

EXECUTIVE SUMMARY
MANITOBA-KRASNOYARSK
POLAR AIR LINK STUDY

Prepared for:
GOVERNMENT OF CANADA
PROVINCE OF MANITOBA
WINNIPEG AIRPORTS AUTHORITY
KRAS AIR

Prepared by:
SYPHER:MUELLER INTERNATIONAL INC.

In association with:
UNIVERSITY OF MANITOBA TRANSPORT INSTITUTE

September 30, 2001

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I. INTRODUCTION

The opening of polar air routes represents the removal of one of the last barriers to civil aviation. The opening of the routes has become possible as a result of developments on three fronts:

- liberalization of Russian and China over-flying authorities;
- improvement of air navigation technologies, including GPS; and
- development of long range aircraft.

The opening of the new routes will not result in an immediate shift away from traditional trade routes. The airlines and freight forwarders have developed a considerable infrastructure based on existing trade routes across the Pacific to West Coast gateways, such as Vancouver, San Francisco and Los Angeles, and to more eastern regions via Anchorage, Alaska.

It is in this context that the Government of Canada, the Province of Manitoba, and the Winnipeg International Airport (the Committee) are investigating Winnipeg's potential as a hub for polar air cargo routes. The development of even one polar air route through Winnipeg would dramatically strengthen the airport's role as an international gateway for air cargo activity.

Objectives

The objectives of the study are to prepare:

- A feasibility study which examines the economic, technical and regulatory considerations in establishing Manitoba-Krasnoyarsk polar air routes for air cargo between North America and Asia; and
- A strategic plan to develop Manitoba-Krasnoyarsk polar routes and related economic opportunities.

Approach

The findings of this report were developed through a number of quantitative and qualitative methods which include:

- Review of all available secondary sources of information including the NAV Canada/Russia study of air polar routes, previous Winnipeg cargo studies and other reports;
- Interviews with federal officials, Province of Manitoba officials, the Krasnoyarsk Airport, NAV Canada, and various airlines and freight forwarders throughout Asia and Canada;
- Review of bilateral agreements and identification of the institutional, administrative and regulatory environment through interviews with Transport Canada;
- Review of the global perspective of the air cargo industry;
- Analysis of route feasibility and comparative costs via Winnipeg and existing routes;
- Development of the current air cargo flows between Asia and North America (by commodity, by geographic location, tonnage, value of goods, etc) and forecast growth;
- Identification of specific market segments that could respond to cargo strategies designed to promote polar traffic via Winnipeg and Krasnoyarsk;
- Identification of any commodities which may present related opportunities for value added processing in Winnipeg or Krasnoyarsk;
- Development of potential target markets and other strategies; and
- Identification of strategies that could be adopted to encourage the use of Churchill as a technical stop.

II. OVERVIEW OF AIR CARGO

A brief overview of the air cargo industry was provided in Chapter II. It describes the environment within which initiatives to promote the region's air cargo industry should be launched. The highlights of this chapter are:

- There are two distinct types of air cargo; courier/express traffic and general cargo.
- Courier/express traffic is served by vertically integrated operators and flies mostly on dedicated all-cargo aircraft. General air cargo is carried by traditional airlines and flies mostly in the bellies of passenger aircraft. It is usually marketed as a by-product for otherwise empty space.
- A wide range of institutions supports the general cargo product.

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- General cargo prices are often not high enough to pay for dedicated, all-cargo aircraft particularly when backhaul is not available.
 - Containerized capacity is very important to general cargo services. Containerized capacity, usually produced as a by-product on widebody passenger flights, is essential for an airport to compete for a region's general cargo traffic.
 - Recently liberalized cargo charters rules make it easier for forwarders to charter aircraft.
 - Winnipeg should seek designation as a special cargo airport to enable unrestricted international cargo flights by the approved airlines.

The decision of the United States to deregulate commercial aviation prompted far-reaching changes in the world cargo network. The most important has been the ascent of integrated carriers, with an accompanying decline in the role of traditional airlines. However, several other trends continue to shape the industry.

III. AIR CARGO ENVIRONMENT

The Boeing Commercial Airplane Group forecasts solid growth in the air cargo industry at 6.4 to 2018, compared to 4.7% for passenger traffic. The forecast flow of air freight between North America and Asia is expected to continue to grow at higher rates than the world average over the next 20 years. The average annual forecast growth between North America and Asia during this period is over 7.5%.

Air cargo between Asia and North America increased at an average annual rate of 15% per year between 1998 and 2000. Forecasts prepared by MergeGlobal, project air freight increased by between 4% and 5% annually from the Asia/Pacific region to North America during 2001 to 2004, but at a higher rate of over 7% for freight from North America.

