THE YUKON ECONOMY
ITS POTENTIAL FOR GROWTH AND CONTINUITY

VOLUME VII REFERENCE STUDY ON TRANSPORTATION

D. Wm. Carr & Associates Ltd.

Ottawa

July, 1968

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A Report on the Transportation Services
of the Yukon Territory

by

J. I. Guest and T. D. Heaver
Intrcontinental Resource Consultants Ltd.
Vancouver

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by

J.I. Guest and T.D. Heaver

INTRODUCTION

The purpose of this Report is to describe the transportation services of the Yukon Territory. This description may indicate some improvements which could be achieved in the transportation system even if radical changes do not occur in the regional economy. It should also provide a basis from which alternative investments in transportation projects in the Yukon can be appraised in the light of economic developments which are being forecast by other studies currently being completed.

To achieve this goal the Report is presented in three sections. First, the most significant physical and economic features of the region are described. No transportation system can be viewed apart from the environment which it serves and in which it operates. The existing transportation facilities are described in the second section; the transportation infrastructure, costs, completion and commodity movements are described. The third section deals with the framework for transportation development; the existing institutional pattern which influences transportation investment is described, previous reports are reviewed and the factors to be considered in the appraisal of alternative transportation projects are set out.

SECTION 1

THE PHYSICAL & ECONOMIC ENVIRONMENT FOR TRANSPORTATION

The Yukon Territory has an area of 207,000 square miles * stretching from latitude 60° North to the Arctic Ocean. This amounts to 5.8% of Canada's land mass yet the population of the Yukon, 14,382 in 1966, was only .08% of Canada's total population. The reasons for this disparity are primarily the climate and the location of the region.

The geology and topography of the Yukon are favourable to settlement. Apart from the Coast and St. Elias mountains the Yukon has few rugged mountains, plateaux occupying most of the area. The plateaux are covered with a thick mantle of soil and sediment which were not swept away by the ice sheet, as in most of the Canadian north.[1] The sedimentaries have been the source of placer gold, so important in the Yukon's early development.

The severity and length of the Yukon winter limits agriculture and causes significant seasonality in many economic activities. For seven months, the majority of the Yukon has an average monthly temperature at or below freezing and it is normally only from June to August that precipitation falls in the form of rain. However, while winter temperatures may fall to less than minus 75°F, the severity of the coldest months is little different in Whitehorse from that in Winnipeg and Saskatoon. In the short summer the temperatures may rise to 90°F.

The relative mildness of Whitehorse, considering its latitude, is accounted for by its proximity to the Pacific Ocean. However, the full effect of its

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* includes 1,700 square miles of water.

proximity is offset climatically by the mountain ranges which exclude the moderating marine air masses. These mountains also make transportation expensive.

The absolute location of the Yukon is more favourable to economic development than that of much of northern Canada. The Yukon border is only very few miles from the Pacific Ocean and Whitehorse is only 110 miles by rail from the ice-free ocean port of Skagway. This is most significant for a resource-orientated economy. However, Whitehorse is 1,010 air miles* from Vancouver and 1,023 air miles from Edmonton:** these distances are significantly more than the distance of Pine Point from Edmonton or Thompson from Winnipeg. However, the relative location of the Yukon is made poorer because of the transportation facilities. Unlike other northern centres which are tied-in directly with the North American railway system and have quite direct highway systems, the Yukon must rely upon circuitous systems designed to low levels of technological service. The Alaska Highway was constructed in a location and to a standard appropriate to a war-time emergency and the White Pass & Yukon rail road has only a 3' gauge.

The limited development of transportation services is in part attributable to the physical environment, in part due to historical accidents and in part due to the limited demonstrated demand for transportation service. Naturally, the small size of the economy is in part because of the nature of the transportation facilities, but it is fruitless to speculate in a general way on the size of the economy if the Yukon had been provided with different transportation services.

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* via Terrace.

* via Grand Prairie and Fort St. John.

In 1966 the population of the Yukon was only 14,382 i.e. less than the total population of Nanaimo, British Columbia.* The biggest city in the Yukon is Whitehorse with a population of 4,771 in 1966, almost double the population for 1951. The other major communities are Watson Lake (597), Dawson (742) and Mayo (479).

The economy of the Yukon has been based on the production and export of staple products, especially gold, silver and other metal concentrates. The first phase of economic development was the gold rush at the turn of the century. About 80,000 people are estimated to have come from all corners of the earth to search for the elusive gold. While the majority of these fortune seekers did not remain in the Yukon for long, some did make their permanent home there. The gold rush also left the Yukon with a major legacy, the narrow gauge railway from Skagway to Whitehorse completed in 1900. Until the Second World War the small population was primarily dependent on gold and silver mining. However, the construction of the Alaska Highway brought renewed activity. Construction of the highway and the Canol pipeline created substantial employment. Traffic on the White Pass and Yukon railway reached unprecedented levels:

> ". . . the traffic moved finally culminated in a epochal August 4, 1943 when the White Pass moved thirty-eight trains north and south (which meant 2,236 locomotive miles in twenty-four hours), and 3,446 gross at 2,085 net tons were hauled from Skagway to Whitehorse."[2]

The highway, although built hastily to a low standard to meet a military emergency, made it easier for mining exploration and development to be carried out and provided a basis for a new industry, tourism.

