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**THE PROVISION OF TRANSPORTATION SERVICES TO ISOLATED COMMUNITIES
WITH EMPHASIS ON THE DEVELOPMENT OF SYSTEMS ON THE LABRADOR COAST**

by

Sandi London Guphill

A thesis submitted to
the Faculty of Graduate Studies and Research

in partial fulfilment of
the requirements for the degree of

Master of Arts

Department of Geography

Carleton University

Ottawa, Ontario

October, 1988

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ACCEPTANCE SHEET

The undersigned recommend to the Faculty of Graduate Studies and Research
acceptance of the thesis

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WITH EMPHASIS ON THE DEVELOPMENT OF SYSTEMS ON THE LABRADOR COAST**

submitted by Sandi London Guptill

B.A. (Hons.) University of New Brunswick

in partial fulfilment of the requirements for the degree of
Master of Arts

Iain Wallace
Thesis Supervisor

Chairman, Department of Geography

Carleton University, October, 1988

ABSTRACT

The absence of a comprehensive remote access policy in Canada has resulted in an ad hoc approach to decision-making in transportation planning. Without consistent criteria against which to measure transportation demand, numerous policies and programs were developed with varying objectives and a variety of different methodologies were used to assess their worth. As a result, systems developed in relative isolation to each other, responding to location- and mode-specific requirements, and were often both operationally and economically inefficient. To illustrate this argument in detail, the Coast of Labrador was chosen as an example. To understand the political environment in which decisions were made, a series of federal policies, programs and studies were reviewed. A selection of alternative approaches to assessing transportation need for isolated communities were analysed and the most significant criteria were extracted to suggest a more responsive basis for a comprehensive remote access policy. More specifically, future considerations for Labrador were proposed.

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PREFACE

The federal government, through the Department of Transport, has assumed the responsibility for ensuring access to remote regions. Consistent with theories of transportation economics and policy, government involvement has consisted of subsidization of the air and marine modes, primarily through capital investment in infrastructure, and regulation of the carriers through market entry/exit and control of network/route structures. However, lack of carrier competition makes it difficult to estimate both the level of service required and the most reasonable cost of providing those services.

Attempts to define the costs and benefits of remote services have relied on methods which are normally used in larger market areas where services are self-supporting. Very little has been done within the federal government to assess the benefits of supplying those services in isolated areas where social factors tend to far outweigh the economic rationale. As a result, the systems that have developed are not always responsive to the actual needs of the users and are often very inefficient both operationally and economically. To illustrate this point in detail, the Coast of Labrador was chosen as an example.

In Canada, most remote areas are in the north, adding complications of rugged terrain and harsh climate to the existing problems of small population centres scattered over great distances characteristic of isolated communities. Construction of transportation "terminals" is, therefore, very expensive and the operation of "vehicles" much more costly on a unit basis than it is in the more heavily populated areas to the south.

In order to appreciate the political environment in which decisions were made in Labrador, an understanding of the history of remote access policies and programs for the entire country is required. A series of policies directed at the regional air carriers, the primary providers of transportation in the north, and the suppliers of marine transport shaped the attitude that influenced the major programs which the government supported. Of primary concern are the three northern airstrip programs, the Arctic Airstrips Program, the Nouveau Quebec Program and the Labrador

Airstrips Program. The coastal services that Marine Atlantic offers are almost unique now in this country but for comparison purposes, the Arctic Resupply Programs are discussed.

The analysis and justification for the types and levels of service provided in remote regions failed to identify, or appreciate, the specific needs of the inhabitants. Traditional methods of determining demand and assessing benefits did not necessarily result in the most efficient systems and in all cases, final costs were far in excess of original estimates due to naive planning and the influence of political will. Moreover, lack of consistent objectives resulted in the provision of different levels of service, and lack of cooperation resulted in isolated networks.

Labrador is in a unique position in relation to other northern regions. Rather than coming under the jurisdiction of the two Territorial Governments and the influence of the Department of Indian Affairs and Northern Development, it has provincial status which changes the scope and direction of federal financial support. Furthermore, transportation services within the province are, to some extent, "protected" by the 1949 Terms of Union with Canada. Therefore, transportation policy and program development in Labrador has been influenced by the constitutional obligation but, at the same time, hindered by its political isolation from the rest of northern Canada. The history of the coastal service and the events leading up to the Labrador Airstrips Program illustrate these factors.

Within the Department of Transport, responsibilities for modal services have been separated. In addition, control of Marine Atlantic was in the hands of the regulatory agency, the Canadian Transportation Commission, until 1974. Therefore, marine and air systems have developed independently, in spite of recent attempts to identify their complementarity, resulting in inefficiencies in both modes.

To assess possible alternatives to the decisions that were made and the systems that are in place, a selection of theories and policies were reviewed in light of remote systems development. Each of the alternatives studied offers some solution to the problem of assessing need in remote regions ranging from measures of degree of isolation, to defining the socio-economic benefits of accessibility, to determining appropriate transportation infrastructure, calculating subsidies, etc. As an added comparison, the factors which influenced transportation development in a parallel

influential to decision-making, are extracted from these alternative approaches and linked together to suggest a more comprehensive method for planning transportation systems in remote regions and the basis for a national remote access policy. More specifically, future considerations for development of systems in Labrador are proposed.

CHAPTER 1

GEOGRAPHICAL BACKGROUND OF COASTAL LABRADOR AND PRE-CONFEDERATION HISTORY OF TRANSPORTATION

I Introduction

The rugged topography, harsh northern climate and small, scattered settlements of the coast of Labrador pose economic and technical challenges to the development of transportation systems and services that are typical of most isolated regions in Canada. Coastal transportation in Labrador has been historically dependent on marine systems, dating back to the supply of colonial fishing communities in the early decades of the 19th century. The responsibility to ensure the provision of essential resupply services has been assumed by various levels of government since the turn of the present century. An historical review of the development of the coastal transportation systems and services illustrates the particular conditions in Labrador which were addressed in the terms of Union and provides insight into the issues that were to follow.

II Geographical Parameters of Labrador

Physical Features

The area known as Labrador, which comprises the continental portion of the province of Newfoundland and Labrador, consists of 294,330 km² (181,580 sq. mi.) of land with 8,000 km (5,000 mi.) of rugged coastline (Labrador Transportation Map, 1984). The area is bordered on the west and south by the Province of Quebec, which held claim to the area until a Judicial Committee awarded it formally to Newfoundland in 1927. Almost the entire coastline fronts that part of the Atlantic Ocean known as the Labrador Sea, from Ungava Bay in the north to the Strait of Belle Isle in the south, which separates it from the Island of Newfoundland. Its northerly location, 52°N - 60°N, results in Arctic to sub-Arctic conditions for almost the entire area.

Labrador is divided into five "regions" for political as well as economic descriptions (Alluring Labrador); the North Coast, South Coast, Straits, Labrador West, and Melville areas (Fig. 1-1). The

Figure 1-1, Place Names in Labrador

north coast region refers to the 920 km. (575 mi.) stretch of populated coastline lying due north of Hamilton Inlet, from Rigolet north to Nain, the northernmost permanent settlement. The southcoast includes those coastal communities on the 350 km. (225 mi.) stretch from Cartwright south to Lodge Bay, just north of the Strait of Belle Isle. The "Straits" area, so named for the Straits of Belle Isle, comprises eight small communities, soon to be connected by paved road, which for convenience and accessibility have close ties with the Province of Quebec. The Labrador West region includes the iron ore deposits at Labrador City and Wabush, near the Quebec border, and the impressive Churchill Falls hydro-electric operation. The Melville area consists entirely of communities located at the head of Lake Melville, including the largest city in Labrador, Happy Valley-Goose Bay.

Labrador lies on the easternmost edge of the Canadian Shield and boasts three mountain ranges; the Torngat Mountains in the extreme north, the Kaumajet Mountains just south of Hebron fiord, and the Kiglapait near Nain, which are the highest peaks in eastern mainland Canada. The extremely rugged coastline is inundated with deeply carved fiords, inlets and bays and dotted with numerous small islands and "tickles" (narrow strips of water between two land masses that are the last to freeze up in winter and the first to break up in Spring) (Getting Along in Labrador, 1982). Except for a 56 km. (35 mi.) stretch of beach (near Davis Inlet), the coastline is edged with glacier carved cliffs and cirques rising to the highest peaks above Nachvak Fiord. These physical features combine to make marine navigation and the placement of airstrips formidable.

Climate

The climate in Labrador is strongly influenced by the cold Labrador Sea. Average summer temperatures range from 10°C on the coast to 15°C in the interior regions, (although they may climb to between 25°C to 30°C), while the ocean current maintains a temperature of about 0°C. In winter, the temperatures may drop as low as -40°C with average temperatures lying between -18° to -12°C along the coast to -23°C in the interior (Getting along in Labrador, 1982). The Labrador current carries frigid, low-salinity arctic waters south from Baffin Bay, chilling the air over the Labrador Sea, resulting in cold onshore winds all year round. The cold waters freeze early in fall (September in

the extreme north) and pack ice brought south by the Labrador Current delays spring breakup on the coast.

Lengthy periods of fog along the south and east coasts (from the Straits of Belle Isle to Cartwright) are typical from May to August as moist air is chilled by the icy waters of the Labrador Current. Winter is typically 200 days in length, increasing to the north and in the interior, and lasts from mid-October to mid-May. After September, strong winds increase month by month as winter sets in. The Lake Melville area is unusual with respect to the surrounding interior regions. It has a characteristically shorter winter (200 days versus 220), warmer summers and an almost total lack of fog due to prevailing westerlies and the combination of the configuration of the Churchill River Valley and the location of the Mealey Mountains. These factors, combined with a level sand plain made Goose Bay an ideal site for a strategic northeast air base during the second world war.

Population

The population of Labrador, which totals approximately 37,000, comprises both natives and white "settlers" of European descent. The fourteen coastal communities support only 5,500 of the total population while the major towns of Happy Valley-Goose Bay, Wabush and Labrador City accommodate the remainder.

The Inuit, who are predominant in the northern coastal communities, number roughly 1,000 and depend on fishing and hunting along the coastline for their livelihood. The Indian population, numbering approximately 850, includes the Naskaupi at Davis Inlet and the Montagnais, who live at Sheshasit near Northwest River. They are traditionally nomadic hunters, at home in the rugged interior, who in recent generations only came to the coast to trade their furs. The industrial west and the communities of Happy Valley-Goose Bay have the largest populations of people "from away", as the Newfoundlanders like to call them. The remainder, the settlers who came as fur traders, fishermen and tradesmen, have intermarried extensively with the native populations and now number approximately 11,000.

In addition to the resident fishermen, Labrador has traditionally supported a large transient population mostly from Newfoundland. They were initially divided into two groups; the "planters"

who moved their families north to summer coastal communities and fished close to shore in small parties of two or three men, and the "floaters", seasonal fishermen who work in groups of eight to ten and who transport their catch to Newfoundland ports for curing. These traditions, which still exist today, have been recorded since 1801 (Tanner, p. 1947). The recent emergence of small fish plants in the permanent settlements has helped to stabilize the industry on the coast and retain a greater portion of revenues for the residents. A brief description of the permanent coastal communities, their resources and transportation services, is provided in Annex 4, Coastal Labrador Community Profiles.

Transportation Constraints

Transportation services have developed in response to harsh weather conditions, where accessibility tends to be seasonal, thus marine transportation is possible from mid May to mid December only (mid July to early October in the far north). Prior to the completion of the coastal airstrips, access by air was restricted to the use of skis and floats (with the exception of the airport at Goose Bay and small landing strips at Nain, Cartwright and Hopedale) which meant that for a period of from 6-8 weeks during spring thaw and again during fall freeze-up, air transport was prohibited. As a further complication, the combination of the warm water associated with the Grand Banks meeting the cold Labrador Sea and predominantly easterly winds result in a climate that rarely boasts more than 2 or 3 days of good weather at a stretch, with fog and precipitation dominating. This hampers air travel in general and restricts VFR (visual flight rules) operations. Coastal tides average about 2 meters but vary in large inlets. Paradise River in particular combines high tides with strong inshore currents to make marine navigation difficult for all but the most experienced.

III History of Coastal Transportation

The present system of coastal transportation in Labrador had its beginnings in the late 19th century, when the government of Newfoundland recognized a need to ensure minimum transportation access to isolated communities along the 6640 km. (4000 mile) stretch of inhospitable coastline. From that time until Newfoundland joined confederation in 1949, the coastal marine service was financially and operationally equated with the railway and considered to be an extension of the services provided by the rail system on the island of Newfoundland. Therefore, references to the Newfoundland Railway Company implied the inclusion of the steamship services.

Marine services were divided into three distinct functions, each requiring specialized vessels and operating on a variety of schedules and levels of service. The "Gulf" service formed the connection between the island of Newfoundland and Canada, carrying passengers and freight, including rail cars, on a year-round basis. Numerous intra-provincial ferries offered connections between the many small islands and isolated outports and the road and rail networks on the island of Newfoundland, operating on schedules applicable to the needs of the particular area being served. Two major coastal routes were identified as early as 1875, serving the sparsely inhabited south coast of Newfoundland and the coast of Labrador. Depending on local climatic conditions, these services were operational between May and December only. In addition to these three types of marine passenger service, a variety of freight transportation routes evolved over the years, connecting the major ports in Newfoundland (Corner Brook, St. John's and Lewisporte) with the larger Canadian ports of Montreal and Halifax (External Affairs, 1947).

At the time of Confederation, there were approximately 2000 small communities scattered along a total of 16,600 kms. (10,000 miles) of coastline in Newfoundland and Labrador. The almost complete inability to build roads along the jagged and often precipitous Labrador coast made marine transportation essential to the survival of the inhabitants. A brief history of the evolution of government involvement in transportation up to the signing of the Terms of Union with Canada in 1949 provides the background necessary to understand the importance of the constitutional commitment on the part of the federal government to assume responsibility for the provision of

transportation services and some of the reasons for the subsequent development of transportation policy and programs in Labrador.

In 1825, by Imperial Statute, Newfoundland was officially raised in status from a fishing base to a colony of the British Empire. Responsible government was introduced in 1855 and remained in effect until 1934 when a Commission of Government was formed in an attempt to rationalize the colony's rapidly compounding financial deficit.

In 1875, the Newfoundland government recognized a need to subsidize a system of coastal marine transportation to carry mail, freight and passengers to isolated communities along the south coast of Newfoundland and the coast of Labrador.¹ The existing system of small private boats (still relied upon heavily to this day) was felt to be inadequate to encourage settlement and to protect the rich Labrador fishing grounds. Bowring Brothers Limited, one of the original St. John's family companies, won the contract to serve the Labrador coast and, in 1876, ordered two boats to supplement the service provided by the private boats (Sullivan, 1976).

In an effort to encourage economic development through improved transportation facilities, the Newfoundland Railway Company, a private company operating under charter, was created in 1881 to build a narrow gauge line across the island. Faced with high construction costs and difficult terrain, it was not surprising that by 1886, having completed only a short section of the line, the company was experiencing severe financial difficulties. Anxious to continue with construction, the Newfoundland government let the first in a series of contracts to R.G. Reid Company of Montreal. In 1893, a ten year term contract to continue construction and operation of the rail line was signed, and finally in 1898, a fifty year contract to operate the Newfoundland Railway system was ratified. Included in the final contract was the provision of the Gulf ferry service from Newfoundland to Nova Scotia on an ice-strengthened vessel and the coastal service provided by seven steamers, one of which served Labrador in the summer months. Local firms, such as the Bowrings and Crosbies, were also awarded contracts to serve smaller communities on the west coast of Newfoundland and

¹Future references to the "south coast" service will refer to the island of Newfoundland, while the Labrador coast service will be divided into Labrador "south", pertaining to the area from the Straits of Belle Isle to Hopedale, and Labrador "north", referring to communities from Hopedale north to Hebron.

the Labrador coast.

In 1920, mounting financial difficulties forced the Reid Company to appeal to the government for assistance, resulting in the creation of a joint commission, composed of representatives of the government and the company, which operated the railway from 1921 to 1923. In 1923, the railway and all other Reid interests in Newfoundland, including the steamship service, were purchased by the government for a lump sum of \$2 million. In addition to the Reid "fleet", the government also acquired vessels operated by the Bowrings and the Crosbies and ordered the "Caribou", a 2200 ton vessel for use on the Gulf route. In 1926, the Newfoundland Railway appointed its first Board of Commissioners.

The 1930's were particularly hard on Newfoundland. The annual deficit grew so large that in 1932 the British government sent Sir William Warren Mackenzie, first Baron Amulree, to investigate Newfoundland's financial status. The conclusions of the "Amulree Commission" report were to dissolve the legislature in favour of a six man commission of British civil servants, in return for which Britain would assume the colony's debt (Gwyn, 1967). During the 1930's and 1940's, loss and deterioration of the now aging marine fleet necessitated the acquisition of several new vessels. Between 1936 and 1946, six coastal vessels were purchased as well as a "splinter" fleet of nine boats built in Clarenville, Newfoundland (Sullivan, 1976).

Constitutional Background

In 1946, a constitutional convention was called in Newfoundland to discuss future forms of government. One of the alternatives presented in the plebiscite was confederation with Canada. In anticipation of Newfoundland's union with Canada, the Department of External Affairs prepared briefing material on key government-provided services for the information of the Cabinet Committee on Canada-Newfoundland Relations. The inquiry into the status of the Newfoundland Railway and Steamship Company concluded that the railway would probably never operate on a profitable basis, primarily due to the enormous expense of infrastructure necessary to serve a small population and the restrictions imposed by the topography and harsh climate. The steamships in particular were found to operate at a substantial loss that was expected to improve somewhat if competition from

small local vessels could be reduced by increasing the number of government operated coastal steamers. At the time of the 1947 assessment by External Affairs, the Railway owned nine coal burning steamers and one motorized vessel. Ten smaller motor vessels were operated for the government on charter and three new vessels were on order. Seven of the government owned steamships were used for the coastal service, travelling as far north as Hopedale. The run from Hopedale to Hebron was provided by a chartered wooden vessel, the "SS Winnifred Lee", which was scheduled to meet the coastal steamer, the "SS Kyle", in Hopedale. It is important to note for subsequent discussion, that the north coast service was not originally operated by the Newfoundland Railway and was not, therefore, included in the Terms of Union, which was eventually signed on December 11, 1948.

It is important to note that during the Second World War, considerable improvement had been made to transportation infrastructure in Newfoundland, notably \$2 million of improvements to equipment and rolling stock by means of a loan from the U.S. Department of Defence to the Newfoundland Railway, and the construction of the Goose Air Base in Labrador. Three new coastal vessels were on order in 1947 to replace the SS Caribou, which had been torpedoed in 1942, and two other vessels which had become uneconomical to operate (External Affairs, 1947). While it was estimated that the Newfoundland Railway would probably never operate on a profitable basis, the infrastructure in 1947 was in considerably better operating condition than it had been in 1932 when the Amulree Commission investigated the national debt.

Federal Commitment

Section 31 of the Terms of Union state that:

At the date of Union, or as soon thereafter as practicable, Canada will take over the following services and will as from the date of Union relieve the Province of Newfoundland of the public costs incurred in respect of each service taken over, namely, (a) the Newfoundland Railway, including steamship and other marine services;

This piece of legislation has resulted in a permanent, federal commitment to provide transportation services to the residents of Newfoundland and Labrador. The meagre wording has

left some aspects of transportation services subject to interpretation, specifically the definition of public cost and the level of service implied. While significant changes have taken place over the years, most notably the inclusion of the northern Labrador service (Hopedale to Hebron) in 1953, cancellation of the rail passenger service in Newfoundland in 1969 and, most recently, final closure of the railway, these modifications have been accomplished without legislative amendment, bringing into question their constitutional legality.

In 1978, the federal government established a Commission of Inquiry into Newfoundland transportation. Arthur M. Sullivan and two other Commissioners were appointed by the government of Canada to examine domestic transportation issues in Newfoundland. While numerous other studies, which had been initiated over the years to advise the federal government on transportation priorities for the province, merely paid lip service to Article 31 of the Terms of Union, only the Sullivan Commission required its investigators to legally examine the implications of the constitutional commitment for the levels and types of service to be provided.

The future of both the railway and the coastal service had been of considerable concern to the Canadian committee in its negotiations with Newfoundland because of the considerable loss experienced by the railway since its inception and the significant percentage of the workforce employed in both the railway and coastal marine operations. Therefore, it was of great importance to Newfoundland that Canada assume the costs of operating these services. The Sullivan Commission was careful to differentiate between the federal responsibilities for transportation, under the constitution, and the provincial responsibilities to determine where the special provisions for Newfoundland conflicted with the legislative division of powers.

At the time of the negotiations, the operation of the rail service was perceived to be merely an extension of the CNR coast-to-coast service. The coastal ferry service, however, was considered a little less usual but, because of the particular requirements of the province, it was accepted as part of the rail system.

It was further noted by the Commission that one interpretation of "public" costs would be the provision of a service entirely free of charge. They supported, however, the contention that the

public cost incurred represented the deficit incurred in operating the transportation service once all revenues had been applied.

The subject of tariffs was also of concern to the Sullivan Commission. One of the recommendations was to rationalize freight rates which had fallen far behind the rest of the country. Certain rail rate provisions were included in Articles 32(2) and (3) which stated in essence that the same principles that applied to the calculations of Maritime provinces freight rates would also apply to Newfoundland. An interesting corollary to that provision affected the interpretation of coastal freight rates. Because there was no precedent in the Maritimes for calculations of coastal rates at the time of union, they remained static from the 1930's to 1980, when the Department of Transport introduced a series of modest increases in an attempt to, at least partly equate the rates with a small percentage of the actual transportation costs. This was typical of some of the problems which awaited resolution until the Sullivan Commission Report. Further explanation is in Chapter 5.

CHAPTER 2

TRANSPORTATION ECONOMICS AND POLICY : CONCEPTUAL ISSUES

I Introduction

Much of the responsibility for the provision of transportation services to remote regions of Canada rests with the federal government through the Department of Transport. In the absence of private sector services, the government has accepted both a financial and a regulatory role to ensure that the needs of residents in remote areas are met. Many of the problems inherent in Canadian transportation systems may be traced to difficulties in conquering relatively vast distances and the diversity of regions, both geographic and economic. As a result, the government's role in transportation development has been influenced by regional economic development policies and the objective of ensuring accessibility.

The role of transportation as a regional development tool is, in general, well documented. However, the subsidization of transportation services as a means to attain regional equity has not been as well researched. Transportation economists have offered varied hypotheses which endeavor to explain how the transportation industry should function and why it sometimes falls short of meeting political objectives. An analysis of the extent to which the federal government adheres to theories of transportation economics and policy will explain how the present systems were developed and suggest alternatives for future policy direction for remote access.

In view of the federal government's recent moves towards a less regulated transportation environment, specifically the 1987 National Transportation Act, there is an urgent need to reassess past practices and to reconcile any conflicts between those practices and existing or impending policies. In particular, the question of how government policy should (or could) be formulated to achieve both economy and accessibility in a deregulated environment is addressed.

Departmental priorities since 1985 have focussed on increased efficiency through regulatory reform, enhanced market competition and reduced capital and operating expenditures through commercialization/rationalization of infrastructure and increased cost recovery for services provided. In possible conflict with these priorities is the commitment to respond to regional socio-economic

objectives. In the most vulnerable position in this debate are residents of remote areas where a loosening of regulatory constraints and an increase in user fees would invariably lead to reduced service.

II Government Involvement in Transportation Investment

Where the private sector is neither willing nor able to invest in the transportation industry for financial benefit, governments may identify potential for longer-term, socio-economic benefits in order to justify interference with the "normal" development of the sector. A number of factors which are generally associated with (but not a prerequisite for) circumstances which demand a public, rather than private, response to investment have been suggested by Heyman (1965). Categorized as economic and non-economic, they include:

Economic	1. exploitation of natural resources,
	2. increase in agricultural activity,
	3. increase in industrial output,
	4. enhancement of per capita consumption,
Non-economic	5. promotion of political cohesion,
	6. strengthening of a country's defenses, and
	7. encouragement of socially desirable locational patterns.

Many of the economic goals are associated with policies of regional development and are justified on the assumption that enhanced transportation services will result in increased economic opportunity, thereby reducing regional disparities. (This is discussed further under the heading of public investment in the transport sector.) The non-economic goals, on the other hand, tend to be used to justify national objectives. For example, the completion of a national rail system contributed significantly in the past to establishing a federal presence, most particularly in remote areas. Political motivation, though not often stated as such, ranks high on the scale of transportation policy objectives. The Polar 8 Icebreaker is a case in point, where the justification to provide high technology, year-round marine access in Canadian waters is strongly influenced by the political desire to assert Canadian sovereignty in the resource-rich areas threatened by the U.S.

It is understandable that private investors would not consider the attainment of social values/benefits appealing. The need for government involvement in commercially viable services, however, is not clear and often reflects inertia, as was experienced for many years with rail transportation in this country and, until recently, the air industry. Government participation in the provision of transportation services may be categorized into two distinct investment areas; initial capital investment in infrastructure (terminals, rail track, runways, etc.) and subsidizing the operation and maintenance of facilities and services. The degree of risk involved in financing transportation infrastructure is generally cited as the reason for government involvement. However, the economic rationalization to provide continued subsidization of transport services is often the cause for debate.

Capital Investment in Infrastructure

The very high capital cost associated with transportation investment has been cited as a justification for government financial support (Jaycox, 1974) coupled with the risk associated with high investment in the face of very sensitive forecast demand (Lefebvre, 1965). In addition to the initial capital cost, transportation projects are often characterized by quantum increments in capacity, and therefore investment requirements, for which private investors seldom have the financial resources or flexibility (Fromm, 1965). The requirement to provide certain facilities in total, rather than in phased components (e.g. runways), often results in initial over-capacity in order to have any capacity at all (ibid., p. 95). The long lead time required to plan and implement transportation improvements can also be a restricting factor. The time required to respond to changes in demand is slow in comparison to other sectors and often precludes private sector investment which requires shorter investment and payback periods.

Operating Subsidies

There are numerous arguments against continued financial support in the form of subsidies. Subsidization may take many forms depending on the objectives to be achieved in a particular situation. Direct subsidies have been defined as specific payments aimed in response to stated policy objectives (Bansor, 1984), while indirect subsidies may be said to occur when non-specific

investments are made which ultimately support the continuation of a non-economically viable service. In this situation, the indirect subsidization of a service may or may not result from a specific policy. In all cases, the cost to the government of providing the service is greater than the perceived cost and is often, but not always, less than the net benefits derived.

Cross-subsidization is often practiced but seldom identified as such. It is characterized by the financial support of unprofitable routes or services by those that are revenue generating and has been used extensively in the past, through government regulatory controls, to ensure the provision of less financially viable services.

A less easily identified form of subsidy has been referred to as "counter-subsidy". Subsidization of an alternate service is required when the provision of a subsidy to one mode results in a distortion of market conditions which negatively impacts on an alternate mode, thereby requiring subsidization of both services (Heggie, 1974). The desired effect is to simulate an atmosphere of perfect competition in an environment of artificial pricing. Recent government policies indicate movement away from this artificial market environment, particularly with the removal of antiquated rail transportation subsidies (such as the Crow Rate or the Atlantic and East subsidy) which attempted to protect prices for Canadian commodities on world markets.

Having established the reasons for government involvement in transportation investment, the methods for determining the level or extent of that investment must be established. If, as suggested, the objective is to achieve socio-economic benefits for an undeveloped region, a methodology which will address both social and economic aspects of remote services is needed. One measure of benefits which may be appropriately applied to transportation projects is enhanced accessibility.

III Accessibility Measures

There are a variety of measures which have been derived to define and quantify accessibility. In a broad context, accessibility may be defined as the provision of services required to travel to a variety of geographic locations. In a study of accessibility in rural environments, Moseley (1979) defined accessibility as simply "the capacity to overcome space". The degree to which space may be

overcome is wholly dependent on the level of transportation services available. Accessibility in this sense is traditionally measured in terms of proximity to neighbouring communities, numbers of links between communities, modal variety, frequency of service and so on. These measures, although they give some indication of geographic location and the extent of mobility, do little to describe the quality of life associated with the term accessibility.

An alternative measure of accessibility takes into account the economic opportunities made available by improvements to transportation services. Therefore, the degree to which a community is accessible can be quantified in terms of the increase in opportunities to interact with other communities (or centres of economic activity) as transportation services increase (Moseley, 1979). This measure approaches an evaluation of the quality of life as well as an economic measure in terms of the ability to explore economic opportunities.