There are over 25 carriers serving the North America-Asian routes, with half of the cargo flown by the five largest carriers.

The analysis of the world-wide air cargo environment generally supports the growth and development of air cargo at Winnipeg. Findings from the analysis were:

- World-wide air cargo growth (6.4%) will outpace passenger growth (4.7%);

- Trade from Asia to North America is 68% more than from North America to Asia;
- There is minimal seasonal fluctuation in trade from North America to Asia;
- Most large Asian air carriers have dedicated all-cargo freighters;
- Aircraft types used for cargo freighter are capable of using the polar air routes, but at reduced payload capacity;
- Anchorage provides a good refueling location, but routes via Anchorage do not make use of the directional imbalance in cargo flows to reduce costs;
- Advent of the A380-F with its long range capabilities will significantly benefit cities such as Winnipeg, but will also benefit its competitors;
- Increasing liberalization will facilitate development of new services;
- The general cargo product makes extensive use of road feeder services, which airports need, to expand their catchment areas; and
- The growing conversion of older passenger widebody aircraft to freighters has increased the opportunity to obtain freighter services.

These trends are now and will likely remain the most important factors driving the growth of air cargo throughout the world. Together, they illustrate the economic environment within which the Government of Canada, Province of Manitoba, and Winnipeg International Airport will operate in the near future.

IV. AIR CARGO FLOW

A clear picture of the current air cargo flow between North America and Asia and how it will evolve are important for planning new services for Winnipeg and targeting the carriers and shippers. This chapter focused on air cargo flows in term of:

- The tonnage being shipped in each direction;
- The types of goods being shipped;
- The value per kilogram of the goods;
- The origin and final destination;
- The airports being used;
- The carriers being used; and
- How these characteristics will change in the future.

This information will be critical in developing marketing plans for air cargo carriers and freight forwarders.

Findings from the analysis of cargo flows are summarized below:

- Almost 27 million tonnes of air cargo was shipped between Asia and North America in 2000, enough to fill 70 B747 freighter aircraft each day for a year.
- There is a significant imbalance in the air cargo flows to and from Asia - for every 100 tonnes of cargo shipped from Asia to North America, there are only 60 tonnes shipped to Asia.
- The variation in cargo flows over the year is small for cargo to Asia, but is peaked during the last quarter, especially during December, for shipments to North America.
- Japan is by far the major destination of cargo to Asia. Taiwan, South Korea, Singapore, Hong Kong and, to a less extent, China are also important destinations.
- China and Japan are the two major sources of air cargo from Asia to the US, followed by Taiwan and South Korea.
- China and South Korea have the highest growth rates for both inbound and outbound US air cargo.
- The value of air cargo between Asia and the US is typically between \$US 75-200 per kilogram, except for exports from China where the average value is only \$US 38.
- The major US airports for receiving and exporting cargo are New York, Los Angeles, San Francisco and Chicago. These four airports handle 75% of the Asia-US air cargo and Anchorage acts as a transit point for much of this cargo.
- Winnipeg will need to obtain a market share of 10% to 20% of air cargo between its catchment area in central/eastern North America and the selected Asian city for a viable all-cargo service twice weekly using a B747F.

V. ROUTE ANALYSIS

In this chapter, comparisons were made between the polar routes and existing trans-pacific routes between North America and Asia. Travel distances, times, payload-range restrictions and operating costs for each route were considered. NAV Canada's analysis of the proposed new polar routes and potential cost savings were also reviewed and summarized. Flight distances and airline costs from Winnipeg to several Asian cities were compared.

Comparative Flight Distances

The direct flying distances from Winnipeg to East Asian cities are greater than the distance a B747F can fly at maximum payload (7,170 or 8,150 km, depending on the model). See Exhibit V-1.

The severity of the payload restriction for flights from Winnipeg directly to Asia, or with a technical stop, is dependent on the aircraft's range and the distance of the longest stage length.

Exhibit V-1. Flight Distances (km) from Winnipeg to Asian Cities

City	Direct	via Anchorage	via Krasnoyarsk	via Bratsk
Tokyo	8,939	8,951	12,507	11,778
Seoul	9,377	9,509	11,555	10,882
Beijing	9,480	9,796	10,782	10,190
Shanghai	10,247	10,376	11,838	11,264
Taipei	10,873	10,957	12,428	11,894
Hong Kong	11,425	11,587	12,419	11,996
Singapore	13,970	14,166	14,405	14,192
Delhi	11,292	12,610	11,453	11,729

Comparative Cost Analysis

The comparative shipping costs via three routes between a number of cities in North America and East Asia are summarized in Exhibit V-2. The three routes considered were as follows:

- *Existing route:* US city to Asian city and back, both via Anchorage.
- *Polar route:* Truck to Winnipeg, non-stop flight Winnipeg to Asia, and back using reverse routing.
- *Triangular route:* Truck to Winnipeg, non-stop flight Winnipeg to Asia (as for outbound Polar route), return via Anchorage to Winnipeg and truck to final destination.