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* 15,188 in 1966.

The United Keno Hill Mines Ltd., started its silver-lead-zinc operations in the late 1940's and since then has accounted for a large proportion of mineral production in the Yukon, in 1963 69% of the total value of the territory's output.[3]

Mining dominates the Yukon economy in spite of the development of tourism. This dominance may well increase as a result of current developments which are leading to the evaluation of several mineral deposits. C.J. Brown suggests that "the results of this reassessment ... it indicates that the Yukon's mineral output should rise to $30,000,000 by 1970 and by 1975 production could exceed $50,000,000."[4]

The pattern of development is vital to the expansion of the transportation system. There are four general mining districts within the Yukon. The Mayo mining district has been the most productive one since the early fifties due to the presence of United Keno Hill Mines Ltd. While the Whitehorse mining district and the Dawson mining district have not been very productive in recent years, the present development work by Anvil Mining Corporation in the Ross River area, by Cassiar Asbestos at Clinton Creek, by New Imperial Mines Ltd., near Whitehorse, and by several smaller mining companies is a strong indication of rising production in these districts in the near future. The Watson Lake mining district has little production activity within the Yukon boundaries, even though just south of the B.C. - Yukon border is the Cassiar Asbestos mine at Cassiar, while the Canada Tungsten operation is just east of the Yukon - Northwest Territories border.

In spite of the dominance of mining in the Yukon economy, one peculiar feature of the economy is the significance of employment in Government service. No statistics are published solely for the Yukon but the pattern shown in Table 1 for the Yukon and Northwest Territories is indicative of the position within the Yukon alone. The relative importance of Government employment can be expected to decline as mining, tourism and other economic activities expand.

TABLE 1

TAXABLE RETURNS BY PROVINCE
AND OCCUPATION 1965 TAXATION YEAR

(000's of Dollars)

	Alberta		Yukon & N. W. T.		British Columbia	
	Number	Total Income	Number	Total Income	Number	Total Income
Employees in Business	225,468	1,065,741	4,903	25,336	385,802	1,979,168
Employees of Institutions	21,046	70,055	298	1,030	29,759	109,845
Teachers	16,679	95,652	428	2,543	19,711	123,128
Federal Employees	12,504)	61,563)	2,718)	15,958)	23,581)	121,801)
Provincial Employees	24,479) 19%	107,350) 17%	498) 36%	2,496) 51%	34,143) 15%	181,488) 13%
Municipal Employees	18,717)	88,179)	72)	358)	19,459)	96,163)
Unclassified	5,320	16,694	75	572	9,330	31,980
Totals	324,213	1,505,234	8,992	48,292	521,783	2,643,513

Source: Taxation Statistics 1967, Department of National Revenue, Taxation Division. (Queen's Printer, Ottawa, 1967).

A resource-based export-orientated economy has to be served by an efficient transportation system so that the distribution costs enable the products to compete in world markets and so that transportation costs on in-bound supplies can be held to a reasonable level. However, the small size of the Yukon economy as well as the physical environment have prevented the development of transportation systems with the technical levels of service and capacities of other parts of Canada. However, short lived historical events have also played a significant part in the development of the region's transportation system.

The gold rush resulted in the early availability of railway service and this railway still serves the economy well. However, with a new period of expansion in sight, serious doubts exist about the adequacy of the railway route. Less fortuitous for the development of the Yukon was the manner in which it obtained its first land link with the Canadian domestic transportation system. The location and design of the Alaska Highway were both conditioned by the emergency military requirement. The location of airstrips was more important than the location of resources and the highway does not follow the route recommended in earlier economic studies.* The Yukon obtained a road link earlier than would otherwise have been the case but has been left with a legacy of a tortuous road in the wrong place.

Because of the inter-dependence of transportation and economic development the selection of the correct technology and correct location are vital for transportation investments. The next section of this report describes the current transportation services to provide the foundation for assessing future transportation requirements.

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* See pages 73 and 74.

SECTION 2

THE EXISTING TRANSPORTATION SERVICES

The Yukon Territory is served by three transportation systems:

i. The White Pass and Yukon route: this includes ship service between Vancouver and Skagway, railway and pipeline transportation from Skagway to Whitehorse, and truck transportation from Whitehorse to other parts of the Yukon and Northern British Columbia.

ii. The overland trucking system: The Yukon is served by trucking via the Alaska highway, the main movements being from Vancouver, Edmonton or by interline shipment with the Pacific Great Eastern Railway at Dawson Creek. Within the Yukon a large number of companies perform trucking transportation. A scheduled bus service is maintained by Canadian Coachways into the Yukon from Edmonton.

iii. The air transport system: the Yukon is served by a number of scheduled services but the scheduled service is dominated by the Canadian Pacific Airlines service from Vancouver. However, non-scheduled services also play an important part in the aviation service, particularly, for services within the Yukon.

For sixty-eight years transportation services to and from the Yukon territory have been dominated by the White Pass and Yukon railway. It is estimated that currently 90% of the northbound and southbound freight movement by weight is handled by the railway and its trucking subsidiary, Loiselle Transport Limited. The following Table shows volumes of freight handled by the major public carriers in 1967, Table 2.