Jones (1981) defined accessibility as "the opportunity that an individual or type of person at a given location possesses to take part in a particular activity or set of activities" (p. 6). His analysis of activities, rather than economic opportunities, widens the scope to include social opportunities which may be equated to quality of life. The three essential criteria he selected - location, characteristics of individuals and opportunities, and connecting transport systems - assume an awareness of the particular needs of both the individual to be served and the activity made available. The types of activities pertinent to isolated communities could include medical and social services, community activities and even retail or re-supply needs.

The adequacy of the transport systems which connect the individuals to the activities is assessed in terms of increases in levels of service. However, in an attempt to emulate the conditions found in larger population centres, transportation services may be oversupplied resulting in unnecessary costs and operating inefficiencies.

Jones also identified criteria directed towards improvements to existing services, which is an important consideration now that almost all remote communities have at least a minimum level of transportation service. Therefore, improved travel conditions, in terms of time and cost, should be reflected in improved accessibility. Similarly, increases in opportunities warrant corresponding increases in levels of service. When designing transportation services in remote areas, however, it is

important to be aware that improvements to one mode may have a negative impact on those users who are captive to another. For example, improved air transportation services would attract passengers from existing marine services, which might require a reduction in levels of marine service.

A correlation has been established between accessibility and economic opportunity. Wilson (1973) proposed a method of measuring accessibility by determining the magnitude of increase in economic opportunity made available through improvements in transportation services. These opportunities, in turn, can be measured by such indicators as the availability of alternative investment options, numbers of people affected by new potential, and most often are a function of natural resources being made more accessible (Wilson, 1973). Further developed, this theory assumes that the greater the degree of accessibility, the greater the probability of development if transportation costs are reduced. This positive relationship (between enhanced transportation services and economic development) must not be assumed in all situations. Therefore, caution must be used when investing in transportation at the expense of other, possibly more remunerative, industries (Gauthier, 1970). An over-investment in transportation facilities could result in reduced or repressed output in other sectors, thereby reducing the net level of economic opportunity.

There are conditions, however, under which transportation improvements can be used effectively to stimulate economic development (Adler, 1965). First, it must be shown that economic development would not have taken place without transportation improvements. Secondly, the resources made available for economic gain would have remained unused, or been used less productively, had transportation services not been improved. Furthermore, it would have to be demonstrated that the economic activity stimulated as a result of transportation investment did not take the place of another activity which would have otherwise developed. Having met all these conditions, "the measure of the economic benefit is the net value of the additional output" (*ibid.*, p. 189).

To understand how these theories of economic development and accessibility have been applied, this thesis studies the approach taken by the Canadian government to ensure the provision of services to remote regions.

IV Public Involvement in the Transportation Sector in Canada

The Canadian government's involvement in the provision of transportation services has been through capital investment in infrastructure and through the regulatory control of carriers. To the extent that transportation facilities (especially airports and ports) are owned and operated by the Department of Transport, operating subsidies may be said to apply. The direct subsidization of carriers, however, is resorted to only in exceptional circumstances of deemed public need. Where the Canadian government has exerted considerable control, however, is in the regulation of carriers.

Transportation Subsidies

A pertinent observation of the Canadian situation was made by Darling (1975):

Insofar as the regional problem, that is the relative economic health of the different regions of the country, was regarded as a factor of distance, transportation and transportation rates became both a cause of and a cure for regional weaknesses. This led to the involvement of the Federal Government into a variety of rate subsidy and deficit covering situations. (p. 95)

A study of the economic basis for transportation subsidies in Canada (Heads, 1975) identified three major categories of argument. First, it was acknowledged that where socio-economic as well as financial benefits exceed total costs, there is a case for transportation subsidy. Second, subsidies can be used to offset the monopolistic powers of carriers and third, transport subsidies can be justified on the grounds of social benefits which may accrue, but for which costs cannot be recovered in the marketplace. An additional argument may be made for the use of transportation subsidies to achieve regional development goals but, as previously discussed, the relative efficiency of transportation subsidies as opposed to alternative measures must be carefully weighed.

Most federal governments engage in some or all forms of subsidy mentioned. A significant portion of Transport Canada's budget is dedicated to capital investment in fixed assets where less than 5% of costs are actually recovered. The return on capital investment varies with the mode; the highest being attributed to the air mode where there is greater opportunity to operate on a commercial basis, and the least return in the marine mode where the unit cost of services, such as navigation aids, is very difficult to quantify and, therefore, recover.

A recurring theme that appears in many analytical studies of transportation is the tendency to invest in transportation facilities at the expense of other alternatives. This is particularly significant to discussions of regional development policies. An investigation of Canadian transport subsidies (Casas and Kotowitz, 1976) attempted to evaluate their effects on regional incomes, production patterns, capital mobility and labour employment through a comparison of prosperous and poor regions. The results were largely negative, except in extremely limited circumstances, which led to the conclusion that,

...in the case where full employment prevails in both regions, increasing returns in the transport industry are likely to be insufficient to offset the effects of the net loss in output imposed on other industries when output of the transport industry increases (p. 43).

It was further observed that, because of the high capital/low labour requirements of transportation supply, labour income and employment in the poor region can actually be reduced through investment in transportation infrastructure rather than in more labour-intensive activities. As a regional policy tool, transportation subsidies are extremely uncertain and may even produce a negative effect on regional economies.

Transportation Regulation

One of the most powerful forms of subsidization is the regulation of the transport sector. Through government control of private sector entry into the transportation market and control of rate increases, the government maintains a firm hold on the development of the industry and the provision and quality of services available to both suppliers and users. This is the most criticized form of government interference, and one which the Canadian government is endeavouring to eliminate wherever possible. Having been cautioned by the recent U.S. experience with a deregulated transport environment, the Canadian federal government has set a course for a much more gradual transition while retaining a moderate control of activities north of the line of demarcation as defined by the NTA (see Chapt. 3), and on the coasts.

The need to retain some degree of control has been identified by the observation that,

...if governments invest in transportation facilities in the hope of developing particular regions, it is incumbent on them to create favourable conditions for success either by direct control or by providing inducements for private investors (Wilson, p. 51).

This statement presents two important views in a discussion of deregulation. First, it identifies a connection between initial capital investment and the responsibility for maintaining continued support, or subsidization, to ensure the success of the project. Second, the use of regulation, or subsidy, as a means to promote regional development is emphasized. This concept may be related to the earlier discussion of the relationship between accessibility and economic growth and an understanding that transportation must be treated as a integral part of a regional development "package" and not as an autonomous source of that desired regional growth.

Another rationale for supporting regulation of the transportation sector is the control it exerts on extremes or fluctuations in the market place (Waters, 1976). By setting transportation prices equal to marginal costs in order to simulate perfect competition, regulators may be creating a deficit situation by failing to consider fixed or capital costs which must be covered somewhere, presumably through taxation. Similarly, where the equilibrium price would normally fall below the cost of providing a service, perhaps due to excess capacity, minimum pricing can control fluctuations and ensure a stable market. Regulators must be cautioned, however, that in situations involving competing modes, the regulatory control of one mode does not have a negative impact on another. This is particularly pertinent in discussions of Canadian remote access policy when there are often only two modes available. The support of either mode must be treated with some degree of neutrality while recognizing the different types of service each one provides.

A variety of criticisms is offered against regulation, which range from distortion of competition to administrative delays and inefficiencies (ibid). Also included is the failure of regulators to identify adequately the policy objectives to which regulation is expected to respond. In Canadian policies in particular, transportation objectives are often sufficiently vague to cause those responsible for the implementation of programs to lose sight of the intent in an attempt to control the sector artificially under a variety of widely disparate conditions. Therefore, the political process must play a much more active and accountable role in the articulation of social objectives.

A more positive attitude towards regulation is offered in which it is attested that: "there is a clear necessity for establishing guidelines and policies under which the private sphere will operate more efficiently" (Fromm, p. 106). The tendency over the years in this country, however, would appear to have been an over-regulation of transportation services to the extent that competition and efficiency have been disregarded in favour of regional development policies aimed at reducing disparities and increasing capacity with or without justified demand. Recent policy decisions should correct this situation as long as the federal government continues to encourage a policy of competition in the transport sector while at the same time recognizing a responsibility for those areas where free market competition cannot support a reasonable degree of accessibility.

An argument in favour of a deregulated industry contends that if government will continue to provide fixed assets and if private interests will invest in fixed assets as well as provide services, competition should ensure efficient utilization of infrastructure and economical pricing of services (Lefebvre, 1965). This hypothesis relates directly to the previous discussion of government involvement where, it was suggested, there is general theoretical agreement for government provision of infrastructure but that continued support of the industry through subsidies was generally seen to have negative rather than positive effects on regional economics. This argument stresses the advantages of increased efficiency resulting from competition but does not address the problem of possible decreases in equity and accessibility of services.

Another argument for deregulation explores the need for the provision of services in unprofitable situations but cautions that all consumers are eventually required to pay for these services through taxes. Regulation in this instance is seen as an alternative to tax subsidies, rather than an additional burden (Bonsor, 1984). Not only does regulation fail to promote economic activity, it is argued, but under certain circumstances it may be perceived as a prime cause of market failure as it invariably causes large scale distortions of the local economy. Regulation of the transport industry has been termed nothing more than a "legalized cartel" (ibid, p. 149), where inherent operating inefficiencies increase unit costs to the extent that profits are reduced or even eliminated.

The final step in establishing a conceptual basis for government involvement in the transportation sector is the selection of an effective measurement of the benefits of public, versus private, investment.

V Evaluating Public Transportation Investment

Continued financial constraints and the implications of a deregulated transportation environment pose significant challenges for the providers of transportation services. Implicit in the government's responsibility to provide remote access is the need to improve the efficiency of transportation systems and to minimize investment. The development of an improved methodology for the economic evaluation of transportation investment proposals is the first step towards defining a remote access policy.

The most commonly applied measures for evaluating transportation investments are cost, demand, level of service, linkages and modal alternatives.

Cost

The costs of providing transportation services usually include fixed, or capital construction, costs and variable, or operating and maintenance, costs. Also to be included are subsidization costs and any increases in the cost of living as a result of accessibility being denied or reduced.

More difficult to assess are multiplier benefits, such as revenues emanating from the sales of commodities made possible through access to processors and markets. Care must be taken to include only the net benefits of new economic opportunities. Also difficult to compute are the social benefits associated with areas of extremely high unemployment. Again, only net benefits should be included as the value placed on leisure time in remote areas might well be tied to livelihood activities (such as hunting, fishing and trapping), which have an imputed value which must be subtracted from wage benefits. There is also a tendency in the analysis of construction-related activities to include a temporary increase in employment as a longer term benefit which, in fact, disappears with project completion. Of equal importance is the calculation of revenue, measured in terms of fares, tariffs

and similarly related charges. A useful measure of cost is "unit" cost which may be applied across all modes and situations with uniformity.

Demand

Demand is most commonly measured in terms of numbers of passengers or tonnes of cargo per unit of time. By comparing the capacity of systems against forecast volumes, a simple relationship is established between supply and demand, which may also be expressed in terms of levels of service. The nature of the demand for transportation in remote areas may have an impact on the level of service required. For instance, medical and resupply needs might well take precedence over social or personal demand.

In a high demand situation, elasticities (such as cost and time) may be analysed to determine the value placed on a particular service by the users. In the case of service to remote areas, there is generally little or no flexibility in choice of transportation mode or level of service offered. Therefore, while it may be possible to establish a relationship between demand and cost, or even time, the results would not be as meaningful as they might be in a higher demand situation. The presence of a subsidy tends to distort the level of demand, which might be reduced or even eliminated should cost recovery be imposed. This is an important consideration when assessing demand for remote services.

Level of Service

A third consideration in evaluating transportation development is level of service offered. Although minimum levels are often stipulated for specific services, effective measures for situations of isolation have not been developed. Therefore, it is concluded that level of service in the absence of measureable profitability in the marketplace is subjective and may vary according to local demand characteristics, availability of suppliers, or any suitable incentives including the provision of operating subsidies. Objective measures (such as increased average local income) could be used if they link level of service to economic output from the affected community although differing circumstances would require individual scales of need.

Inter-modal Tradeoffs

In most cases of remote access, travel by road is considered the basic alternative to both air and rail transport. An inherent difficulty with dependence on the marine mode in most northern regions is the seasonality of that service. Therefore, any consideration of alternative modes must carefully weigh the disadvantages of a seasonal operation. Nevertheless, the provision of more than one mode, whatever the level of service, clearly enhances accessibility.

Additional Considerations

The legal and social obligations of the supplier involved, in this case the federal government, must also be considered when evaluating transportation investments. For Labrador, in particular, the legal obligations to provide essential transportation services are stipulated in the Terms of Union with Canada; however, the exact details regarding level of service are open to interpretation. Social obligations are more elusive to specify or quantify. Particularly in a politically motivated environment, favouring social responsibility and equitable treatment, the value of enhanced quality of life cannot be ignored. Aside from suggesting methods to evaluate economic opportunities and social activities made possible through enhanced transportation services, there are no practical methods for assessing social obligation.

VI Conclusions

In the past, Canadian governments, as suppliers of transportation services and facilities, have responded to the social and economic needs for national transportation systems by investing in either fixed assets or supporting subsidies as the need arose. The regulatory arm of the Department of Transport maintained a tight control on service operators while the industry was developing to ensure minimum standards of service wherever possible. Now that the country's networks have reached a level of relative maturity and a competitive environment exists, federal policies are changing to respond to the emerging needs of a market-oriented industry.

As financial constraints increase, the need to establish an economically efficient and socially effective transportation network for isolated regions of the country becomes more pertinent. It is

evident that the traditional methods of economic analysis cannot be made to fit situations of low or negative return on investment. In developing a policy for remote access, considerable attention must be paid to reconciling social need with economic viability. Therefore, effort should be directed to developing methodologies to quantify more accurately the large and varied list of criteria necessary for responsible decision-making. Worthy of note are methods currently employed to evaluate transportation projects involving multi-attribute criteria which could be successfully adapted to situations of isolation. Consideration of the eligibility criteria used by other government social and economic development policies and programs (such as ERDA's²) may prove useful in assessing levels of economic need which might then be applied specifically to the provision of transportation services. The same policies will not apply to the provision of services to remote regions which will continue to require financial assistance to support transportation services.

²Economic Regional Development Agreement. Cost shared arrangements between the provinces and the federal government to provide financial assistance for specific projects designed to encourage economic growth. (Transportation Sub-Agreements)

CHAPTER 3

FEDERAL TRANSPORTATION POLICY DEVELOPMENT FOR REMOTE REGIONS

I Introduction

The federal Department of Transport, as the primary owner and operator of transportation facilities, establishes the policies that govern the provision of transportation services to remote areas. In the absence of a comprehensive remote access policy, transportation development in the north has taken place on an ad hoc basis with little or no consistency of service standards.

Many of the earliest northern transportation facilities were constructed by private companies in support of the fur trade and the fishery and later resource exploration and development. Marine transportation policy evolved primarily from constitutional commitments (with British Columbia, Prince Edward Island and Newfoundland) to ensure passenger and freight access to mainland Canada, and from federal responsibility to resupply defense and remote settlements. Northern air transportation policies, on the other hand, originated with a desire to protect the national airline (serving east/west routes) from encroaching regional networks (serving northern regions) but gradually assumed the responsibility of ensuring remote access to meet social objectives. These goals were achieved primarily through the provision of infrastructure and the licensing and subsidization (regulatory control) of transportation carriers.

Transportation development in the 1960's and 1970's concentrated public expenditures on the profitable networks in the southern, densely populated areas of the country, leaving the private sector to respond to the needs of northern communities. The exceedingly high costs of implementing a policy of uniform service standards prohibited development of a comprehensive remote access policy, based on supplying subsidized services to small populations to meet primarily social objectives. In its place, a series of related policies were implemented to address peripheral issues on a priority basis. A chronological analysis of remote access policies, programs and studies demonstrates the changing approach to transportation needs that has characterized the development of northern systems. A more complete list is found in Annex 1.

II Air Transportation Policy for Remote Regions

Introduction

Advances in aircraft technology during World War One marked the beginning of northern air travel in Canada. The initial development of northern aerodromes and air routes was largely in response to resource exploration by private interests. It remained a private sector responsibility until 1964, when the first civil aviation policy was implemented. Throughout the mid 1960's and 1970's, the development of air services in the north continued to be viewed as a support service for commercial activities. Aircraft were used primarily to transport freight and equipment to resource centres and to provide airmail and resupply services to remote settlements. The need for a regularly scheduled passenger service was not recognized.

Transportation concerns which arose from the Northern Transportation Conference, held in Yellowknife in 1970, led to the formation of the Arctic Transportation Agency within Transport Canada and through that organization came a policy (National Northern Objectives) which, for the first time, addressed the social needs of northern residents. A number of related policies and programs designed to ensure adequate provision of air transportation in the Canadian north, quickly followed.

The greatest achievements in northern air policy were initiated in the 1970's in a series of studies, policies and programs in DIAND, Transport Canada and the CTC. It was during this period that recognition was finally given to the particular needs of northern residents, primarily as a result of pressure from DIAND. Nevertheless, programs continued to be developed in isolation, establishing different service level criteria in each region according to the individual terms of reference of each program. Specifically, the 1974 Policy for the Provision of Air Transportation Facilities and Services in the Yukon and Northwest Territories defined the objectives for the Arctic Air Transportation Facilities Program, the James Bay Agreement was the driving force behind the Nouveau Quebec Program (1982) and a series of studies heralded by the Sullivan Commission of Inquiry into Newfoundland Transportation was instrumental in developing the Labrador Airstrips Program (1982). An analysis of the circumstances which led to the establishment of northern air policies and programs follows.

Jurisdictional Boundaries

Federal policies affecting northern air transportation have originated with the Department of Transport, Department of Indian Affairs and Northern Development (DIAND) and the National Transportation Agency, (NTA, formerly Canadian Transportation Commission). While each has a designated role, a general lack of coordination between federal departments often makes policy formation and program implementation difficult. For instance, differences in jurisdictional boundaries maintained by each body result in contradictory definitions of what constitutes the Canadian north for program purposes. DIAND's boundaries include "that area of Canada north of the 60th parallel, excluding those parts of Quebec and Labrador which extend north of sixty". That department's role in supporting northern air transportation has been limited to commercial endeavours only. The NTA, the regulatory body of federal transport, maintains a definition of northern Canada based on its regulatory function. The NTA describes a line of demarcation that includes:

Canada north of the 50th parallel from the Atlantic to the Ontario/Manitoba border, north on a diagonal line from that point to the intersection of the 55th parallel and the Manitoba/Saskatchewan border, and north of the 55th parallel to the Pacific (Axworthy, 1984).

South of that line a modified deregulation policy is in effect (Fig. 3-1). Labrador, being entirely within provincial boundaries, is outside DIAND's jurisdiction, as is northern Quebec.

The Department of Transport manages airports programs from five regional offices whose boundaries extend into the Arctic, dividing it into three separate areas. The Quebec Region includes northern Quebec and the Baffin Island area, Central Region encompasses western Hudson Bay and the eastern Arctic, and Western Region takes in the Mackenzie Delta and the Yukon Territory (Fig. 3-2). Each region is responsible for its own programs. Although most policies affecting remote regions are primarily concerned with arctic airport development in the Territories, federal policies will often include the extreme northern portions of the provinces.

Figure 3-1, Geographic Scope of Liberalization

Figure 3-2, Aviation and Airports Authority Groups Regions

The result of these overlapping boundaries is a multiplicity of responsibilities and policies which can be complementary but which may also inhibit the attainment of national objectives. An example of the latter are the three separate northern airport policies which resulted in: the Arctic Air Facilities Program, the Nouveau Quebec Program and the Labrador Airstrips Program.

Role of Regional Air Carriers

During the 1960's, the government began to recognize the relatively unstable market conditions under which the regional carriers operated, resulting primarily from the highly cyclical nature of resource development. At the same time, their importance for remote regions was seen as a complementary component of the domestic aviation system.

The government's position, however, was that competition in the industry should not be allowed to compromise the national airline's (Trans Canada Airline) operations. Therefore, in 1966, the role of the regional carriers was stipulated in a "Statement of Principles for Regional Air Carriers". In summary, this statement allowed:

1. limited competition by regional carriers on mainline routes,
2. the transfer to regional carriers of secondary routes previously operated by mainline carriers, and
3. a larger role for regional carriers in the domestic and international charter business.

In addition, a plan for temporary subsidies (to assist in the shift in responsibility) was introduced based on maintaining certain volumes of traffic. The statement did not, however, define regional boundaries or designate the regional carriers.

In spite of their importance to remote services, the regional carriers retained a relatively minor role in the entire domestic air transport scene until the introduction of medium-range jets (notably the Boeing 737 which enabled them to participate in the medium-haul market) encouraged their rapid growth throughout the 1960's. By 1969 the situation demanded a "Regional Air Carrier Policy", which recognized five regional carriers, Eastern Provincial, (which served Goose Bay, Wabush and Churchill Falls in Labrador) Quebecair, (which also served Wabush) Nordair, Transair and Pacific Western, and their operating boundaries. Altogether they provided service primarily to

small northern resource communities with populations of less than 5,000, operating from hubs on the transcontinental system and branching northward to secondary distribution centres.

Throughout the 1970's, the regional carriers increased their share of the domestic market and expanded their scope of operations, largely through major takeovers and the establishment of new hubs on main routes. Their markets continued to be mixed, however, serving southern trunk operations with small jet aircraft and maintaining a dominance of the northern hinterlands through arrangements with subsidiary and third level (local) carriers (Courtney, 1985, p. 14). As changes in ownership and route access continued to develop, the regional "boundaries" became increasingly vague, a development that was further encouraged by the 1984 liberalization policy of domestic air services. Although current policy allows regional carriers access to all domestic routes in southern Canada, northern routes continue to be "regulated" to the extent that the NTA reviews all license applications to ensure that northern objectives are being met.

Future prospects for regional carriers suggest greater competition for the traditional mainline carriers on southern trunk routes, while the hinterlands, including northern regions, will probably see a reduction in regional carrier service as the more economically efficient subsidiary carriers assume a greater role. The policy of continued regulation of northern routes is intended to ensure minimum standards of service and accessibility.

National Northern Objectives

During the 1972 federal election campaign, the Liberal government promised to introduce a remote access policy. In order to identify major issues and explore possible alternatives, a series of studies was initiated, resulting in a policy which identified a series of National Northern Objectives.

The major components were:

1. quality of life,
2. economic growth,
3. sovereignty and security,
4. protection of the environment,
5. evolution of government,

6. social and cultural development,

7. leisure and recreation. (see Annex 2, for more detail)

Subsequent programs, such as the major upgrading of arctic airstrips, were designed to meet at least some of these objectives.

Department of Indian Affairs and Northern Development - Remote Airstrip Program

During the 1960's and early 1970's, DIAND managed a remote airstrip program designed to encourage exploration and development of natural resources and the transfer of raw materials from remote areas to world markets. It included road development as well as airstrips and concentrated on communities that lacked regular, scheduled service. During 1970-71, four airstrips were built in support of tourism, four for oil exploration and eight for mining interests. The program effectively disappeared when the Transport Canada program came into effect in 1974. It was never the intent of the DIAND program to support the social needs of northern communities through transportation-related investment.

Canadian Transportation Commission - Northern Air Transport Study

In 1968-69, the CTC initiated the Northern Air Transport Study, the objective of which was "to provide a complete overview of commercial air transport in Northern Canada" (p. 1). The problem as seen by the CTC was to maintain a standard of air service support at minimum cost. An important component of the study was the documented recognition of the relationship between population distribution, resource development and transportation needs. A hierarchy of settlement types was identified, each type with distinct characteristics and specific transportation requirements:

1. regional centres - main population growth poles such as Yellowknife and Whitehorse,
2. area centres - with retail outlets, co-operatives and government representatives,
3. subsistence settlements - dependent on hunting and fishing,
4. mining towns,

5. defense sites - such as the DEW Line stations,

6. weather stations.

The study clearly delineated proposed levels of air service and routes according to population size and function. For the first time, northern Canada was being studied as a network system, with a well-defined hierarchy of transportation services, rather than isolated settlements dependent on supply links with southern Canada. The CTC saw the advent of economical air transport as the key to strengthening the development potential of northern settlements. As a result of this viewpoint, the study recommended infrastructure investment according to the socio-economic characteristics of permanent settlements and demand for freight and passenger transport. The variables identified were:

- volume of freight in and out,
- numbers of passengers in and out,
- settlement population (1966-1969),
- % population change (1966-1969),
- % population non-white,
- runway length,
- air navigation aids,
- permanent road access.

The analysis of the variables showed definite relationships between population size and demand for passenger travel, which is not surprising in itself, but it led the way for further study into the importance of social factors, such as quality of life and cultural development, in northern transportation development.

Arctic Transportation Agency

As a result of the Yellowknife Transportation Conference in 1970, Transport Canada began to realize that there was an urgent need to assess the future of arctic air transport. Consequently, the Arctic Transportation Agency (ARTA) was formed to identify the issues and make recommendations for a public policy to deal with problems of accessibility in the north.

Incorporating many of the same objectives used in the CTC Northern Air Transport study, the Department of Transport (ARTA) initiated a Northern Air Policy Study (NAPS) which, among

other objectives, analysed existing networks and made recommendations for future development.

Eight of the northern networks were considered, each with an operating hub.

NETWORK	HUB
1. South Baffin	Frobisher Bay
2. North Baffin	Hall Beach
3. High Arctic	Resolute
4. Central Arctic	Cambridge Bay
5. Mackenzie Delta I	Inuvik
6. Keewatin	Churchill
7. Mackenzie Delta II	Inuvik
8. Middle Mackenzie	Norman Wells

From an analysis of the services provided in each network, recommendations were made to rationalize internal route structures by matching aircraft types and government provided infrastructure. A list of 28 possible sites for upgrading was proposed. Each site was considered in terms of growth issues which were defined as:

1. health services and social development,
2. education,
3. housing and commercial,
4. government services (i.e. resupply and movement of personnel).

The results of the analysis were to have been used to establish a hierarchy for airport development which should have formed the basis for a remote access policy. But before a government plan of action could be formulated, social need had to be defined in terms of capacity and level of service. Therefore, a two year study of local air carriers was initiated by ARTA in 1973. The important linkage between accessibility and public policy is explained in Courtney, (1977).

Air transport policy development for remote areas is closely related to the principle of accessibility - the provisions of capacity and levels of services to the movement of people and goods. This requires the definition of how air carriers - especially local service carriers - met socioeconomic objectives (p. 164).

A large scale public consultation program was included to help identify service issues. A questionnaire was distributed with the help of the mainline air carriers, in English and Inuktitut, and 22 public meetings were held throughout the Territories. In order of importance, the issues identified were:

SERVICE ISSUES

1. reliability and regularity,
2. passenger and freight rates,
3. information,
4. facilities,
5. equipment capacity,
6. mail services,
7. medical evacuations,
8. competition,
9. safety.

The significance of this portion of the study was the role of users in identifying transportation need. A clear definition of need was required before proceeding with government investment and, by defining need at the source (the users) the study concluded, it became apparent that government, carrier and user issues all converged. To reconcile carrier and user issues, it was suggested that specific accessibility/need criteria be addressed:

- population size and economic base,
- geographic location and distance to hub distribution centre,
- availability of alternative modes and the role of air transport.

These three factors could then be used to set government investment priorities for construction and upgrading of airport facilities. The importance of these recommendations to the development of a remote access policy was the need for government to acknowledge the role of air transport in achieving social goals in the north.

Arctic Air Facilities Policy

In 1974, in response to the needs identified in the earlier studies, Cabinet approved the Arctic Air Facilities Policy, (Policy for the Provision of Air Transportation Facilities and Services in the Yukon and Northwest Territories). This policy was developed primarily in response to the socio-economic needs of the residents of the Northwest Territories, recognizing the advantages of regular, year-round air services over other modes of transport which are subject to seasonal limitations. Using the criteria identified in the earlier CTC and Transport Canada studies (NAPS, Northern Air Transport Study), three categories of airport facilities, called Arctic A, B, C were developed, using specific community characteristics (population, location, economic base, etc.) to define the level of

service required as represented by the selection of a critical aircraft(s) (see Chapt. 4). This policy represented the first major attempt to respond specifically to the air transport needs of northern communities.