A detailed description of this analysis is presented in Chapter V of the report.

Exhibit V-2. Summary of Comparative Round Trip Costs (\$US) of Shipping via the Three Routes for Shipments Between Various Cities

Route		Chicago- Hong Kong	Chicago- Taipei	Chicago- Seoul	Toronto- Shanghai	New York Shanghai
Load Demand						
Westbound		100%	70%	90%	70%	70%
1. Existing Route	Average Cost per kg	\$1.08	\$1.20	\$0.96	\$1.17	\$1.23
(via Anchorage)	Payload (tonne)	226.0	192.1	214.7	192.1	192.1
	Travel Time (hrs)	40.8	39.4	36.0	55.1	40.0
2. Polar Route	Average Cost per kg	\$1.42	\$1.29	\$0.93	\$1.21	\$1.23
(via Winnipeg)	Saving over Route 1	No saving	No saving	3.7%	No saving	0.5%
	Payload (tonne)	154.3	162.3	199.0	169.2	169.2
	Travel Time (hrs)	66.2	64.9	61.5	88.6	100.1
3. Triangular	Average Cost per kg	\$1.16	\$1.09	\$0.88	\$1.08	\$1.09
(Polar Westbound	Saving over Route 1	No saving	8.9%	8.4%	8.1%	11.7%
via Anchorage	Payload (tonne)	190.1	192.1	212.5	192.1	192.1
Eastbound)	Travel Time (hrs)	67.7	66.3	63.1	90.1	101.6

Anchorage provides a good location for a technical stop on flights between central and eastern North America and East Asia as it is roughly half way and the distance via Anchorage is not much further than flying direct.

Use of the polar routes to most Asia cities reduces flight times significantly in the westbound direction to Asia, but by much less in the eastbound direction due to the prevailing westerly winds. Few flights from East Asia to the US in the easterly direction would benefit from the use of the polar routes. Most would use the existing Russian Far East Routes. The polar routes would rarely provide any reductions in flight times between Japan and North America.

Use of the polar routes via Krasnoyarsk or Bratsk significantly reduces flight distances to India, but results in much longer flight distances to most East Asian cities. Distances to Singapore are similar to those via Anchorage.

Comparisons of the truck and aircraft costs per kilogram to ship goods via the Winnipeg using the polar routes and via Anchorage to East Asian cities indicate:

- Large cost savings using the polar routes for westbound flights to South Korea, China and Taiwan at typical load factors for cargo flights to those countries.
- Higher costs per kilogram for eastbound shipments to North America via the polar routes.

- Typically 8% to 12% savings in costs for a triangular route using the polar routes from Winnipeg to South Korea, China and Taiwan, and returning via Anchorage to Winnipeg.
- Cost saving of over 20% using the polar route via Krasnoyarsk to India.
- Cost savings of 5% using the polar route both directions via Bratsk to Singapore, and 8% using the triangular route returning via Seoul and Anchorage.
- Cost savings are relatively insensitive to the trucking costs, small differences in jet fuel prices at Winnipeg.

The triangular route takes advantage of the generally lower loads going to Asia and the lighter headwinds and shorter distance via the polar route to Asia, and allows maximum loads on the return trip.

The analysis showed that the use of the triangular route will more than double the cost advantage of the intermodal route used by Winnport for shipments to/from China.

VI. CHURCHILL REFUELLING

The Province of Manitoba requested that Churchill be considered as a potential refueling stop for polar air routes. Exploration of Churchill's role as Refueling stop presents both challenges and opportunities. A summary of the analysis is presented below.

- ➔ Technically, Churchill is satisfactory. The runway will be more than up to technical specifications by the end of September, 2001.
- ➔ The lack of Emergency Rescue Service (ERS) is the main barrier to carriers' use of the Churchill airport. The ERS could be restored at a first year cost of less than \$1.5 million, after which there would be annual costs of about \$600,000.
- ➔ Even if ERS is restored, carriers see Churchill mainly in the emergency airstrip role, rather than as a scheduled technical stop.
- ➔ If a Churchill refueling stop is an objective, the strategy must be to expand on-ground services, possibly extending to commingling or transshipping, thereby giving increased value-added to both air carriers and the Churchill area.

Any expanded or enhanced role for the Churchill Airport must be coordinated with a focused marketing strategy.

