involvement in operations, and

most likely, some form of direct financial exposure.

Within the current context of government policy, fiscal restraints and priorities, participation by GN in a Public Private Partnership delivering a service, currently and most importantly in the future capable of being delivered by private sector investment, is not considered appropriate for consideration at this time.

The principal advantage of a public private partnership to government is the ability to harness private sector funding, resources and skills in delivering a service.

The principal disadvantage is the assumption of some form of risk by the GN as a partner.

Private - Private Partnerships

This term refers to the unique situation in Nunavut where one single organization, NTI, is the recipient of all proceeds from the territorial Land Claims settlement, and is investing those funds in businesses and activities of benefit to the Inuit of Nunavut. While being independent of government, this organization has a territory-wide mandate to seek improvements in the standard of living which includes the mobility of the people, and by extension, accessibility to improved air transportation.

Whereas the territorial government may not currently be in a position to enter into an air service partnership, NTI might conceivably be in a position to participate in any of the foregoing activities associated with a public private partnership for air service delivery.

The principal advantage of a private - private partnership would be the ability accorded NTI to directly participate in effecting improvements to the transportation system serving the Inuit of Nunavut.

The principal disadvantage would be the need to trade-off the costs of culturally desirable improvements against the impact on airline financial performance for services which are not, on their own, economically feasible.

Industry Partnerships

Partnerships between Canadian companies involved in delivering air transportation services may be a viable means of improving air services in Nunavut. Partnerships can take a great many forms and already exist in the air transportation sector. For example Canadian North has partnering agreements with Aklak Air, Kenn Borek Air, Calm Air, Air Tindi and other carriers to provide feed to their trunk air service system. First Air has agreements with Unaalik Aviation, Air Inuit and other carriers to feed their network.

However corporate partnerships cannot in and of themselves necessarily deliver the improvements sought by Nunavummiut. The need for modernized equipment, improved safety, dependable and convenient services and schedules, and seamless service cannot necessarily be delivered through the varying terms of current partnering relationships.

In addition the Canadian Transportation Agency and the Competition Tribunal may become involved in air service activities if there is a perceived attempt to limit competition, or actions by air carriers which may be considered to be anti-competitive. For example, were two carriers perceived to be colluding to limit or eliminate competition in an air service bidding process, then an investigation would likely be launched. On the other hand, if two carriers merged prior to a competition, then there may not be grounds to consider anti-competitive conduct by the carriers.

The principal advantage of industry partnerships is the bringing together of good combinations of air carrier capabilities, operating under differing regulatory regimes, able to offer improvements to the status quo air transportation system.

The principal disadvantage is the broad spectrum of contractual relationships under which current air carrier partnerships operate.

5.3.4 GN - Furnished Equipment

One implementation mechanism that has been used in the past in Canada is the use of government-owned equipment (aircraft for example) that are operated, managed and maintained by service contractors. Air services are procured from air carriers that are contracted to the government under service contracts using the government-owned aircraft.

This approach was used by the Government of Ontario when it established NorOntair to serve remote communities in northern Ontario. This approach was abandoned after more than a decade of operation as highways improved, cost reductions became necessary, and it came time to procure new aircraft. Dash 8 service had just been introduced on routes already served by commercial carriers when the operation was folded up.

The indirect subsidies offered by this approach and the up-front capital requirements can be costly but the mechanism ensures that the type and capability of the aircraft used, and service delivered is well controlled. The government supervisory operation was run from a small office at North Bay Airport with services operated by several contractors throughout northern and north-western Ontario.

The principle advantage of government furnished equipment and directly contracted air services is the control available to government with respect to the quality of services provided.

The principle disadvantage is the need for capital and operating funds by government. Given the current budget constraints and the requirements for capital expenditures on sewage and water works, hospitals, schools, housing etc. it is unlikely that funds could be made available for this option. It puts a large responsibility on the government to select and purchase the most appropriate aircraft type(s) and does not allow carriers opportunities to apply innovative solutions to network or local requirements.

5.3.5 GN - Owned and Operated Facilities

A second form of direct government support and participation includes ownership, and possibly operation, of ground facilities. These facilities could include air terminal check-in counters, ground service facilities, hangars and air cargo facilities

where required. The ground services would be provided to the contracted air carrier, either as an indirect subsidy or under a service contract to the air carrier. This type of operation is used extensively and successfully by Island Governments and their Airport Authorities in the Carribean with the exception that the supplier is normally a private corporation rather than the government directly.

The principal advantage of government-owned air carrier facilities is the control and flexibility to establish aviation infrastructure at key territorial airports and to more easily change service providers. A key barrier to Nunavut market entry has traditionally been the cost of developing dedicated facilities at remote airports. The principal advantage of government-operated facilities is the stability afforded trained staff in small communities, while giving government better control of such aspects as groundside customer service quality and multilingual services.

The principal disadvantage is the need for capital investment in facilities, and also risks associated with delivering quality service, staff recruitment, training and retention costs. Given the current budget constraints and the requirements for more pressing capital expenditures it is unlikely that funds could be made available for this option.

5.3.6 GN - Direct Subsidies

In many ways, direct subsidization would be the easiest and most quickly implemented strategy to improve air services in small Nunavut markets with very low demand. The Nunavut Transportation Strategy did not consider direct subsidization of territorial air services, as a matter of government policy in 2000-1. The ability to subsidize air services from GN revenues still appears to be unlikely in 2002.

The Government of Canada does not subsidize air services. The government also does not have a remote air service policy at this time. However suggestions have recently arisen that Transport Canada may examine such a policy in 2003. Whether such a policy study would lead to a subsidization program similar to the US Essential Air Services Program is unknown at this time.

The United States Essential Air Service (EAS) Program was developed following deregulation to

preserve service to small and remote communities upon the withdrawal of commercial carriers from these markets. It has been largely successful and is currently undergoing some reductions in funding as the original objectives are being modified.

The EAS Program serves as an example of a direct subsidization initiative that is comparable, especially in its support for aviation in Alaska, to the situation in Nunavut. A number of parallels can be drawn. For example, there are 26 settlements in Alaska that receive air services subsidies and there are 26 remote communities in Nunavut.

A review of the applicability of an EAS-type subsidization program for Nunavut is informative, especially if the possibility exists that the Federal Government might study the issue in the near future. In particular, some of the criteria for subsidization and route selection may have application in various contracting options for Nunavut as the air services strategy moves forward.

In the current EAS, the level of subsidization and the routes that qualify for subsidized services are determined in accordance with published criteria. Application is made by the prospective carrier, usually after negotiation with community leaders.

The principal advantage of direct subsidization is that an agreed level of service is provided to all communities, regardless of route economics. And by using directed subsidies, minimum economic distortion occurs in the larger commercial air carrier industry.

The principal disadvantage is the need for government to assume the cost.

Table 5-2 on the following page presents the subsidization and route criteria applicable in Alaska. Subsidized services vary from B-737 jet airline operations into the state capital Juneau, to Cessna 185 air taxi services to the most remote points.