Nouveau Quebec Airports Program

While there was no specific policy governing the development of air facilities in the Nouveau Quebec region, the program (see Chapt. 4) emanated directly from federal commitments under the 1975 James Bay Agreement. Pressure resulting from the 1982 DIAND review of the James Bay Agreement led to Cabinet approval for a federal-provincial cost-shared program to upgrade infrastructure at eleven Inuit communities over a ten year period. Three Cree sites on James Bay were added later. Consistent with the DIAND objective to encourage native control of facilities and services in the territories, the program proceeded in concert with the emergence of two new native-owned local carriers, which established their own policies based on the provision of economic and social services to residents of remote areas.

Labrador Airstrips Agreement

In 1975, the Department of Transport completed a study of the air network in Labrador in response to pressure from the provincial Ministry of Transportation and the Sullivan Royal Commission. The study recommended the construction of airstrips at fourteen permanent communities with populations over 100 (see Chapt. 4). The program criteria reflected the emerging policy to address accessibility through the quantification of quality of service to users.

CTC Adequacy of Northern Air Service Study

In June and July of 1984, the Canadian Transport Commission held hearings in 19 northern communities from the north shore of Quebec to the Yukon. The purpose of the exercise was to obtain direct feedback from the residents/users of the existing air services and to assess the adequacy of air services which were then in place. The main points raised, in order of frequency,

are listed in Annex 3. During the analysis of the results of the hearing, the committee identified four components to air transport demand:

1. community resupply,
2. passenger transport,
3. government services (mail and health care, excluding medical evacuations),
4. mining, petroleum exploration, other commercial concerns.

The significance of this study was the analysis of service requirements based on categories of need and the importance of air transport in providing the necessities of life (quality) to remote areas.

Analysis of Air Transport Committee Decisions

In 1979, the Research Branch of the CTC produced an economic analysis of the Air Transport Committee's (ATC) decisions for the past decade, in an attempt to see if committee decisions were consistent with respect to economic objectives. The significance of this study to northern air travel was the determination of the level of government involvement, through regulation, that is required in northern markets. The analysis considered all of Canada but references to regulatory practices were found to be more pronounced in northern areas. The study concluded that although the CTC operated under legislation which allowed some regulatory flexibility, policy statements and ministerial judgements limit that flexibility and give rise to inconsistencies in practice. Five years later, in 1984, Minister Axworthy presented his "New Canadian Air Policy" which set out guidelines for the "liberalization" of the air carrier industry in southern Canada and reaffirmed a need for regulatory intervention in the north. The passage of the 1987 National Transportation Act has continued the deregulation process but does not address the future objectives for northern markets separately.

Northern Expenditures Plan (DIAND)

The Northern Expenditures Plan grew out of the 1971 Northern Development policy. The purpose was to coordinate all federal and territorial government programs and to provide a common base for the allocation of resources to meet the national northern objectives. The plan includes all expenditures in northern Canada (excluding northern Quebec and Labrador) by all federal

departments. The substantial expenditures by Transport Canada in recent years (12.7% of total planned expenditures in 1987/88) and the emphasis on the provision of transportation services in support of economic growth, reflect the importance of accessibility to northern development. In addition, the increase in spending attributed to improved quality of life objectives reaffirm recent federal commitments to address the social as well as commercial needs of northern residents.

Conclusions

The federal government's response to northern air systems development was to initiate a number of policies, programs and studies which addressed transportation issues on an ad hoc basis. Without the benefit of a comprehensive remote access policy, many of the foregoing initiatives were developed in relative isolation of each other, responding instead to the immediate concerns of the department or the affected region. Nevertheless, an evolution of political attitude is evident in these endeavors.

The recognition, in official public policy, of the socio-economic needs for transportation services in remote regions was slow in coming. Although the federal government's role in supporting northern air development was identified in the 1964 Civil Aviation Policy, the importance of remote access in meeting socio-economic objectives was not acknowledged until the 1971 Yellowknife Conference and the creation of the National Northern Objectives. Subsequent policies (Arctic Air Facilities Policy, Northern Air Policy) responded to the major components of the northern objectives.

The 1969 Regional Air Carrier policy focussed on the network structures of the carriers responsible for providing remote air service and drew attention to the north/south linkages between regional and national systems. Further analysis of northern transportation issues by the CTC (Northern Air Transport Study) and Transport Canada (ARTA) identified hierarchies of transportation needs based on population characteristics and introduced to the air policies the principles of accessibility. For the first time, northern services were studied as networks serving specific regions rather than isolated settlements.

In the decade from 1969 to 1979, there was a noticeable increase in activity within Transport Canada, CTC and DIAND in which the role of air transportation in encouraging economic development and achieving social objectives was emphasized. Two major public consultation studies (CTC Adequacy of Northern Air Service Study and ARTA Study of Air Carriers) were prompted by the need to further identify socio-economic objectives in the north. Both studies recommended a set of accessibility criteria (consistent with Jones' criteria of location, characteristics of individuals and opportunities and connecting transport systems) which stressed the importance of air transport in meeting the specific needs of remote settlements and the value of public input to the identification of service issues.

The shift in public policy from a passive, regulatory role to direct involvement in the provision of remote access services was eventually realized in the three northern airstrip programs, Arctic Airstrips, Nouveau Quebec and Labrador Airstrips. While each program varied in scope and service standards, the policy direction was consistent; to provide reliable, year-round transportation service to remote communities where no other reasonable options were available.

The regulatory role of the government in ensuring remote access, which was first introduced in the 1969 Regional Air Carrier Policy, was repeated in the 1984 New Canadian Air Policy and confirmed in the 1987 legislation. A 1979 analysis of CTC decision on regulatory practices re-asserted the need for regulatory control of northern markets.

Future policy direction for remote access will have to respond to the maturation and expansion of local and regional carriers serving northern regions. The role of the NTA will concentrate on minimizing the impact of deregulation on northern markets. As the control of northern air systems and services is gradually transferred to the users (through native organizations and territorial governments) a more socially responsive policy direction is expected to emerge.

III Marine Transportation Policy Development

Introduction

The development of marine transportation policies for remote regions has a longer history than air transport policy but perhaps is not as visible or complex. Federal involvement in the

provision of marine transport may be divided into two specific areas; water transport assistance (primarily ferry services) and northern resupply. Policy implementation tends to take the form of direct subsidies, based on annual deficits. Because the subsidies have been largely uncontrolled, services have tended to be priced well below actual costs, creating an artificial demand. The marine programs, therefore, are more likely to result in uneconomic services.

Water Transport Assistance Policy

There are three constitutional agreements (British Columbia, 1871; Prince Edward Island, 1873; Newfoundland 1949) which require the federal government to support inter- (and sometimes intra-) provincial ferry services all of which were included in the BNA and are now part of the Canadian Constitution. Although the intent of the agreements signed under the BNA was to support international and interprovincial marine transport services, the government of Canada found itself more and more involved in the financial support of intraprovincial ferry services. By the mid-60's, annual financial support had risen to almost \$50 million. In an effort to control the growth of federal financial commitments, Cabinet issued a statement in 1966 which attempted to confine federal support to those services which were consistent with the jurisdiction established under the BNA. Nevertheless, the support of intraprovincial ferry services continued, usually as a result of precedent or expediency. As the annual subsidy continued to increase, a federal study, involving all interested departments and agencies, was initiated in 1975 which resulted in a new policy framework which was presented to Cabinet in 1976. The policy established, in principle, four types of service that qualified for federal assistance:

1. constitutional services, and alternatives to constitutional services,
2. Newfoundland coastal service,
3. services supporting special development opportunities,
4. services to remote communities with no other means of access.

In contrast to the 1966 policy statement, this did not specifically rule out support to intraprovincial ferry services. In 1977, a Cabinet decision authorized the Minister of Transport to rationalize the federal government's involvement under the Water Transport Assistance Policy (WTA). A number of significant events followed the initiation of this policy. Of particular interest are:

1. the creation of CN Marine in 1977 as a wholly owned, non-comprised subsidiary of CN to provide ferry and coastal shipping services on a fixed price contracting basis.
2. agreements reached between the federal government and the provinces of British Columbia (1977), Newfoundland (1979), and Quebec (1979) which transferred responsibilities for ferry operations and coastal shipping services to the provinces in return for an annual operating subsidy (see p. 67), and
3. Changes made to the CN Marine-operated Newfoundland Coastal services which resulted in some services being upgraded while others were eliminated where alternative transport services were available.

Although the intent of the WTA Policy was abundantly clear, the actual conditions were sufficiently vague that they could not reasonably be used to determine action in many cases. For instance, the definition of "constitutional alternative" does not accord with the government practice of employing the "least cost" method, especially if that alternative involves the air mode. The "economic development" category does not specifically exclude services to promote tourism, yet it has been treated as such. The duration of a "limited period" of joint federal/provincial support, during which the service was to have become self-supporting or supported solely by the province, was never specified. Furthermore, the definition of "remote community" does not make clear the adequacy of alternative modes in terms of efficiency, safety or expense. An in-house Department of Transport study (untitled document, 1985) concluded that, "in all cases which have arisen since the establishment of the policy, the reaction has been based on the government's restraint program rather than the policy." The study further reported that,

The policy has been a useful tool in enabling the federal government to reject requests for new subsidies or new services, the rationale being that the government does not want to incur additional expenditures.

Services which were proposed and which warranted support, the authors argued, could not be assessed until clear definitions of terms were provided. Even more critical, there was no means by which to address or measure social factors, which are especially important to the coastal services in Newfoundland and Labrador where marine services go beyond the mere provision of transportation and are part of the societal framework. (The twice weekly visits of the coastal boats provide a

welcome diversion in an isolated environment and the annual excursion to summer residences is a tradition that spans more than 200 years.) In spite of the noted drawbacks, a number of options were proposed:

1. status quo,
2. remove the time limitation and provincial participation from services that require these criteria but do not satisfy them,
3. same as option 2 but removing mandatory time limitation and provincial participation criteria from any new communities,
4. strictly interpret the 1976 policy structure.

No further action has been taken.

CN Marine (Marine Atlantic)

Until 1976, the CNR, through the East Coast Marine and Ferry Branch, managed and operated specific ferry and coastal shipping services under various Orders-in-Council pursuant to the Canadian National Railway Act. The lack of contractual provisions to define service levels and financial obligations resulted in uncontrolled increases in spending. This so-called "back-end" deficit funding drew criticism from the Auditor General who argued that the system permitted no financial control of public funds. Therefore, as part of the 1976 policy, the government created a new crown corporation, CN Marine Inc. to manage, under specific operating contracts, certain ferry and coastal shipping services. Part of the initial terms and conditions included the transfer of \$100 million of crown assets and provision for a further \$143 million which, it was hoped, would make the company independent in terms of capital acquisition.

Of particular interest to this study were the services taken over by CN Marine in Newfoundland, specifically the coastal service in southern Newfoundland and the Labrador coastal service. In 1981, as part of the five year Newfoundland Transportation Plan, Cabinet approved certain reductions in service, most of which were implemented during the 1982 season. A current study to further rationalize the Newfoundland coastal service, which will make recommendations to the year 2000, is still under consideration.

Federal/Provincial Agreements

Between 1977 and 1979, financial assistance agreements were signed between the federal government and the governments of British Columbia, Quebec and Newfoundland. The Quebec and Newfoundland agreements provided annual grants for a five year term with the possibility of renewal whereas the agreement signed with British Columbia provided an annual grant with no fixed term and a five year indexing based on the Consumer Price Index. The Labrador Coastal service was not affected by the Canada/Newfoundland Agreement but the responsibility for several small services connecting outlying islands with provincial highways, previously entrusted to the CNR, was transferred to the province.

V Current and Future Policy Direction

To some extent, federal transportation decision-makers have recognized the limitations of a policy of complete deregulation. The recognition that most of the northern and peripheral regions will still require government support to retain even a portion of the services presently available is at least identified in some of the recent policy statements. The emerging attitude, however, is that government-provided services are costly to operate and maintain and that users of these services must appreciate their value and be willing to pay, if not the real market value then a rate representative of increases in operating costs, for their continuation. Until a more market-oriented system is devised, transportation policies in the southern, most densely populated areas of the country will support a deregulated environment while the government will support some form of regulatory control north of the line of demarkation to ensure continued provision of minimum service. This geographic separation is, however, a rule of thumb and in no way commits the federal government to continued direct financial or regulatory assistance.

The wording of the position paper, "Freedom to Move" is sufficiently vague to ensure as much discretionary power as possible. Similarly, the wording of the 1987 National Transportation Act attempts to restrict government responsibility to only the most critical situations. The results of this attitude can only be assessed once negotiations with private carriers are actually conducted.

Already, the indication is that most of the effort to retain services will be in the north, where improved transportation service is an essential component of the deregulation policy.

Less prominent in the public view, but more significant in terms of regional economies, are the problems faced by isolated, and especially coastal, communities whose existence depends on government subsidized transportation services. These communities rank low on the government's visibility list, because of the small population representation, yet without continued support they could suffer far more economic hardship. Some of these seemingly "low-profile" communities have, under the right circumstances, the potential to become self-sufficient as long as adequate transportation services are provided. Most of these communities depend on a single, resource-based industry and without a diverse economic base cannot support a regularly-scheduled, market-priced transportation service. Without reasonable access, however, the economic mainstay of the communities would collapse. Many of the inhabitants, especially native populations, are too financially dependent on local resources and too emotionally attached to their communities to accept an extensive resettlement program. Instead, they would have no alternative but to remain in an environment of reduced accessibility and, by association, economic opportunity.

The challenge to conquer distance, through the public provision of remote access services, is potentially threatened under current policy direction. Since 1985, the Department of Transport has responded to overall government priorities of economic growth, deficit reduction, regional development and reform of economic regulation with its own emphasis on transportation regulatory reform, departmental reorganization and reduced expenditures through such policies as privatization, divestiture, and cost recovery. The results of these policies could have serious negative implications for remote regions as projects which provide primarily social welfare benefits must compete for limited resources with those capable of achieving cost recovery.

Even if it can be successfully argued that there is no sound economic basis for continued subsidization of transportation services as a means to promote regional development (see Chapt. 2), governments must appreciate the implications of cessation of support in those areas where there is reliance on only one, or a few, resource-based industries. The alternative to supporting local

economies is increased social welfare support which reduces the potential for economic independence even further.

The paradox is that while decision-makers are forcing policies which may reduce or eliminate certain transportation services to remote areas, the department's mandate to provide a safe and efficient national transportation system, and to support broader government social and economic objectives, has not changed. It is inevitable that conflicts will arise in situations where "deemed public need" and the potential for cost recovery are in opposition. The lack of a definitive cost recovery policy is inhibiting the determination of eligibility for remote access. No consistent criteria exist for the determination of equity or accessibility, much less levels of service within or between modes, against which to measure possible policy impacts. As a result, needs are often assessed on the basis of political pressure (for example, the Nouveau Quebec Airstrips Program) rather than a consistent national approach to service levels. The present system of fostering modal competition in the absence of a national remote access policy can only exacerbate the situation through lack of coordinated effort towards an identifiable end.

VI Conclusion

If the Department of Transport continues to pursue policies of deregulation, privatization/rationalization of services and infrastructure, and increased cost recovery, a reconciliation must be reached between the desire to encourage private sector involvement and the socio-economic responsibility for remote regions. Until adequate definitions of accessibility and levels of service are formulated, transportation programs will continue to operate on an ad hoc basis, placing much of the effort on increased financial independence of the transportation sector (carriers, owners, operators) at the possible expense of those areas where demand is insufficient to support continued service at market rates. No doubt some of the positive results of the experiences in the U.S., such as lower rates due to increased competition, will be felt in this country, and some of the failures, such as reduced service on unprofitable routes, will enact a cautious approach to our own policies. But where government interference has for so long distorted "normal" market conditions,

the impact of the removal or relaxation of the government's role in the provision of transportation services can only be expected to be severe.

CHAPTER 4

ANALYSIS OF RELEVANT PROGRAMS

I Introduction

The federal government's response to ensuring reliable transportation service in remote areas has been directed towards marine cargo resupply and air passenger services. Post World War II policies have favoured the provision of air infrastructure and the regulatory control of air carriers. Direct subsidization of aircraft operators has been avoided except in very unusual circumstances. This decision is based on the theoretical concept that by relieving private industry of the prohibitively high capital cost of providing the infrastructure, carriers will supply the appropriate operational equipment and level of service. Regulatory control of air networks further ensures minimum access to even the most remote communities.

In the absence of a comprehensive, remote access policy, practical application of this approach has taken the form of three major air facilities programs, the Arctic Airstrips, the Nouveau Quebec Airstrips and the Labrador Airstrips, all of which originated in the period 1974 to 1982. Each program developed from a different policy and although the objectives were similar (to ensure minimum transportation services in isolated areas where air transportation was the only alternative to the provision of reliable, year-round access) the estimation of need and the economic analysis used to determine the most appropriate service were quite different. While the infrastructure varies considerably between programs, many of the problems encountered in the construction of the airstrips were repeated in all three cases. A brief analysis of the three programs will demonstrate the disparity in decision-making and policy development which has resulted in varying standards for similar situations (Fig. 4-1).

There has not been the same program-oriented approach to marine transportation development in the north. Resupply services in the Arctic tend to be mainly tug and barge operations which use beach unloading facilities. (This is discussed in more detail later in this chapter). The provision of port facilities on the Labrador coast, in response to the more rugged geographical characteristics is more sophisticated but, nevertheless, has developed on a site-specific

Figure 4-1, Northern Airstrip Programs

NORTHERN AIRSTRIPS PROGRAMS			
	Arctic Airstrips	Mouveau Quebec	Labrador Airstrips
Area	2.6 million km. ²	595,000 km. ²	8,000 km. coastline
Population	70,000 (1979)	10,800 (1983)	5,500 (1984)
Sites	62	14	14
Cost (\$ millions) per airstrip	200 3.22	62.4 (85)* 4.45	42.3 (51)* 3.02
Infrastructure (runway length)	A 6,000 ft. B 5,000 ft. C 3,000 ft.	3,500 ft.	2,500 ft.
Level of Service (aircraft type)	A B-737, Hercules B F28, 748, F227, YS11 C DHC-3, Cessna, AZTEC	B-737, MS-748, DH-125	DHC-3 (Twin Otter)
Analysis	JASPER**	JASPER** (abandonned)	modified C/B
Demand (eligibility criteria)	- population (see Fig. 4-2)	- minimum population - permanent community - no reliable alternative	- minimum population - permanent comm. - present service 2 flights/week marine
Inter-modal tradeoffs	roads	roads	
Other Considerations	1970 Northern Conference	political pressure from DIAND	Sullivan Royal Commission
* approved levels	** see Chapt. 5.4		

rather than program-based approach. For Labrador in particular, the apparent disregard for a coordinated effort between the two modes, air and marine, is emphasised in the analysis.

II Arctic Air Facilities Program

Background

The Arctic Air Facilities Policy developed in response to decisions taken by senior government officials at the Northern Transportation Conference in 1970 in Yellowknife. Prompted by a study completed by DIAND which outlined deficiencies in aviation facilities in the Arctic, the Minister of Transport committed the department to investigate the issues raised at the conference. In response, the department initiated a joint CTC/Transport Canada study of northern networks, in line with the earlier Northern Air Transport Study. The report presented an analysis of existing and proposed hub and spoke air networks, identifying the sites which were to be categorized as Arctic "A", "B" and "C" according to infrastructure and aircraft requirements (Fig. 4-2).

Socio-economic Characteristics of Arctic Communities

The 62 communities identified in the Arctic Air Facilities Program span the whole of the Yukon and Northwest Territories, an area roughly 2.6 million km.² (1.5 million sq. mi.). The populations represented vary dramatically in terms of size and economic base from administrative centres such as Whitehorse and Yellowknife, to resource based communities, native settlements and weather stations. As a result of the widely disparate needs of the populations, the classification criteria and minimum standards of facilities and services for the airports were based directly on the socio-economic characteristics of the communities. For example, the Arctic "A" airports, which are defined as major hubs, were designed to accommodate the operation of larger passenger and cargo aircraft such as the B-737 and Hercules, connecting with regional networks and bringing passengers and supplies to major distribution centres. On the other end of the scale, the Arctic "C" community airports, with populations between 100 and 400, were designed to accommodate light twin engine aircraft, such as the Twin Otter used on the Labrador coast. This minimal type of service would

Arctic "A" (Major) Airports

Those airports serving population centres which have the following characteristics:

- served by an air carrier on a regular scheduled basis,
- no means of regular transportation other than air,
- major distribution centre,
- strategic location,
- a capital or regional administrative centre,
- an extensive continuing resource development role.

Arctic "B" (Area) Airports

Those airports serving population centres which have the following characteristics:

- a population of more than 400,
- no means of regular transportation other than air,
- served by a regular, reliable air service,
- a growing community,
- an area administrative centre,
- an active role in resource development.

Arctic "C" (Community) Airports

Those airports serving population centres which have the following characteristics:

- a population of more than 100,
- no means of regular transportation other than air.

Arctic Seaplane Bases

Seaplane facilities will be provided where it is determined that such facilities are justified on the basis of economic and technical evaluation.

ensure reliable, year-round service to area centres, represented by the Arctic "B" airports, for relatively small numbers of passengers and small parcel cargo, such as mail.

Program Details

In 1974, Cabinet approved the Policy for the Provision of Air Transportation Facilities and Services in the Yukon and Northwest Territories. The intent of the policy was to develop or upgrade aerodromes to licencable standards at 62 arctic communities which met established criteria of minimum population and degree of isolation. The communities identified were to be permanent places of residence with minimum populations of 100 persons. (A list of sites and their location is found in Fig. 4-3 & Fig. 4-4) The initial program was to have cost \$60 million and taken five years to complete. As a result of overly optimistic planning and limited experience in northern construction projects, the program required an extension in 1977, allowing for total expenditures of \$200 million and an estimated construction period of 15 years.

A review of the program was conducted in 1980-81 in an attempt to document the problems that led to the excessive cost overruns, and to estimate future requirements in terms of capital and construction scheduling. At the time of the review, basic facilities were in place at all eleven of the Arctic A airports, and half of the B & C airports had been completed. In addition to Transport Canada's expenditures, DIAND and the Government of the Northwest Territories had spent a further \$11 million to assist in the upgrading of the Arctic B & C airports. In spite of the problems with construction schedules, energy costs and inflation, which inevitably led to the overwhelming increase in costs, the 1981 Status Report concluded that, "the main finding of the review is that the program has been successful in improving transportation access to isolated Arctic communities" (p. 30).

In 1983, Transport Canada again went to Cabinet for increased funding to complete the Arctic Airports Program but the proposal was rejected. The only remaining funds in the department's budget are to complete the airports that have already been started. To date (1988), eleven communities still lack upgraded facilities. Transport Canada, under pressure from the regulatory agency and the air carriers, has initiated yet another program of small airports assistance

Figure 4-4, Arctic Airstrips Program - List of Place Names

Major Hub Airports (Arctic A):

Cambridge Bay, NWT
 Fort Simpson, NWT
 Fort Smith, NWT
 Frobisher Bay, NWT
 Hay River, NWT
 Inuvik, NWT

Norman Wells, NWT
 Resolute Bay, NWT
 Yellowknife, NWT
 Watson Lake, YT
 Whitehorse, YT

Area Airports (Arctic B):

Baker Lake, NWT
 Coppermine, NWT
 Coral Harbour, NWT
 Nanisivik, NWT

Rankin Inlet, NWT
 Tuktoyaktuk, NWT
 Dawson City, YT
 Mayo, YT

Community Airports (Arctic C):**1. Northwest Territories**

Aklavik
 Arctic Red River
 Broughton Island
 Cape Dorset
 Chesterfield Inlet
 Clyde River
 Eskimo Point
 Fort Franklin
 Fort Good Hope
 Fort Liard
 Fort McPherson
 Fort Norman
 Fort Providence
 Fort Resolution
 Gjoa Haven
 Grise Fiord
 Holman Island

Igloodik
 Lac la Martre
 Lake Harbour
 Pangnirtung
 Paulatuk
 Pelly Bay
 Pine Point
 Pond Inlet
 Rae/Edzo
 Rae Lakes
 Repulse Bay
 Sacks Harbour
 Sanikiluaq
 Snowdrift
 Spence Bay
 Whale Cove
 Wrigley

2. Yukon Territory

Beaver Creek
 Burwash
 Carmacks
 Faro

Haines Junction
 Old Crow
 Ross River
 Teslin

which is to be funded from internal sources. According to the terms of the original agreement, the Arctic A facilities will remain under Transport Canada's ownership, while the B & C airports are to be transferred to the Governments of the Northwest Territories and the Yukon. Negotiations are currently underway to establish the terms and conditions of the full devolution, particularly federal financial support to ensure ongoing operation, restoration and upgrading of the existing facilities. Operational funds have already been transferred to the territorial governments for the completed airports.

III Nouveau-Quebec Airports Program

Background

In 1975, the James Bay and Northern Quebec Agreement was signed by the government of Canada, the government of the province of Quebec, the James Bay Development Corporation, the Quebec Hydro-Electric Commission, the Northern Quebec Inuit Association and the Grand Council of the Crees (of Quebec). In 1978, the Northeastern Quebec Agreement was signed with the Naskapi. Consistent with the objective to allow native populations to control their own destinies, the agreements identified the necessity of reliable, year round transportation. In 1982, the Minister of Indian and Northern Affairs published a full review of the agreements which recommended the development of airports at permanent communities in the area defined as Nouveau-Quebec, lying north of 55° latitude between Hudson Bay and the Labrador border. Cabinet approved the airports development proposal, in principle, in 1982 and in 1983 a federal-provincial agreement was signed for the development of air transportation infrastructure at eleven Inuit communities over the next ten years. Under separate submission, the Treasury Board approved construction of airports at three Cree sites on James Bay.

Inuit Communities

Inukjuak
Akulivik
Salluit
Quaqtaq
Aupaluk
Kangiqsualuujuaq

Povungnituk
Ivujivik
Kangisujuaq
Kangirsuk
Tasiujaq

Cree Communities

Wemindji
Fort Rupert
Eastmain

In line with the recommendations of the Northern Air Policy Study (Chapt. 3), the eligibility criteria that were established required:

- a) a minimum (year-round) population of 100,
- b) isolated communities,
- c) no year-round reliable transportation means.

Therefore, some communities connected by provincial highways were deemed ineligible initially and some which were connected by road to existing airport sites were also excluded from the program.

In 1984, Transport Canada completed the Nouveau-Quebec area aviation master plan which included specific details relating to the design and construction of the airport infrastructure at both the Inuit and Cree sites.

Socio-economic Characteristics of the Communities

The area defined under the Nouveau-Quebec agreement covers approximately 600,000 square kilometers, roughly 40% of the total area of the province of Quebec. The climate of Nouveau Quebec and the James Bay area is classified as moist subarctic and tundra polar³, therefore similar to Labrador. The two large native populations, Cree and Inuit, live along the eastern coasts of James Bay and Hudson Bay, Hudson Strait and the Ungava Bay coastline. Total population in 1983 was 10,800 which included 4,511 Cree, 5,251 Inuit and 1,042 non-natives. Of the 18 permanent communities represented in the program, four have populations of over 1,000 residents, nine range between 250 and 1,000 and five have less than 250 residents. In comparison, the population of Coastal Labrador, which numbers approximately 5,500 in 14 permanent communities, includes only one community with a population of 1000 (Nain), four with populations between 500 and 750, six between 250 and 500 and two with less than 250. The lifestyle of the residents of Nouveau-Quebec is dominated by traditional activities of hunting, fishing and trapping. The economy of the region is dependent on natural resources such as fishing, forestry, mining and hydro-electric power.

³Koppen-Geiger classification system

With the exception of the five Cree communities on James Bay, there are no roads north of the 55th parallel. The nearest rail lines extend to Chibougamau and Matagami to the south west and to Schefferville on the Labrador border. All bulky merchandise is shipped by boat and transferred to barges for delivery to the communities, most of which lack adequate wharves. The absence of road transportation and the limitations of marine transport makes air transport the only reasonable option for year-round access. All permanent communities have an airstrip of varying quality and capability.

As a result of the Nouveau-Quebec program, the Inuit and Cree communities established their own airlines, Air Inuit and Air Creebec, including air service policies. Both airlines are dedicated to providing economic and social community services to residents of remote areas.