VII. AIR FREIGHT STRATEGIES

This chapter summarizes the analysis and integrates it into a strategic framework. The strategies and recommendations were developed and discussed with the Government of Canada, Government of Manitoba, and the Winnipeg International Airport (the Committee).

The strategies and recommendations are largely independent. Each can be followed without reference to the others. There are also strategies which the Committee should not pursue. They may have a superficial appeal, but could lead to lost time, and wasted energy. A brief synopsis of the proposed strategies and recommendations is outlined below. A detailed discussion is presented in Chapter IX of the report.

Air Carrier Cargo

The demand analysis determined that there is significant volume of air freight between the US and Asia-Pacific, but that there is a substantial imbalance of trade. The imbalance of air cargo is at a ratio of 1.68 tonnes from Asia for every tonne to Asia.

There are several potential air routes, however a direct non-stop polar air service from Winnipeg to Asia, with the return from Asia to Winnipeg via Anchorage on a trans-pacific route could create the greatest potential. Polar air routes from Winnipeg are shorter and more cost effective than trans-pacific routes via Anchorage when aircraft loads are not at capacity. However, from Asia to Winnipeg the prevailing winds and the high load demands minimize the benefits of a polar air route, so a trans-pacific route to Winnipeg via Anchorage is a quicker more cost-effective route for all-cargo service. The distances from Winnipeg to various Asian destinations would likely mean that aircraft would fly to Asia with loads of 60% to 80% full, which is typical of the loads that are flying to Asia from the US already.

The Asian all-cargo carriers will be the most likely candidates provide in developing Winnipeg as a polar air hub. Most of the US carriers have well established hubs in the US, and may likely wait until long-range aircraft, such as the A380-F are available before developing polar all-cargo service for Asia-pacific destinations.

There are a number of foreign cargo carriers including China Southern Airlines and China Airlines that could potentially be interested in Winnipeg as a cargo hub. To create a competitive edge for Winnipeg, it

is recommended that the Committee promote a direct non-stop service to these carriers. For those cities beyond the range of most all-cargo freighters, such as Singapore or Delhi, Krasnoyarsk or Bratsk could be marketed as a technical stop.

NAV Canada

Winnipeg will be competing for cargo carriers against a number of US airports (See detailed discussion in Chapter VII). To level the playing field for Winnipeg, NAV Canada may be receptive to a fee schedule that would, at least initially, benefit those carriers who are willing to use polar air routes at the very early stages.

It is recommended that the Committee actively lobby NAV Canada for a revised fee structure for all-cargo carriers on new polar routes and a discount on fees for all-cargo operations.

Anchorage Partnership

Anchorage International Airport could play a key role in the development of Winnipeg as a hub for polar air routes. Most of the routes proposed in this report involve a triangular air service route to/from Asia/Winnipeg, which includes direct non-stop polar routes from Winnipeg to Asia, but on the return route, includes Anchorage as a proposed technical or transit stop. It is recommended that the Committee meet with Anchorage airport staff to determine if there is interest, and if so, to jointly promote the new routes to the foreign carriers.

Regulatory Environment

Many of the current bilateral agreements are generally restrictive to foreign carriers. It is recommended that the Committee develop a governmental strategy to liberalize the bilateral agreements for cargo carriers interested in operating to Winnipeg. The Department of Foreign Affairs will be a key partner in the development of a strategy.

Proposed Resources

The implementation of these strategies will require a concerted investment of time and effort. Funding should be provided by the major champions of this project, including the Government of Canada, the Province of Manitoba, and the Winnipeg International Airport. A cargo

marketing specialist, with a good knowledge of the air cargo and freight forwarding industries, and familiarity with the air carrier route structures is required. Presentations will need to be made to the prospective carriers. It is recommended that the presentations should include detailed route analysis, yield and cost structure, proposed cargo demand, and other airline benefits.

The scope of the effort should include developing detailed presentations specific to each carrier. A three year term would be appropriate. Three years of intensive cargo marketing should determine if Winnipeg will be able to attract an airline and forwarders needed to create a viable polar air cargo service.

Exhibit VII-1. Cargo Development Budget

	2002	2003	2004	Total
Specialist	\$70,000	\$70,000	\$70,000	\$210,000
Travel/Conferences	\$30,000	\$30,000	\$30,000	\$90,000
Promotional Materials/Displays/Advertising	\$15,000	\$10,000	\$5,000	\$30,000
Total	\$115,000	\$110,000	\$105,000	\$330,000

It is estimated that a total expenditure of \$330,000 over three years will be required to successfully implement the strategies outlined above. shows how the funds would be allocated. The budget includes development of promotional packages, travel to air cargo conferences, and visits to the head offices of the major cargo airlines, and forwarding associations.