TABLE 2

FREIGHT AND EXPRESS MOVEMENTS IN AND OUT OF THE YUKON TERRITORY, 1967 (Including Cassiar, B.C.) - Tons

	Total Freight	Northbound	Southbound
White Pass & Yukon Railway	188,000*	66,000	122,000
Loiselle Transport	16,200	6,700	9,500
Canadian Freightways	9,500	7,500	2,000
Canadian Pacific Airlines#	398	327	71
Total	214,098	80,527	133,571

* Does not include 60,000 tons of diesel fuel which is pipelined to Whitehorse from Skagway.

\# Includes mail.

Source: Company records: Canadian Freightways, Canadian Pacific Airlines, Loiselle Transport and White Pass & Yukon Railway.

To provide a clear picture of the services provided by the transportation systems the physical facilities will be described first, then the commodity flow characteristics of each mode, prior to examining the costs and level of competition.

A. Transportation Facilities

i. The White Pass and Yukon route.

The White Pass and Yukon railway is unique in North America. The railway still occupies the same right-of-way upon which it was constructed at the height of the Klondike gold rush in 1898. The toughest part of the 110.7

mile right-of-way is the 20 miles out of Skagway, Alaska, where the average grade is 2.6% and the steepest grade is 3.9%. The railway's history has been one of feast and famine.

The Klondike gold rush was over within six months of the completion of the line, and the railway has been on the verge of bankruptcy on several occasions. The immense work load placed on the railway during World War II resulted in control passing to the U.S. Army until July 1946. In the post-war period the economic position of the Company has gradually improved as the economy of the Yukon has expanded.

The railway between Skagway and Whitehorse is geared to a low volume operation. One train a day is operated in each direction over the 36" gauge tracks in which the lines are placed directly on the railway ties. Since 1963 the railway has only used diesels; a pair of diesels can haul 410 tons from Skagway to Whitehorse, 620 tons with the use of a third unit; southbound two units can haul 620 tons all the way to Skagway unassisted.

The Yukon territory has been fortunate in having available to it a railway constructed during the optimism of the gold rush, but the Company and the territory are continuously faced with the problem of up-dating the facilities so that they provide a service commensurate with today's needs.

The main improvement which has been made in the operations in recent years has been the utilization of containerization. The use of water, rail and truck transport has led to the use of containers to cut down on transshipment handling costs. From 1956 to 1965 the Company used the "Clifford J. Rogers "for the sea haul; since 1965 they have used the specially-designed container ship the "Frank H. Brown."

In order to understand the nature of commodity movements on the White Pass and Yukon Railway in contrast with other railways, the company's handling of goods will be described. As an illustrative description of the movement of goods, commodity "X" will be traced from Vancouver warehouse to mine site at Cassiar in Northern British Columbia.

Assume commodity "X" is a container load, that is, goods which will occupy and 8' x 8' x 25'3" aluminum and steel box with capacity of 40,000 lbs. The shipper may have the goods picked up either from his Vancouver area warehouse (pick-up charge is included in the rate), or he can have an empty container delivered to his warehouse and load it himself with a rate reduction of 20¢ per cwt. White Pass management justify the discount in view of the very high labour costs incurred in hiring longshoremen to pack the containers at the company wharf. In addition to the pick-up service mentioned above, the tariff includes delivery service and cargo insurance.[5]

Once the goods have been loaded and the container locked, it is loaded on the company's specially designed container ship, the "Frank H. Brown." To move these cumbersome containers from warehouse to dockside (they have a payload equivalent to a medium size truck) the company has invested in six straddle carriers. (The carriers are so large they can straddle a truck or a railway flat car, to place the containers aboard.) The containers and other materials, including open topped containers, called trays, are then loaded by the ship's gantry crane which moves fore and aft on rails, enabling it to service all seven of the ship's holds. The crane can lift up to 40 tons as well as being able to lift and replace the ship's hatch covers.

A total of 258 containers can be accommodated, 200 of which can be stowed in holds which are specially designed container cells, enabling the steel framed aluminum containers to be stacked four high. The remaining containers can be stowed on deck. To prevent any damage from the weather in transit the containers are available in four modified forms. The dry containers are used for hard goods that are not affected by temperature extremes. The vented containers permit a constant flow of fresh air, and are used for transporting hardy perishables during summer months. Heated containers are used for transporting freight that must be kept warm during freezing weather. Similarly refrigerated containers are available.

The ship is also equipped to carry petroleum products, having 12 tanks with a capacity of 900,000 gallons. The "Frank H. Brown" makes a round trip from Vancouver to Skagway every two weeks, 25 trips a year, with the sailing time being just less than three days from Vancouver to Skagway.

After the containers are unloaded at Skagway they are moved to Whitehorse on railway flatcars, one to a car, held in place by a special cone-shaped holding device. Once again transfer is made by using straddle carriers. Perishables are moved to Whitehorse on the day that they are unloaded, if possible, but it may be a further five to ten days before low priority freight reaches Whitehorse.