Program Details

The Nouveau-Quebec Agreement originally identified eleven communities to receive upgraded facilities under the program. The agreement stipulated that the runways would be 3,500 ft. where prevailing conditions permitted, except for Povungnituk in the event that the Province built a regional hospital facility. The original Transport Canada submission, however, called for six sites to be provided with 3,500 ft. runways, four sites with 2,000 ft. runways, and one site (Povungnituk) with a 4,000 ft. runway, in accordance with a JASPER study carried out by De Havilland. Because the three Cree airports which were constructed first were all equipped with 3,500 ft. runways, Inuit expectations ran high and by the time the specifications for the eleven remaining airports were drawn up, each airport was to consist of a 3,500 ft., gravel landing strip. The agreement also stipulated that the infrastructure provided at the Cree communities would be owned by Transport Canada and operated under contract by the Cree. The infrastructure provided at the eleven Inuit communities, however, would be owned and operated by the province, similar to the arrangement for the Labrador airstrips.

Between the original Cabinet approval and the final allocation of funds, capital program costs doubled. The reasons given for the dramatic cost increases were reminiscent of the problems encountered in the Arctic Airstrips program which were in turn repeated during the Labrador

Airstrips program. Specifically, the original estimates were made without site visits and determination of exact locations, therefore, technical requirements had to be amended and unexpected items, such as access roads to water and power supplies, were added. The program was delayed by one year, to carry out soil and geological tests, adding inflation costs to the first estimate. Finally, the requirement to build 3,500 ft. runways at all sites, and not at the six originally planned, caused a significant increase in estimates. Furthermore, the ambitious construction schedule had to be modified as a result of a number of administrative problems.

To date (1988), the three Cree airports have been completed. Of the eleven Inuit airports, two sites are nearly completed, two sites are in the construction phase and four sites have contracts awarded for construction but have been delayed to 1989/90 at the request of the province. Two conditional sites have been identified, but to date no decision has been made to construct facilities at these communities as they currently do not meet the eligibility criteria. Current cost estimates are within the approved \$62.4 million.

Conclusions

Because of the politically sensitive nature of this program (having been stipulated in the James Bay Agreement), requirements to justify the level of service and associated infrastructure costs were not the same as those demanded of the Arctic Airstrips Program or the Labrador Airstrips Program (which was not required under any other agreement). Rather, the basis for determining facility need was a comparison with the facilities built at the Cree sites on James Bay. A JASPER study was completed on the region, with the same eligibility criteria used for the Arctic Airstrips Program, but the results were unanimously rejected by the Inuit. It was acknowledged in the James Bay Agreement that the lack of reliable year-round service necessitated development of air transportation in the region, however, a meaningful needs analysis was not completed on the thirteen communities identified in the final agreement. Instead, the airstrips were designed to meet the demands of the residents.

IV Labrador Airstrips Program

Background

In 1974, the Minister of Transportation for the Province of Newfoundland and Labrador presented a list of airstrip construction needs to Transport Canada. A subsequent review of airport facilities confirmed a critical need for improved transportation in Labrador in particular. A complete study of the network was conducted through an area aviation master plan (LAMP).

The study involved consideration of geographical features, existing transportation services and facilities, and socio-economic characteristics of Labrador. The final report presented four alternatives; continuation of existing service, helicopter service, selected airstrip development and full airstrip development. A comparative analysis considered financial implications, fuel consumption, level of service, safety and operational requirements. The study concluded that coastal Labrador was primarily dependent on air transportation for the year-round movement of goods and people and, therefore, airstrips should be developed at all thirteen major communities in coastal Labrador (LAMP, 1975) (see Fig. 4-5).

The report was approved by the department and endorsed by the province in 1976. As no immediate source of funding was available to support the \$25 million preferred option, the recommendations were not implemented. Nevertheless, arrangements were made with the province to improve facilities at Cartwright under the local commercial airport program, for which the federal government contributed a maximum share of \$100,000. Similar applications were made for Nain, Makkovik, Mary's Harbour and Hopedale.

During the same time period, the Marine and Ferry Branch of the Department of Transport was engaged in the Newfoundland Coastal Transportation Study (Chapt. 5) which attempted to establish long range planning and policies for the coastal service, which was plagued with aging vessels, unrealistically low rates and inefficient management. When the recommendations of these two studies were brought forward, it became clear that prior to implementation, consideration should be given to an inter-modal approach to transportation requirements for coastal Labrador, therefore, the Labrador Coastal Air/Marine Study (Chapt. 5) was initiated by the department in 1975. Consideration was given to traffic demand in both modes for passengers and freight, potential

Figure 4-5, Labrador Airstrips Location Map

economic growth and the opinions of residents. That study also supported the construction of the coastal airstrips, identified in the LAMP, to be supported by a "feeder" marine passenger service. Scheduled freight service would continue to be provided by sea during the Labrador shipping season (Labrador Coastal Air/Marine Study, Status Report, 1977).

Program Approval and Funding Arrangements

The history of the program approval and funding arrangements of the Labrador Airstrips Program demonstrates the level of scrutiny given the program, in contrast to the other two northern airstrip programs. The complications encountered contributed significantly to the dramatic increase in costs from the original LAMP proposal to the final estimates and delayed the implementation of a much needed reliable, year-round transportation service on the coast.

In 1976, the newly formed Federal-Provincial Committee on Atlantic Region Transportation reviewed a report on inter-modal passenger transport. Encouraged by the committee's assurance of adequate service levels at minimum cost, Cabinet approved \$125 million in 1977 for the Atlantic Provinces Transportation Program (APTP), \$21 million of which was earmarked for airport facilities. Four Labrador communities, Nain, Makkovik, Hopedale and Mary's Harbour, were selected for funding. Also in 1977, the Minister of Transport initiated a federal commission of inquiry into Newfoundland transportation in an attempt to resolve the issues surrounding federal responsibility for transportation services in Newfoundland, particularly the aging Newfoundland Railway. Echoing the recommendations of LAMP, the "Sullivan Report" further sanctioned the construction of the fourteen airstrips. The four airstrips already identified under the Atlantic Provinces Transportation Program soon grew into the more ambitious Labrador Airstrips Agreement.

In 1981, the Air Administration of Transport Canada produced the Newfoundland and Labrador Air Transportation Plan in response to the recommendations of the Sullivan Commission and to Cabinet direction to develop a preliminary financial plan (Newfoundland Five-year Transportation Plan). Included in the air plan were the scope and costs of ten airstrips to be built at the remaining sites identified in the LAMP. The recommendations were contingent on an agreement with the province to own and operate all the facilities and a suitable reduction in the

marine service. The total cost of constructing the ten-airstrips, based on an update of the 1975 LAMP, was estimated at \$26 million which was to be funded between 1982 and 1986.

In 1982, Cabinet approved the Newfoundland Transportation Funding Envelope in an attempt to "cap" expenditures at 1981 dollar values as recommended in the five-year plan. The total cost of the Labrador airstrips was to be funded from this program, which was to follow the expiration of the APTP. In the same year, a Memorandum of Understanding was signed between the federal and provincial governments stipulating that 100% of the construction costs would be borne by the federal government but that the province would own, maintain, manage and operate the facilities. Additional amounts for annual restoration expenditures were included. The agreement also called for a reassessment of requirements for airstrips at Red Bay and Hopedale.

In 1984, an annual update of the Newfoundland Five-year Transportation Plan forecast increased expenditures for the Labrador Airstrips Program. Furthermore, delays in the original construction schedule resulted in expenditures forecast beyond the program funding period. In 1985, Transport Canada received Treasury Board approval to spend up to \$51 million on the airports, \$12 million more than the original Cabinet approval. The 1985 Labrador Area Master Plan (Update II) recommended the installation of lighting at nine of the airport sites and supported the construction of an airstrip at William's Harbour, in place of the facility at Red Bay. When the "envelope" terminated in 1986, all of the originally identified sites had an airstrip in place although none had received the required lighting and several had unfinished support facilities. More competitive bidding on construction contracts reduced actual costs to \$35 million although current (1988) estimates place the final cost at \$42.3 million. Expenditures occurring after the 1986 expiration of the funding envelope have been taken from the department's regular capital budget.

Terms and Conditions of the Airstrips Agreement

Based on the original LAMP study, the Labrador Airstrips Agreement established the following eligibility criteria:

- 1) present service at least 2 flights per week,
- 2) winter population average of 100 people.

At that time, Labrador Airways provided regular service to the fourteen coastal communities under a provincial government subsidy, using Beaver and Otter aircraft on floats and skis.

Analysis of Alternatives

The 1975 LAMP recognized that the often criticized coastal air service could not be improved through a piecemeal development of individual facilities. The analysis of alternatives, therefore, considered a network approach to airstrip development and the future relationship between a coastal network and the regional network. The alternatives considered were:

1. continuation of existing system,
2. the provision of air service utilizing helicopters,
3. selected airstrip development,
4. full airstrip development (Fig. 4-6).

The evaluation included both operational requirements and financial implications. A true "economic analysis" was not conducted for the following reason:

In an area such as Labrador, improvements to the transportation system should not be evaluated on the basis of economic benefits and costs. The benefits of significant improvements to the system are mainly social, the social impact of transportation being a key consideration in an area as isolated as is coastal Labrador. Therefore, since benefits are largely unquantifiable, they have been dealt with in narrative form only in this evaluation (LAMP, Systems Analysis, 1975, p. 2).

The only variables to be quantified were costs, as revenues were assumed to remain constant across the alternatives with no possibility of covering even the lowest cost alternative. Total system costs were estimated by component; direct and indirect operating costs and infrastructure costs. A consulting firm (ADI Limited) was hired to evaluate direct operating costs by establishing service routes and networks for each alternative. Insurance and depreciation costs were not included. The indirect costs were acquired from the carrier, Labrador Airways Limited. The non-economic, unquantifiable aspects were assessed in terms of reliability, convenience and passenger appeal.

The results of the analysis indicated that substantial changes in the network were required, involving both infrastructure and aircraft, in order to significantly improve service. The following conclusions were presented:

Figure 4-6, LAMP Alternative - Twin Otter Network

1. The existing service provides an unacceptable level of service from the points of view of dependability, safety, and comfort of the passenger. It is, however, the overall cheapest alternative.
2. The exclusive use of helicopters in the area would provide a substantial improvement in the dependability of the air service as well as provide year-round air service to all communities. However, it is an unreasonably expensive option to pursue with all costs except those for facilities higher than all other options and the total cost being significantly higher than any other alternatives.
3. The exclusive use of Twin Otter aircraft on the scheduled service would provide the highest level of service to the system user and a reasonable cost to the operator. The total cost would be high due to the cost of developing airstrips at all communities along the coast.
4. The development of airstrips at selected points is economically attractive and would provide Twin Otter service to the major communities. The level of service to the remainder of the communities would continue to be unsatisfactory if service was still provided with Otters. However, local service utilizing a helicopter could provide an adequate level of service to these communities. Of course, an extra cost would be associated with the operation of these vehicles and agreement would have to be achieved on who would bear this extra cost.
5. In order to provide an improved level of service to a community in Labrador, it can be concluded that airstrips are required in that community. Therefore, the alternative described as full airstrip development provides the best level of service and the best operational characteristics at the least cost (LAMP, Systems Analysis, p. 72).

Having applied the eligibility criteria to the communities along the Labrador coast, the following priorities for development were defined:

A.	Priority Level I	- Cartwright - Nain - Mary's Harbour - Makkovik
B.	Priority Level II	- Davis Inlet - Hopedale - Postville - Rigolet - Black Tickle - Charlottetown - Port Hope Simpson
C.	Priority Level III	- Fox Harbour (St. Lewis) - Paradise River

The province proceeded with federal financial assistance for commercial airport development to improve the airport at Cartwright, therefore, Nain, Makkovik, Hopedale and Mary's Harbour were selected for immediate funding under the Atlantic Provinces Funding Envelope. For the remainder of the airstrips, the priority list was generally adhered to with the exception of a location in the Straits area, which was included in the Labrador Airstrips Agreement. The community of Red Bay was originally selected, however the recent agreement to complete a road connection to Red Bay resulted in the substitution of William's Harbour for airstrip development.

Conclusions

The single, most significant fault of the Labrador Airstrips Program was the unnecessary delay in initiating the recommendations of the original LAMP. From 1974 to 1982 the residents of Labrador had to contend with a transportation service that was inadequate by any standard, while five studies were undertaken, all under the authority of the Department of Transport, and all of which reached the same basic conclusion. Had the appropriate priority been accorded these remote communities, the facilities might have been in place as early as 1980 and at considerably less cost. Furthermore, related initiatives, such as the upgrading of water and sewer systems, might have taken place earlier had there been a reliable air service available. Had the government adhered to the recommendations of the Air/Marine Study a much better service to residents would have been provided at less overall cost. The obvious complementarity of the two transportation systems should have been emphasized before the airstrip program began so as to ensure the achievement of economies in both modes. The present political climate, especially with the recent (1988) decision to eliminate the railway freight service in Newfoundland, will not favour any alteration to either air or marine services.

Of the three airstrip programs, the Labrador program was the least politically motivated and therefore the least publicized. The scope of the project was the smallest of the three, yet it was subjected to the greatest departmental scrutiny. Experience gained in the construction of the Arctic Airstrips was not passed on to the Labrador project, nor was the emphasis on networks and the determination of need (JASPER). The apparent lack of communication between programs resulted

in repetitions of problems with construction schedules, cost-overruns and incomplete facilities. The demand criteria and critical aircraft vary considerably from one program to the other, partly due to local operators and partly to political pressure. The influence of DIAND appears to have had an impact on the setting of priorities for airstrip development in Quebec and the Territories, from which the residents of Labrador could not benefit.

The similarities between this program and the Nouveau Quebec Program reveal a general lack of information sharing and the same optimistic approach to deliver the proposed program on schedule and within cost. The legal contracts for both programs neglected to provide mechanisms to end the agreement in the event that either party failed to live up to the terms of the agreement or to deal with project cost overruns.

In spite of all the problems experienced in implementing the program, the fourteen coastal airstrips have provided a much more reliable year-round service than previously offered by LabAir using floats and skis. The costs have been significant, both financially and socially (as a result of unnecessary delays), but the program is considered by the department to be a success in terms of providing an adequate air service to the permanent, coastal communities.

V Labrador Port Development

Introduction

Responsibility for the provision of port facilities on the Labrador Coast rests with the Department of Transport, Harbours and Ports Directorate, and the Department of Fisheries and Oceans, Small Craft Harbours Branch. The latter is concerned with providing facilities strictly for the use of fishermen and fish processors whereas the Department of Transport's mandate includes all commercial operations, which may include the fishery, as well as social responsibility for remote access. Both departments recover a portion of their costs through the collection of wharfage, berthage and storage fees. The primary users of the public port facilities on the coast are the fish processors and Marine Atlantic. Historically, the Department of Transport has met the facilities requirements of Marine Atlantic without explicit cost recovery arrangements. That attitude has

changed in recent years due to increasing demands from Marine Atlantic (to accommodate containerized and ro-ro services) and reduced funding within the department.

Port Development

There have not been any major port facilities programs on the Labrador coast, instead, development has taken place on a site-specific basis according to greatest need. Nevertheless, upgrading of wharf facilities at the largest permanent communities has been approached on a more system-oriented basis over the last few years, through Transport Canada's regular capital program.

In 1983, the financial responsibility for public port facilities was transferred from the Department of Public Works (DPW) to the Harbours and Ports Directorate. In preparation for this transfer, Transport Canada initiated a series of Port Master Planning Studies. The Labrador coast was included in the Newfoundland Coastal Ports Study, completed in 1984. The study examined, on a site-specific basis, existing facilities, local and regional economies, traffic flows (past and future), and the role of each port. Specific planning issues included:

- Marine Atlantic coastal service requirements,
- future containerization of coastal freight services,
- vessel sizes using the ports,
- development issues relating to Labrador fishing ports,
- specific cargo requirements,
- potential offshore related requirements (Newfoundland Coastal Ports Study, 1984).

Analysis of these factors resulted in recommendations for future port development including costs and implementation schedules.

Based primarily on Marine Atlantic's proposals to replace passenger and freight vessels and to introduce containerized cargo service on the Labrador coast, development was recommended at:

Goose Bay	Hopedale	Postville	Davis Inlet
Black Tickle	Makkovik	Red Bay	Port Hope Simpson
Cartwright	Mary's Harbour	Rigolet	
Charlottetown	Nain	St. Lewis	

Total estimated cost for improvements was \$12.280 million (1984 \$'s). Cartwright was identified as the future site for stern ramp, ro-ro facilities, similar to that provided at Goose Bay. The remainder were to have received a variety of wharf and shed upgrades and replacements, scheduled over the period 1985-1990.

In 1985, Marine Atlantic requested that facilities at 10 coastal communities be upgraded to accommodate a containerized cargo service provided experimentally at the time by a prototype vessel, the M.V. "Astron". Subsequently, improvements were programmed for two priority sites, Postville and Black Tickle. As there was no special funding immediately available, the department requested recovery of that portion of the project costs directly attributable to Marine Atlantic's proposal. The request was withdrawn in 1987 and Marine Atlantic has subsequently relinquished its lease on the Astron.

Routine maintenance and replacement of facilities, many of which are past their economic lives and inadequate to meet user requirements, has continued based on the recommendations of the port study. Major restoration projects have been completed at Goose Bay, St. Lewis, Charlottetown and Black Tickle. Additional improvements were made to facilities at Cartwright (to accommodate the ro-ro vessel, Sir Robert Bond), Makkovik, Rigolet, Nain and Mary's Harbour. In total, approximately \$10 million worth of projects have been programmed since 1985.

There are no additional programs which have earmarked funds for port development in Labrador. Future port development in the province will focus on large container facilities in Newfoundland, funded from an ERDA agreement, in response to commercial shipping interests operating from Montreal and Halifax to Corner Brook and Argentina.

Conclusions

Failure to coordinate port development with the needs of the primary supplier, Marine Atlantic, has resulted in facilities which are inadequate for the most desirable level of service. Lack of efficient planning by DPW resulted in serious deterioration of facilities and the inability to accommodate newer technology vessels.

VI Northern Resupply Programs

Federal involvement in northern resupply dates back to 1922 when the Canadian Government first began regular annual patrols to the Arctic using a variety of small craft. In 1930, Coast Guard ice-breakers were first employed in annual operations to support commercial vessels in the High Arctic and Hudson Bay. In 1947, the joint Canada-U.S. program to establish weather stations in the Arctic Archipelago was begun and the task of supplying these and other outposts and defense establishments was the responsibility of the U.S. government. Increased interest in exploration of the Arctic's natural resources coupled with growing responsibility for the improvement of living standards of the native population caused the Canadian government to assume full responsibility for northern resupply in 1950. During the next decade, the Department of Transport gradually assumed responsibility for supplying weather stations at Resolute Bay and Eureka and the mid-Canada Line bases. In 1960, Transport Canada began supplying settlements to the Western Arctic from a base in Vancouver and in 1975, the coordination of the annual marine resupply operation, known as the Eastern Arctic Sealift, was granted to the Minister of Transport. Included in the mandate was the resupply of DEWLINE sites in Eastern Canada and the resupply of bulk liquid fuels to sites in Greenland.

Coast Guard Northern

At present, the responsibility for the coordination of all northern resupply programs rests with the Department of Transport branch, Coast Guard Northern. Three separate programs form the annual northern resupply; Eastern Arctic Sealift, Keewatin Resupply and Western Arctic and Mackenzie Resupply. The Eastern Arctic Sealift is still operated by the Coast Guard while the other two operations are provided on contract by the Northern Transportation Company Limited (NTCL). The company provides annual resupply services to 28 communities in the Mackenzie Valley watershed and Western Arctic coast as well as to six communities in the Keewatin District on the west coast of Hudson Bay and Southampton Island. The northern resupply is essentially a tug and barge operation that provides the only reasonable alternative to air freight transport in the region.

Keewatin Resupply

In 1973, a proposal was made at the Western Economic Opportunities Conference (WEOC) to transfer the annual Keewatin resupply service from the Coast Guard to NTCL operating from a base at Churchill, Manitoba. NTCL provides "door to door" shipping service using a tug and barge operation, with each of the six communities visited at least twice in the season and some three times depending on weather conditions. The current government contract was signed in 1981 for a period of 10 years and provided a subsidy which was tied to a specific profit level. Since the company was privatized in 1985, it has not been necessary to subsidize the resupply operation.

Eastern Arctic Sealift

This is the largest of the annual resupply operations and the only one which is entirely coordinated by the Coast Guard under Treasury Board mandate. In 1987, 38 sites and communities, including the existing Dewline and the new North Warning System sites, were supplied. Unlike the Keewatin resupply, this service is essentially a "beach" operation utilizing barges and fuel hoses to discharge cargo. The government's objective is to use commercial carriers wherever practical and to recover the direct costs of the transport service provided.

Western Arctic and Mackenzie Resupply

This resupply program is also a tug and barge operation providing annual service to 28 communities in the Mackenzie watershed and the Western Arctic, out of Hay River and Tuktoyaktuk. It has always been managed as a commercial operation even when NTCL was a crown corporation. No subsidy has ever been requested and none was offered. There is, however, a degree of cross-subsidization practised to communities that are particularly isolated, such as Coppermine and Spence Bay, although this has always been an informal arrangement rather than government imposed.

Conclusions

While there are a number of resupply programs that serve the interests of northern communities, there is no single policy to support government transportation activities/subsidies in the remote northern regions. In the absence of a comprehensive policy, a variety of programs developed in response to individual situations and circumstances. Where the need to subsidize a service was identified, the government responded with a program tailored to that region; and where commercial operations could be maintained with full cost recovery, no subsidy programs were offered.

While government intervention may have ensured certain levels of service were offered to northern residents, it is clear that the federally provided services were very cost inefficient and that the primary private supplier of transportation services in the north, NTCL, provides a much more cost effective service.

CHAPTER 5

POST-CONFEDERATION TRANSPORTATION IN COASTAL LABRADOR

I Introduction

From 1949 to 1978 (Sullivan Commission of Inquiry), the federal government's constitutional responsibility to provide domestic transportation services in Newfoundland was restricted to the continued operation of the marine ferry services and the Newfoundland Railway. During that period, assets were upgraded, new facilities were provided, national and regional air services were introduced, (by Air Canada and EPA respectively) and, in 1969, the passenger rail service was discontinued and replaced with an intra-provincial bus service (CN Roadcruiser/Terra Transport). Between 1967 and 1975, a significant number of studies, reports and recommendations for the future of the Newfoundland transportation services were generated, very few of which were implemented. By 1978, the demands for transportation services had changed significantly, due primarily to road network developments and increases in air transport. Therefore, in an attempt to link the recommendations of these studies with the legal responsibilities of the federal government, the Sullivan Commission of Inquiry was created.

An analysis of the federal government's policies and programs from 1949 to 1978, reveals the attitude of public neglect that prevailed. From 1978 to the present, the Labrador Airstrips program dominated transportation discussion. A description and analysis of the existing systems demonstrates the degree to which federal policies and programs have responded to the constitutional commitment.

II Transportation Modes and Responsibilities

The internal organizational structure of the principal supplier of transportation services in Labrador, Transport Canada, has tended to complicate the issue of responsibility for the supply of services and infrastructure. Furthermore, the overlapping involvement of other federal departments, such as Fisheries and Oceans, and the role of the provincial department of Transportation tends to create unnecessary conflicts rather than improve on the existing systems.

For example, marine freight and passenger services are provided by Marine Atlantic, a Crown Corporation under the jurisdiction of the Minister of Transport. An annual subsidy is supplied by the federal government which is administered by the Water Transport Assistance Directorate under the direction of the Assistant Deputy Minister for Policy and Coordination. The public port facilities, however, are supplied and maintained by the Harbours and Ports Directorate of the Canadian Coast Guard under the direction of the Assistant Deputy Minister Marine. Wharves for small fishing vessels, on the other hand, are provided by the Small Craft Harbours Branch of the Department of Fisheries and Oceans and in some instances, fish plants provide their own wharf facilities. Any number of combinations of facilities may be found at a single site. To encourage economic growth in the region, both federal and provincial grants are periodically made available to the coastal communities and are sometimes used to build new harbour facilities or upgrade existing ones.

Travel by air along the coast is provided by Labrador Airways, a privately owned company which receives an annual subsidy from the provincial government to operate the regularly scheduled Twin Otter service. The airstrips, however, were constructed by the federal department of Transport under the Labrador Airstrips Agreement.

A third alternative, operated and maintained by the provincial department of Transport, provides a rather unique form of surface transport. During the winter months, some 400 miles of groomed skidoo trails are maintained from Red Bay in the south along the coast to Cartwright and back in a loop through the interior. While not conducive to the transport of cargo, this nevertheless offers a practical alternative for travel when the coastal boats are inoperable. In early 1988, federal funding was approved for the construction of an all-weather road from Red Bay to Blanc Sablon on the Straits of Belle Isle. When completed, this will complete a link with the highway system in Newfoundland, making use of the St. Barbe ferry across the Straits.

The consequences of this rather fragmentary division of transportation modes and responsibilities has been the development of a very inefficient coastal transportation system, a problem which the federal government is just now attempting to rectify. Because of the internal structure of the federal department of Transport in the recent past, each administration was

responsible for its own budget and justification of expenditures; an atmosphere which not only failed to promote intramodal co-operation but in some instances led to a fiercely competitive attitude between modes. This resulted in the absence of incentives to reduce operating expenditures or to achieve efficiency through a cooperative multi-modal approach to the problem. The recent restructuring of the department and the emphasis on equity between modes in the new transportation legislation has forced the issue of intermodal competitiveness, although it will take several years before the impact of new planning methodologies will be felt by the users of the systems. In the case of Labrador in particular, efforts will continue to reduce the carriage of passengers by marine ferry in favour of the more efficient air service.

III Transportation Policy Overview

The constitutional obligations accepted by the federal government when Newfoundland joined Canada have, in general, precluded the need for additional transportation policy. Nevertheless, in response to federal and regional objectives, specific programs of a uni-modal nature have been developed in support of transportation needs in Labrador.

Marine transportation, for example, has been provided by Marine Atlantic through subsidy arrangements since 1950 in direct response to the Terms of Union with Canada. However, the absence of clear policy direction has meant that expenditures have been authorized without regard to the level of service to be provided or the amount of costs to be recovered. The extent of unchecked operating expenditures, revenues and volumes of freight and passengers from 1950-1984 are demonstrated in the charts in Fig. 5-1. The contributing factors in this rather alarming situation were the freezing of rates at 1930's levels until the mid 1970's for passenger travel and the mid 1980's for freight, and the calculation of subsidy payments to the operator based on value of capital assets rather than on traffic volume. This had the interesting effect of actually encouraging the purchase of vessels to increase the value of the subsidy payment.

Probably the single most significant action was the 1980 approval of the Newfoundland Transportation Funding Envelope, a portion of which was used for the construction of thirteen coastal airstrips. Ironically, Treasury Board approval of the Labrador Airstrips program was based on

Figure 5-1, Marine Atlantic Operating Statistics

Transport Canada, unpublished report, 1984

the understanding that trade-offs would be made between the air and marine services, which should have resulted in a net saving to taxpayers and better service to users. Unfortunately, the program was started without first securing clear sanction from the province and, as a result, the anticipated reductions to the marine coastal service have not taken place. As a further impedence, there still exists within the Department of Transport two very different factions; one which believes in the ability to rationalize and consolidate transportation services in Labrador and the other which holds that the air and marine services provide entirely different functions and cannot be substituted one for the other.

Attempts that have been made to establish a multi-modal policy for transportation development in Labrador stem directly from the Sullivan Commission report which was published in 1978. The commission endorsed the recommendations of an earlier modal study, the Labrador Area Master Plan, and added that "immediate action be taken to implement a plan for the rationalization of such (coastal marine) service and integration of the service with the airstrip building programme underway." The report went on to recommend "the separation of passengers and freight to achieve a greater efficiency of service with minium cost" (p. 216).

It is possible, therefore, to trace through individual programs emanating from the recommendations of numerous studies and reports, a policy direction for Labrador that was entirely based on constitutional obligations and then updated in an attempt to provide a better level of service through an intermodal approach to transportation planning.