Table 5.2 - EAS Direct Subsidization and Route Criteria

Subsidization Criteria	Route Selection
<p>1. Reasonable projected costs of a carrier to provide the service Direct costs are assessed by comparing projected costs as submitted by the carrier with the carrier's historical direct operating costs with same or similar aircraft type, direct operating costs of similar carriers using similar aircraft type, as well as data supplied by the aircraft manufacturer</p> <p>Indirect costs are assessed by assigning, as appropriate, the indirect costs to the cost of operating the essential route, and comparing those with the carrier's systemwide indirect costs, and to those across the industry. For any costs that deviate from the norm, consideration is given to any unique circumstances of the carrier or community being served.</p> <p>2. Reasonable projected revenues of a carrier providing the service. Carrier revenues are projected by multiplying a "reasonably projected net fare" (a standard fare less any dilution attributable to joint fare arrangements, discounts or prorates), by the projected traffic both local and through (based on carrier and DOT research estimates).</p> <p>Reasonableness of revenue projections are evaluated by comparing the proposed fare with those charged in other markets of similar distances and traffic densities, with historical pricing practices in the market or other industry guidelines.</p> <p>Freight revenue and/or other revenue from the route are assessed based on recent experience in the market and on that of the carrier in other markets</p> <p>3. Appropriate size of aircraft for serving the community. Appropriateness of an aircraft for a given service is based on traffic levels, the level of service determined and set as a basis for the subsidy program, distance to the designated hub, and any operational requirements of the aircraft involved</p> <p>4. Reasonable profit for a carrier serving the community. A reasonable return for the carrier providing the essential service is set at flat percentage, typically 5% of that carrier's projected operating costs</p>	<p>1. Number and designation of hubs Service is required to one large or medium-sized hub airport (at least 1.00% of total enplanements in the US in the case of a large hub, or .25%-1.00% of total enplanements in the case of a medium sized hub). In Alaska, the DOT makes a provision for service to intermediate points, either small hub or even a non-hub from which flights to larger hubs are frequent. The hub to be served is selected based on the extent to which the hub provides access to the national air transportation system, commercial, geographic, and political ties of candidate hubs to the EAS community, traffic levels to candidate hubs as shown by studies and O/D data, the distance to the candidate hub, and the size of the candidate hub.</p> <p>2. Minimum Equipment Size In Alaska aircraft are required to seat a minimum of 15 passengers with few exceptions, must be twin-engined, and use two pilots. The aircraft must be pressurized when service involves flights above 8,000 feet ASL, and be conveniently accessible by stairs (as opposed to over-wing loading).</p> <p>3. Frequency of Service In Alaska, at least two round trips per week must be provided. Otherwise, two round trips per weekday and two on the weekend. If historical data indicate that this will be insufficient, more service may be required. Should aircraft be shared with other communities, additional capacity in the form of more frequent service or larger equipment are provided. To accommodate adequate flight connections, more flights may be required. Should current capacity not be suitable to accommodate freight volumes, greater flight frequency may be required. In communities where seasonal variances in traffic exist, a two-tier schedule may be established accordingly.</p> <p>4. Seat Guarantees The number of seats offered at a given community should be sufficient to accommodate the estimated traffic at an average load factor of 60%, or 50% when aircraft seating less than 15 passengers are authorized. Criteria for guaranteeing a greater number of available seats is based on the existence of multi-stop itineraries, long stage lengths, and sudden or abrupt reductions in flight frequency at the community.</p> <p>5. Timing of Flights To qualify as an essential service, flights must depart at reasonable times, considering the needs/ purpose of those passengers travelling. If the purpose of those travelling is to connect at the hub, times are designed so as to link with connecting flights.</p> <p>6. Number of Intermediate Stops Except in Alaska, no more than one intermediate stop is permitted in providing essential air service between the community and the hub. In Alaska, multiple stops are permitted if required by low traffic levels or by the distances involved.</p>

5.4 Operational Feasibility

For consideration, Contracting Options must be operationally feasible and offer a practical solution towards improving Nunavut's air services. Assessing the operational feasibility for each contracting option involves:

- examination of the regulatory environment imposed by the Canadian Aviation Regulations;
- examination of the Nunavut airports environment; and
- assessment of related operational concerns raised by Nunavummiut in consultations.

5.4.1 Regulatory Environment

The three operational classifications of commercial air service applicable to delivery of air services to Nunavummiut (airline, commuter and air taxi operations) are regulated to differing degrees by the Canadian Aviation Regulations. Some of the most important differences include the following.

Air Taxi Operations

Air Taxi (1-9 seats) operations are the simplest types of operations with the fewest specialty requirements. The pilot is depended upon for dispatch and operational control, maintenance is generally performed "as required" and on a "time basis" for certain components, and crew training requirements are straight forward. This leads to a relatively low cost operation by small independent operators.

An example of an air taxi operation in Nunavut might include Air Nunavut's B-100 charter flights to Sanikiluaq.

Commuter Operations

Commuter (10-19 seats) operations are subject to more complex regulation in a number of areas. While the pilot is still responsible for "self-dispatch" and operational control, a more sophisticated flight following service is required operationally, and time-based intervals regulate the performance of scheduled maintenance activities. Some specific additional regulations (compared to air taxis) include regulations pertaining to safety features, aircraft performance limitations, aircraft equipment, emergency equipment, training, and specific aircraft operating manuals. This is consistent with the operation of more sophisticated (and capable) aircraft and is considerably more expensive than air taxi regulations.

An example of a commuter operation in Nunavut might include Kenn Borek Air's Twin Otter or Beach 99 operations on scheduled services within Baffin Island.

Airline Operations

Airline Operations (20+ seats) must comply with still more sophisticated requirements. For example under Subpart 705, over 30 additional regulations apply to flight operations, aircraft performance, aircraft equipment, emergency equipment, personnel requirements, training and manuals.

If the carrier is further classified as having "complex operations" (ie: more than 6 large aircraft, 18 movements per day + other factors) then the most stringent requirements apply. These include the need for a comprehensive Operational Control system which provides continuous communications and control of flight operations as they progress. Maintenance standards demand a sophisticated reliability management program. There are many additional regulations pertaining to flight attendants, carry-on baggage and a host of related issues.

Consequently airline operations must comply with the most expensive regulatory regime due to the advanced aircraft types involved, and the sophistication of the air services delivered. Nunavummiut have expressed, directly and indirectly, a **desire for the benefits** of these **more sophisticated services**.

Examples of airline operations in Nunavut include those conducted by Canadian North, and First Air. First Air recently inaugurated their own Type A Flight Operations Centre which continually tracks aircraft operations and provides in flight advisories of weather, airport conditions and other factors affecting the safety, comfort and efficiency of the flight. Airline operations are therefore the most expensive to undertake and support in the regulatory environment.

5.4.2 Impact of Aviation Regulations

Nunavut's air services market is currently served by a mixture of independent air taxi, commuter and airline operations, using an assortment of aircraft types, and subject to differing regulatory and cost structures. The current disparity in airfares between similar routes however is not consistent with the

differing aircraft types or regulatory regimes under which competing carriers may operate.

The complexity of the regulations make it difficult for an air carrier to operate under more than one type of operational classification. At most, carriers sometimes operate under two authorities, either airline and commuter, or commuter and air taxi. However the impracticality of mixed operations and regulatory compliance is well known and carriers avoid doing so where possible. For example, Canadian North operates only under airline operation regulations and First Air recently devolved its Baffin Island commuter operations to Unaalik Aviation thereby simplifying its operations to that of airline operations.

One of the key obstacles to meeting the stated desires of Nunavummiut with respect to improved aircraft and amenities is the fact that the levels of service wanted are consistent with airline operations (20+ seat aircraft) irrespective of the size of the local market. While markets should in theory be served by “right-sized” aircraft, airlines cannot readily operate under multiple regulatory regimes. Maximizing the use of air transport category aircraft for airline operations in Nunavut means, in effect, that the public want the most sophisticated type of aircraft operating under the most expensive regulatory regime.

This is not operationally feasible without major improvements to many airports in the territory. And it may not be financially feasible in the smallest markets. At a minimum, without subsidization, it may result in reduced flight frequencies by larger aircraft.

At this time it is not feasible to serve all 26 Nunavut communities with large (air transport category) aircraft. Some must remain served by commuter aircraft, at least in the short term. Consequently consideration of the single **Master Contract Option** where one carrier provides all services within the territory is **not feasible** in the short term.

However, the **Prime + Subcontracts Option** variants may provide a **feasible** means of consolidating air

services under a single provider with subcontractors able to operate under the less restrictive regulatory regimes providing service to those communities unable to receive, or support larger aircraft operations.

Smaller scale Structured Contracts for Territorial Trunk services, Regional Feeder services and Local Feeder services are impacted less by the regulatory environment as these contracts more narrowly focus on one type of operation consistent with a single regulatory regime. Therefore **Structured Contract and Bundling Options** may also be considered initially **feasible** pending further analysis.

5.4.3 Airport Environment

Air service improvements are constrained by shortcomings and deficiencies in some of Nunavut's airports. The two principal deficiencies are runway length, and runway surface. Both factors restrict both the types of aircraft capable of serving a community and therefore the operational classification of commercial air service. Specifically, not all runways are long enough (4,000') to accept the air transport category aircraft used in airline operations and in addition, many aircraft cannot operate on gravel runways. The cost of rectifying these deficiencies is modest at some airports, but high at several locations such as Kimmirut and Pangnirtung. Given the current GN budget constraints the application of GN capital budget to airport improvements will remain a matter of defined government priorities.

The Nunavut Transportation Strategy examined the airport infrastructure issue and recommended a strategic airport improvement program for the territory's hub airports. It identified key deficiencies with respect to runways throughout the territory. Tables 5.3 and 5.4 present a summary of current limitations.