Once in Whitehorse the containers are moved off the train to await further movement by truck or to be opened and the contents distributed in the Whitehorse area. A shipment to Cassiar will probably be put straight onto a flat deck truck and delivered via the Alaska Highway, the goods still being under lock and key. In this case the entire container is moved by truck because the entire load is going to one destination, and what is more important,

there is a backhaul of goods readily available. Sacks of processed asbestos are available to fill the container for the haul back to Whitehorse and then to Vancouver. Unfortunately such situations are unusual in the company's area of distribution. Many shipments outside the Whitehorse area are less than container lots, which means the container bulk must be broken at Whitehorse for distribution. As a result White Pass must use regular semi-trailer trucks for small deliveries with little chance for backhaul.

Mining companies such as United Keno Hill invest in their own truck fleets to move ore concentrates to the Whitehorse terminal, and equip some trucks with low slung tanks to provide backhaul in the form of petroleum products.

The pipeline operated by the White Pass and Yukon railway is the only remaining part of the Canol pipeline constructed by the U.S. Army in 1944-45. The 4" pipeline is used to transport diesel fuel from Skagway to Whitehorse; it has a daily capacity of 3,000 barrels, several times the current needs of the district. Gasoline is transported by tank car to Whitehorse where there is a tank farm for storage.

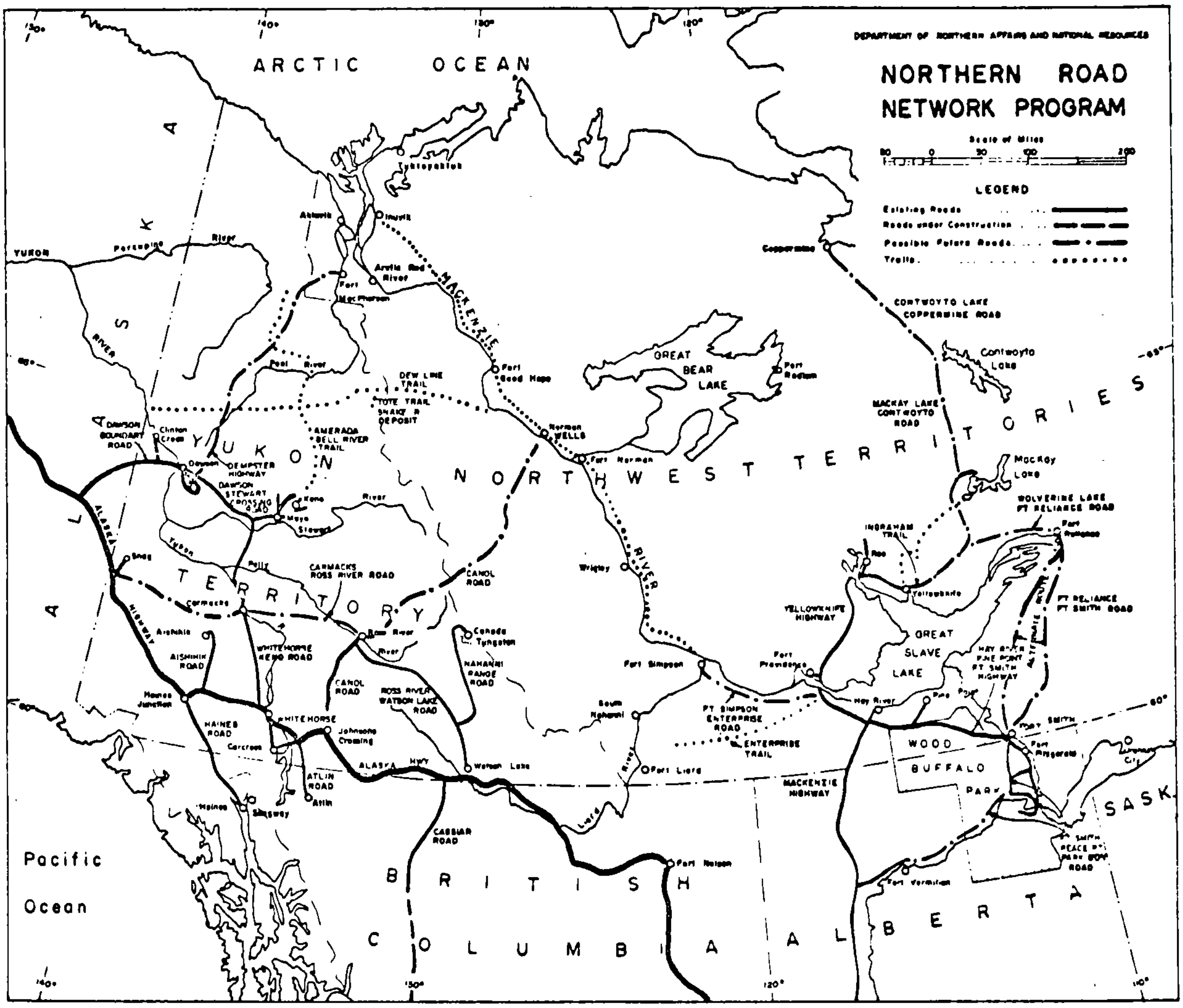
ii. Highway Transportation

The availability of highway transportation service is generally dependent upon two separate decisions; the first on the part of Government to construct a road or give financial assistance to road construction; the second, the decision of private firms to operate vehicles on these roads.

(a) Roads

The roads of the Yukon are shown in Figure 1. The overall road system can be sub-divided into a number of classes, firstly on the basis of quality and secondly on the basis of the nature of Government responsibility.