IV Transportation Network Development in Coastal Labrador

Aviation Development

Aviation development in Labrador took place very slowly from the construction of the Goose Air Base in 1938 to the initiation of the Labrador Airstrips Program in 1982. Following the establishment of the military airport at Goose Bay, industrial developments in Western Labrador (Churchill Falls and Wabush) necessitated construction of privately owned and operated airstrips on which the companies were entirely dependent. By the time the Labrador Area Aviation Master Plan was written, the only community airstrip facilities were at Northwest River (built primarily for use by

the International Grenfell Association), Forteau (winter use only), Red Bay and Nain. A USAF airstrip at Saglek was abandoned in 1975. The airstrip at St. Anthony served as a distribution hub for Labrador and also provided service for the Grenfell Association hospital in that community. The airport at Blanc Sablon, Quebec, the largest and the only one equipped for IFR conditions, served the Straits of Belle Isle communities.

The next airstrip development to take place was in 1978 at Cartwright, where the Newfoundland Government constructed an airstrip suitable for small, wheeled aircraft. Some of the funding was provided through the federal program for local commercial airports. No further airport construction took place until the Newfoundland Transportation Funding Envelope was established by Cabinet in 1982.

The local carrier, Labrador Airways (LabAir) began originally as a bush operation providing essential services between coastal communities that were very much isolated from each other. By 1976, LabAir offered three scheduled flights to coastal communities (Fig. 5-2). Flight 201/202 served the thirteen major coastal communities, plus Red Bay and Blanc Sablon twice a week from Goose Bay using ten passenger Otter aircraft on floats and skis. Flight 301/302 provided connections between St. Anthony, Blanc Sablon and Goose Bay with five passenger aircraft three times a week from Goose Bay. Flight 401/402 joined Blanc Sablon, Red Bay and Mary's Harbour with St. Anthony, on the island of Newfoundland, on a twice weekly schedule. Newfoundland and Labrador Air Transport, which was purchased by LabAir in 1976, served Blanc Sablon and St. Anthony from Deer Lake twice a week while the regional carrier, Eastern Provincial Airways (EPA) had connections from Goose Bay to Montreal, Moncton, (N.B.), Sydney (N.S.) and St. John's using B-737 aircraft.

Marine Development

From the time Newfoundland entered Confederation with Canada, the coastal marine service continued to grow at a steady but not spectacular pace. The original routes taken over from the Newfoundland Steamship Co. were expanded to include the north coast service in 1953 and by 1974, CN Marine was serving 200 communities from 6 major terminals over 2000 miles of coastline

Figure 5-2, Labrador Air Routes 1976

in Newfoundland and Labrador. Following the transfer of responsibility from the Canadian Transport Commission to the Department of Transport, the number of communities served by coastal ferry was reduced to 60, the same level that it had been in 1949.

Coastal freight and passenger services provided by CN Marine originated from terminals in St. John's and Lewisporte and served all isolated communities along the Great Northern Peninsula and the Labrador Coast. Freight service and limited passenger service was also available to the Straits area and to Lewisporte from Corner Brook. A private company, Chimo/Clarke freight lines, offered bi-weekly freight service from Montreal to Goose Bay, stopping at Cartwright when required. One third of the cargo carried was destined to the Hudson Bay store in Goose Bay for redistribution to the coastal communities (Fig. 5-3).

Port development took place on an individual rather than network basis with much of the distribution taking place from Lewisporte, St. Anthony and Goose Bay. In the 1984 Newfoundland Ports Study, Cartwright was identified for development of a ro-ro cargo facility and the remaining permanent communities were to receive new or expanded wharf facilities.

Summary

With the exception of Goose Bay and the industrialized western portion of Labrador, the population is distributed along the coasts with many of the communities too far away from each other to maintain any other transportation connection than air and marine. Therefore, transportation development in Labrador has not followed the more conventional network patterns found in interior regions. The patterns that did exist were based almost entirely on supply distribution from the Island of Newfoundland, or from Goose Bay, out to the coastal communities. Between the communities there was minimal linkage, with the exception of the communities in the Straits of Belle Isle area which were connected with Quebec, through Blanc Sablon, and with Newfoundland, through St. Anthony. The Grenfell Hospital in St. Anthony maintained transportation connections with the numerous nursing stations along the coastline. It has not been deemed practical to develop additional marine distribution points in Labrador, although it has been recommended that St. Anthony become the terminal for cargo rather than Lewisporte. Alternative

Figure 5-3, CN Coastal Freight Service

North Coast and Labrador Routes

from: Newfoundland Coastal Ports Study, Transport Canada, 1974

networks presented in the Labrador Area Master Plan, using both helicopter and float planes as feeder services to four major connecting sites, were all eliminated for reasons of cost or passenger inconvenience.

The network that exists now is, understandably, linear in nature with limited connections to areas outside the province. All travel originating on the coast must depart from Goose Bay and until there is sufficient demand to warrant increased connections to other northern communities in Quebec or the Arctic, the present structure will most likely remain. Between coastal communities, the possibility still exists to connect smaller or seasonal communities with feeder services employing the Beavers and Otters used by LabAir prior to the construction of the coastal airstrips. In the interim, these communities will continue to be served by charter operations.

V Policy and Program Development

While it may not be possible to list specific policies that have governed the development of transportation in Labrador, there have been numerous studies, reports and commissions that have guided the federal government in its decision-making. A list of documents considered pertinent to this discussion is presented in Fig. 5-4. Taken in chronological order, a brief explanation of the aims and recommendations of these studies will identify the direction of transportation policy development in coastal Labrador.

Lewis Commission

In 1964, the Newfoundland government, in an attempt to assess the status of the Newfoundland transportation system and determine priorities for the future, established the Royal Commission on Transportation chaired by the Honourable P.J. Lewis. The principal recommendation called for the creation of a provincial department of transportation "to replace ad hoc approaches of the past with conscious planning for the future". The commission further recommended that "the Labrador coastal service be expanded and improved to provide adequate, cargo and passenger facilities and to make provision for the transport of motor vehicles" (Sullivan Commission Report, p. 23).

Figure 5-4, Reports and Studies on Transportation In Labrador

DATE	SHORT TITLE	PROPER TITLE AND SPONSOR
1964	(Lewis Commission)	Royal Commission on Transportation Government of Newfoundland and Labrador
1972		Transportation in Labrador CTC Systems Analysis Branch
1972	(NCTS)	Nfld. Coastal Transportation Study Marine and Ferry Branch of CSTA
1974	(LAMPS)	Labrador Area Master Plan Study Atlantic Region, CATA
1974	(Snowden Report)	Royal Commission on Labrador Government of Newfoundland and Labrador
1975	(LCAMS)	Labrador Coastal Air/Marine Study CSTA and CATA Atlantic
1976		Atlantic Region Inter-Modal Passenger Study Federal-Provincial Committee on Atlantic Region Transportation
1976		Transportation Project for the Ministry of Transport - Coastal Labrador Memorial University Extension Department
1977	(AFTP)	Atlantic Provinces Transportation Program
1978	(Sullivan Report)	Commission of Inquiry into Newfoundland Transportation Transport Canada
1982	(Sypher Study)	Newfoundland and Labrador Coastal Study CN Marine
1983	(Acres Study)	Update - Nfld. and Labrador Coastal Study CN Marine
1984		Newfoundland Ports Study Harbours and Ports Directorate, CMTA
1984		Newfoundland and Labrador Coastal Passenger Services, and Newfoundland and Labrador Coastal Freight Service Transport Canada and CN Marine

While the Lewis report resulted in significant changes to the road and rail systems in Newfoundland and the Gulf ferry service, Sullivan notes in 1978 that, "the situation in Labrador remained essentially unchanged" (Sullivan Commission Report, p. 24). The most significant action taken was the introduction of the "William Carson", a ro-ro vessel capable of carrying vehicles as well as passengers and freight which sailed weekly from St. John's to Goose Bay. The Carson sank in 1977 in the Straits of Belle Isle but was replaced in 1978 by the "Sir Robert Bond", which is still in service.

Newfoundland Coastal Transportation Study (NCTS)

In 1971, the Department of Transport Marine and Ferry Branch, of the Surface Transportation Administration, took over the operation of coastal services from the CTC, (now the National Transportation Agency). This report represented the first attempt at establishing long range planning and policies for the coastal service. Specifically, the department was concerned about ageing vessels, unrealistic rates (which hadn't changed in over forty years) and inefficient management. At the core of the problem, according to the study, was the seeming indifference on the part of the government to CN's operating strategy. "Most fundamental to all problems associated with the Coastal Service is the almost total lack of explicit policy directive from the Government to the operator" (NCTS, p. 39).

Among its recommendations, the study advocated the designation of services into essential, trade-off and non-essential. This, it was hoped, would encourage efficiency, reduce costs and provide better service to users. Fundamental to this approach was the recognition of trade-offs between alternative modes, specifically air and road, and the separation of passengers and freight. However, most input was required from the Air Administration before these proposals could be implemented.

Labrador Area Master Plan Study

In 1974, as part of a larger program of master planning studies, CATA (Canadian Air Transportation Administration) initiated the Labrador Area Master Plan (LAMP), the objective of which was to determine the most appropriate locations and roles for a series of airports to meet the

2 of/de 2

social, economic and environmental needs of the area. The study was approached through three phases; an inventory, traffic forecasts, and determination of alternatives. The alternatives comprised various combinations of aircraft types, including Otters on floats and skis, Twin Otters on conventional landing strips, and Bell Helicopters. Based on the projected traffic forecasts, network costs were determined and evaluated for each alternative, based on safety, level of service, operational considerations and economic costs.

The final recommendation was to build 13 airstrips along the coast near communities with permanent populations greater than 100, capable of providing year-round IFR service by Twin Otter. The original report was approved by Transport Canada in 1976 and endorsed by the Newfoundland government. However, funding was not immediately available and the implementation of the program was put on a temporary hold. An update of the LAMP was completed in 1980. Although the anticipated costs increased significantly, the original conclusions remained the same.

Royal Commission on Labrador

Not wishing to miss out on the momentum generated by the federal government, the 1974 Snowden Report on the economic state of the province produced a list of eighteen, somewhat ambitious, recommendations pertaining to transportation. Included was the identification of four priority sites for airstrip development at Nain, Cartwright, Mary's Harbour and "a suitable site for the Straits". The province subsequently designated Cartwright as a service point for potential off-shore oil development and built a gravel runway with access road and mobile maintenance equipment with a \$100,000 grant from the Airport Financial Assistance Program. Cartwright was later upgraded in line with the other coastal airstrips.

Labrador Coastal Air/Marine Study

By now the Department of Transport had two extensive modal studies on Labrador and it was clear that action was needed to coordinate transportation expenditures and provide adequate year-round service. Therefore, an inter-modal study, the Labrador Coastal Air/Marine Study (LCAMS), was initiated in 1975 in the hopes of establishing a common approach to the provision of

transportation facilities and services in Labrador. The stated objective was "to identify the existing roles of the air and marine modes in the provision of passenger and freight transportation in coastal Labrador and to determine future modal relationships in this area" (Terms of Reference, p. 2). The study was approached in four stages; demand statement, traffic forecast, systems evaluation and a final report.

The report was conducted jointly by members of the CSTA (Canadian Surface Transportation Administration) Ferry Services Branch and by the Civil Aviation Branch of CATA Atlantic, with input from consultants where required. The recommendations favoured completion of the airstrips as identified in the LAMP and a concurrent, coordinated reduction of marine coastal passenger service. Furthermore, it was proposed that passenger and freight service would be dealt with separately, emphasizing the advantages of year-round air passenger service and the economics of moving freight by water.

This study was the first integrated approach to transportation planning and the recommendations were the most realistic for the situation in coastal Labrador. Unfortunately, the report was shelved before receiving final approval in the wake of the Sullivan Commission Inquiry and the creation of the Atlantic Provinces Transportation Program.

Atlantic Provinces Transportation Program

By this time, the notion of inter-modal transport was well-steeped in the minds of departmental decision-makers. Therefore, when in 1976 the Federal-Provincial Committee on Atlantic Regional Transportation (FP-CART) met to review a report on inter-modal passenger transport, it was resoundingly agreed that this was the approach needed to ensure adequate service levels with minimum cost. In 1977, Cabinet approved \$125 million to be spent over a three year period (1977/78 to 1979/80) to improve transportation services in the four Atlantic provinces. Of that sum, \$21 million was to be spent on airport facilities. In accordance with the recommendations of the LAMP, the communities of Nain, Makkovik, Mary's Harbour and Hopedale were selected for funding under the APTP.

Sullivan Commission of Inquiry

In 1977, the then Minister of Transport, Otto Lang, announced a federal Commission of Inquiry into Newfoundland transportation, chaired by Arthur M. Sullivan. When the report was presented in 1978, all previous studies were temporarily put "on hold" and the "Sullivan Report" became the gospel for transportation in Newfoundland. Although spawned by the urgent need to decide the fate of the legendary Newfoundland Railway, the report made a thorough examination of all aspects of transportation in Newfoundland and Labrador. It included its share of emotional content, which resulted in a separate "minority report" filed by Commissioner Esau E. Thoms, who could not sanction the demise of the passenger railway. Furthermore, Labrador was singled out, said the Commission, "not so much because the issues are controversial, as because they have heretofore been neglected or even ignored" (p. 215, volume 1).

Transport Canada paid scant attention to two of the report's three "urgent" issues; paving of the road between L'Anse-au-Clair and Red Bay, and construction of a highway to link Labrador City/Wabush and Churchill Falls with Goose Bay and coastal Labrador. The infamous "Trans Labrador Highway" had been begun by Joey Smallwood in the 1960's and though it is passable in the peak of summer, the cost of paving and maintaining it as a year-round facility is prohibitive. Even more ambitious suggestions included a year-round deep water port, "Port Labrador", a rail link between Port Labrador and central Canada, and a submarine tunnel under the Straits of Belle Isle. What did arouse interest was the recommendation that "the movement of freight and passengers along coastal Labrador must be improved and rationalized" (p.216). The Commissioners endorsed the Labrador Area Master Plan and urged an intermodal approach to transportation problems, including the separation of passengers and freight.

This "sanctioning" of the APTC airstrips already underway led to the creation of the more ambitious Labrador Airstrips Agreement under the Newfoundland Transportation Funding Envelope, which sought to coordinate expenditures by approving one large sum of money for all modes. The emphasis on rationalization of coastal marine service also inspired two consultants' studies, the Sypher Study and the Acres Study, commissioned by CN Marine as a direct result of the Sullivan Report.

Newfoundland and Labrador Coastal Service Studies

In 1982, Transport Canada acted on two recommendations of the Sullivan Commission, to report on the rationalization of the coastal freight service and the passenger service. These studies became known by the names of the consultants who produced them; the Sypher Study and the Acres Study.

The Sypher Study essentially supported the position of the Sullivan Commission, that passengers and freight should be separated to ensure efficiencies for both roles. Added to that recommendation was the need to unitize (in this case containerize) freight so as to reduce damage and facilitate transfer from rail, truck or ship.

With the results of the LCAMS and the Sypher studies as supporting material, the Water Transport Assistance Directorate (WTAD) and CN Marine in Newfoundland produced two reports in 1984 which proposed the future routes and equipment for the operation of passenger and freight service on the Labrador coast. A most important component of these studies was the estimate of vessel acquisition and related capital and operating costs for a planning period extending from 1986-2000. The reports produced six scenarios for passenger service (keeping in mind the impact of the improved air service) and five scenarios for freight transport, employing various combinations of CN owned and chartered vessels.

At present, a task force composed of officials from the new corporation, Marine Atlantic, and WTAD are finalizing a study based on the chosen alternatives from the previous studies.

Newfoundland Ports Study

In 1982-83, the responsibility for public port facilities was transferred from the Department of Public Works to the Harbours and Ports Directorate of the Marine Administration of Transport Canada. The directorate immediately commissioned a series of ports studies to serve as both inventory and status report of physical conditions of facilities as well as to determine future requirements.

The Newfoundland Ports Study, which included Labrador, designated regional and local ports, identified areas where anticipated economic development warranted expansion and made

recommendations concerning facilities that should be either transferred to another jurisdiction (especially Fisheries and Oceans), or simply abandoned due to lack of commercial activity.

Although the report did address Marine Atlantic's requirements for mini-container facilities (as recommended in the Sullivan Report) it made no reference to the integration of marine services with the air mode and the resultant impact on port facilities.

Conclusions

There can be no doubt that transportation on the coast of Labrador has been exhaustively studied. It may also be argued that much of what was recommended was not implemented because of its politically sensitive nature. Like the Newfoundland Railway, the coastal marine service has emotional connotations for the people of Labrador. Equally unshakable is the firm belief that the residents of Labrador are entitled to the same levels and types of services enjoyed by other Canadians, transportation included. These principles have guided the actions of Ministers of Transport for the past few decades.

Although a policy direction may be traced from the Terms of Union with Canada to the creation of the Newfoundland Transportation Funding Envelope, the obvious lack of a uniform policy, or policies, has created a situation of gross economic inefficiency and unchecked expenditure. Furthermore, the ad hoc approach to providing transportation services to isolated communities in general, has led to the application of inappropriate standards and levels of service with little regard to the socio-economic costs of providing those services.

Finally, failure on the part of the federal government to secure a firm commitment on intermodal trade-offs from the provincial government before proceeding with the Labrador Airstrips Program has resulted in a net cost to taxpayers where a saving had been promised. Had there been a formal policy to deal with essential transportation services, that situation would most likely have been prevented.

VI Current Transportation Service In Coastal Labrador

Introduction

Travel on the Labrador coast is restricted to the marine and air modes, with the exception of the local roads within major communities and the provincially maintained skidoo trails, which allow winter travel between Red Bay and Cartwright. For purposes of comparison between past and existing systems, an analysis of the current types and levels of service offered by the major commercial carriers is presented.

Marine Passenger Service - Description

Marine passenger transportation is provided by Marine Atlantic (formerly CN Marine) which operates a coastal ferry service from Lewisporte, on the Island of Newfoundland, to Nain, the northernmost permanent settlement in Labrador. The published schedule shows a maximum of 46 ports of call over a distance of 2161 kms. (1166 nautical miles) (see Fig. 5-5). Not all of the 46 possible stops are made each trip, depending on particular requirements at the time. Only a small number of communities have adequate wharf facilities to accommodate the coastal ferries: at smaller settlements, the vessel is forced to "anchor-off" and accept or discharge passengers and cargo over the side to smaller craft.

The coastal service generally runs from mid-June to mid-November, although the actual number of trips changes subject to the ice conditions each year. For 1987, eighteen round trips were published. The first trip is scheduled only as far as Goose Bay and the extent of the second and last trips is subject to ice conditions.

Marine Atlantic operates two passenger ferries on the north coast service, the "M.V. Taverner" and the "M.V. Northern Ranger", alternating departures every 8 days, with a round trip of 15 days and one day in Lewisporte to take on cargo and passengers. Prior to the 1986 season, the Labrador coast was separated into two services, north and south of Goose Bay, using different vessels.

In addition to the coastal ferries, passengers may also travel on the "Sir Robert Bond", a car and rail ferry with ro-ro (roll on, roll off cargo) capabilities, which travels between Lewisporte,

Cartwright and Goose Bay on a twice weekly schedule. Passengers travelling on the Bond from Lewisporte may connect with the coastal service in Goose Bay to continue the trip to Nain.

The vessels used on the Labrador service are employed elsewhere when the season is over; most commonly on the south coast (Terrenceville to Port-aux-Basques on the Island of Newfoundland), which operates all year round. The Bond, because it was also designed to carry rail cars, is used on the "Gulf" service (Port-aux-Basques to North Sydney, N.S.), to supplement the car ferry, "Caribou".

The Taverner is the older vessel on the Labrador route, having been built for the coastal service in 1962. The ship was designed to carry 20,930 cu. ft. of cargo, 102 passengers and 22 crew complete with sleeping cabins, lounges and a small cafeteria. At 25 years old, the Taverner is approaching the end of her useful life, and will probably be retired within the next 5 years.

The Northern Ranger, on the other hand, has been in service only since October 1986, having been purchased by Marine Atlantic to replace the "Bonavista" which was retired in 1987 after 30 years service on the Labrador coast. While the Bonavista was equipped to carry 35,418 cu. ft. of cargo and 113 passengers, the Northern Ranger was designed to accommodate only 25,235 cu. ft. of cargo, 131 passengers and 34 crew. The difference in freight carrying capacity reflects the emerging policy in Marine Atlantic to improve both the passenger and freight service by restricting the carriage of cargo on the passenger ferries.

Marine Passenger Service - Analysis

Scheduling

Marine Atlantic has been criticized by coastal residents for its failure to react quickly to climatic conditions in both the spring and fall. Schedules are based on historical information and are not amended to take advantage of an early break-up of ice or a late freeze. As residents must plan for up to eight months of isolation during the winter, the flexibility in scheduling extra trips is very important. The existing schedule for transporting fishermen to summer locations is adequate to accommodate those wanting to travel in early June and late September and the regularly scheduled trips appear sufficient to meet the needs of those wishing to travel at off-peak times.

Reservations

Reservations on the coastal boats are made by telephone to the Marine Atlantic offices in St. John's. No written confirmation is provided and reservation numbers are not assigned. This is an unsettling feature when planning a trip.

Deposits are not required and payment is made at the time of embarkation, placing no responsibility on customers to claim their reservations. Consequently, not all trips are full to capacity and other passengers wishing to travel on an already "booked" voyage do not have the opportunity to access a waiting list.

Of greatest concern is the acceptance of "tourists" on the coastal boats. While non-residents are actively discouraged from making reservations in advance, they are allowed to book passage at the time of departure at the possible expense of residents who request reservations at points further along the route. As the service is provided by constitutional commitment, and heavily subsidized by the federal government for the benefit of residents of isolated coastal communities, the presence of tourists on the coastal boats is unacceptable from an economic as well as social perspective.

Level of Service

A once weekly passenger service appears adequate to meet the needs of coastal residents. This is not to say, however, that the present system is either economically or operationally efficient. Current estimates suggest that the trip time could be reduced by as much as 50% by removing the cargo responsibilities from the coastal boats. The implication of this alternative is that only one boat would be required to maintain the same level of frequency of service while reducing travel time by close to half. This would result in a significantly increased level of service to residents while reducing the operating costs associated with a second boat.

Infrastructure

Only 16 of the 46 published ports of call have wharf facilities that will accommodate the Northern Ranger, and a large portion of these are operationally inadequate. This represents a lack of coordination between those responsible for providing wharf facilities and those responsible for the

design of the boat. Not only is passenger comfort and convenience jeopardized at the inaccessible locations, but the potential damage to existing wharves is considerable.

Vehicles

Accommodations on the Taverner are cramped and dingy, when compared to the newer boat, in spite of a 1985 renovation. The cafeteria and lounges are small, the cabins are without shower facilities and observation room on the deck is minimal. However, if it is surmised that the average length of time that a non-tourist actually spends on board the vessel is three or four days, (personal observation), then the facilities are adequate for the purpose for which the vessel was designed. Moreover, the Taverner is capable of entering more ports than the Northern Ranger and the height of the vessel in water is much more convenient for disembarking to a waiting boat or off-loading cargo onto a wharf. The Northern Ranger, on the other hand, provides a much greater level of comfort than is required for trips of short duration. What it offers in luxury is traded for a lower level of convenience to the residents of those communities it is supposed to serve.

Fares/Tariffs

Passenger fares on the Labrador Coast routes remained essentially unchanged for almost 50 years, (1930 to 1980) with a small increase applied in 1975. Nevertheless, the rate per nautical mile for an adult passenger increased 140% from 1979 to 1987 (Newfoundland Coastal Service - Tariffs, Transport Canada, January, 1987). While the coastal marine rates are considered comparable to other modes within the province (such as CN roadcruiser or the Gulf and Argientia ferry routes), the only real alternative service to residents of coastal Labrador is LabAir, with rates two to five times greater than the Marine Atlantic tariffs. Therefore, while the Marine Atlantic rates may not reflect the cost of providing the coastal service, the wide discrepancy between revenues and costs cannot easily be reduced in the short term.

No visible attempt is made to determine user willingness to pay, nor to differentiate between residents and non-residents. A rebate is available to residents travelling on LabAir from Labrador to the Island of Newfoundland, but no similar assistance is offered to marine passengers. Tourists

pay the same subsidized rate as residents and fares remain the same throughout the season despite the fact that residents tend to travel at the beginning and the end of the season and tourists prefer the peak of the summer. The opportunities for adopting a sliding scale for tariffs seem obvious.

In the past, operating subsidies were tied to capital asset value but, in the absence of any other method of linking revenues and operating costs, the approach was not unreasonable under the circumstances. Recent decisions within Marine Atlantic and Transport Canada both favour a more realistic approach to cost recovery. Therefore, charges such as cabin fees on the two coastal boats vary in relation to their operating costs. Basic passage is computed on a nautical miles basis, with special discounts for children and seniors. Nevertheless, passenger fares are still far from representative of operating costs. Fares on the auto-ferry service (Lewisporte/Cartwright/Goose Bay) are fixed according to origin/destination, both for the basic passage and for cabin accommodation, and relate to distance travelled. The increase in fares for cabin accommodation on the Northern Ranger has brought the cost of marine transportation closer to the air fares, making travel by air more appealing than previously when travelling to major communities.

Marine Cargo Service - Description

At present, Marine Atlantic operates five cargo vessels, on time charter, to serve the Labrador coast. One of these vessels, the "Duke of Topsail", is a container ship which, if the service proves to be substantially superior to that being offered by the regular cargo ships, will become the prototype for new coastal vessels. Another of the cargo vessels, the "Astron", a ro-ro container ship, was also being used for demonstration purposes on the Labrador coast, but has recently been redeployed. The cargo vessels operate on a different routing system from the passenger ferries, bringing freight from St. John's, as well as from Lewisporte, and serving select groups of ports, according to need. Like the passenger ferries, the cargo vessels operate generally from mid-June to mid-November, depending on ice conditions. On the special fishermen's runs, a cargo vessel travels alongside the coastal ferry to ensure the fishermen arrive at their destinations with as much of their gear as possible. A similar return trip is made in the early fall, to bring the men and their equipment home.

Marine Cargo Service - Analysis

Scheduling

The scheduling of cargo vessels is based on the anticipated volume of freight demand, expressed as ship days. For example, in 1988 an anticipated 581 days are scheduled from June 1 to December 7. Four vessels will be employed from late June to late November with extra ships recruited for the fishermen's special runs in early June and the heavy demand for winter supplies in October.

In the past, Marine Atlantic experienced difficulty in meeting demands for cargo transport in November and December because residents were delaying their orders of winter supplies as close to the end of the season as possible. The now common use of freezers, combined with greater cooperation between the residents and the carrier over the past few years, has alleviated this problem considerably by spreading orders over a much wider time frame. Although efforts are made to accommodate the fluctuating demands for coastal freight transport, difficulties still occur at the beginning and end of the season.

Reservations

The transport of cargo is entirely dependent on circumstance. Once a shipment has been consigned to the carrier, there are no guaranteed delivery dates or choice of vessel. This often presents difficulties for those travelling to summer residences who cannot depend on a delivery date for important supplies and equipment. It is not uncommon for fishermen to make personal arrangements with the captains of the cargo vessels to transport their gear, especially their small fishing boats. The present system occasionally leads to lost or misplaced cargo which is seldom insured beyond Marine Atlantic's personal liability of \$500.

Level of Service

Marine Atlantic is moving towards a more economically efficient system by employing fewer cargo boats but streamlining operations through the use of unitized cargo and vessels with ro-ro capabilities. A variety of vessels is presently under consideration by the Transport Canada/Marine Atlantic task force studying coastal operations. It has been demonstrated in the past that the use of time charter vessels is considerably less expensive than purchasing a cargo fleet. For example, the cost in 1984 for operating chartered conventional freighters on the northern coast was on average 25% less per ton than for a CN owned and operated freighter, while the chartered ro-ro container ship (M.V. Astron) was more than 50% cheaper. Therefore, the alternative with the optimum cargo handling capabilities, which would also result in the lowest cost, would be to charter vessels similar to the Astron, at least two of which would have ro-ro capabilities.

While the use of containerized vessels would result in the most efficient freight handling system for the coast, there is also a requirement for wharf facilities designed to accommodate the loading equipment. Although efforts have been directed recently to restore and replace many of the wharves along the coast, the provision of infrastructure to accommodate a ro-ro system at all of the major communities would be very costly. Furthermore, a secondary handling system would still be required to transport goods to those communities without the necessary port infrastructure. Until residents are willing to pay for improved service, some form of compromise between the current system and the ideal will have to be reached.