Table 5.3 - Airport Environmental Limitations

Pangnirtung	The airport is located in a fjord, against a steep mountain where low ceilings and severe turbulence common place. If the mouth of the fjord is blocked by poor visibility, aircraft approaching visually will usually not attempt to land at Pangnirtung.
Qikiqtarjuaq	Mountains in the vicinity of the airport dictate high circling minimums during instrument flying conditions.
Grise Fjord	Aircraft cannot land if wind velocity is greater than 10 knots, owing to a difficult curved approach to avoid mountainous terrain.
Kugaaruk	The airport is in a valley surrounded by hills. Furthermore, the airport cannot be specified as an alternate airport for flight planning purposes even with its recently extended 5,000 foot runway, as it has no fuel available.
Nanisivik	Fog and high winds are common. The airport is on an exposed mountain top at over 2,000 feet above sea level. The mine site has closed and the airport's future is uncertain.

Table 5.4 - Nunavut Airport Capability Summary

Community	Runway Length	Runway Surface	Nav Aids	Community	Runway Length	Runway Surface	Nav Aids
Arctic Bay	1,500	Gravel	-	Kinggauk	strip	Unprepared	-
Arviat	4,000	Gravel	NDB	Kugaaruk	5,000	Gravel	NDB
Baker Lake	4,200	Gravel	NDB, VOR/DME	Kugluktuk	5,500	Gravel	NDB
Cambridge Bay	5,000	Gravel	NDB, VOR/DME	Nanisivik	6,400	Gravel	NDB
Cape Dorset	4,000	Gravel	NDB	Pangnirtung	2,900	Gravel	NDB
Chesterfield Inlet	3,600	Gravel	NDB	Pond Inlet	4,000	Gravel	NDB
Clyde River	3,500	Gravel	NDB	Qikiqtarjuaq	3,475	Gravel	NDB
Coral Harbour	5,000	Gravel	NDB, VOR/DME	Rankin Inlet	6,000	Asphalt	NDB, VOR/DME
Gjoa Haven	4,400	Gravel	NDB	Repulse Bay	3,400	Gravel	NDB
Grise Fiord	1,950	Gravel	NDB	Resolute Bay	6,500	Gravel	NDB, ILS VOR/DME
Hall Beach	5,420	Gravel	NDB, VOR/DME	Sanikiluaq	3,800	Gravel	NDB
Igloolik	4,000	Gravel	NDB	Taloyoak	4,000	Gravel	NDB
Iqaluit	8,600	Asphalt	NDB, ILS VOR/DME	Umingmaktok	Strip	Unprepared	-
Kimmirut	1,900	Gravel	NDB	Whale Cove	3,785	Gravel	NDB

Note: NDB = Non-Directional Beacon VOR/DME = VHF Omnidirectional Range / Distance Measuring Equipment
 ILS = Instrument Landing System

5.4.4 Nunavummiut Issues

Extensive community consultations were undertaken during preparation of the Nunavut Transportation Strategy and follow-up community consultations have taken place as part of the Nunavut Air Services study. The results are described in Chapter 3 and the most significant are summarized below.

Operational issues are among the many concerns consistently raised by Nunavummiut. These are most commonly articulated as concerns with safety, reliability, dependability, comfort, cabin service, in-flight meals and washrooms, ease of flight connections, ease of reservations and bilingual service, and other issues.

Assessment of Contract Options with respect to these public issues provides an indication of which options may have the greatest expectation of satisfying the public desire for improvements. Nunavummiut operational concerns may be broadly classified under two headings: safety related issues and service related issues. Some issues span both these classifications as described below.

Price Issues

The issue raised most frequently is air fare costs and air cargo charges. However, when pressed, most respondents considered that costs can be considered secondary provided that service levels are improved and fares are seen to be fair when compared to others in Nunavut, and to those for comparable routes in the south.

Safety Issues

A number of useful safety-related comparators may be used to differentiate Contract Options and types including the following:

Flight Operations

While there are many measures and ways to assess safety, one useful prediction for improved future operations is to compare the sophistication of the regulations concerning actual operation of each commercial flight, in particular the regulatory requirements for Operational Control. Although all forms of control are officially deemed to be safe, safety is a relative term. In the harshness of the arctic a more sophisticated system will lead to better perceived results by the travelling public as aircraft avoid bad weather, are appraised of evolving

circumstances while in flight, are better coordinated with the arrivals and departures of connecting flights, and the needs of passengers are considered in advance of schedule interruptions.

Maintenance

An underlying public concern often pertains to how well aircraft are maintained. Once again CAR requirements are progressively more stringent as aircraft size and the complexity of operations increases. Comparing the sophistication of maintenance approach within each Contract Option is informative.

Pressurization

Pressurization offers both a safety and comfort benefit to the travelling public. Pressurized aircraft are able to operate at a broader range of altitudes than unpressurized aircraft, thereby avoiding both high terrain and bad weather as appropriate.

Cabin Attendants

Required for safety purposes by regulation, cabin attendants are perceived by the public to offer a safer flight experience as well as to provide inflight service.

Service Issues

A number of useful service comparators may be used to differentiate Contract Options and types including those listed below:

Computer Reservations Systems (CRS)

Not all Nunavummiut air carriers utilize comprehensive CRS systems to serve the travelling public whereas a full CRS is a fundamental requirement for all scheduled services outside of Nunavut. The likely availability of CRS capability within an air carrier contracted to deliver service may vary with the type or scope of contract.

Multilingual Service

A seemingly easy issue for carriers to address, the likelihood of implementing an effective territory-wide program increases as the scope of contract(s) become progressively more all-encompassing. Simply stated, a patchwork of small contracts will lead to a disorganized delivery of multilingual services to Inuit-speaking travellers.

Connections

This is a key service issue since many Nunavummiut must use several connecting flights to reach most destinations in the territory. Once again the more

all-encompassing each contract is, the greater the likelihood that a seamless service will be provided to travellers. The Master Contract Option, operated by a well organized carrier, is most likely to achieve the level of service sought by the public.

Passenger Comfort

Passenger comfort is most frequently measured in terms of the size of the aircraft and specifically in the roominess of the cabin, headroom, leg room and the ability to stand-up and move around the cabin.

In-flight Meals and Washrooms

These amenities improve with increasing aircraft size and are generally absent, or are at best rudimentary, in carrier operations below the airline classification.

Table 5-3 on the following page compares the ability of the Contract Options to meet the operational needs expressed by Nunavummiut, and includes the commercial air service classification which might deliver some or all of the services contemplated.

Analysis

It may be readily observed from Table 5.5 that the larger and more sophisticated the air carrier operation, the greater the opportunities to effectively address Nunavummiut needs.

Similarly, the larger the contract, the greater the likelihood of achieving more of the improvement objectives more equitably across the entire territory.

Table 5-4 reveals that contract strategies involving certain types of Multiple Structured Contracts, and Bundled Contracts are unlikely to achieve significant improvements from the status quo.

5.4.5 Preliminary Assessment

The long list of Contract Options included in Section 5.3 was developed to ensure no potential contracting solution to improving air services was excluded from consideration. Further analysis of the Contract Options was carried out to identify those options that are most feasible for implementation.

A preliminary comparison of contract options with implementation mechanisms permits identification of the more appropriate contracting options. The contracting options identified in Section 5.2 and Table 5-1, and the Implementation Mechanisms identified in Section 5.3, are presented in Table 5.6 and the feasibility of implementation assessed.

**Table 5.5 - Contract Options - Operational Comparison
Nunavut Air Services**

Contract Type	CAR Operator Classification Part VII Commercial Air Services			Response to Nunavummiut Issues								
				Safety				Service				
	Sub. 705 Airline 20+ seats	Sub. 704 Commuter 10-19 seat	Sub. 703 Air Taxi 1-9 seats	Operational Control	Maintenance Approach	Pressuriz- ation	Cabin Attendants	Computer Res. System	Biling. Staff	Ease of Connecting	Passenger Comfort	In-flight Meals & Washroom
Master	•			A.,B, or C	Reliability	Yes	Yes	Yes	Yes	Good On-line	High	Yes
		•		C or D	Time based	Varies	No				Medium	No
			•	D	On Condition	Varies	No				Low	No
Prime + Subcontracts	•			A.,B, or C	Reliability	Yes	Yes	Yes	Yes	Good On-line or inter-line	High	Yes
		•		B or C	Time based	Varies	No				Medium	No
			•	C or D	On Condition	Varies	No				Low	No
Multiple Structured / Multiple Carriers	•			B or C	Reliability	Yes	Yes	Yes	Yes	Poor	High	Yes
		•		C or D	Time based	No	No	No	Varies		Medium	No
			•	D	On Condition	Varies	No				Low	No
Bundling		•		C or D	Time based	Varies	No	No	Varies	Poor	Medium	No
			•	D	On Condition	Varies	No				Low	No

Notes:

Operational Control

- A - Flight Centre ensures continuous operational control, Dispatch Release
- B - Flight Centre provides assistance to pilots, Dispatch Release
- C - Flight following (contracted) including data advisory, Pilot responsible
- D - Flight following service (contracted), Pilot responsible

Maintenance

- Reliability - Mandatory reliability programs with sophisticated monitoring
- Time based - Maintenance at set intervals of flight, cycle or calendar time
- On condition - Maintenance as required, and at set time intervals

Pressurization

Pressurization is both a safety benefit and a level of service issue (comfort) for flights in Nunavut. Pressurization allows an aircraft to fly above the weather which leads to safer operations over mountainous areas, more comfortable travel for passengers and a more dependable schedule.