FIGURE 1


DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES
NORTHERN ROAD NETWORK PROGRAM
Scale of Miles
LEGEND
Existing Roads
Roads under Construction
Possible Future Roads
Trails
ARCTIC OCEAN
Pacific Ocean
YUKON TERRITORY
NORTHWEST TERRITORIES
BRITISH COLUMBIA
ALBERTA
SASK.
ALASKA
GREAT BEAR LAKE
GREAT SLAVE LAKE
WOOD BUFFALO PARK
MACKENZIE RIVER
ALASKA HIGHWAY
ALASKA HWY
DEMPSTER HIGHWAY
CANOL ROAD
CASSIAR ROAD
MACKENZIE HIGHWAY
YELLOWKNIFE HIGHWAY
HAINES ROAD
ATLIN ROAD
AISHIHIK ROAD
NAHANNI RANGE ROAD
CONTWOYTO LAKE COPPERMINE ROAD
MACKAY LAKE CONTWOYTO ROAD
WOLVERINE LAKE FT RELIANCE ROAD
FT RELIANCE FT SMITH ROAD
FT SIMPSON ENTERPRISE ROAD
ENTERPRISE TRAIL
INGRAHAM TRAIL
DEW LINE TRAIL
TOTE TRAIL
CARMACKS ROSS RIVER ROAD
ROSS RIVER WATSON LAKE ROAD
WHITEHORSE
Whitehorse
Dawson
Mayo
Carmacks
Ross River
Watson Lake
Fort Nelson
Fort Simpson
Fort Providence
Hay River
Yellowknife
Norman Wells
Fort Norman
Fort Good Hope
Coppermine
Contwoyto Lake
MacKay Lake
Fort Smith
Fort Liard
Fort McPherson
Aklavik
Inuvik
Tuktoyaktuk
Wrigley
Haines
Skagway
Atlin
Johnsons Crossing
Haines Junction
Carcross
Canada Tungsten
South Nahanni
Fort Vermilion
Pine Point

With the exception of town streets,roads are unpaved. Road quality, therefore, varies according to width, curvature, etc., generally consistent with the purpose of the road and, therefore, the volume and nature of the traffic, Table 3.

Table 4 shows the breakdown of the highways system according to the agency responsible.

The northwest highway system is made up of the Alaska Highway, the Haines road and the Watson Lake airport road. These roads were constructed by the United States Army and are now maintained by the Federal Department of Public Works.

The development roads are those constructed or being constructed under the development programs of the Department of Indian Affairs and Northern Development. Depending on the specific purpose of the road the Department may pay all (area development roads and network and communication roads) or part (permanent access roads) of the construction cost. The costs of maintenance are shared eighty-five per cent by the Department and fifteen per cent by the Territory. The road construction program is presently taking place under the ten-year program providing for an annual expenditure in the Yukon of about 5 million dollars.

The tote roads or initial access roads are low standard roads to facilitate access for an established resource exploration program. The Department of Indian Affairs and Northern Development may pay as much as fifty per cent of the construction cost; the road is maintained by the primary user. The program has been in effect since 1961; annual expenditures under this particular program are shown in Table 5.

TABLE 3

MINIMUM DESIRABLE ROAD STANDARDS[a.]

Type	Desirable[b.] Design Speed	Width of Right of Way	Width of Travelled Surface	Width of Shoulders (each)	Bridge Width & Height	Maximum Grade	Maximum Curvature
Area Development Road	50 m.p.h.	100'	18'[c.]	3'	24'& 14' 6"	10%	20°
Permanent Access Road	50 m.p.h.	100'	18'[c.]	3'	24'& 14' 6"	10%	20°
Initial Access Road	25 m.p.h.	50'	12' Min. with turnouts	nil	12'& 14' 6"	14%	35°
Resource Development Road	50 m.p.h.	100'	18'[c.]	3'	24'& 14' 6"	10%	20°
Tote	Tote Road may be constructed to whatever standard that will provide suitable access to property of individual						
Trunk	60 m.p.h.[d.]	150'	24'	4'	28'& 14' 6"	5%	7°
Secondary Trunk	40 m.p.h.	70'	18'	2'	24'& 14' 6"	12%	14°
Airport	30 m.p.h.	70'	18'	2'	24'& 14' 6"	12%	14°
Local	30 m.p.h.	100' or full dedicated right of way	18'	4'	24'& 14' 6"	14%[e.]	30°[f.]

a. Particular sections of road may be built to lesser standards where difficult terrain makes strict adherence to stated standards excessively costly.

b. Desirable design speed is not related to minimum standards shown.

c. 18' width should be considered as absolute minimum as any less width would be dangerous when heavy duty trucks meet.

d. Trucks 55 m.p.h.

e. & f. Required for various street layouts. Note: Bridge design on all roads H20-S16.

Source: Federal Department of Public Works, Whitehorse.

TABLE 4

ROAD MILEAGE BY TYPE IN THE YUKON 1967

Federal	-	Northwest Highway System (Alaska Highway, Haines Road and Watson Lake Airport Road) (An additional 666.5 miles of the Alaska Highway are in B.C.)	727.3 miles
Federal	-	Development Roads	113.70
Territorial	-	Territorial Roads	414.4
Private	-	Tote Roads	N.A.
Private	-	Winter Roads	N.A.
		Total available	2,278.7

TABLE 5

TOTE ROAD ASSISTANCE PROGRAMME
ANNUAL EXPENDITURES

1961 - 62	50,000
1962 - 63	44,733
1963 - 64	44,029
1964 - 65	69,942
1965 - 66	59,264
1966 - 67	100,000

Sources: N.G. Needham, "Tote Trail Progress Report", May 1966
K. Baker, Dept. of Engineering, Whitehorse.