Fares/Tariffs

Freight rates on the Labrador coastal service remained at the same level from 1930 to 1980 in spite of significant increases in the level of service in the 1960's and 1970's. Traffic increases were unable to match the significant costs of providing the coastal service resulting in an ever widening gap between user revenue and operating costs. Since 1980, annual rate increases of between 6% and 15% have been applied, with a recent (1986) agreement having been reached to ensure a 6% increase each year for five years (to 1991-92). In spite of these moderate increases, revenue gains between 1979 and 1987 amounted to only \$1.9M while operating costs rose by \$3.6M (Transport

Canada, Marine Policy and Programs). In comparison, 1986 freight rates on the Labrador coast and other similar areas show how far behind the Marine Atlantic tariffs have fallen (Fig. 5-6).

There are a number of acceptable ways in which to improve cost effectiveness while continuing to respond to the socio-economic needs of coastal residents. For instance, recent increases have focussed on the user's ability to pay by adopting a multi-tier rate structure. In addition, an examination of the old commodity breakdown resulted in significantly higher increases to rates for less essential goods in order to enhance revenue generation and deal with anomalies. While all these initiatives have resulted in a gradual decrease in net operating costs, until the decision is made to remove the responsibility for freight transport from the coastal ferries, or at the very least to institute separate rate schedules, the overall cargo system will continue to operate on a less than efficient basis.

Air Passenger Service - Description

The Labrador coast is served by one unit toll carrier, Labrador Airways Limited, and a variety of small, charter operations. The carrier receives an annual operating subsidy from the province, "to help offset the costs of providing what is deemed an essential service". (pers. comm. W.T. Beckett, Director of Transportation, Government of Newfoundland and Labrador)

LabAir presently operates both charter and scheduled air services for Labrador, out of Goose Bay, using primarily Otter and Twin Otter aircraft. The mixture of service is 60% charter and 40% unit toll. LabAir holds a class 3, specific point commercial air service licence, (first awarded in 1976) to operate a regularly scheduled air service between all major points on the Labrador coast, plus St. Anthony on the northern peninsula of Newfoundland and Blanc Sablon, Quebec. The company also holds a class 4, charter commercial air service licence, to operate from a base at Stephenville, Newfoundland.

Air passenger service is provided year round by Twin Otter, with 14 scheduled stops between Mary's Harbour on the Strait of Belle Isle to Nain, five times per week, with no service on Saturdays and Sundays (Fig. 5-7). Up to 19 passengers and 2 crew can be accommodated plus a limited amount of cargo. The routes are direct and efficient with short turn around times at each

Figure 5-6, Comparison of Marine Freight Rates

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1986 Freight Rates (CWT)¹

<u>Marine Atlantic</u>	<u>Food</u>
St. John's-Goose Bay	\$1.70
Interport (Lewisporte/Nain)	\$1.02
<u>Logistec</u>	
Rimouski-Blanc Sablon	\$5.11
Sept Isles-Blanc Sablon	\$4.58
<u>Northern Transportation Co. Ltd.</u>	
McKenzie River	\$6.21 - \$10.40
Keewatin Resupply	\$18.85
Arctic Resupply	\$13.77 - \$23.13
<u>B.C. Coastal Ferries</u>	<u>\$18.00</u>

In 1987, the rates on the Labrador coast had increased to:

<u>St. John's</u>	
temperature controlled	\$2.15
non-temperature controlled	\$1.80
<u>Lewisporte, Goose Bay</u>	
temperature controlled	\$1.55
non-temperature controlled	\$1.17
<u>Other Coastal Ports</u>	
temperature controlled	\$1.45
non-temperature controlled	\$1.10

¹Transport Canada, Newfoundland and Coastal Service Tariffs, 1987.

Figure 5-7, Labrador Airways Schedule 1987

DHC - 6 TWIN OTTER PASSENGER SERVICE FLIGHT SCHEDULE

Effective May 1, 1987

FROM GOOSE BAY (Melville North)

Departs

YR	0800
PV	0855
MK	0715
HO	0740
DI	0805

Flight 200

Freq 1 2 3 4 5

Arrive

PV	0845
MK	0705
HO	0730
DI	0755
NN	0830

FROM NAIN

NN	0850
DI	0925
HO	0950
MK	1015
PV	1035
YR	1110

Flight 201

Freq 1 2 3 4 5

DI	0915
HO	0940
MK	1005
PV	1025
YR	1105
YR	1150

FROM GOOSE BAY

YR	1300
YR	1345
MK	1425
PV	1440
HO	1505
DI	1530

Flight 202

Freq 1 2 3

YR	1340
MK	1415
PV	1435
HO	1455
DI	1520
NN	1555

FROM NAIN

NN	1615
DI	1650
HO	1715
PV	1735
MK	1755
YR	1830

Flight 203

Freq 1 2 3

DI	1640
HO	1705
PV	1730
MK	1745
YR	1825
YR	1910

NORTH LABRADOR COAST:

YR - Goose Bay
 YR - Repulse
 MK - Melville
 PV - Peaville
 HO - Hopeville
 DI - Davis Inlet
 NN - Nain

FROM GOOSE BAY (Melville South)

YR	0700
PR	0755
CA	0845
ST	0915
CH	0940
PH	1000
PH	1015
MH	1030

Flight 200

Freq 1 2 3 4 5

PR	0750
CA	0835 (Local Time)
ST	0905
CH	0935
PH	0950
PH	1010
MH	1020
AY	1100

FROM ST. ANTHONY

AY	1430
MH	1510
PH	1520
PH	1540
CH	1555
ST	1625
CA	1655
YR	1840

Flight 201

Freq 1 2 3 4 5

MH	1500
PH	1515
PH	1530
CH	1550
ST	1615
CA	1645
PR	1635 (Local Time)
YR	1730

SOUTH LABRADOR COAST:

YR - Goose Bay
 PR - Paradise River
 CA - Cartwright
 ST - Black Tickle
 CH - Charlottetown
 PH - Port Hope Simpson
 PH - St. Lewis
 MH - Mary's Harbour
 AY - St. Anthony

NOTE: Arrival times at Goose Bay may occasionally be earlier than scheduled due to aircraft routing.

Arrival at and departure from Coast Stations may vary with routing of aircraft.

All bookings will be done from Goose Bay. No seat assignments. First come, first served.

location, but they are often delayed or re-routed due to weather conditions and passenger requirements.

In addition to the unit toll carrier, there are two other fixed-wing, charter operators based in Labrador and serving the coast as well as two helicopter operators serving primarily off-shore oil exploration. A further ten carriers are based outside of Labrador but fly into the area, including Air Nova (Air Canada's subsidiary in Atlantic Canada) and Newfoundland/Labrador Air Transport (the original operator to serve the Labrador coast).

Air Passenger Service - Analysis

Scheduling

The present five day per week service offered by LabAir is adequate to meet current demand. This is, however, a very difficult characteristic to document and analyse as demand for the service tends to adjust to the level of service offered. This results in a difficult planning problem for the unit toll carrier. For the immediate term, no changes in scheduling are anticipated.

Reservations

Reservations on LabAir must be made and confirmed by telephone to the office in St. John's and, until just recently, not every community served had a LabAir representative. This situation should be alleviated shortly, as LabAir plans to relocate the reservations office to Goose Bay and to implement a new computer reservation system in 1988. Because there is no incentive to pay in advance for reserved space, flights are often over-booked by up to 100%, but passengers are rarely turned away.

Level of Service

Considering the geographic restrictions of the Labrador Coast, Twin Otter service is the most logical choice to deliver the maximum level of service for the generated demand. Although the aircraft provide only a minimal level of passenger comfort, the technology has yet to be improved upon for the particular conditions on the coast. Therefore, LabAir is able to offer a reliable and

easily accessible air service in spite of adverse weather conditions and the most basic landing facilities.

Infrastructure

The landing strips were designed to accommodate the Twin Otter as the critical aircraft, although only a very small portion of the runways are actually used under normal circumstances. However, there are certain economies inherent in initial over-provision of infrastructure in order to accommodate future demand without often costly expansion.

Vehicles

The Twin Otter aircraft provides the most efficient service both from a technological as well as capacity viewpoint. The aircraft are not as comfortable as some of the newer generation STOL vehicles, a fact which is made up by their reliability and versatility.

Fares and Tariffs

Under the 1987 National Transportation Act, air carriers are no longer obliged to seek federal approval for, and publish, passenger and freight rates. Nevertheless, because Labrador is north of the line of demarkation, the coastal services will continue to be monitored by the NTA, although to a lesser degree than previously.

The passenger fares are based on a rate per passenger mile with a minimum fare provision. This compares favourably with similar services offered in the Canadian Arctic and is slightly higher than regularly scheduled services in other parts of Atlantic Canada.

Special passenger fares are offered to children under 12, seniors, youth standby for persons between 12 and 21 years of age, and for accompanying spouses. A rebate is payable to residents travelling to the island portion of the province based on a percentage of the cost of the ticket. There are no discounts for advance bookings, etc., except in the case of group fares (10 or more passengers). Payment is due upon embarkation and there is no incentive to either pay in advance or to cancel reservations that are not required.

The Province of Newfoundland provides an annual operating subsidy to LabAir. Therefore, the fares charged by the airline are not truly representative of the actual cost, and passenger generated revenues cover only a portion of the expenditures. Should users be required to recover fully the operating costs, considerable opposition would be expected.

Air Cargo Service - Description

The comparatively high cost of transporting retail commodities by air generally restricts this service to small parcels and items of high value, including mail, which is carried on board the Twin Otter aircraft on the regularly scheduled passenger routes. Nevertheless, there is sufficient demand for air freight to warrant the operation of a LabAir DC-3 cargo aircraft to serve Red Bay from the base in Stephenville.

Air Cargo Service - Analysis

Scheduling

The Twin Otter unit toll service provides a favourable schedule for the transportation of small parcels and high value goods. Assuming that all permanent communities receive once daily, Monday to Friday, service year-round, this can readily be equated to the acceptable norm for postal delivery in most major centres, with the additional advantage of chartered and contract cargo service where required.

Reservations

Although LabAir advertises that cargo will be accepted up to thirty minutes before flight time, there is no guarantee that individual parcels will be carried on a particular flight. There is also no guarantee that they will be shipped on the next available flight. This is a problem that the carrier hopes to alleviate with the implementation of the new computerized scheduling/reservation system.

Level of Service

To the extent that level of service implies convenience and/or reliability, the problems with cargo delivery certainly reduce that service level. However, the availability of daily scheduled flights on weekdays, plus additional charter and contract capabilities, indicates a relatively high level of air cargo service to the residents of the coast.

Vehicles

The only dedicated cargo aircraft is LabAir's DC-3 which operates from the base at Stephenville to undefined points in Newfoundland and Labrador. All of the other passenger aircraft are also employed in the carriage of cargo. Almost equal amounts of freight are transported by unit toll aircraft as by charter and contract service.

The demand for air freight is likely to remain constant for those months of the year when marine cargo service is not provided, therefore any improvements to the Marine Atlantic service could impact on the demand for air freight during the shipping season.

Tariffs/Rates

Air express and air freight rates are calculated per pound mile, with minimum charges applicable. Small package service, (1 cubic foot, maximum 10 pounds), is available at a fixed rate between Goose Bay and all points on the Labrador coast. Certain commodities, such as household appliances and foodstuffs, are subject to specific rates per pound for points from Goose Bay north. A subsidy, based on pounds carried per mile, is also available to offset the cost of transporting food items from points in the Straits of Belle Isle area to isolated communities south of Rigolet.

The operating subsidy paid to LabAir may distort the value of year-round cargo delivery if tariffs do not accurately reflect the carrier's costs. When compared to marine cargo rates, the average costs per pound to transport foodstuffs make air freight unreasonable except under very special circumstances. The carriage of small parcels however, based on minimum charges by route, is not considered prohibitive. Details of charter and contract rates are confidential.

VII Conclusions

The development of Labrador's transportation systems has been influenced by the federal commitment under the Terms of Union with Canada. However, a lack of federal policy direction resulted in a long period of inaction, from 1949 to 1978, coupled with unchecked cost increases for the coastal ferry services. The division of responsibilities within the Department of Transport and the CTC resulted in a mode-specific approach to transportation development, a situation that has yet to be resolved. The Sullivan Commission of Inquiry was the first comprehensive study of all transportation services in the province which attempted to define the government's legal responsibilities in the wake of technological advances and increases in transportation demand. As a direct result of the Commission's recommendations, the long overdue Labrador Airstrips Program was implemented. However, one of the most important aspects of the program, an equivalent reduction in the marine passenger service, was never acted upon. Many of the difficulties experienced in the existing systems may be traced to the lack of public response to changing transportation demands, the failure to develop the complementarity of the air and marine modes, and the ad hoc approach to planning exhibited by the federal government.

CHAPTER 6

DETERMINING TRANSPORTATION NEED IN ISOLATED COMMUNITIES

I Introduction

The determination of transportation need in remote areas is a critical but poorly understood component of transportation planning. The accepted approach involves the analysis of traffic statistics and economic forecasts to meet anticipated demand. In high traffic areas, with adequate modal choice, this is an acceptable approach, but reliance on statistical data to determine the requirements of remote settlements is inadequate. Social and cultural issues that impact on transportation needs are not always evident in the traffic analysis. Similarly, the criteria used to evaluate the benefits of transportation services are ill suited to place a value on the enhanced quality of life resulting from improved services. Nevertheless, the federal government continues to evaluate remote services against these indicators.

Many of the weaknesses in the existing transportation systems in Labrador can be linked to a lack of communication between users and decision-makers. A community attitude project conducted in 1975 revealed a profound sense of disillusionment on the part of residents with government inaction. No further public consultations have been conducted in Labrador since the Sullivan Commission of Inquiry in 1978. As a result, there is a gap between the expectations of coastal residents and the interpretation of need for specific services by the government. Consequently, decisions are often made in ignorance of the particular circumstances which created the demand.

To determine a more suitable approach for low demand situations, a selection was made of practical and theoretical methodologies of evaluating need in northern and remote areas. For illustrative purposes, an analysis of traffic characteristics of coastal Labrador is provided.

II Coastal Labrador Community Needs Analysis

"Coastal residents have every reason to become sullen and bitter in their dealings with government, ... especially in matters so crucial, so often-studied and yet in the end still so inadequate as their transportation service" (Transportation Project for the Ministry of Transport, Coastal Labrador, 1976).

In 1975, as part of the Labrador Coastal Air/Marine Study, (LCAMS), a community attitude project was launched to determine residents' perceptions of the problems with their transportation services, to enlist their suggestions for improvement and to determine the effects of transportation on social, cultural, health, education and economic activities. The Extension Service of Memorial University was chosen to conduct the study. It is significant that the opinions of residents were specifically sought during the first attempt to co-ordinate and rationalize the coastal service. The change in attitude was due in part to the transfer of responsibility for the service to the Department of Transport and the overall strategy of the department to bring support payments (subsidies) under control.

Memorial University had developed an "outreach" program which made use of field representatives in almost all Newfoundland and Labrador outposts, including ten "Community Learning Centres" along the Labrador Coast. The study was both exhaustive and emotional. Aside from the written report, twelve hours of video taped interviews were documented. The principal researchers accepted the project with guarded enthusiasm.

coastal residents are getting weary of studies, which have been increasingly common in recent years but which, in terms of results on the coast, have been almost uniformly fruitless. Our fieldworkers engaged in this current project were very reluctant to become involved precisely for this reason. They felt their own credibility in their areas would be seriously impaired by their involvement in yet another study of transportation on the Labrador coast, and that continued research in the face of continued inactivity was becoming a cruel hoax (Phase I report).

The results of the study, as recorded in the LCAMS, indicated a general dissatisfaction with both air and marine service, as could be expected. Typical of northern communities, (the same was found in studies in the Arctic⁴), residents felt that competition in the air mode would improve service and decrease fares but that government regulation was required to ensure adequate service was provided to all communities. While the low Marine Atlantic rates were appreciated, losses and damage to cargo due to theft, careless handling and improper scheduling were felt to far outweigh the cost savings. Overall, the researchers gained an understanding of the "remarkable

⁴Evidence presented at hearings on the adequacy of air services in northern and remote areas, Canadian Transport Commission, 1985.

complementarity" of the two modes and urged refinement of both. A feeling of being totally left out of the decision-making process was also expressed by residents and echoed by researchers who were "dismayed" that no federal officials participated in the public meetings.

It is not clear whether the results of this study were ever taken into consideration as no other reference to it was found, during the research for this thesis. It is known, however, that the emergence of the Sullivan Commission in 1977 put a complete hold on all other existing studies on Labrador (LAMP, LCAMS, NCTS) at the time. It is possible that efforts to implement the recommendations of the Royal Commission invalidated some of the recommendations made in earlier studies.

The attitude of residents towards transportation studies/investigations has improved since the Memorial study, most likely due to completion of the Labrador Airstrips Program. While a great number of individual submissions were presented to the Sullivan Commission, there has not been a specific public consultation program since that time. Recent efforts by the Department of Transport and Marine Atlantic to rationalize the coastal marine service did, however, include detailed community profiles, the details of which are not publically available. Decisions continue to be made without sufficient community involvement.

III Coastal Labrador Traffic Characteristics

The Northern Air Policy Study (1973) acknowledged the role of users in identifying transportation needs. Nevertheless, studies of remote services continue to focus on econometric models used to generate origin/destination movements and traffic forecasts. Not surprisingly, the 1975 LAMP concluded that as the communities exhibited individual peculiarities, it was "impossible" to adopt a standard model for air transport demand in the area. A subjective analysis, based on a "working knowledge" of the area, was attempted, which indicated economic growth in the industrial areas (Wabush/Labrador City and Happy-Valley/Goose Bay) but also growth of traffic on the coasts. This, the study reported, was "indicative of the demand for relief of the isolation in these coastal villages" (LAMP, Part B-Forecasts, 1975, p. 5).

The demand to ship cargo, dominated by marine transport, may be successfully linked to population characteristics and economic forecasts. The movement of passengers, however, is much more difficult to quantify in isolated situations. Even with the desirable "working knowledge", the actual demand for services on the Labrador Coast has proven surprising. (pers. comm. Marine Atlantic, Transport Canada, Labrador Airways) Neither carrier provides statistics by trip purpose. Therefore, it can only be assumed that passenger surveys are conducted periodically to estimate the appropriate mix. The analysis presented here is based on available community information and personal observation during a two-week period in July, 1987.

Residents of coastal Labrador use transportation services for much the same reasons as other Canadians; business, visiting, recreation, etc. They also travel for medical purposes, to access educational facilities and social services. The almost complete lack of roads and the distances between isolated communities restricts personal travel to the use of small boats during the marine season and skidoos in the winter.

The provincial government is continuing to provide as many social services as practicable in the coastal communities, thereby reducing the need to travel. For instance, all major communities on the coast now have high schools when, as recently as 1980, students were required to board in Goose Bay. Travel for medical purposes is still prevalent as the only hospitals are located at Forteau, Cartwright and Goose Bay. An air ambulance service, financially supported by the provincial government, is available to take patients to the International Grenfell Association hospitals at Goose Bay and St. Anthony (on the northern tip of Newfoundland). Professionals such as social workers, RCMP officers and Fisheries Inspectors, travel on a regular basis to most communities, making use of the services provided by LabAir and Marine Atlantic, and chartering transportation or providing their own when necessary. Business travel is generally directed to Goose Bay, which has the only banking facilities and legal aid for the coast. Air travel by residents between communities is generally for personal purposes.

Travel by boat is generally for one of two purposes; to access summer fishing stations or for visiting/recreational purposes. In June, Marine Atlantic provides two special "runs" for fishermen only, from Conception Bay near St. John's, to designated fishing grounds on the Labrador coast.

Similar return trips are made in late September/early October. Residents also use the Marine Atlantic service to travel to summer residences to fish and hunt. During July and August, the Marine Atlantic boats are recreational vehicles, transporting friends and relatives to the smaller communities inaccessible by air, and providing tourists with an inexpensive and memorable holiday.

Chartered cargo vessels provide re-supply services to most communities on the coast from early July to late October. Perishable goods are also transported by the passenger vessels. The transportation of fish is provided privately by major buyers (such as the Salt Fish Corporation) or by Marine Atlantic for some of the smaller, privately-owned plants. High value items, such as fresh salmon and char, are packed in ice and sent by LabAir to Goose Bay and on to major centres.

The provision of a regularly-scheduled air service has significantly improved the quality of life on the coast and the steady increase in traffic since the airstrips were built supports the demand forecasts. Travel by boat has not decreased proportionally, supporting the need for an alternative to air travel. The differences in trip purpose between the two modes should have a significant bearing on future transportation planning, keeping in mind the artificial demand for marine passenger service brought about by low fares and the accommodation of tourists.

IV Definitions of Need and Alternative Considerations

There are no uniform federal standards for measuring isolation that could be used to determine either the need to provide transportation services to remote communities or the level of that service. The rationale for public provision of remote transportation services is based on the attainment of long term, socio-economic benefits. These benefits, however, are measured in terms of economic development without specific reference to non-economic (social, cultural, etc.) benefits. Accessibility, an alternative measurement of isolation, includes the concept of quality of life but it assumes a positive correlation (between levels of service and quality of life) which may not exist in reality. For example, failure to accurately analyse local characteristics could result in economically inefficient services that are not responsive to the particular needs of the users.

To determine a more appropriate approach to evaluating the need for remote services, a selection of techniques, applied in similar circumstances, is provided. Each example includes a set of

criteria which offer suitable alternatives to the more commonly applied measures of cost, demand, levels of service, inter-modal tradeoffs, etc.

An analysis of transportation development in Greenland, a similar geographic environment, but with very different political and economic influences, is presented for comparison to the Labrador Coast.

Nordicity Index

Hamelin (1972) undertook a study of isolation allowances for northern Canadian workers in the late 1960's and produced what he termed a "nordicity index". A comparison of various methods employed by the U.S., Russia, the two Canadian Territorial Governments and private enterprise (predominantly oil exploration companies), revealed a variety of calculations, ranging from functions of distance and percentages of income to increased cost of living in isolated situations.

Hamelin found that the Canadian federal government system was the only one to at least attempt to incorporate a spectrum of considerations; namely, environment, cost of living and availability of services, measured on a graduated scale. To these, Hamelin added what he referred to as "human factors" to take into account the seasonality of northern employment and the range of economic development possibilities. His index comprises ten distinct criteria:

- latitude,
- summer warmth above 6 degrees celcius,
- annual cold below 0 degrees celcius,
- types of ice,
- total precipitation,
- development of vegetation,
- accessibility (all modes),
- number of inhabitants or regional population density,
- degree of economic activity.

These criteria are further aggregated into three measures of northern living; one identification variable (latitude), five natural elements, and four human elements. Each criterion was assigned a range of values from 0 to 100 (100 being the highest value of "nordicity"). The sum of all criteria values indicated a series of ranges which were then translated into VAPO (for "valeurs polaires") lines. Theoretically, the north pole would have a value of 1,000 under this system. Specific locations could then be categorized in terms of VAPO lines and an appropriately graded allowance applied.

The significance of Hamelin's index of nordicity is twofold. First, it recognizes a series of factors related to northern climates that affect accessibility and second, it attempts to place a value on the quality of life associated with northern, isolated settlements. In other words, Hamelin identifies the specific needs of northern residents and attempts to quantify those needs in compensatory terms. Not all of his criteria could be readily adapted to a discussion of transportation, but the general premise of measuring need in terms of geographic and economic factors is valid and could prove useful in evaluating socio-economic benefits of subsidized transportation services in remote regions.

Isolation-Usage Index

Airline deregulation in the U.S. has contributed to a marked decline in the supply and quality of air transportation to small communities. A quantitative methodology for characterizing the accessibility to air service of small communities was developed in conjunction with the introduction of airline deregulation (Hulet and Fisher, 1981). Included in this methodology is a benefit/cost criterion which was intended to be used as a planning and policy tool to justify the provision of local air service. The measure was termed an "isolation-usage index". The analysis aims to produce an optimal configuration of local air service in terms of:

- a) the link to be served,
- b) airport investment,
- c) the type of flight equipment, and
- d) flight-frequency.

The study area was New York State and the problem definition based on accessibility to the nearest local airport. Very simply stated, benefits were expressed in terms of net time savings of a direct trip from origin to destination over an indirect trip from origin to the nearest airport-served community and, finally, to the destination point. It was recognized that a tradeoff existed between travel time and monetary costs associated with the construction of a new facility versus the car drive to an alternate airport. Accordingly, the provision of direct air service was determined to be justified when the annual time savings were at least as great as the incremental costs. The frequency of

service was calculated by dividing yearly ridership by the capacity of the selected aircraft. The index was algebraically defined as:

$$I = 1 - (X/Y)$$

where:

X = theoretical ridership per unit time, as predicted by the criterion

Y = actual, estimated or forecast future ridership per unit time.

Since X is related to supply, the index is effectively a measure of the balance between supply and demand.

The ideal Index value was $I = 0$, where supply matches demand. Similarly, $I > 0$, indicated a relatively isolated community, deserving of better service, and $I < 0$, indicated oversupply.

In the case of undersupply, it was suggested that the policy makers consider some of the following options:

- construction of an airport where none exists, or upgrading of an existing facility,
- increase in flight frequency,
- increase in type and capacity of aircraft,
- temporary subsidy or similar incentives to carriers until they are satisfied that an adequate market exists and the service is self-supporting.

In the case of oversupply, it was noted that policy makers have little or no influence over the air carriers (under deregulation) but should subsidies be involved, a close examination of the level of service offered is warranted. As the index permits sensitivity analysis, it can also be used to establish the necessity and level of subsidy indicated as well as relating the subsidy to a particular cost.

When applied to an existing airport system, in this case New York State, the optimal network configuration was selected and fine tuning of the air service applied to bring individual community service as close to the zero value as possible. Decisions could then be made regarding discontinuance of service at sites no longer considered economically deserving, or continued subsidization of service, where justified through legal or social obligation.

This particular analysis is consistent with the current U.S. policy of subsidizing air carrier service. Present policy in Canada, however, favours support of airport infrastructure rather than

direct subsidies to private air carriers. The exception is the Essential Air Services Policy, which has been developed specifically in response to the 1987 National Transportation Act, under which subsidies will be available to protect those communities with a regularly scheduled air service who lose their service as a direct result of deregulation. Some provincial governments, such as Newfoundland, already provide direct subsidies to regional carriers to ensure a minimum level of service is offered in remote areas. In spite of the current policy difference between the U.S. and Canada, the principles used to formulate the isolation-usage index are still applicable to the determination of need for services in isolated areas, such as the Labrador coast.

Rural Rail Abandonment

The financial costs of providing transportation services are not difficult to calculate. Much more difficult to quantify are the economic effects of the abandonment of those services on small communities. A study that attempted to identify and analyse the impact of rail abandonment on rural communities in Alberta reviewed the social, economic and land use issues as well as the transportation implications (Maloney, 1982).

In almost all cases, the communities studied were under 2000 population and almost entirely dependent on local grain elevators for their existence. Loss of rail branch lines, it was learned, invariably leads to economic demise of the communities as grain shipments must be redistributed to neighbouring delivery points. A comparison may be drawn between the rural Alberta communities, developed around a branch line system, and the small coastal communities of Labrador that are dependent on natural resources, especially the fishery, and on transportation to the nearest fish plant for their economic livelihood.

In this study, rail line abandonment was found to result in economic decline of the community affected and the shift in focus, if not in actual population, to an adjacent community where services were still available. Logically, the communities with a broader economic base were able to recover from the setback and continue to develop.

Some of the observed impacts of branch line abandonment were:

- a) redistribution of grain haul,
- b) lost tax assessment associated with rail rights-of-way,
- c) population decrease and resultant underutilization of social services/ structures,
- d) misallocation and misuse of public investment in infrastructure,
- e) decline in retail receipts,
- f) reduction in standard of living for remaining residents.

This is, unfortunately, characteristic of many small communities that are dependent on one major industry and served by one (or two) modes of transportation.

In conclusion, it was proposed that those communities which exhibited economic and social stability prior to rail abandonment should be assisted in maintaining their stability, as characterized by:

- a stable population (between 200 and 1000),
- a tax assessment less than 30% dependent on rail and right-of-way properties,
- a business community,
- a municipal infrastructure,
- a social infrastructure (schools, libraries, etc.)
- close proximity to the next grain delivery point (within ten miles), and
- good road access.

While not all of these criteria are applicable to the Labrador coastal communities, the economic dependence on local transportation services is sufficiently similar to draw some comparisons. For instance, the reference to road access could be substituted for an alternate transportation mode (air or marine) and the importance of rail infrastructure for tax assessment could be substituted for a dependence on the fishery and access to fish plants for processing.