Minimum Equipment

Analysis is based on the minimum requirement for twin-engine, turbine powered aircraft for enhanced operational safety and dependability.

Table 5.6 - Preliminary Assessment of Options

Contracting Option	Scope	Commentary
More Feasible Options		
Prime Contract + Subcontractors	Territorial	<ul style="list-style-type: none"> - allows teaming of air carriers operating under different CAR regulations - one contractor responsible for overall service delivery and improvements throughout territorial system - several air carriers may be involved - suitable for service contract approach
Structured Contracts / Multiple Carrier Contracts:	Territorial Trunk	<ul style="list-style-type: none"> - allows operation under specific CAR Sub Part regulations - one contractor responsible for improvements in one type of service - achieves limited equity in fares and rates
	Regional Feeder	<ul style="list-style-type: none"> - achieves limited schedule coordination improvements - challenges include overall fare equity for travel within Nunavut, achievement of seamless services among independent carriers, schedule interruption impacts on users, aggregate fares and rates costs
	Local Feeder	<ul style="list-style-type: none"> - multiple carrier supervision required - limit to overall system improvements based on differing interests of different sized carriers - suitable for service contract approach
Less Feasible Options		
Master Contract	Territorial	<ul style="list-style-type: none"> - requires one air carrier to operate under CAR Sub. 704, 705 and 706 regulations (all air carriers who have tried this in the arctic have eventually restructured due to high costs, operational and management challenges - see Section 1.2 Historical Context) - partnerships would be required since no current operator is capable of assuming all responsibilities and ownership requirements - service contract would be very complex
Structured Contracts / Multiple Carrier Contracts:	Regional	<ul style="list-style-type: none"> - major challenges include achieving and sustaining uniformity or equity in fares and rates among multiple contractors, operating dissimilar equipment, in different areas - schedule coordination would be contentious and schedule interruption strategies would favour the carriers, not users - since smaller increases in traffic would be offered carriers, smaller improvements in service could be expected, and only on a regional basis - improvements to trans-territorial services would be difficult to specify, implement, and coordinate
Bundling	As required	<ul style="list-style-type: none"> - assembling specific users to contract pooled, common requirements is close to the status quo - little leverage available by GN to effect system-wide improvements to overall scheduled services in the territory.

5.5 Option Selection Criteria

Those contracting options that are found to be feasible in a general sense may be evaluated for effectiveness with respect to a number of relevant issues. These issues are grouped as listed below:

- Public outcomes;
- Government outcomes;
- Risk minimization;
- Industry acceptability;
- Government/contractor resource requirements;
- Regulatory compliance; and
- Financial Support requirements.

The selection process assesses the capability of the candidate contracting strategy to allow the Government of Nunavut to manage each criterion issue.

The goal is to provide a greater capability than today to manage the issues.

Each issue identified below is followed by a short description of the major considerations included in the issue.

5.5.1 Community / Public Outcomes

Public outcomes include improvements to the services offered to the public as a side benefit to the contracting of government air service requirements. Some of these outcomes are directly affected by and may be included in contract terms and conditions; some are incidental and are a result of improvements made to meet government requirements. Many of these goals are also of direct benefit to GN employee travel and are also considered in that context.

Public Fares/Rates

The reduction in the cost of air fares and cargo rates to members of the public, both in absolute terms and also relative to other regions in the territory is an advantage. The stated government policy is fare equity, not necessarily fare equality, however to the members of the public, significantly lower fares are a major goal.

Service Levels

The option that increases the ability of the GN to ensure the availability of flights at the frequency and timing most preferable to the public would be marked higher.

Customer Service

The public consultation indicates that a contract option that maximizes the quality of customer service, both in the terminal building, by telephone and on-board is preferred. Specific items mentioned include higher frequency, new direct flights, better connections, better cargo delivery, hot meals on flights, washrooms on flights etc.

Multilingual Service

The preferred option should maximize the ability to ensure that customer services are offered in Inuktitut and Inuinnaqtun as well as in English, as appropriate to the location.

Route Structure / Service Area

The preferred option should maximize the ability of the GN to ensure provision of a scheduled services route structure including the most requested direct connections and the ability to make easy connections between flights while minimizing the requirements for overnight stays enroute. A reduction in the number of parallel, half-filled competing flights is a goal.

Passenger / Cargo Separation

Public users feel that the trade-offs made by carriers between passenger and cargo on flights leads to service problems so there is a desire to separate passenger and cargo to allow the use of the best aircraft for each function and hence better service.

Equipment Types / Modernization

A contracting option that offers long term commitments by the contracting authority will encourage investment by the air carriers in newer, more comfortable aircraft.

System Stability

A contracting option that will reduce the number of new and deleted routes over short time periods, resulting in a more stable and predictable route structure is preferred.

5.5.2 Government Outcomes

Government outcomes are those results of using the contracting process to directly specify requirements that support territorial and federal government priorities. The options are ranked on the basis of their capacity to improve the ability of the GN to manage the issue in question.

Employee Fares

the reduction in fares paid by government employees on government business

Government Cargo Rates

the reduction in overall costs for the carriage of air cargo for government customers

Nunavummiut Control

to meet GN policies related to preference for businesses based in Nunavut and/or coming under Nunavummiut control

Improved Employee Productivity

to reduce travel times and connection / over-night delays and thereby to improve employee productivity

Reduce Indirect Travel Costs

to reduce requirements for over-night stays etc. and thereby to reduce travel costs

Employment Equity\

to meet the requirements of GN and Federal government policies on employment equity and non-discrimination

Nunavut Employment

to improve the level of employment in skilled jobs in Nunavut

Inuit Employment

to increase the level of Inuit employment in jobs in the aviation industry and related fields

Language Capabilities

to meet GN policies and goals for the provision of services to the public in the most appropriate language

Transportation statistics

to improve the capability of the GN to collect statistics relevant to future planning of air services and infrastructure requirements

Land Claim Agreement

to meet the requirements of the land claim agreement that affects the provision of services in Nunavut

Canadian Content

to meet Federal government policies and regulations related to Canadian ownership of air carriers operating in Nunavut

Subsidies

to minimize the requirement to provide either direct or indirect subsidies for air services in more remote communities

Payments Procedures / Methods

to simplify procurement procedures for government travel requirements while ensuring that the best possible prices are attained

Bathurst Mandate

to ensure that the terms of the Bathurst Mandate are met in all air services improvements.

5.5.3 Risk Minimization

Risk minimization issues relate to the requirement of the GN to minimize the risk and liability of the government with respect to a number of specific issues.

Insurance / liability

Aviation insurance has become very expensive and difficult to obtain. Options that require the Government of Nunavut to increase insurance and liability will be expensive.

Performance Measurement

Any contract must allow for the measurement of the performance of the contractor to minimize risks of continued procurements under the contract.

Bidding Process

A high complexity in the bidding process will increase the risk of political, industry or public embarrassment during the procurement process.

Re-bid Constraints

The contracting process and terms should minimize the risk of not being able to carry out an effective re-bid process at the end of the contract. The aim is to minimize barriers to entry for contractors.

Implementation process

The best contracting process will minimize risk of problems arising during the contract implementation phase.

5.5.4 Industry Acceptability

The recommended contracting strategy must be acceptable to the industry including service suppliers, insurers, financial backers and owners. This issues under this heading are concerned with the ability of the GN to manage contract terms to minimize industry objections (not necessarily to maximize industry acceptability).

Nunavummiut Ownership

Government policy with respect to Inuit, Nunavummiut or northern ownership of the service provider companies can be reinforced through the appropriate contracting process.