Winter roads are constructed by companies to provide access either for tractor trains or trucks. The actual number of winter roads used cannot be determined; however, the Federal Department of Public Works in Whitehorse indicates that the major examples used since 1960 are as shown in Table 6.

In most cases these roads are "one shot" efforts, built without Government assistance and costs are not readily available. Based on oral statements of operators, costs would seem to vary between $500 and $1,000 per mile.

(b) Trucking

Three public companies and one private company dominate the highway transport services into, out of, and within the Yukon. The public companies are Canadian Freightways Limited, Loiselle Transport Limited and the White Pass and Yukon Railway, Highway Division. The private company is the Cassiar-Keno Transport Division at Whitehorse. There are a number of smaller carriers which operate up and down the Alaska Highway, for example, Alaska Highway Express, and within the Yukon Territory, some specializing in the contract hauling of machinery, oil well drilling equipment, and truck load lots of construction supplies, for example, Gordies Trucking Limited. The only comprehensive quantitative measure of all trucking is provided by motor vehicle registrations, shown in Appendix 1. However, the registrations include all vehicles from taxis and tow trucks to buses and inter-city trailers.

Highway transport is critical to the development of the Yukon economy. With only 59 miles of railway in the Territory, all commodities must be moved to or from railhead or tank farm by truck. Thus in 1966 of 118,000 tons of northbound traffic over the White Pass and Yukon railway and pipeline,

TABLE 6

ESTIMATED WINTER ROAD MILEAGE 1960 - 1967

Road	Approx. Mileage
1. Wind River Trail, Mayo to Bell River Drill Site	330
2. Dempster Highway to various drill sites, Socony-Mobile	400
3. Teslin-Tintina Silver Mines	120
4. Burwash Landing - Casino Silver Mines	180
5. Carmacks - Mt. Nansen Mines	40
Total	1,070

Source: Federal Department of Public Works, Whitehorse.

51,800 tons were delivered beyond Whitehorse.[6] The White Pass and Yukon Corporation, Highway Division, handles the movement of most inbound commodities past the rail terminus at Whitehorse as the rates ex Vancouver include pick-up and delivery. In addition gasoline and fuel oil are trucked from the Whitehorse tank depot to all accessible points in the territory, and south along the Alaska Highway into Northern British Columbia.

The southbound movement of concentrates and asbestos fibre (122,000 tons in 1967) travels from 9 to 395 miles by truck to railhead at Whitehorse. The Cassiar-Keno Transport Division hauls asbestos fibre from Clinton Creek and Cassiar, B.C., and concentrates from the Keno Hill Mine to Whitehorse, with a backhaul of all mine supplies except perishables and some petroleum products.

The two main common carriers on the Alaska Highway, Loiselle Transport Limited and Canadian Freightways Limited, operate scheduled service between Vancouver, Calgary, Edmonton, Dawson Creek and the Territory. Canadian Freightways Limited make available up to 20 units out of Dawson Creek for this service. Loiselle Transport Limited operate ex Edmonton, Dawson Creek and the north inter-lining with Vancouver-based carriers at Dawson Creek. Both companies have limited backhauls of mineral concentrates or asbestos fibre.

iii. Air Transport

Air Transport plays an important role in Northern Canada and is essential for the development of the Yukon economy. Like highway transport, the service which aviation can provide is partly dependent on Government investment and partly dependent on private enterprise. Since many aviation services are provided without public airports, the companies providing service will be described first.

(a) Aviation Companies

Three companies provide scheduled services, Canadian Pacific Airlines, Wein Air Alaska and Great Northern Airways, Figure 2. While the scheduled carriers and especially Canadian Pacific Airlines dominate available passenger and cargo statistics, other companies play an important role in internal movements in particular. All commercial air services provided in the Yukon and adjacent points are listed in Appendix 2. In recent years, the substitution of helicopters for fixed wing aircraft, particularly for mineral exploration, has been notable.

(b) Airports

There is no complete list of airports. The Canadian aerodrome directory does not include all unlicensed aerodromes; Table 7, while based on this directory, is supplemented for as many sources as possible. Both the Department of Transport and the Department of Indian Affairs and Northern Development have policy statements concerning airport development applicable to the Yukon. These policies will be considered further in Section 3. The Department of Transport has not constructed an airstrip in the Yukon since 1956.

B. Commodity Movements and Selected Passenger Statistics

A knowledge of existing commodity flows is vital to the formulation of transportation policy. The information is basic to the evaluation of effective competition, the understanding of rates and costs and the making of realistic forecasts.