Although this example does not attempt to quantify impacts, it does discuss both the economic and social implications of abandonment of services. In this instance, rail transportation was not the only mode for passenger and freight travel, but the economic stability of the communities was dependent on the rail service and associated grain elevators. The criteria

established for determining economic and social stability should prove useful in the development of a needs assessment for policy makers when faced with the prospects of determining level of service and/or service reductions.

"JASPER"

"JASPER" (Joint Air Service Planning and Evaluation Review) is a technique designed to analyse and recommend future planning options for low- to medium-density air services. It was developed in 1976 for use by the Northern Airports Program for the Yukon and Northwest Territories which considered development in the Central Arctic Coast Network (Coppermine, Holman Island, Gjoa Haven, Spence Bay and Pelly Bay). The area was already being served by DHC-6 "Twin Otter" aircraft from Yellowknife but permission had been given to the carrier to operate with larger F-27 J aircraft. Only three points along the route had suitable facilities to accommodate the F-27 J and therefore, the question of present and future airstrip requirements for the area had to be addressed.

The approach used to analyse the situation relied on an integration of air service components (vehicles and infrastructure) to enable joint decisions to be made by both suppliers (government and industry) with "full awareness of their total impact" (JASPER, p. 1, 1977). The need for basic air facilities had already been determined, but the choice of "critical" aircraft, which would determine the investment level, remained a challenge.

JASPER is an iterative process which makes use of computer simulation techniques. It comprises 22 components which, in the final analysis, combine to present a range of solutions ranked against pre-determined criteria. The system includes both quantitative and qualitative factors in an attempt to uncover the optimum solution, not only in terms of cost but also carrier and user expectations. For instance, in the case of the Central Arctic Coast Airstrips, operating costs of both aircraft and the costs to extend the runways to accommodate the larger aircraft were considered as quantitative factors. Qualitative considerations included capacity, speed, comfort and accessibility. One of the biggest advantages of the system is its capacity to accept new data, policies and priorities

that could result in re-definitions of the air service, infrastructure or socio-economic variables. (A graph of the process is provided in Fig. 6 -1)

JASPER was also used on the Arctic Air Facilities program to determine the optimum use of air facilities at the Arctic B & C airports. De Havilland used a JASPER-type approach during the planning stages of the Nouveau Quebec airports program which was supported by the initial proposal to employ a mix of airport facilities based on a hub and feeder network.

JASPER was not used for the Labrador Airstrips Program. When the original LAMP study was initiated, the JASPER process had not been formalized, although the basic concept was not far removed from practices and procedures already employed in site master plans, area aviation plans and in the criteria used by the CTC to evaluate licence applications. The original analysis did separate financial costs from non-economic factors, such as reliability, convenience and passenger appeal, but did not take into account such aspects as the provincially-provided operating subsidy or the capital cost of purchasing the alternative aircraft. When the LAMP update was completed in 1980, the results might have been different had a JASPER approach to network analysis been taken. For instance, changes in estimated costs of airstrip development as a result of on-site inspections and practical experience at locations such as Cartwright, could have been addressed in the simulation program. Furthermore, changes in socio-economic variables, such as the closure of many small lumber mills, changes in the Labrador fishery and delays in oil and gas exploration activities could also have been included in the analysis, perhaps giving rise to a different set of alternatives. It must be recognized, however, that by the time the update was completed, the operator, Labrador Airways Limited, had already purchased two Twin Otter aircraft on speculation, following the recommendations of both the LAMP and the Sullivan Commission report, which would have biased the results of the analysis from that point on.

Future analysis into aircraft/airport requirements should endeavor to incorporate the types of components used in the JASPER system in order to obtain the most realistic solution to the problem of providing airports in low to medium density situations.

Figure 6-1, The 'JASPER' Process

U.S. Essential Air Services Program

The U.S. Airline Deregulation Act provides federal government financial assistance for air service to small communities under the Essential Air Service (EAS) Program. Under the EAS, guaranteed levels of service were established for each designated point, with reduced service for Alaska. In addition, the Civil Aeronautics Board (CAB), the original administrators of the program, were required to specify:

- number and designation of hub(s),
- maximum capacity guaranteed,
- time of flights,
- maximum number of stops, and
- size of aircraft.

When an existing carrier files notice to terminate or reduce service at an EAS point, the board requests proposals from alternate carriers and initiates a procedure for determining the suitability of applicants and the calculation of a subsidy, if one is required to maintain the level of service specified. Since the cut-off point for subsidized air carrier service was established at 30 passengers daily enplanement, the total number of subsidized carriers dropped by 50% and subsidy payments were reduced by more than half. In 1983, a recommendation was made to include isolation from major hubs as an additional criterion for inclusion in the EAS program. An additional twenty communities, located within the stipulated 100 miles from the nearest hub, were expected to be eliminated.

A study of the U.S. program was undertaken by the CTC (National Transportation Agency) and the following requirements for successful implementation in Canada were determined:

1. The presence of a well-developed commuter airline industry is essential for the application of this form of subsidy program.
2. The implication is that a sufficient number of reliable, proven air carriers exists to ensure continuity of air service in small communities.
3. To eliminate the possibility of excess capacity, subsidy payments should be determined on the basis of the minimum required level of service.

4. Subsidy costs based on long term passenger projections should be reviewed to avoid a large number of perpetually subsidized points as a result of the absence of alternative programs (CTC, 1985, pp. 101-102)

It is doubtful whether this type of program would be successful under a deregulated system in Canada. In Labrador in particular, the major carrier, Labrador Airways, is already subsidized by the Newfoundland government and it is unlikely that a sufficient number of alternative carriers would surface to ensure consistent service, even under a subsidy program. Of particular interest to the discussion of Labrador is the set of criteria used to determine those communities to be included in the EAS program, specifically:

- the level of service determined by the CAB,
- the actual demand of the community (measured in terms of passenger trips per week), and
- the degree of isolation (more than 100 miles from the nearest hub).

The change from compensation derived from the carrier's financial needs to compensation based on minimum level of service required has resulted in service being more closely matched to actual demand, creating a much more efficient system. This represents a departure from the current Canadian system which compensates carriers based on operational deficits, which not only provides no incentive to operate efficiently but which might be seen to create incentive to oversupply, thus producing larger and larger deficits. Recent efforts by Transport Canada to control these situations are leaning heavily towards the U.S. system of first determining a standard level of service against which to measure user demand and, consequently, carrier supply.

NTA Essential Air Services Policy

Section 85 of the 1987 National Transportation Act includes the provision of a federal subsidy in those cases where an air service, deemed to be essential and existing on January 1, 1988, would require financial assistance to ensure its continuation. The provision has been described by the policy makers as a "safety net" to protect those uneconomical services which are affected by deregulation. The exact terms of the policy are not yet available, however the intent, and some of the more pertinent provisions are made clear in the wording of Section 85. For instance, the policy

stipulates that a commercial, specific point, service be in place (as distinguished from charter operations). Furthermore, currently subsidized services are not eligible nor are services which commence after January 1, 1988.

In the event that a service which qualifies is discontinued, the federal government, through a provincially operated program, will offer a subsidy to a carrier under tender. If no operators apply, then the government will assume the responsibility of providing that service under the clause pertaining to "imposed public duties". There is no sunset clause in the new policy but there is a "use it or lose it" philosophy which eliminates the eligibility of a carrier to cancel an existing service and re-apply under the subsidy program.

The payment methodology has not yet been finalized although it is recognized that a reasonable profit incentive is needed to encourage operators. However, if a route becomes sufficiently profitable to encourage competition, the subsidy should be dropped.

The question of quality of life has not been addressed in this policy although some definition of minimum level of service is required, which will most likely be based on the nature of the service being provided and any alternative transportation modes available (excluding seasonal services). One alternative criterion might be that only a minimum service would be eligible for subsidy and that additional services would be the financial responsibility of the carrier.

While the government has taken positive steps to ensure that remote communities are not made to suffer unduly from deregulation, the criteria for this policy are so restrictive that, to date, only one province has enquired on behalf of a commercial carrier and that service was deemed to be ineligible according to the terms of the policy. Furthermore, this policy does not take into account the need for future air services as communities continue to grow and develop.

Transportation Development in Greenland

Although there are many northern coastal environments which maintain both air and marine transportation services, the west coast of Greenland was determined to be the best comparison to Labrador in terms of population, culture and economics as well as climatic conditions. Unlike the development in Labrador, which was largely a result of alternating political disinterest and temporary

enthusiasm, the history of Greenland's transportation systems can be tied to more tangible events which resulted in different approaches to similar types of problems. This series of events may be discussed in terms of the development of transportation systems and the most obvious developmental constraints.

Background

Prior to the Second World War, Greenlanders still relied on traditional transportation methods, including dog sledges, kyaks and umiaks, which are still used today in some of the more remote communities. Marine transportation links to Europe, begun with the Norse and Danish explorers between 900 and 1400, provided essential resupply needs. Greenland's first airfields were built by the U.S. military forces at Sondre Stromfjord and Nassarsuak. Contact between native Greenlanders and the Americans brought an end to Denmark's policy of isolation and protectionism and provided the impetus needed to bring Greenland into the twentieth century.

This transition was initiated in 1948 following a visit by the Danish Prime Minister, Hans Hedtoft, who ~~ordered~~ a special commission to study the needs of the people of Greenland; socially, politically and culturally. The development of transportation over the post-war period both resulted from the political and economic reforms taking place and contributed to the remarkably rapid progress. Beginning with the construction of the U.S. air bases, air transport connections in Greenland emerged and became a state controlled entity in 1960 with the creation of Greenlandair.

The 1959 sinking of the Danish flag ship, Hans Hedtoft, resulted in a change in marine policy prohibiting passenger travel during the winter months. An earlier climatic event, which warmed the waters around southern Greenland sending seals further north and bringing large stocks of codfish to the shores, resulted in rapid development of port facilities and fish plant operations as the economy switched from a dependence on marine mammal hunting to commercial fishing. More recently, the demand for salmon, shrimp and other seafood delicacies in Europe encouraged the improvement of air and marine transport to Danish markets.

Greenland has made changes in the past thirty years that took most European countries generations to complete. The success of this endeavor depended on the ability of sophisticated transportation systems, specially designed to accommodate the harsh climate.

Geographic Conditions

Greenland's climate is arctic but varies considerably due to the influence of ocean currents. Though further north than Labrador, the warm Gulf Stream from the south, which swings up and around the west coast, keeps major harbours from Julianehab to Holsteinsborg navigable all year round. North of Holsteinsborg to Thule, marine transportation is possible only from April to September. From May to July, icebergs from the great northern glaciers create navigation problems all along the coast. North of Thule, settlements are ice-bound year round. On the east coast, arctic ice from the polar basin prohibits marine navigation for all but a few months of the year. Winds and fog predominate in this coastal climate and create problems for air navigation as well as marine. The most stable weather conditions are found in the Disko Bay area (mid west coast) and at the heads of the great fjords. It is not surprising then that of the 52,000 people who live in Greenland's 133 settlements along the 39,100 km coastline, the vast majority make their homes on the warmer, relatively ice-free, south west coast.

The Influence of Trade

Long before Denmark was granted official control of Greenland, trade relations were established with other countries, notably Iceland and Holland. In the mid- 1700's, however, the establishment of mission settlements secured trade between Denmark and Greenland. A monopoly was established and over the years a system of resupply and defense was developed, primarily to maintain the mission and trading settlements. In 1927, the first exclusively diesel powered ship was built for the Greenland trade and from that time on, socio-economic development and population increases required larger ships and more frequent passage to keep pace with demand for imports. Marine transportation continued to dominate both trade and passenger carriage until the 1950's. Although Greenland's independence from Denmark is continually progressing, the lack of secondary

industry keeps the country very much dependent on trade with Denmark and although efforts are being made to expand export markets, distance and lack of reciprocal agreements are still creating trade barriers.

Marine Transport

Social and health reforms played a large role in the development of marine transportation. The need to provide medical, education and social assistance to a small population scattered over a vast coastline necessitated an efficient system of marine transportation which, in the 1950's included such innovations as a floating X-ray clinic to attempt to control the tuberculosis epidemic. To achieve many of the promised reforms, a concentration policy was adopted and the population was consciously moved to select settlements on the south west coast where state-owned fish plants were constructed near major harbours.

Currently, a modern fleet of ships control the supply of Greenland's coastal settlements. When weather conditions permit, each major town expects a ship at least once a month. Passenger services are offered between Julianehab and Upernavik once a week in spring, summer and fall and from Julianehab to Holsteinsberg in the winter. Passenger ships also travel the east coast in summer, similar to the Labrador coastal service. Local passenger ships serve the Disko Bay and Julianehab districts and in the fjords, small open boats with outboard motors provide transport between settlements in summer months.

The major ports have wharf facilities for loading and unloading while the remainder depend on transfer to smaller ships off-shore or the use of specially designed barges. Special oil pipeline connections are available at Godthab and Narsaq.

Air Transport

Beginning in 1947, Greenland was visited by its first commercial airline, SAS, which regularly flew tuberculosis patients from the American built airbase at Narsarsuag to Alborg for treatment. In 1954, SAS began an arctic route from Copenhagen to Los Angeles, stopping to refuel

at Sondre Stromsfjord. Greenland quickly became a popular site for refuelling for flights using the Trans Polar route, a service that is no longer required.

By 1960, the four northern DYE (listening) stations built by the Americans required dependable supply service and because they were forbidden to sign a contract with another state, SAS created a national airline, Greenlandair. In the same year, the Royal Greenland Trade Company chartered three planes from Canada's EPA for use on the first domestic air service. In 1962, Greenlandair took over the charter service and all marine passenger service to Denmark ceased.

Except for the three military air bases, flights were restricted to landing on water or ice. When one of the chartered aircraft crashed on a sea approach to Godthab in 1962, authorities were faced with the problem of providing safer, ground facilities. Greenland's decision to purchase three Sikorsky helicopters in 1964 stemmed not so much from an efficiency point of view as the least cost alternative to airstrips.

In 1977, however, a Home Rule Commission report recommended the use of fixed-wing aircraft and a series of five asphalt landing strips were scheduled to be built. To date, only three of the airstrips have been completed at an overwhelming cost. Unfortunately, the Danish Air Regulations prohibit the use of gravel runways, an obstacle which the Home Rule Government would like to overcome.

Today, Greenland has a very effective feeder helicopter service which operates out of the three major airports. In addition, three outlying areas, Thule, Scoresbysund and Ammassalik, have air service provided by the smaller Bell 212 helicopters. Altogether, these routes form an efficient network of air passenger service which touches all major settlements on the island.

Transport Economics

Transportation services in Greenland are very expensive compared to more developed countries. Regular fares, for both air and marine, are well beyond the reach of the average Greenlander. From the 1.8 billion kroner annual subsidy provided by Denmark, 49 million is spent on transportation related expenses.

Certain routes, such as the air route between Godthab and Sondre Stromfjord, are profitable and help subsidize some of the less profitable routes. Similarly, the price for goods from Denmark to anywhere in Greenland is the same, permitting cross-subsidization of routes to more remote settlements. Air rescue and ambulance flights are provided by Greenlandair as are services for education and all government related travel.

Future Development Possibilities

The Home Rule government is presently considering the economic justification of retaining helicopter service in lieu of the completion of the five airstrips initiated in the 1970's. The acquisition of DASH-7 STOL aircraft provides a flexibility not offered by the existing DC-6 equipment, an important consideration in a country where the geography is not conducive to the building of airports. If the government is successful in its attempts to permit the construction of gravel landing strips, the helicopter service might well be discarded or, at the least, considerably reduced. Future transportation policy development will undoubtedly be directed towards a more market-oriented system which would strive to become more self-reliant.

Transportation concerns figure prominently in Greenland's struggle for economic independence. On a world scale, the ability to trade depends not only on the availability of desired commodities but also on the accessibility to foreign markets. Modern, dependable transportation services are crucial to the transfer of goods to and from this northern island country. Domestically, a climatically suitable, efficient internal transportation system is necessary to ensure the equitable distribution of social and economic benefits to all of Greenland's population.

Major advances in Greenland's development have resulted from technological and policy achievements in transportation which have, in turn, responded to social and economic needs. It may be further argued that transportation and economic development must be considered together, in this situation, to ensure the success of the country's aim for independence.

V Conclusions

Attempts by the Department of Transport to assess transportation need and define appropriate levels of service have been sporadic and inadequate. In the absence of a federal remote access policy, programs have been developed in relative isolation with insufficient coordination between modes. Analysis of alternatives has repeatedly focussed on least cost method with little understanding of the socio-economic needs of coastal residents. Therefore, project costs have not been adequately related to program benefits. Similarly, program evaluations have been limited to monitoring milestones rather than the achievement of socio-economic goals and objectives.

The variables introduced in the examples above offer pertinent suggestions for a method(s) to balance socio-economic need in northern and isolated communities with economic efficiency. For example, accessibility, economic opportunity and seasonality of employment are important variables in Hamelin's Index of Nordicity, placing emphasis on quality of life. The U.S. Isolation Usage Index introduced simplistic measures of transportation over- and under-supply, a factor often difficult to determine in remote environments. The study of the impact of rural rail abandonment links the factors that identify social and economic stability with the absence of transportation services, an important contribution to the assessment of need in isolated communities. The U.S. EAS criteria established minimum guaranteed levels of service for remote regions, a policy that the Canadian government has continued to postpone. "Jasper" identifies both qualitative and quantitative variables to be used to determine optimum investment by striking a balance between cost effectiveness and accessibility. An additional advantage is its ability to accept new variables and to continue to refine alternatives through an iterative process.

It is clear that greater emphasis should be placed on the identification of the particular needs of northern and isolated communities, preferably through a better interaction with residents. Furthermore, in an environment of increasing financial restraint, more attention must be paid to economic efficiency in the selection of alternatives. The optimum methodology for determining the appropriate transportation service will include a comprehensive mix of social and economic variables tailored to the specific requirements of remote communities.

CHAPTER 7

SUMMARY AND RECOMMENDATIONS

I Summary

The argument presented is that the absence of a federal remote access policy in Canada has resulted in an ad hoc approach to decision-making in transportation development. As a result, transportation systems that have developed have not always been responsive to the needs of the users and are often very inefficient both operationally and economically. To illustrate this point in detail, the Coast of Labrador was chosen as an example.

As most of the remote areas in this country are in northern locations, the geographical constraints in Labrador were considered characteristic of isolated areas. Specifically, the harsh, sub-arctic climate restricts marine transportation to four to six months of the year and places greater demands on the operation of air and surface transportation. The maritime environment, common to most but not all remote communities, adds complications of wind and fog to navigation and the rugged Labrador coastline presents engineering challenges to the placement of port facilities and airstrips. Small, scattered populations and a great number of transients, also characteristic of northern remote areas, generally create a requirement for some form of transportation subsidy to ensure a minimum provision of accessibility.

The constitutional commitment ratified under the Terms of Union with Canada to ensure the provision of transportation services in Newfoundland and Labrador adds a different dimension to federal responsibility for remote access in Labrador. While most of Canada's north falls under the jurisdiction of the Department of Indian Affairs and Northern Development, Labrador's provincial status separates it politically from the rest of the arctic and sub-arctic regions. The Department of Transport, however, continues to play the leading role in the provision of transportation services for all remote communities.

In order to understand more clearly the government's role in providing subsidized transportation services, a brief exploration of the theories of transportation supply was offered. Of particular interest to the provision of services in isolated areas are methods for measuring

accessibility, the impact of transportation on regional development, and the reasons for government involvement with transportation systems and services. In accordance with prevailing views of transportation economics, the Canadian federal government has engaged heavily in the provision of capital infrastructure and the regulation of carriers. What the Department of Transport failed to do, however, was to establish a more appropriate set of criteria for determining levels of service in isolated areas, taking into account both the economic and social costs and benefits of remote transportation systems. The reluctance to deal directly with the issues is apparent in the history of transportation policy development which tended to address related problems, such as the role of regional air carriers and the resupply of arctic communities, without ever addressing the framework for a comprehensive remote access policy. Current and impending departmental policies, which focus on a more commercial approach to the provision of transportation services, could have a negative impact on isolated communities which depend on government supported services.

The application of federal remote access policies is expressed in the programs financed by the Department of Transport. Those programs considered the most relevant to demonstrate the ad hoc approach to transportation planning in remote regions of the country were, therefore, evaluated. The methods used to define need and to estimate required levels of service varied in all cases and consistently failed to address the problem of evaluating project worth in a situation requiring subsidization. Almost without exception, these programs were found to have exceeded original time and cost estimates, in spite of lessons learned in the construction of northern facilities, and failed to demonstrate a competent knowledge or appreciation of the requirements of the communities being served. The internal structure of the Department of Transport hindered inter-modal cooperation, resulting, in some instances, in the duplication of services or the exploitation of one mode at the expense of another. Nowhere was this more apparent than in Labrador.

The history of post-Confederation transportation policy development in Labrador reflects a general lack of interest on the part of the federal government. Failure to communicate effectively with users resulted in inaccurate definitions of need for services and a general feeling of neglect on the part of residents. In spite of numerous reports, studies and two Royal Commissions, no significant improvements were made to the air and marine systems until the creation of CN Marine

in 1976 and the Labrador Airstrips Program in 1981. The freezing of marine rates at 1930's levels for almost 50 years and the lack of financial control exerted by the CTC created an artificial demand for marine services and made it almost impossible to estimate their true economic value. Ineffective planning delayed the start of the Labrador Airstrips Program, leaving residents without year-round dependable transportation until 1986, and resulted in project costs far in excess of original estimates. Furthermore, lack of coordination within the Department of Transport and failure to negotiate effectively with the provincial government resulted in an economically inefficient, uni-modal approach to the provision of transportation services to the residents of Labrador.

Having identified the deficiencies in the federal government's remote access policies and programs, and in particular the provision of services in Labrador, a number of related approaches to defining need and estimating levels of service in isolated communities were selected from government and academic literature to demonstrate the variety of alternative considerations that might be used in the development of a remote access policy. Inherent in many of these cases was the acknowledgement that traditional evaluation techniques, such as cost/benefit analysis, were insufficient to apply to isolated communities. The need to address and, if possible, quantify socio-economic variables pertinent to northern, isolated situations is expressed in these studies. Some of the more relevant criteria were selected as appropriate for inclusion in a proposed remote access policy.

II Recommendations

The formulation and implementation of a federal remote access policy is necessary to ensure that further development in Canada's northern and peripheral regions takes place in an efficient and effective manner, responding not only to national requirements associated with objectives such as resource exploration and development and sovereignty assertion, but also to the particular socio-economic needs of the residents of isolated communities. The government and the Department of Transport have a responsibility to taxpayers to ensure that public expenditures not only achieve the goals of public welfare but that the programs selected are the most economically desirable both from a national and a regional perspective. The problems associated with remote access have been

exhaustively studied within the government over the past four decades. The task that remains is to assemble the information available and, by applying the appropriate principles of transportation economics and policy and theories of accessibility, determine a set of criteria which will provide the basis for a new comprehensive policy.

The necessary components of a remote access policy have been categorized under the following headings, not necessarily in order of importance, to facilitate discussion:

1. standards of service,
2. economic and social considerations,
3. public consultation,
4. geographic limitations,
5. multi-modal attributes of transportation systems,
6. network systems,
7. jurisdictional responsibilities,
8. regional (and other government) goals,
9. funding sources.

Many of these categories will include elements which overlap with other categories, as all are inter-related to some degree.

Standards of Service

As discussed in the analysis of the three northern air programs, the lack of service standards resulted in a wide variety of levels of service in similar environments. Moreover, the standards that were applied were not necessarily the most appropriate for the particular communities. Therefore, a consistent set of standards of transportation service should be developed specifically for northern and remote regions which should recognize the fundamental differences which exist between isolated regions and the more populated areas of the country. Specific criteria should include safety, population size, seasonality of requirements, alternative transportation systems available, proximity to social services and markets, opportunities for growth, existing and potential carriers, technological innovation, etc. Levels of service, defined as extent and quality, should be derived for individual

situations, recognizing the diverse economic and cultural structures in the north but including one or more base levels of service against which to establish minimum standards. Useful references for this exercise might be the "JASPER" criteria, the U.S. Essential Air Services Policy, the NTA's Essential Air Services Policy, the Isolation Usage Index, and the Nordicity Index.

Economic and Social Considerations

The ad hoc approach to remote access policies and programs has resulted in a lack of consistency in the evaluation of project worth. Each major program presented its own set of criteria for measuring the economic and social value of alternatives to providing a necessary service. The methodologies used ranged from the basic least cost to the more traditional economic analysis (cost/benefit, net present value), to engineering evaluations and specially tailored analyses such as "JASPER". Very few included an analysis of the social costs and benefits associated with the provision of a certain level and standard of transportation service. This arbitrary approach also resulted in an inherent inability to conduct a useful post-project evaluation as the criteria against which to measure the success or failure of a particular program were either not stipulated or lacking in one or more aspects.

Remote access projects have been considered to be essentially exempt from traditional financial and economic evaluation as the basis of their justification has been either to fulfill a mandate to supply essential services, or to respond to political goals and objectives. The direction that the federal government has taken since 1984 has resulted in a much more comprehensive scrutiny of projects and expenditures. The evasive approach to project analysis taken in the past will no longer be acceptable in an environment of restraint and emphasis on commercial opportunity. It is imperative, therefore, that a set of criteria, designed specifically for transportation projects in isolated areas, be implemented in order to ensure the continued provision of essential services.

While the standard net present value approach to project worth will invariably produce negative results, analysts must not discard the basic principles of economic analysis. Even if the values are negative, the opportunity is still available to compare project and program alternatives under funding constraints. An important indicator that would be of use in this situation is unit cost

(cost per passenger trip, cost per tonne kilometer of cargo), one which is too often neglected but which will allow similar comparisons when a net economic loss is assumed. A certain degree of flexibility is important to capture the economic reality of small communities dependent on one or a few primary industries often supplemented by subsistence activities, such as hunting, trapping, fishing, etc.

The quantification and analysis of social costs and benefits is a much more difficult prospect but also invaluable for comparison purposes. The dependence on one or more transportation systems for basic survival places an even greater emphasis on the social benefits of enhanced accessibility than for areas with greater opportunities. In the absence of any quantifiable measure of social benefit, a substitute measure, such as health and education trends, welfare dependence, crime rates, etc. could be successfully used to approximate social benefit. Differences in cultural behaviour and preferences must also be included as these may play a significant role in the interpretation of community need.

Finally, in the current environment of financial restraint, it is imperative that programs dedicated to providing services to northerly and remote locations not be assessed against the same criteria used to evaluate programs in areas of greater opportunity. The unique set of circumstances applicable to isolated communities should be appreciated and evaluated as such, keeping in mind the special needs associated with life in a remote and often hostile environment.

Public Consultation

A general lack of communication between the policy makers and the users of transportation systems in remote regions has been suggested as a major factor in the provision of inappropriate services and systems. Public consultation should be an essential component of any major transportation program and could be used as a first step in the development of a remote access policy. A clear understanding and appreciation of the environment (physical, cultural, economic) is essential for all those involved in the decision-making process. The NTA, in its role as regulator of transportation systems, should play an active part in the investigation and analysis of public need. The NTA may also assume the role of liaison between the users and suppliers, thereby ensuring

consistency in the transmission of information and requirements. The extent to which public consultation should play an important role in policy development is evident in the study initiated by the CTC in 1984, the Adequacy of Air Service in Northern and Remote Areas. This type of information gathering exercise should be conducted on a regular basis and provide the means by which to evaluate program achievement and adjust policies to reflect changes in user requirements.

Geographic Limitations

The special requirements associated with small, scattered populations, arctic and sub-arctic climates, and seasonality of demand have not been addressed consistently in the context of providing transportation services. The expertise accumulated by private developers, other northern countries and even other federal departments has not been applied consistently to transportation programs in our own north. It is recommended that either the Department of Transport or the Department of Indian and Northern Affairs be responsible for consolidating information relating to the construction and maintenance of infrastructure (including new technologies especially designed for northern climates), maintenance of vehicles, local weather anomalies, population characteristics, economic opportunities and any other relevant characteristic of remote regions for the purposes of ensuring the most appropriate transportation systems are put into place. Included in this responsibility would be the development of standards for northern construction, keeping in mind the cultural identity of the north as well as the economics inherent in the use of local materials and labour. As with the level of service standards, a built-in flexibility is imperative to respond to local requirements.