Subcontracting

Some industry consultations indicate that subcontracting is the only possible mechanism as no single prime contractor could provide all services required.

Incentives to Improvement

The preferred contracting strategy should permit the management of contract terms and RFP clauses that provide for incentives for the service providers to improve services and to provide for sanctions against under-performing suppliers.

Contract Duration

The preferred strategy should allow the GN to freely determine the preferred contract duration, possible different for different services.

5.5.5 Government/Contractor Resource Requirements

The various contracting options may demand differing levels of resource investment, both financial (capital and O&M) and physical, by the supplier and the Government. The options are evaluated on the basis of reduction in requirements for GN resources.

Contract Administration

To select a contracting strategy that minimizes the requirements for GN administration resources and staff

Ground Infrastructure Improvements

This issue relates to the requirement for the GN to make increased investments in ground infrastructure, such as runway extensions and paving or new approach light systems, to enable the use of new aircraft on specific routes. A contract option that will minimize investment requirements or that will at least provide longer term planning notice for investment requirements is preferred.

GN Facilities Investment

Similar to the above issue, this relates to the requirement for the GN to make investments in the improvement of hangars and similar facilities for lease or for free use.

GN Resource Requirements

If the contract option calls for the GN to provide services to the contractor, such as check-in counter or ground handling services, it will require ongoing resources, training and management on the part of the GN. Such options are not preferred.

Service Evaluation

A contract option that facilitates the setting up of formal service evaluation processes and effective collection of service evaluation data is preferred.

Feedback

A contract option that facilitates the setting up of formal supplier feedback processes and effective action on fixing service problems is preferred

5.5.6 Compliance with Transportation Regulations

Each contracting option must comply with government regulations. Two significant sets of regulations are discussed below, however others may have an impact.

Compliance with Transport Canada regulations

All air services are required to comply with Transport Canada air regulations. Any contracting option that implies an operation that is not in compliance is not feasible.

Compliance with Competition regulations

Transport Canada, in discussions and consultations, does not at this time appear to be

concerned that the goals of the GN in air services procurement are anti-competitive. However, it has been noted that the sequence of events among RFP calls and teaming / sub-contracting agreements between bidders should be carefully considered to avoid violating guidelines of the Competition Board. The options are evaluated in terms of the ability of the GN to manage the process to avoid problems.

5.5.7 Financial Support Requirements

It may become apparent that a contracting option cannot be completely financed by suppliers due to an inadequate market size, particularly for routes that are not considered to be economically viable. Consequently issues related to possible financial support must be considered. The types of financial support are identified below for evaluation. They consider the type of support under consideration, and the ease of application of the support methodology if it is required. Given the current budget constraints and the requirements for capital expenditures it is unlikely that funds could be made available for financial support.

Direct Subsidy

Direct subsidy includes contract terms that allow for direct payment by the government of, for example, a surcharge on the public price for a ticket for travel between certain community pairs if the cost/revenue equation is not positive.

Indirect Subsidy

Indirect subsidy would, for example, include such provisions as the guarantee of a specified number of seats on low volume routes by the GN in exchange for a commitment to provide service on the route.

Government Furnished Equipment

The government may provide information technology systems, ground support equipment at or below cost to the contractor to support particular routes or services.

Government Furnished Facilities

The government may provide hangar, terminal building check-in counters or offices or other facilities at or below cost to the contractor to

support particular routes or services.

Government Provided Services

The government may provide passenger check-in services or ground handling services at or below cost to the contractor to support particular routes or services.

5.6 Options Evaluation

Public Outcomes / Government Outcomes

The main objective is the capability that the selected option provides for the Government of Nunavut to influence public and government air services improvements, including the overall quality of service, to the greatest degree.

Risk Minimization

Assessments within this group are a trade-off between the complexity and uniformity of implementation on one hand, and the ease of re-bidding on the other.

Industry Acceptability

Industry consultations indicated a preference for maintaining the status quo with a large number of smaller air carriers operating on a regional basis. Industry would clearly prefer a Moral Suasion approach by government.

Government/Contractor Resource Requirements

Two elements are important in this grouping: contract administration effort and evaluation and feedback.

Compliance with Regulations

There is little to discriminate between options as all operators are required to comply with regulations. Smaller operators can be more flexible in their response to regulatory requirements but larger carriers will deliver a more sophisticated response.

Financial Support Requirements

Government will clearly prefer not to be required to provide financial support. If financial support should be required to meet agreed air service objectives, then the least amount of support will be preferred.

6 Recommended Air Services Strategy

6.1 Strategic Direction

Implementation of an air services strategy will require a clear understanding of several important issues of GN policy, procurement and support. In essence, Nunavummiut want more advanced air services which may be uneconomical given the small population, extremely long distances between communities, and high costs of arctic operations. Industry stands ready to make some financially viable improvements, but the extent to which innovative improvements may be achievable, is not yet known.

To foster significant change, the GN must be prepared to assume some portion of the economic risks needed to achieve the higher levels of service and more profound changes desired by Nunavummiut. Several of these risks and related GN policy issues are identified below.

1. The GN will need to share the risk with contractor(s) with respect to the impact that the entry into locally lucrative markets by competitors to GN-selected contractors might have on the economic stability of the overall Nunavut service network. Methods of achieving this risk sharing objective must be discussed with industry and government. Two important questions for discussion are:
 - Should cross subsidization of routes be encouraged in the proposals from industry as a means of achieving fairer and more equitable air fares?
 - Should some form of fare equity be attempted across the territory?
2. The risks of modernizing air service will be shared to a greater or lesser degree between the contractor(s) and the government. For example, the selected contractor(s) must be encouraged to initiate new air services. However, if they become demonstrably uneconomic, or are threatened by outside factors, the contractor(s) must be able to either withdraw from the route to protect the economic viability of the network, or

receive some form of support from government if deemed appropriate. Criteria for this critical aspect of the contract must be discussed with government and industry.

An important question for discussion is:

- Should an essential air services subsidy program be proposed to or by Government?
3. Airline modernization will depend, in some markets, on improvements to local infrastructure which falls within the purview of GN. For example, lengthening of several runways may be required, access to or availability of airport facilities may be required, and modifications to air terminal interiors to accept upgraded computer systems may be required.

The inability to provide necessary improvements such as selected runway expansions, could create financial risks as the type of aircraft operating on a route will be limited by the capability of the most restricted airport, and newer more modern aircraft acquired may not be able to operate the agreed service.
 4. Depending on the size of a contract, the selected contractor will hopefully have included in its proposal, a variety of recruitment, training, and employment initiatives for Nunavummiut. Two important questions for discussion might be:
 - To what extent should the contractor(s) be responsible for example, if Nunavummiut do not avail themselves of the opportunities presented, or are unable or unwilling to meet the industry standards necessary for long term employment?
 - To what extent will the risks of training and career development investments be shared by government?

Once a preferred strategy has been agreed for air service improvements, many specific issues must

be assessed through formal consultations with industry and government.

Comprehensive consultations will increase the likelihood of success in:

- identifying the optimum number of contracts to be awarded;
- identifying the best scope of work for all proposed contracts;
- preparing sound requests for proposals;
- eliciting viable responses from industry ranging from small point-to-point services to network improvements;
- implementing fair and effective service contracts with diverse objectives and promised rewards; and
- achieving desired improvements in Nunavut air services.

6.2 Risk Assessment

Strategies considered for improving air services progress from moral suasion, through mild intervention in the form of multiple structured contracts, to more significant intervention which would include a large single contract for all government air services.

The likelihood of improving existing air services progresses from achieving minor adjustments in the system with moral suasion, to some limited improvements with multiple contract intervention, to expectations of significant change with a single, territorial airline contract.

Correspondingly, the level of risk escalates with increasing intervention from little or no risk to the GN with moral suasion, to a limited level with multiple contracts, to a relatively high risk with the single contract intervention.

Moral suasion has achieved few if any improvements in the past. In recent consultations (January 2003) airlines strongly favoured the moral suasion

approach by the GN when faced with any other alternatives to achieve improvements. This position is to be expected as Nunavut's airlines do not generally acknowledge a need to make significant improvements in their services.

Business interests, and an ultimate expectation of profit, underpin all airline activities. No airline provides competition just for the sake of competition. Significant opposition to GN attempts to improve air services system-wide is likely since the government must address the need for air service improvements in both **profitable and unprofitable markets**.

Air carriers in the arctic have traditionally held a far greater influence over daily life and business activity than have airlines in southern Canada. As such, their arguments have carried greater political weight in the north since they are relied upon to provide essential transportation services, and therefore the necessities of life and commerce.

