Executive Summary

Purpose of the Study

The Government of the Northwest Territories (GNWT), through the Northwest Territories Department of Transportation (the Department), owns and operates fifty-two public airports as part of its mission to provide for safe, accessible and reliable movement of people and goods throughout the North. These airports form an integrated system of local community and regional facilities that link the region from east to west as well as to points in southern Canada.

Many communities and air carriers have requested that improvements be made to existing airport infrastructure. These requests range from runway resurfacing to airport relocation projects with a number of projects involving runway extensions. These requests are made with the expectation that economic gains will be made, that service improvements will be obtained, or that regulatory compliance will be achieved.

However, available funds for airport improvements are limited and means must be found to prioritize requests. With only $9 million available annually for capital projects, the Department cannot respond to all the requirements identified by community leaders and air carriers. The purpose of this study is assist the Department in this proces with a proposal to improve the process by which airport capital expenditures are made.

The study's specific objective is to review current and future runway requirements, over a 20 year horizon, at GNWT airports, and to propose a methodology for the evaluation and prioritization of runway extension requests and related proposals.

This study:

1. Assessed existing air services and existing facility requests
2. Projected future air service volumes
3. Reviewed the existing airport classification system and planning methods
4. Proposed a new airport classification system and planning approach
5. Applied the proposal classification system to the system of airports and provided recommendations.

Existing NWT Air Services

The Northwest Territories are served by an extensive air transportation network that links the region from east to west and to points in the South. The region, however, has unique characteristics that distinguish it from other air systems. Because of a sparse population dispersed over vast distances, air routes are the lifeline of northern transportation. Northerners use air services more than four times as often as the average Canadian.

The northern air system consists of 47 airports receiving scheduled service. These airports are owned and operated by the Government of the Northwest Territories. Northern air services are characterized by scheduled gateway, trunk and feeder air routes. Scheduled gateway jet air services link three northern gateway airports to Southern hubs, and scheduled trunk services link the airports in each regional administrative centre. Smaller remote communities are linked to their regional administrative centres through scheduled feeder services. Charter flights augment scheduled services. In both all cases, cargo air services are provided either by dedicated freighters of by "combi" – passenger/cargo – aircraft.

In addition, medevac services are provided in a variety of aircraft types. Standards for medevac services are established by the Department of Health and Social Services.

Community and Air Carrier Surveys

To identify deficiencies in the NWT air transport system, surveys were conducted with two stakeholder groups – community leaders and northern air carriers. The results of the two surveys showed considerable convergence regarding the question of adequacy of current runway lengths. The same percentage of respondents in both surveys - 75% - expressed the opinion that runway facilities were adequate. Together, the respondents of the two surveys identified eleven airports where runway lengths were perceived to be inadequate. These airports are: Arviat, Chesterfield Inlet, Colville Lake, Igloolik, Jean Marie River, Kimmirut, Nahanni Butte, Rae Lakes, Repulse Bay, Taloyoak, and Trout Lake.

In addition, it should be noted that some carriers and communities made general comments that referred to runway requirements. In the analysis of the report, the adequacy of runways at all GNWT airports is assessed.

The surveys also produced significant responses with respect to the need for improved communications, weather reporting and navigation aids.

Factors in Air Service Development

Factors that impinge on the provision of future air services in the NWT relate to four broad areas. These factors are summarized as follows:

i. Economic Change

The economy of the NWT is expected to grow at 1.2% per annum to the year 2006. This is about half the expected growth rate for Canada overall. Population is expected to grow 2.1% per annum.

Since airlines operating in the North are now deregulated, airline economics greatly influence the level of service provided. Combi aircraft continue to offer substantial benefits to northern travellers by sharing operating costs between freight and passengers. Notwithstanding, a market of almost 15,000 annual passengers is required to support daily non-stop B-737 combi service. By comparison, 3 times a week Dash 8 combi service requires 1,648 passengers.

Not only does cargo provide a critical transportation service for daily necessities, it also supports passenger air services.

Airfares are linked to load factors with thinly populated areas being at a disadvantage. Again, cargo is a key component in contributing to fixed costs and stabilizing fares.

ii. Territorial Governance

The creation of the Territory of Nunavut will influence future patterns as a result of:

- Decrease in east-west travel to Yellowknife.
- Increased travel to regional administrative centres.
- Increase in total travel.

iii. Aircraft and Aviation Technology - Key Developments

- Replacement aircraft will have improved performance and require less runway.
- GPS will improve overall airport accessibility.

iv. Regulatory Environment – Canadian Aviation Regulations

- Take-off and landing performance requirements will penalize older aircraft.
- Most modern aircraft meet standards.
- Contaminated runway regulations will levy need for maintenance of gravel/pavement runways to remove contaminants.

Medevac Operations

- Will benefit from aircraft performance improvements.
- Require matching of aircraft performance to airports for best results.
- Would benefit from centralized management of operations.

Future Air Services Structure

Based on forecast traffic growth and air carrier survey results, the air service structure in the Northwest Territories is expected to remain as it is today with a few exceptions.

Air Traffic Forecasts

Air traffic forecasts indicate that overall air travel will grow in the North but not a phenomenally fast pace. Passenger growth at the ten airports representing 73% of the total northern passenger traffic in 1996 is forecast at 2.2% per annum. Total aircraft movements would increase annually by 1.1% during the same forecast period. Passenger growth is forecast to increase more in the Nunavut Territory.