Multi-modal Attributes of Transportation Systems

Failure to identify the complementarity of different transportation modes has resulted in the development of parallel services and inefficient use of some systems. The expansion of air transportation has tended to overshadow the need to develop other, less costly, modes, notably road and marine. In situations of low market demand, such as is characteristic of northern, remote regions, the most efficient, rather than the most modern, transportation systems should be developed. To achieve this end, a multi-modal approach to remote access must be foremost in a

new policy. Consideration must be given to modal characteristics, requirements for carriage of freight and passengers, economic efficiency, levels of service, seasonality of demand, availability of alternative systems and carriers, new technologies, network development, and willingness to pay. The current internal structure of the Department of Transport is more conducive to a cooperative planning effort than it has been in the past and should encourage the development of multi-modal transportation systems.

Networks

The development of northern networks has responded largely to needs generated by the exploration and development of natural resources and the achievement of national, political goals. Accessibility has been perceived primarily in terms of north/south connections with little, if any, consideration to linking northern regions latitudinally. A new policy should encourage future systems growth which focusses on local and regional connections taking into consideration the roles and operational capabilities of existing and potential carriers. The identification of regional centres for supply distribution, social services, education and cultural enhancement is a necessary first step in the development of appropriate networks.

Jurisdictional Responsibility

The present division of responsibilities for the provision of transportation systems and services is hindering rather than assisting remote access. The overlapping jurisdictional boundaries between federal departments, provinces and within Transport Canada create inconsistencies in policy development, funding arrangements, definitions of service standards and encourage a uni-modal approach to planning. In order to ensure the most efficient and effective use of public funds, a clearer definition of the roles and responsibilities of each of the sponsors must be articulated and better communication between sponsors must be achieved. A central, coordinating committee, perhaps chaired by the NTA, is recommended to ensure that all transportation-related initiatives, whether federal, provincial or private, are complementary rather than duplicative and are consistent

with a global plan of action. This should also serve to simplify the funding approval process, ensure consistency in the application of standards and promote individual expertise.

Regional Goals

The role of transportation in regional development was considered in detail in Chapter 2. It was concluded that with the appropriate cautions, enhanced accessibility would assist in the economic development of isolated areas. Implementation of regional development objectives has, in the past, been accomplished through ERDA (Economic Regional Development Agreement), Transportation Sub-agreements. Projects emanating from this program, however, were not always consistent with related initiatives and were not always appropriate to achieve the objectives for which they were intended. There is a need, therefore, to establish a set of criteria for determining the impact of transportation projects on regional economic development and ensuring that those projects are consistent with more comprehensive transportation systems plans. The analysis presented in the study of Rural Rail Abandonment supplied an appropriate set of variables which could be revised to accommodate different transportation modes and, when combined with local characteristics, used to estimate the extent of impact likely to occur.

Funding Sources

Funding for the programs studied was supplied through a variety of means, none of which appeared to have an effective measure of control. Almost consistently, project costs were exceeded resulting in some instances in the failure to complete a program and in others to expropriate funds which might have been better spent elsewhere. While the use of funding "envelopes" gives the appearance of placing a cap on expenditures it fails to address the problem of evaluating project worth in comparison with regions, modes, or other stipulations inherent in the provision of funds. It is recommended that in the context of coordinating jurisdictional responsibilities, another dimension, that of the availability of funds for remote access projects, also be included.

III Future Considerations for Labrador

The history of transportation development in Labrador since 1949 is indicative of a policy of inactivity and neglect. In spite of numerous, exhaustive studies the Labrador Coast remained low on the government's priority list until the 1980's. This attitude may be attributed in part to a national policy direction which favoured the development of services in high demand areas over the provision of services in peripheral regions. But while Labrador remained isolated due to government unresponsiveness, private industry was expanding transportation services into the Arctic. Limited resource industries on the Labrador Coast failed to attract the same level of private investment, yet the needs of the residents were no less important than those in the remainder of northern Canada. Furthermore, Labrador's provincial status made it ineligible for the assistance or focus provided by DIAND which could exert political pressure on behalf of residents of the territories.

Over time, as transportation services in Labrador remained stagnant, recommendations for improvements became more and more ambitious, often greatly in excess of practical needs and, therefore, program proposals were often discarded for lack of necessary funding. While a minimum standard of service was being provided to the larger communities in the Arctic regions, with the exception of Goose Bay, residents of the Labrador Coastal communities did not have a reliable, year-round transportation service until the coastal airstrips were completed in 1986. In spite of the recent improvements to Marine Atlantic's coastal service (new vehicles, scheduling, port facilities) and the operation of a scheduled unit toll air service, the residents of the coast are still not well served. To a great extent, the failure to communicate effectively with users can be blamed for the inefficiencies inherent in the present systems. Equally damaging has been the uni-modal approach to transportation planning displayed by the Department of Transport.

A number of development scenarios are offered, some of which are presently under consideration by the government and the carriers, and others which have been rejected or deferred in the past. All suggestions build on existing systems and services with the aim of improving accessibility at minimal or reduced cost. The focal point for future development is assumed to be a multi-modal approach to the provision of transportation services based on more definitive roles and responsibilities of individual modes and their inherent complementarities. These scenarios include:

Marine Atlantic

Priority #

1. separation of passengers and cargo on coastal boats,
2. separation of resident and tourist services,
3. greater use of unitized cargo carriage,
4. expansion of coastal service through the introduction of "feeder" lines.
5. relocation of the base of coastal operations to St. Anthony from Lewisporte,

Air Transportation

Priority #

1. expansion of air service through the introduction of "feeder" lines,
2. rationalized air freight service,
3. improved regional air connections.

Other

Priority #

1. further development of skidoo trails,
2. expansion of road network in the Straits area and on the South Coast,
3. improvements to the road link from Goose Bay to Wabush.

Marine Atlantic

The separation of passengers and cargo on the coastal boats was introduced in the Labrador Coastal Air/Marine Study in 1975. The transfer of even small amounts of freight has the effect of doubling the time required to complete a round trip from Lewisporte to Nain (17 days versus 8). Furthermore, the high unit cost of transporting cargo by Marine Atlantic Coastal boat as compared to charter vessels should limit the use of passenger vessels to the carriage of urgent and perishable goods which cannot be accommodated easily on the cargo boats.

The extended use of unitized cargo would significantly reduce damage incurred during the loading and unloading of cargo on conventional freighters. This was demonstrated successfully

during the trial use of the ro/ro container vessel "Astron". Not only is the cost of chartering this type of vessel less expensive than conventional freighter (\$118/ton versus \$252/ton, on average, 1983 estimate), but the introduction of a container service was found to have a moderating effect on stevedoring rates which are constant for all vessels.

The relocation of coastal operations from Lewisporte to St. Anthony was discussed in the Newfoundland Coastal Ports Study at the request of CN Marine. The cost of providing new facilities in St. Anthony would have to be weighed against the cost of routine replacement/restoration of facilities at Lewisporte, reduced operating costs associated with the transport of cargo from Lewisporte to St. Anthony by marine versus road (passengers are assumed to provide their own transportation to and from terminals), and the implied increase in level of service to residents due to reduced trip time.

The subsidization of tourists on the coastal boats which are intended to provide essential service to residents must be eliminated. Separation of tourists could be approached through differing fare structures, the provision of rebates (already in use by the air carrier), variable tariffs based on seasonal peaks (tourists tend to travel in the middle of the summer while residents travel and the beginning and end of the season), or even the introduction of additional vessels where practicable.

The economies associated with marine transportation, especially for the carriage of freight, should be emphasized in the expansion of the present network to include feeder services. This is particularly significant in light of the increased use of container vessels which are limited in their ability to enter the smaller ports. The use of specially designed launches to provide door-to-door service would improve the present system of unloading over the side of the vessel into privately owned open fishing boats. A similar enhancement of the passenger service should be considered especially since the new coastal boat "Northern Ranger" is also restricted in its ability to serve smaller communities.

Air Transportation

The Labrador Area Master Plan suggested as an alternative to the thirteen coastal airstrips the use of smaller (single-engine) planes to provide a feeder service to designated distribution points (Hopedale, Nain, Makkovik, Cartwright, Mary's Harbour, Goose Bay). As communities on the coast continue to grow, consideration should be given to providing a feeder service to the existing airstrips based on criteria similar to that used for the Arctic "C" airports. The selection of aircraft would be dependent not only on carrying capacity but also on seasonality of demand which might infer the use of float and ski equipped planes or helicopters. It is recognized that the greater distances between communities and more rugged terrain in northern Labrador severely limits the potential for surface transportation. As a result, the earliest attention should be given to the expansion of the present air and marine services along the northern portion of the coast.

The role of air freight services should be defined in relation to the cargo service provided by Marine Atlantic. The transport of small parcels and perishable goods now accommodated on the passenger boats might be more efficiently carried on a cargo plane. The adaptability of the carrier's fleet and scheduling restrictions would dictate the extent to which air freight services could be significantly expanded. The use of cargo aircraft would also improve the scheduled delivery of freight which at present is dependent on available space in predominantly passenger designed aircraft.

The need to establish better regional air connection with northern Quebec and the Territories was identified as a priority issue in the CTC study on the Adequacy of Air Service. The present lack of transportation links across northern Canada hinders the interchange of political, social and cultural experiences between northern residents, especially for the Inuit of northern Labrador and the Naskapi and Montagnais of Davis Inlet and Sheshasheits. There may also be marketing opportunities available (food, household commodities, art, handicrafts) that have not developed to their potential because current transportation systems are oriented almost exclusively in a north/south direction.

Other

• The provincially maintained skidoo trails provide an economical and practical alternative to road travel on the coast. The opportunity to residents to travel economically between isolated communities during the long winter season has a social value that should not be overlooked. The Provincial Department of Transportation should be encouraged to expand this system in areas where communities are sufficiently close to make travel by skidoo feasible. In the longer term, the use of larger, specialized winter vehicles on a scheduled basis could be used as an alternative feeder service to access those communities served by air transportation.

The road system in the Straits area is presently being upgraded under a federal/provincial agreement. When complete, residents will be able to travel by road from Red Bay to Blanc Sablon where they will connect with the Quebec provincial highway system. Further expansion of the road network to connect the numerous small communities along the coast to Cartwright should be investigated. The most practical approach might be the provision of dirt or gravel roads for limited summer use supplemented in winter by upgraded skidoo trails.

The province and the federal government are presently negotiating an ERDA (Economic Regional Development Agreement) to secure funding to complete the section of the Trans Labrador Highway from Ross Bay Junction (the last completed section of the road from Wabush) to Twin Falls. When complete, residents will be able to access the Quebec provincial highway system unrestricted from Goose Bay. This is, however, a summer road only. Consideration should be given to maintaining a winter road for use either by specialized winter vehicles or by truck to permit year-round surface travel.

The future development of transportation systems and services on the Labrador Coast should be based on a greater appreciation of the needs of residents, a clearer knowledge of alternative solutions, recognition of the complementarity of the existing modes, the most practical and economical means by which to ensure an adequate standard of service and a sensitivity to the ability of the users to pay for the services provided.

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ANNEX 1

REMOTE ACCESS POLICIES, PROGRAMS AND STUDIES

REMOTE ACCESS POLICIES, PROGRAMS AND STUDIES

<u>Date</u>	<u>Title</u>	<u>Sponsor(s):</u>	<u>Mode(s):</u>	<u>Infrastructure</u>	<u>Recommendations</u>	<u>Action</u>
1871	Canada/British Columbia Constitutional Agreement	Canada, B.C.	marine	vessels, wharves	provide mail service between Victoria and San Francisco and between Victoria and Olympia	Vancouver/Victoria ferry service still in existence
1873	Canada/PEI Constitutional Agreement	Canada, PEI	marine	vessels, wharves	provide mail and passenger service between the island and the mainland	service between Borden and Cape Tormentine still in existence
1928	Trans Canada Airway Act	federal government	air	airports	provide inter-city airmail service	series of airports built coast-to-coast
1936	Department of Transport	federal government	all	all civilian	expand Department of Railways and Canals to include civil aviation and highways	creation of new department, financial assistance made available for airport development
1937	Trans Canada Airline Act	federal government	air	aircraft	create trans-continental air passenger service	regular, scheduled national passenger service created
1944	Northern Transportation Company Ltd.	federal government, NTCL	marine	vessels, tugs, barges	purchase NTCL to provide resupply in McKenzie Valley watershed and Western Arctic	operated as federal Crown Corporation from 1944-1985
1949	Canada/Newfoundland Constitutional Agreement	Canada, New-foundland	marine, rail	vessels, wharves, railway	assume responsibility for services previously provided by Newfoundland Railway Company	responsibility assumed for rail, Gulf ferry service and coastal marine service

1964	Civil Aviation Policy	federal government	air	N/A	competition in the industry should not compromise Trans Canada Airlines' operations, establish relationship with regional carriers	defined structure and policies for commercial operators
1965	Remote Airports Program	DIAND	air	airports, access roads	encourage resource development in the North	16 airstrips built in early 1970's
1966	Cabinet Policy Statement on Water Transportation Services	federal government	marine	ferries, coastal vessels	confine federal support to international and interprovincial services according to jurisdiction under BNA	led to development of federal/provincial Water Transport Assistance agreements
1969	Regional Air Carrier Policy	Transport Canada	air	N/A	establish operating boundaries for regional air carriers	5 regional carriers identified, developed scope into North from hubs on transcontinental systems to secondary distribution centres
1971	Northern Transportation Conference	federal government	air, marine	N/A	improve accessibility through infrastructure development	led to creation of Arctic Transportation Agency in Transport Canada
1971	Northern Air Transport Study	Canadian Transport Commission	air	N/A	infrastructure investment based on characteristics of permanent settlements and demand for freight and passenger transport	led to policy on arctic air facilities
1971	Northern Air Policy Study	Transport Canada	air	N/A	28 possible sites identified for upgrading	led to 1974 policy on arctic air facilities

1971	National Northern Development Policy	federal government	all	N/A	co-ordinated approach to resource allocation	identified 7 national northern objectives.
1973	Local Air Carriers Study	Arctic Transportation Agency	air	N/A	specific accessibility/need criteria to be assessed before deciding investment priorities	led to 1974 arctic air facilities policy
1973	Arctic Air Services Issues Study	Transport Canada, CTC, DIAND	air	N/A	encourage northern transportation development	led to arctic air services policy
1973	Transfer of Keewatin Resupply to NTCL	Transport Canada, NTCL	marine	N/A	transfer Keewatin resupply from Montreal to private company to operate from Churchill	annual operation provided by NTCL at profit
1974	Arctic Air Facilities Policy	Transport Canada	air	airports	upgrade aerodromes at 62 arctic communities	11 arctic 'A' airports built, 13 arctic 'B' and 'C' airports unfinished
1974	Arctic Transportation Study	DIAND	air, marine	airports, ports	development of infrastructure to support movement of bulk freight	none
1974	Royal Commission on Labrador	Province of Newfoundland	all	airports, ports, highways, railways	four priority airstrips to be built in Labrador, 'Port Labrador', Trans-Labrador Highway, etc.	built gravel runway at Cartwright
1975	Labrador Coastal Air/Marine Study	Transport Canada	air, marine	airstrips, CN Marine vessels	build airstrips identified in LAMP, reduce coastal service accordingly, separate passengers and freight	none- superseded by Sullivan Commission

1975	Water Transport Assistance Policy	federal government, Transport Canada	marine	N/A	define services that qualify for federal assistance, transfer administration from CTC to DOT	CN Marine formed, new provincial agreements reached with B.C., Quebec and Newfoundland
1975	Eastern Arctic Seelift	federal government	marine	N/A	Coast Guard to coordinate resupply of isolated settlements in Eastern Arctic	annual operation still operated by Coast Guard
1976	Labrador Community Transportation Project	Ministry of Transportation for Newfoundland	air, marine	N/A	refinement of both modes and recognition of complementarity	no formal recommendations made
1976	Arctic Air Services Policy	Transport Canada	air	airports		
1977	Canada/B.C. Agreement on Water Transport Assistance	Canada/B.C.	marine	ferries	provincial government assume responsibility for financial assistance in return for direct annual grant	federal government relieved of historic financial association with 4 coastal freight and passenger services
1976	CN Marine	Canada, CNR	marine	ferries, cargo vessels, terminals	rationalize and manage, under specific operating contracts, certain ferry and coastal shipping services	transfer of \$100 M assets to new Crown Corporation, provision of \$143 M for capital acquisition
1977	Atlantic Provinces Transportation Program	federal government, provincial governments	all	airports, highways	support Labrador Area Master Plan recommendations	led to creation of Atlantic Provinces Transportation Funding Envelope

1978	Commission of Inquiry into Newfoundland Transportation	Transport Canada	primarily rail but included all	railway, ports, airports	future requirements and policies to guide change to achieve goals in transportation development	led to creation of Newfoundland Transportation Funding Envelope
1978	Canada/Quebec Agreement on Water Transport Assistance	Canada/- Quebec	marine	cargo vessels, wharves	province to assume responsibility for financial assistance in return for direct annual grant	five year agreement signed relieving federal government of responsibility for shipping service to isolated communities
1979	Canada/Newfoundland Agreement on Water Transport Assistance	Canada/ Newfoundland	marine	ferries, cargo vessels, wharves	province to assume responsibility for financial assistance in return for direct annual grant plus new or rebuilt terminals	five year agreement signed relieving federal government of responsibility for Greenspond Island Service and all capital works
1981	Canada/Newfoundland Agreement on Newfoundland Coastal Service	Canada, Newfoundland	marine	N/A	provide transportation service on contract to communities now isolated as result of rationalization of CN Marine	Argentia named new terminal port on trial basis
1982	Newfoundland and Labrador Coastal Study (Sypher)	CN Marine	marine	vessels	separate carriage of passengers and freight, containerize freight	none
1983	Update - Newfoundland and Labrador Coastal Study (Acres)	CN Marine	marine	vessels, wharves	separate passengers and freight, containerize cargo, acquire new vessels	mini-container cargo vessels chartered on trial basis
1984	Newfoundland Ports Study	Transport Canada	marine	wharves	designate regional and local ports for development	facilities upgraded at major sites

1984	New Canadian Air Policy	Transport Canada	air	N/A	deregulate air industry	incorporated in new National Transportation Act, development of TCAAM
1985	Northern Transportation Company Limited	federal government, Inuvait Development Corporation, Munasi Corp.	marine	vessels, tugs, barges	privatize company	resupply operation provided by new owners
1984	Newfoundland-Labrador Coastal Passenger Service Study and Coastal Freight Service Study	Transport Canada, CM Marine	marine	vessels	acquire new passenger and cargo vessels	formation of Task Force to study future rationalization of coastal service
1985	Report of Adequacy of Air Services	CTC	air	N/A	long term program for airport development	none
1987	National Transportation Act	Transport Canada	all	all	new regulations governing industry operations	new Act passed in 1987
1987	Marine Atlantic Task Force Study	Transport Canada, Marine Atlantic	marine	vessels	further rationalize service, purchase new vessels	not yet implemented

ANNEX 2**NATIONAL NORTHERN OBJECTIVES****1. Quality of Life**

To provide for a higher standard of living, quality of life, and equality of opportunity for Northern residents by methods which are compatible with their own preference and aspirations.

2. Economic Growth

To encourage viable economic development within the regions of the Northern Territories so as to realize their potential contribution to the national economy and the material well-being of Canadians.

3. Sovereignty and Security

To maintain Canadian sovereignty and security in the North.

4. Protection of the Environment

To maintain and enhance the Northern environment with due consideration to economic and social development.

5. Evolution of Government

To further the evolution of self-government in the Northern Territories.

6. Social and Cultural Development

To realize the potential contribution of the Northern Territories to the social and cultural development of Canada.

7. Leisure and Recreation

To develop fully the leisure and recreational opportunities in the Northern Territories.

ANNEX 3

**ADEQUACY OF AIR SERVICES IN NORTHERN AND REMOTE AREAS -
FINAL REPORT AND SUMMARY OF EVIDENCE, 1985
Canadian Transport Commission, Air Transport Committee**

In June and July of 1984, the Canadian Transport Commission held hearings in 19 northern communities from Quebec to the Yukon to obtain direct feedback from the residents/users of the existing air services and to assess the adequacy of air services which were then in place. The main points raised, in order of frequency were:

1. greater use of Native Peoples' language,
2. safety (also related to language, emergency procedures),
3. enhanced employment opportunities for native people,
4. subsidies - reviews of needs for subsidies to Quebecair and EPA,
5. capital asset acquisition program for air carriers,
6. elimination of government taxes, fees, charges, etc.,
7. CTC continue to monitor fares and prices,
8. encourage discount fares to "communities of interest",
9. access to through fares, joint fares and reservations systems,
10. CTC monitor cargo services and rates,
11. no reduction in mail service as a result of crown corporation status of Canada Post,
12. change line of demarkation to 53°N on Manitoba-Saskatchewan border,
13. competition -
 1. Intra-Northern and Remote Area Markets - retain "public convenience and necessity" requirement.
 2. North-South Markets - increased emphasis on competition between unit-toll carriers.
14. retain "use it or lose it" philosophy for licensing,
15. CTC actively solicit replacement carriers when service withdrawn,
16. streamline current licensing application procedures,
17. CTC review current restrictions on licenses in northern and remote areas,
18. abolition of class 4 positioning charges regulations,
19. base protection for charter carriers,

**Adequacy of Air Services in Northern and Remote Areas -
Final Report and Summary of Evidence, 1985 (cont'd)**

20. reduce requirements for licensing of charter carriers once public convenience and necessity proved,
21. CTC lessen reporting requirements and travel conditions,
22. CTC establish monitoring system for carriers operating in the North,
23. continuation of funding to Arctic Air Facilities Program, (or equivalent).

ANNEX 4

COASTAL LABRADOR COMMUNITY PROFILES

Forteau

- population 580 (white)
- resources: fishery, fish plant
- transportation: Marine Atlantic (coastal and ferry to St. Barbe)
Labrador Airways (floats and skis)
road

Red Bay

- population 334 (white)
- resources: fishery, fish plant
- transportation: Marine Atlantic
Labrador Airways (floats and skis)
road access to neighbouring communities

St. Lewis (Fox Harbour)

- population 300 (white)
- military installation until 1960's
- new Loran "C" station completed early 1980's
- resources: fishery
- transportation: Labrador Airways (airstrip)
Marine Atlantic
snowmobiles

Port Hope Simpson

- population 582 (white)
- logging operation established 1933 then taken over by Bowaters who ceased operations in the community in the late 1960's
- resources: fishery, sawmilling
- transportation: Labrador Airways (airstrip)
Marine Atlantic
snowmobiles

Williams Harbour

- population 66 (white)
- summer residence until late 1970's
- resources: fishery
- transportation: Labrador Airways (floats and skis)
Marine Atlantic
snowmobiles

Charlottetown (Square Islands)

- population 270 (white)
- established in 1950's as sawmilling operation which employed the people of Square Islands
- resources: fishery, boat building
- transportation: Labrador Airways (airstrip)
Marine Atlantic
snowmobiles

Black Tickle

- population 215 (white)
- flourishing fishery around 1800
- resources: fishery, fish plant
- transportation: Labrador Airways (airstrip)
Marine Atlantic, snowmobiles

Paradise River

- population 105 (white)
- resources: fishery, fish plant
- transportation: Labrador Airways (floats and skis)
Marine Atlantic
snowmobiles

Cartwright

- population 685 (white)
- resources: fishery, fish plant, off-shore drilling base, marine service centre
- transportation: Labrador Airways (airstrip)
Marine Atlantic (coastal plus 'Ro-ro')
snowmobiles

Rigolet

- population 275 (white, some Inuit)
- first trading post established 1787
- Canadian army base with navy base 4 miles away at narrows of Hamilton Inlet and Lake Melville
- resources: fishery, hunting, trapping
- transportation: Labrador Airways (airstrip)
Marine Atlantic

Makkovik

- population 335 (white, some Inuit)
- settled by Torsten Andersen of Norway, employee of Hudson's Bay Co.
- radar station built 1952 - part of Pine Tree Defense Line
- resources: fishery, fish plant, hunting, trapping
- transportation: Labrador Airways (airstrip)
Marine Atlantic

Postville

- population 190 (white)
- Hudson's Bay Co. trading post founded in 1837
- logging and sawmilling industry closed in 1952
- possible uranium development in vicinity
- resources: fishery
- transportation: Labrador Airways (airstrip)
Marine Atlantic

Davis Inlet

- population 285 (Naskaupi Indian)
- A.B. Hunt and Co. established trading post in 1831
- Hudson's Bay Co. took over post in 1869
- townsite moved in 1968 and 31 new houses built
- resources: fishery, hunting, trapping
- transportation: Labrador Airways (airstrip)
Marine Atlantic

Hopedale

- population 480 (white and Inuit)
- Moravian Mission established 1782
- Pine Tree Radar Station built 1952
- evidence of early Thule Eskimo culture found
- staging port for northern Labrador until 1986
- resources: fishery, off-shore oil drilling base
- transportation: Labrador Airways (airstrip)
Marine Atlantic

Nain

- population 950 (white and Inuit)
 - established in 1771 by Moravians
 - only Europeans until 1926
 - in the late 1950's mission stations north of Nain closed (Okak, Hebron, Ramah, Port Burwell)
and inhabitants moved south to Nain
 - resources: fishery, fish plant, Labradorite
 - transportation: Labrador Airways (airstrip)
Marine Atlantic
-

ANNEX 5

POLICIES, PROGRAMS AND STUDIES FOR COASTAL LABRADOR

POLICIES, PROGRAMS AND STUDIES FOR COASTAL LABRADOR

<u>Date</u>	<u>Title</u>	<u>Sponsor(s)</u>	<u>Mode(s)</u>	<u>Infrastructure</u>	<u>Recommendations</u>	<u>Action</u>
1949	Canada/Newfoundland Constitutional Agreement	Canada, Newfoundland	marine, rail	vessels, wharves, railway	assume responsibility for services previously provided by Newfoundland Railway Company	responsibility assumed for rail, Gulf ferry service and coastal marine service
1974	Royal Commission on Labrador	Province of Newfoundland	all	airports, ports, highways, railways	four priority airstrips to be built in Labrador, 'Port Labrador', Trans-Labrador Highway, etc.	built gravel runway at Cartwright
1975	Labrador Coastal Air/Marine Study	Transport Canada	air, marine	airstrips, CN Marine vessels	build airstrips identified in LAMP, reduce coastal service accordingly, separate passengers and freight	none- superseded by Sullivan Commission
1976	Labrador Community Transportation Project	Ministry of Transportation for Newfoundland	air, marine	N/A	refinement of both modes and recognition of complementarity	no formal recommendations made
1977	Atlantic Provinces Transportation Program	federal government, provincial governments	all	airports, highways	support Labrador Area Master Plan recommendations	led to creation of Atlantic Provinces Transportation Funding Envelope
1978	Commission of Inquiry into Newfoundland Transportation	Transport Canada	primarily rail but included all	railway, ports, airports	future requirements and policies to guide change to achieve goals in transportation development	led to creation of Newfoundland Transportation Funding Envelope

<u>Date</u>	<u>Title</u>	<u>Sponsor(s):</u>	<u>Mode(s):</u>	<u>Infrastructure</u>	<u>Recommendations</u>	<u>Action</u>
1981	Canada/Newfoundland Agreement on Newfoundland Coastal Service	Canada, Newfoundland	marine	N/A	provide transportation service on contract to communities now isolated as result of rationalization of CN Marine	Argentia named new terminal port on trial basis
1982	Newfoundland and Labrador Coastal Study (Sypher)	CN Marine	marine	vessels	separate carriage of passengers and freight, containerize freight	none
1983	Update - Newfoundland and Labrador Coastal Study (Acres)	CN Marine	marine	vessels, wharves	separate passengers and freight, containerize cargo, acquire new vessels	mini-container cargo vessels chartered on trial basis
1984	Newfoundland Ports Study	Transport Canada	marine	wharves	designate regional and local ports for development	facilities upgraded at major sites
1984	Newfoundland-Labrador Coastal Passenger Service Study and Coastal Freight Service Study	Transport Canada, CN Marine	marine	vessels	acquire new passenger and cargo vessels	formation of Task Force to study future rationalization of coastal service
1987	Marine Atlantic Task Force Study	Transport Canada, Marine Atlantic	marine	vessels	further rationalize service, purchase new vessels	not yet implemented

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