A transport market can be measured in several ways. The statistics relied upon here are tons of freight and numbers of passengers. Passenger statistics are provided only as ancillary information available from the White

TABLE 7

NUMBER OF AERODROMES BY TYPE OF OPERATOR - NORTH WEST CANADA
1967

	Dot	Other Federal Departments	Territorial/ Provincial Govt.	Municipal Govt.	Commercial	Private	Other[a]	Total
Yukon Territory								
Land Aerodromes	8	2	5	-	1	1	2	19
Water Aerodromes	-	1	2	-	3	1	4	11
Total Yukon	8	3	7	-	4	2	6	30
Northwest Territories (Dist.MacKenzie)								
Land Aerodromes	8	2	-	-	5	-	13	28
Water Aerodromes	-	-	-	-	19	1	8	28
Total Northwest Territories	8	2	-	-	24	1	21	56
Northern British Columbia								
Land Aerodromes	8	-	3	5	2	7	2	27
Water Aerodromes	-	-	-	3	7	2	2	14
Total Northwest British Columbia	8	-	3	8	9	9	4	41
Heliports								
Yukon	-	-	-	1	-	-	-	1
N.W.T.	-	-	-	1	-	-	-	1
Total	-	-	-	2	-	-	-	2

a. Includes U.S.A.F., Emergency and non-operated strips.

Source: Canadian Aerodrome Directory, D.O.T., Ottawa, April, 1967.

FIGURE 2

SCHEDULED AIR SERVICES

INTO, OUT OF AND WITHIN THE

YUKON TERRITORY

(See Map in envelope affixed to back cover.)

Pass and Yukon Railway and the airlines. Freight statistics have been gathered where available from the main carriers.

An overall picture of the freight market is provided in Table 8. This Table is based on Company records except for the movements via the Alaska highway for which the Stanford Research Institute Report was used. The selection of 1964 thus enables a complete picture of the external commodity movements to be presented.

The Table shows the dominant position of the White Pass and Yukon railway, that Company being even more significant because of its trucking subsidiary, Loiselle Transport Limited. However, the aggregate figures mask significant features of the transport market which can be indicated most effectively by studying each route separately.

i. The White Pass and Yukon Railway

Aggregate traffic flow: Table 9 shows the White Pass and Yukon rail traffic for the period 1962 to 1967. General merchandise, gas and oil are virtually entirely northbound movements while the mine products are southbound movements. In 1967 the southbound movement of general merchandise totalled only 1000 tons. The Table shows several significant trends:

- A substantial increase in total shipments since 1965.
- Marked increases in the level of general merchandise, asbestos and ore concentrate shipments.
- An increasing absolute disparity between north and southbound shipments.

These developments are clearly related to the mining communities served by the White Pass and Yukon railway route. Such surges of demand have been a fundamental feature of the railway since its inception. The significant feature of the current changes is that they are related to long term developments in the economy.

TABLE 8

COMMODITY MOVEMENTS INTO AND OUT OF THE YUKON
BY MODE, 1964

A. INTO THE YUKON

Mode	General Freight and Household Effects	Petroleum	House Trailers	Air Mail	Total	
Truck, via Alaska Highway	14,130 tons	11,720 tons	104	-	25,954 tons	38.3%
Air	216	-	-	34	250	0.4%
White Pass	25,000	16,547	-	-	41,547	61.3%
Total	39,346	28,267	104	34	67,751	100.0%

B. OUT OF THE YUKON

Mode	General Freight and Household Effects	Asbestos	Ore Concentrates	Air Mail	Total	
Truck, via Alaska Highway	2,730 tons	10,248 tons	-	-	12,978 tons	12.6%
Air	53	-	-	31	84	
White Pass	2,000	56,000	31,700	-	89,700	87.3%
Total	4,783	66,248	31,700	31	102,762	100.0%

Source: Company data and Stanford Research Institute Report.

TABLE 9

WHITE PASS AND YUKON RAILWAY

Freight Traffic North and Southbound, 1962-1967 (Tons)[a.]

	1962	1963	1964	1965	1966	1967[b.]
General merchandise[c.]	34,000	25,700	27,000	25,000	38,200	41,600
Gas and Oil	18,422	22,075	16,547	20,707	22,647	23,358
Asbestos	49,096	54,553	56,033	56,400	80,010	85,249
Ore concentrate	26,966	28,161	31,711	29,447	23,945	37,000
TOTAL	128,484	130,499	131,291	131,554	164,802	187,207
Number of Passengers	24,662	29,112	28,758	19,578	27,185	26,908

a. Excludes Skagway traffic

b. Preliminary Figures

c. Rounded to the nearest hundred

Source: Whitepass and Yukon Railway, Rail Traffic Statements.

Origin and destination: The impact of the development activity at New Imperial Mines, Clinton Creek Mines and Ross River are clear in the destinations of northbound freight in the period 1965 to 1967, Table 10. The high proportion of freight consigned to Whitehorse reflects the role which the community plays as a break bulk and distribution centre for the region.

The volume of freight destined for Skagway from Seattle is evidence of the benefit that has been gained by the exemption of the traffic from the Jones Act. The exemption was given when Alaska steamships stopper operating into Skagway. The only other scheduled service available to Skagway now is the Alaska State Ferry system. This system now has the right to move Canadian highway traffic from Prince Rupert to the Yukon since the provision in the Canada Shipping Act favouring Canadian vessels has been lifted.