In approaching air transportation improvements and reform, the political exposure to controversy is high. It must be recognized that each air carrier prefers improvement concepts based on their commercial interests, and not necessarily based on the interests of Nunavumiut. During airline consultations carriers were **unable to suggest** ways to improve service to small Nunavut markets where a **profit could not be made** on each specific route sector. System-wide improvement initiatives, which include integrated services in both profitable and unprofitable markets, are problematic to the airlines.

Coupled to the political risk of upsetting the airlines, are risks associated with implementation of a new air transportation strategy. For example, the degree to which other government agencies will agree to support consolidated GN air service contracting strategies is not certain, and the degree to which Inuit ownership issues might influence the outcome of major reform initiatives is unclear.

Figure 6-1 on the following page illustrates the four more preferable options for air service improvement along with summary comments on the related risks, benefits and likely change from current practices (ie: the status quo).

**Table 6.1 - Comparison of Preferred Options
Nunavut Air Service**

Feasible Improvement Options	Service Area of Contract(s)	Benefits for Nunavummiut	Risks		Change from Status Quo
			Impact on Industry	Political Risk	
Moral Suasion All air carriers have indicated that they are most eager to work with the GN to negotiate service improvements. The extent of improvements that can be implemented and maintained using this strategy will depend on air carrier attitudes and perceptions.	Random routes and markets	Sparse - several new routes (trial basis) - slow modernization	None - greater sensitivity to Nunavut priorities	None	Nominal
Multiple Airline Contracts All air carriers would be invited to compete to provide service on specific new routes and markets in return for guaranteed government business on these, and / or other routes at a set price. Air carriers would also be invited to improve schedules on stipulated routes. While the level of government business cannot be stated air carriers would be free to propose scope and volume of government business required to serve stipulated new markets and schedules.	Selected routes and markets	Limited - selected new routes and services - selected modernization - improvements on stipulated routes	Low - varies with scope of responses - expanded services - improved revenues - indirect subsidization	Low - un-acceptable responses - high level req'd govt. business - higher fares to govt.	Minimal
Multiple Airline Contracts All air carriers would be invited to compete to provide inter-locking air services to all markets in a region. Airlines would propose a regional network service including a declared service pattern, specific routes, service frequency, fare and rate structure, modern equipment types, service quality, and other improvements. In return the government utilizes the selected carrier for all passenger and cargo business.	Kivalliq, Kitikmeot, Qikiqtaalq Regions	Moderate - regional fare equity - regional cargo equity - regional schedule coordination - regional service co-ordination	Medium - possible carrier consolidation - stabilization of market shares - organization of smaller air carriers	Moderate - competing ownership interests - intra-regional conflicts	Modest
One Airline Contract Airlines would submit competitive proposals to deliver air services using their own resources and other air carriers operating under subcontract. The lead airline would assume responsibility for all services throughout the territory. Airlines would propose a complete network service including a declared service pattern, specific routes, service frequency, fare and rate structure, modern equipment types, service quality, and other improvements. The services contract would include scheduled and charter, passengers and cargo services.	All 26 communities + gateways	Maximum - equity in airfares - equity in cargo rates - equity in services - seamless services - territorial scheduling - cross subsidisation	High - carrier organization - no overcapacity - reduced number of carriers - one strong carrier	High - competing ownership interests - few future bidders	Major

6.3 Recommended Strategy

6.3.1 Progressive Intervention

An escalating strategy of progressively increasing intervention is recommended to achieve improvements in air services provided in Nunavut. A minimal level of intervention will be undertaken in the short term.

If this strategy does not achieve desired results, or if greater systemic improvements are desired in the future, then a moderate to high level of intervention should be undertaken.

A strategy of escalating intervention will send an important signal to the air carrier industry that serious improvements are desired by government, even though only modest contractual incentives are initially available.

6.3.2 Short Term Approach

Multiple Airline Contracts for improvements to **selected routes and markets** has been selected as the preferred strategy in the short term by the GN. While offering limited improvements, this strategy is of low risk to both the GN and industry and may deliver some visible improvements with respect to some communities served and possibly to certain schedules. All airlines have expressed interest in bidding on GN government contract business.

Moral suasion has been selected as the preferred strategy in the short term by the GN to achieve more general system-wide improvements across the entire territory. Airlines have recently voiced their desire to consider improvements on this basis.

6.3.3 Long Term Approach

Nunavut air services have evolved considerably over the last four decades and will continue to evolve as the territory develops.

Should the natural evolution not proceed in the direction desired by the GN, a greater level of intervention might be justified in the future. For example the consolidation of government air service procurement could be utilized to foster either regional or territorial air service contracts designed to deliver a wide range of system and service improvements as shown in Figure 6-1.

6.4 Short Term Improvements

6.4.1 Multiple Contract Objectives

It is recommended that the GN attempt "moral suasion" to effect specific service improvements such as:

1. fare and rates equity between regions;
2. improved service patterns and connectivity;
3. more direct flights;
4. a limitation on number of permissible stops;
5. improved cargo logistics and handling;
6. cargo shipping performance standards;
7. equipment modernization;
8. increased services in Inuktitut and Inuinnaqtun;
9. one day travel to the capital;
10. other service improvements.

6.4.2 Moral Suasion Objectives

Along with the above improvements, contracting may be employed to implement short term improvements which might include the following enhancements to current services:

1. same-day service from Sanikiluaq to Iqaluit;
2. same-day service from Cambridge Bay to Iqaluit;
3. regular service from Iqaluit to Greenland;
4. a direct route from Qikiqtarjuaq to Iqaluit;
5. adjusted community connections such as Qikiqtarjuaq north to Baffin Island destinations; and Pond Inlet to Igloolik;
6. same day connections for Kivalliq residents with trans-territorial services;
7. reduction in route duplication where excess capacity is extreme (Iqaluit - Rankin -Yellowknife);
8. other new, or modified services depending on airline equipment capability and fare economics.

Appendix A - Airline Network Model

A.1 Nunavut Air Services Model

A.1.1 Overview

One of the main challenges in undertaking the Nunavut Air Services Study is understanding the unique operating environment in the territory. Traditional airline business practices that may work in the south do not necessarily work in Nunavut. In proposing alternatives to the current regime of air routes and services, one needs to come to grips with these differences. It was also important to look at the system as a whole, and not on a route by route basis, particularly since the Nunavummiut have expressed strong desires to be able to have closer ties to one another. Cross-territory travel is expected to increase as the government decentralizes, while community consultations reveal a desire to travel between communities currently not served directly or at the very least conveniently.

Developed in order to analyse the Air Transportation system in Nunavut from a network standpoint, the Nunavut Air Services Model (NASM) is a powerful spreadsheet designed to illustrate the feasibility of employing various air service strategies, given the current realities of operating in the territory.

The model starts with current data; schedules, fares, routes, operating costs and demand data being the primary drivers. The model assesses these and other variables, and through sensitivity analysis and “what if” scenarios creates a system-wide profitability picture.

The model is flexible. For example, freight and passengers may travel on the same flights, as they do now. However, they can be treated individually if the aim is to analyse the opportunities created by operating separate passenger and cargo flights on given route(s).

The model is also expandable. Should the government choose to build a new airport, the site can be added and the model run to simulate potential routes, fares, and profitability levels.

At the heart of the model are tradeoffs between various forces; demand, cost, service level, fares, financial return and operational issues. It is through analysis of the interplay between these factors that one is able to determine an effective alternative to the status quo. The model can illustrate the effect of adding different equipment to a route. Its operating

cost might dictate higher or lower fares. Such would be illustrated by varying the average fare. Adding frequency to a particular route might improve service level but demand may not be sufficient to warrant it. Such would be illustrated by examining resulting load factor. Other examples might include operating conditions that prevent a potentially effective aircraft from operating on a given route, while the operating margin of another type may be such that an acceptable level of return may produce large fare inequities with other routes.

A.1.2 Input Considerations

The model requires a number of basic assumptions with which to work. These are:

Hourly operating costs for numerous fleet types in use or potentially suited for Nunavut

- Average block times (gate-to-gate) on routes both present and future
- Community populations and government staff by area of concentration
- Propensity to travel
- Weekly O-D (origin/destination) demand, both passengers and freight
- Demand with network contribution
- Average fares and freight charges net of any special discounts

Hourly operating costs consider both direct as well as indirect costs. Direct operating costs include such items as fuel, crew, direct maintenance and maintenance burden (anything not related to the airframe or engines such as spares inventory, seat refurbishing..), servicing costs including landing fees, passenger variable costs including meals, insurance, and security charges, as well as rental fees or depreciation costs if the aircraft is owned. Indirect operating costs include such items as training, hangar costs and terminal fees, sales and marketing, ground equipment and office/administration costs. This figure is used to compare the economics of different aircraft and their viability on a given route.