Between 1996-2007, enplaned and deplaned passenger traffic increases at Gateway Hub airports is forecast to range from 2.4% to 3.2%. Aircraft movements are forecast to increase at a much lower pace.

The forecast air traffic at the Regional Hub airports will vary depending on the socio-economic characteristics that are specific to each community.

Future Air Services Route Structure

Minor adjustments to levels of service and the introduction of a few new air service routes are expected in certain regions.

The following routes may witness more rapid flight frequency growth than others:

Igloolik – Hall Beach

Pangnirtung – Iqaluit

Pond Inlet – Iqaluit

Arviat – Churchill

Arviat – Rankin Inlet

Baker Lake – Rankin Inlet

Whale Cove – Rankin Inlet

Potential route development is expected on the following route segments:

Rankin Inlet – Cambridge Bay

Cambridge – Iqaluit

Igloolik – Pond Inlet

NWT Airport Planning

A revised approach to northern airport planning is proposed in the study. The approach is based on the three airport categories identified each with a planning methodology suited to the airport role:

Airport Category	***Planning Methodology***
Gateway Hub	Airport Master Plan
Regional Hub	Airport Systems Plan
Community Airport	Airport Planning index

Seven of the 52 GNWT airports are identified as hubs. The development of these airports is guided by the preparation of comprehensive plans predicated on forecast aircraft movements and passenger and cargo volumes. Detailed system demand/capacity analysis and designation of a Critical or Planning Aircraft are used to identify future requirements.

Because of their vital role, Community Airports also require site plans. Due to the cost and work involved, however, these plans should only be prepared when required. The Airport Planning Index (API) has been developed for this purpose. The API monitors sites by verifying that the capacity of the selected Planning Aircraft is adequate for demand. APIs over 0.75 suggest action will be required to augment capacity. The API takes into account cargo space allocations on "combi" aircraft; enroute stop capacity constraints, and distance/time to a hub airport.

The evaluation of projects seeking runway expansion or airport relocation to achieve runway expansion is undertaken according to the issues identified through site assessment. These issues are related to safety, socio-economic objectives and level of service requirements.

Runway Requirements Analysis

Application of the assessment methodology indicates that 50 of the 52 GNWT airports (96%) support operation of the current Critical/Planning aircraft without payload restriction. Nine community Airports have some form of constraint due to runway length: the introduction of replacement aircraft will reduce this number to seven.

With few exceptions, runway facilities at GNWT airports meet the requirements of both current aircraft and future replacements. To support the needs of the northern air service system, however, specific measures are required at certain sites. These sites and the measures required are as follows:

Cambridge Bay: Extend runway to 6,000 feet (5,500 feet may be acceptable); pave within 10 years to allow fan-engined jet aircraft to operate.

Pangnirtung: Runway length required 3500feet. Conduct a technical evaluation to address site limitation and constraint issues and assess options using Multiple Account Analysis.

Repulse Bay: Extend runway to 3,500 feet.

Colville Lake: Not certified -conduct site evaluation.

Grise Fiord: Not certified - conduct a site evaluation.

Furthermore, facility and operational safety should be confirmed at all remaining non certified airports regardless of scheduled service status. These sites are :

- Jean Marie River
- Nahanni Butte
- Trout Lake

Study Findings and Recommendations

The following key finding and eight recommendations contain the major study results. In addition, five "Observations" were provided on other operational aspects and these are summarized in Section 8.

Key Findings

50 of the 52 GNWT airports (96%) support operation of the current Critical/Planning aircraft without payload restriction. Nine community Airports have some form of constraint due to runway length: the introduction of replacement aircraft will reduce this number to seven.

Hub Airports

- One hub airport runway should be paved and extended within 10 years

Community Airports -

- Two airports require runway extension to meet payload requirements. Site and terrain problems at one of the sites requires a technical site evaluation.
- 5 non certified airports sites require site evaluation.

Recommendations

Recommendation: That the following airport planning structure be adopted for GNWT Airports:

- Gateway Hub Airports: Airport Master Plan
- Regional Hub Airports: Airport Systems Plan
- Community Airports: Airport Planning Index

Recommendation: That Multiple Account Analysis methodology are used to evaluate airport expansion proposals related to socio-economic initiatives.

Recommendation: That the GNWT undertake a joint analysis with the Nunavut Government to assess options for operational and administrative management of medevac operations**.**

Recommendation: That the standards for air medevac carriers be expanded to contain minimum performance requirements for each airport in the area covered by the contract.

Recommendation: That the following airport planning structure be adopted for GNWT Airports:

Recommendation: That the GNWT consult with Transport Canada to obtain recognition and consideration for the special operating factors associated with northern airport operations.

Recommendation: An analysis should be conducted of staffing and communication requirements to provide runway condition reports and airport advisories.

Recommendation: Establish enhanced runway condition monitoring and maintenance procedures to reduce, to the extent possible, contaminants that may interfere with aircraft operations.

Recommendation: That the GNWT conduct a joint study with the northern air transportation industry to assess requirements and evaluate options to establish appropriate fuelling facilities.