Propensity to travel is a measure of the number of trips per person per year.

Network contribution is a measure, on a given route, of those passengers travelling behind and/or beyond the two points in question.

Also considered in assembling the model are:

- Airport infrastructure
- Airline scheduling practices and maximum allowable crew time
- Regulatory constraints

A.1.3 Outputs

The model produces profitability data for any two points in the territory for which an air service (real or proposed) is defined. The model also measures the results by producing general economic data useful to industry professionals and researchers alike. Outputs summarized:

- Passenger and freight revenue per flight
- Total System-wide revenue
- Available Seat Kilometres (ASKs) and Available

Tonne Kilometres (ATKs)

- Revenue Seat Kilometres (RPKs) and Freight Tonne Kilometres (FTKs)
- Trip operating and unit costs given fleet type
- Operating ratios
- Load factors

ASKs (or ATKs) are the industry's standard measure of supply, and is equal to the number of seats (or tonne capacity) multiplied by the distance flown, in turn multiplied by flight frequency. RPKs (or FTKs) are the industry's standard measure of demand, and is equal to the number of passengers (or amount of freight) multiplied by the distance flown, in turn multiplied by flight frequency. Trip unit cost is the cost of the trip per available seat kilometre. A trip's operating ratio is obtained by dividing trip revenue by trip cost. Load factor is a measure of the percentage of seats filled (RPKs/ASKs). A leg load factor may also be obtained by dividing the number of seats filled by the total number of seats.

Air Services Model

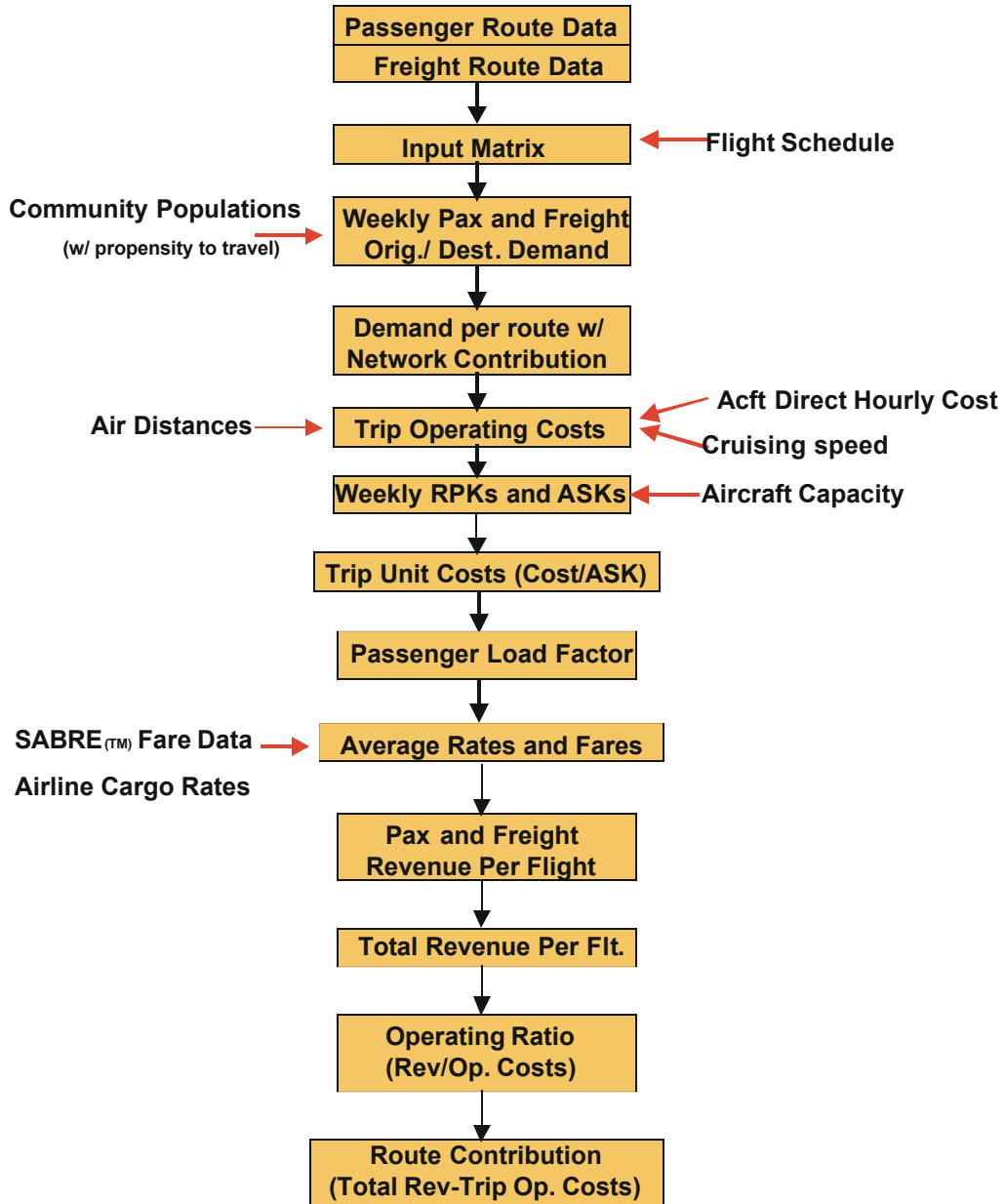


Figure A-1 Air Service Model Flow Chart

Appendix B - Community Air Schedules

Spring 2003

Table B.1 - Community Air Services -Spring 2003

Community	Nonstop Flights	Airline	Weekly Frequency	Equipment
Arctic Bay				
Arviat	Churchill	Calm Air Kivalliq Skyward	10 3 6	SF340 PC12 EMB110/ B1900D
	Rankin Inlet	Calm Air Kivalliq	10 1	SF340 PC12
	Whale Cove	Skyward Kivalliq	4 2	EMB110/ B1900D PC12
Baker Lake	Chesterfield Inlet	Calm Air	1	HS748
	Rankin Inlet	Calm Air	2 6	HS748 SF340
Cambridge Bay	Gjoa Haven	First Air Kenn Borek	4 3	HS748 EMB110
	Kugluktuk	Aklak Air First Air	3 2	DHC6 ATR42
	Resolute Bay	Kenn Borek	2	BEC
	Taloyoak	Kenn Borek	3	EMB110
	Yellowknife	First Air Canadian N.	2 4 3	B737 HS748 B737
Cape Dorset	Iqaluit	First Air Kenn Borek	5 6	HS748 BEC
Chesterfield Inlet	Baker Lake	Calm Air	2	HS748
	Coral Harbour	Kivalliq Air	1	PC12
	Rankin Inlet	Calm Air Kivalliq Skyward	1 8 7	HS748 PC12 EMB110/ B1900D
	Repulse Bay	Kivalliq Skyward	2 1	PC12 EMB110/ B1900D
Clyde River	Iqaluit	First Air	4	HS748
	Pond Inlet	First Air	4	HS748
Coral Harbour	Chesterfield Inlet	Kivalliq	2	PC12
	Repulse Bay	Calm Air	2	SF340
		Kivalliq	4	PC12
	Rankin Inlet	Calm Air	2	SF340

Community	Nonstop Flights	Airline	Weekly Frequency	Equipment
		Skyward	4	EMB110/ B1900D
		Kivalliq	3	PC12
Gjoa Haven	Cambridge Bay	First Air Kenn Borek	1 3	HS748 EMB110
	Kugaaruk	First Air Kenn Borek	1 3	HS748 EMB110
	Taloyoak	First Air	5	HS748
	Yellowknife	First Air	2	HS748
Grise Fiord	Resolute	Kenn Borek	2	DHC6
Hall Beach	Igloolik	First Air	2	HS748
	Iqaluit	First Air	2	HS748
Igloolik	Hall Beach	First Air	2	HS748
	Iqaluit	First Air Kenn Borek	2 2	HS748 B99
	Pond Inlet	Kenn Borek	2	B99
Iqaluit	Cape Dorset	First Air Kenn Borek	5 6	HS748 BEC
	Clyde River	First Air	4	HS748
	Goose Bay	Air Labrador	1	B1900D
	Hall Beach	First Air	4	HS748
	Igloolik	First Air Kenn Borek	2 2	HS748 B99
	Kimmirut	First Air Kenn Borek	4 2	DHC6 DHC6
	Kuujuaq	First Air	4	B737
	Ottawa	First Air Canadian N.	7 (6 N/S) 6	B727 B737
	Pangnirtung	First Air Kenn Borek	7 6	HS748 BEC
	Rankin Inlet	First Air Canadian N.	3 3	B737 B737
	Resolute Bay	First Air	2	B727
Kimmirut	Iqaluit	First Air Kenn Borek	4 2	DHC6 DHC6
Kinggaug				

Community	Nonstop Flights	Airline	Weekly Frequency	Equipment
Kugaaruk	Gjoa Haven	First Air Kenn Borek	2 3	HS748 EMB110
	Repulse Bay	Kivalliq	2	PC12
	Taloyoak	First Air Kenn Borek	1 3	HS748 EMB110
Kugluktuk	Cambridge Bay	Aklak First Air	3 2	DHC6 ATR42
	Holman	First Air	3	ATR42
	Yellowknife	First Air	5 2	ATR42 HS748
Nanisivik	Iqaluit	First Air	2	B727
Pangnirtung	Iqaluit	First Air Kenn Borek	7 6	HS748 BEC
	Qikiqtarjuaq	First Air Kenn Borek	5 6	HS748 BEC
Pond Inlet	Clyde River	First Air	4	HS748
	Igloolik	Kenn Borek	2	B99
	Resolute Bay	Kenn Borek	2	B99
Qikiqtarjuaq	Pangnirtung	First Air Kenn Borek	5 5	HS748 BEC
Rankin Inlet	Arviat	Calm Air	10	SF340
	Baker Lake	Calm Air	6 1	SF340 HS748
	Chesterfield Inlet	Calm Air Kivalliq Skyward	2 6 7	HS748 PC12 EMB110/ B1900D
	Churchill	Kivalliq	6	PC12
	Coral Harbour	Calm Air	2	SF340
		Kivalliq	3	PC12
	Iqaluit	First Air Canadian N.	3 3	B737 B737
	Repulse Bay	Calm Air Kivalliq Skyward	2 3 5	SF340 PC12 EMB110/ B1900D
	Whale Cove	Calm Air Kivalliq Skyward	3 3 6	HS748 PC12 EMB110/ B1900D

Community	Nonstop Flights	Airline	Weekly Frequency	Equipment
	Winnipeg	First Air	3	B737
	Yellowknife	First Air Canadian N.	5 3	B737 B737
Repulse Bay	Chesterfield	Kivalliq Skyward	1 1	PC12 EMB110/ B1900D
	Coral Harbour	Calm Air Kivalliq Skyward	2 5 5	SF340 PC12 EMB110
	Kugaaruk	Kivalliq	2	PC12
	Rankin Inlet	Calm Air	2	SF340
Kivalliq		3	PC12	
Resolute Bay	Cambridge Bay	Kenn Borek	2	BEC
	Grise Fiord	Kenn Borek	2	DHC6
	Nanisivik	First Air	2	B727
	Pond Inlet	Kenn Borek	2	B99
	Yellowknife	First Air	1	B737
Sanikiluaq	Inukjuaq	Air Inuit	1	DHC8
	Kuujuarapik	Air Inuit	2 1	DHC6 DHC8
Taloyoak	Cambridge Bay	First Air Kenn Borek	3 3	HS748 EMB110/ B1900D
	Gjoa Haven	First Air	1	HS748
	Kugaaruk	First Air Kenn Borek	2 3	HS748 EMB110/ B1900D
Umingmaktok				
Whale Cove	Arviat	Kivalliq Skyward	3 6	PC12 EMB110/ B1900D
	Chesterfield Inlet	Kivalliq	2	PC12
	Churchill	Calm Air	3	HS748
	Rankin Inlet	Calm Air Skyward	3 4	HS748 EMB110/ B1900D

Appendix C - Helicopter Service Options

C.1 Helicopter Services

The analysis of strategic options for the procurement of helicopter services by the Government of Nunavut is very similar to the analysis described in Chapter 5.

There are no scheduled helicopter services now offered in Nunavut and the long distances involved discourage any such offering. Helicopters are, however, used in charter operations for both passenger and cargo purposes. As the requirements for procurement of charter helicopter services are so different from the requirements for scheduled aeroplane passenger and cargo services, the contracting for helicopter services has been considered separately in this Appendix.

Helicopter services, as they are all charter services, would lend themselves more easily to negotiation or multiple contracts options that would scheduled fixed-wing services.

C.2 Contracting Options

Table C.1 includes the contracting option descriptions and defines the characteristics of the contract types. The definitions are similar to those in Chapter 5 for Aeroplane services.

The options considered to be most feasible based on operational constraints include the following:

- Prime + Subs Territorial
- Prime + Subs Regional

The Prime + Subcontractors strategy for acquiring territory-wide rotary-wing air services is the preferred strategy for many of the reasons stipulated for the fixed-wing strategy. It will be simpler in implementation, however, as no scheduled services are likely to be required under the contract. The territory-wide contract is advantageous over regional contracts because it will allow government to request service more equally throughout the territory and it should offer a large enough amount of potential flying to the successful contractor to justify basing helicopters in the territory year-round. These

objectives could be harder to meet under the regional helicopter contract strategy.

The helicopter services contract would include provision of charter services, for passengers and cargo services throughout the territory of Nunavut, and to the maximum extent possible, any services to and from the territory.

Prime contractors will be invited to submit proposals to deliver helicopter services using a combination of their own resources and the resources of other licenced commercial air carriers operating under subcontract to the prime contractor. The prime contractor will assume responsibility for the delivery of all services throughout the territory under the contract.

Prime contractors will be invited to submit proposals to deliver air services using a combination of their own resources and the resources of other licenced commercial air carriers operating under subcontract to the prime contractor. The prime contractor will assume responsibility for the delivery of all services throughout the territory under the contract.

Prime contractors will be invited to propose a basing strategy and area service plans including a declared rate structure, modernized equipment types, service quality, and variety of other operational measures of performance to meet the needs of Nunavummiut and the government.

An infrastructure investment and operations plan will be requested.

Specific objectives for delivering services in Inuktitut, for training and employing Nunavummiut, and for maximizing activities and benefits to Nunavut will be encouraged.

Prime contractors will assume contractual obligations to provide the services as proposed, with provisions for mutually acceptable adjustments to certain aspects of the contract on an annual, or other periodic basis.

**Table C.1 - Contract Options - Definition
Nunavut Air Services - Helicopter**

Contract Type	Aircraft	Service Area	Service Type		Payload		Canadian Aviation Regulations Part VII Commercial Air Services **			Description	Recent Example
			Sched.	Charter	Pax	Cargo	Sub. 705 Airline 20+ seats	Sub. 704 Commuter 10-19 seat	Sub. 703 Air Taxi 1-9 seats		
Master	Helicopter	Territorial		•	•	•	•	•	(•)	Single contract Single supplier	Greenlandair Domestic Service
Prime + Subcontracts	Helicopter	Territorial		•	•	•			•	Single contract Lead supplier responsible for fares and performance of subcontractors	DND - NWS Air Support Helicopter
	Helicopter	Regional		•	•	•			•		
Multiple Structured Contracts	Helicopter	Territorial Trunk		•	•	•				Multiple contracts by Mission Multiple suppliers	Northern Stores, Co-op
	Helicopter	Regional Feeder*		•	•	•				Multiple contracts by Region and Mission Multiple suppliers	Essential Air Services Prog.- U.S.
	Helicopter	Local Feeder*		•	•	•				Multiple contracts by Locality and Mission Multiple suppliers	GN links to Greenland, Saniqiluaq
	Helicopter	User & Mission		•	•	•			•	Multiple contracts by User and Mission Multiple suppliers	Nunavut Health Board
Bundling	Helicopter	User & Mission		•	•	•			•	Multiple contracts by Groups of Users for Defined Missions Multiple suppliers	Polar Continental Shelf Project

* Feeder services assume that air carriers will utilize a hub-and-spoke strategy due to the long distances and small market for point-to-point services.

** Significantly different Canadian Aviation Regulations (and costs) apply to air carriers depending on their operational classification, type of aircraft and nature of operations. Regulations effectively preclude operation in more than 2 adjacent categories due to the high costs of compliance in small markets.



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