Commodity mix: While the broad categories of commodity mix are important, the share of the general freight market served by the railway is important in assessing the degree of competition with other modes of transport. Since the White Pass and Yukon railway dominates the transportation market, the Company carries a very wide range of commodities. Some of the most significant are liquor, groceries, especially canned goods, and a wide range of consumer supplies, construction equipment and machinery. An indication of the competition for some high valued or perishable freight is shown in Table 11; in particular, meat is now moving almost entirely by truck from Edmonton.

In relation to other Canadian resource railways the White Pass and Yukon has a relatively limited dependence on mineral products although it has a low total volume of freight, Table 12. The diversity arises from the relatively high volume of general freight and fuel which provides a seasonable volume of backhaul traffic; the general freight is a major source of revenue.

TABLE 10

NORTHBOUND GENERAL MERCHANDISE TO SELECTED DESTINATIONS
VIA THE WHITEPASS & YUKON ROUTE - 1965-1967

(tons)

	1965	1966	1967
Skagway (from Seattle)	1,100	910	1,749
Skagway	1,723	817	664
Carcross	224	276	541
Whitehorse	21,485	24,920	27,189
Carmacks	107	81	35
New Imperial	-	1,663	1,664
Mayo	400	511	259
Dawson	806	768	752
Clinton Creek	652	7,809	6,506
Cassiar	8	179	241
Ross River	32	538	2,326
Other	426	361	1,087
TOTAL	26,951	38,833	43,048

TABLE 11

VOLUME OF ANNUAL MOVEMENTS OF SELECTED COMMODITIES ON THE WHITE PASS AND YUKON RAILWAY, 1956 - 1966

'000 lbs.

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
20. Agricultural implements	1.1	15.0	9.8	11.8	2.2	13.7	2.6	2.6	3.4	1.5	8.3
30. Airplane parts	4.1	2.1	1.7	-	4.1	1.3	1.0	1.1	-	-	0.6
31. Airplane engines	-	-	2.4	3.3	7.6	5.3	6.4	7.0	3.6	0.5	0.5
50. Household appliances	157.2	188.2	182.5	248.2	282.1	299.4	265.6	181.6	170.1	166.1	207.5
145. Drugs, toiletries medical supplies	109.9	112.7	515.9	105.7	134.1	133.6	140.4	113.1	106.6	112.3	202.9
165. Industrial electrical parts and equipment	356.2	384.3	495.5	221.9	451.8	243.5	306.2	171.9	196.2	195.3	202.9
365. Fresh meat & poultry	34.7	42.0	19.4	6.3	-	0.1	0.3	1.9	-	-	-
366. Frozen meats & poultry	-	149.5	12.6	8.3	21.1	19.0	41.1	78.3	55.1	8.1	-
12. Paper products (Not otherwise classified)	-	149.8	302.0	100.8	75.3	86.8	106.6	94.1	110.6	145.2	462.7
13. Manufactured paper products	-	-	-	187.4	275.6	274.7	310.1	321.0	256.6	271.4	251.8
14. Radios, televisions	15.6	23.6	33.7	29.5	22.0	28.0	17.3	19.2	16.4	15.9	19.4

Source: Whitepass and Yukon Railway, Rail Traffic Statements.

TABLE 12

SOME CLASS II AND III RAILWAYS CARRYING MINERAL PRODUCTS
(5 YEAR AVERAGE - 1962-1966)

'000 tons

	Agri-culture	Mines	Mines (Percentage of total)	Forests	General	Total
Quebec North Shore	-	14,438	98%	7	323	14,768
Cumberland	-	3,385	99%	2	26	3,413
Algoma Central	-	2,947	70%	534	690	4,171
Roberval and Saguenay	-	2,397	80%	-	481	2,878
Napierville Junction	14	190	72%	2	58	264
White Pass and Yukon	1	87	64%	1.3	45	134.3
Northern Alberta	707	126	12%	218	58	1,109
All Canada Railways			15%			

Source: Dominion Bureau of Statistics, Railway Transport Part V, 1966, Queen's Printer, Ottawa.

Back haul: In general, resource railways can be expected to have a high empty freight car-mile ratio due to inadequate freight to balance the heavy commodity movements. However, the White Pass and Yukon has a lower empty freight car mile ratio than even the Canadian average, Table 13. The relatively monopolistic position of the Company on account of the lower total cost of operation on the Vancouver-Skagway-Whitehorse route is a partial explanation.

Seasonality: The cost level of the railway is assisted by only a limited problem with seasonality. The southbound movement of mineral products does not have a regular or significant seasonality. Since more goods move south on the railway than north, the northbound peaking has not exceeded the capacity of the Company's facilities, Table 14. The Company's real concern has been to provide sufficient rail capacity to meet the increasing volume of southbound freight. The implications of the increasing volume of mineral products are the most significant issues in planning the development of the railway. During periods of heavy shipment of construction material, northbound tonnage may exceed the capacity of the "F.H. Brown", and close to 2 weeks may be required for rail shipment from Skagway to Whitehorse.

Shipment size: Thus far the discussion has been concerned with traffic statistics which showed the White Pass to have considerable advantage in traffic mix over similar railroads. However, the railway has one traffic characteristic which has been of considerable concern to the Company, namely, the large number of small shipments they have been required to handle in the northbound movement of the general merchandise, Tables 15 & 16. Because the size of the individual shipments is small, terminal handling costs, particularly in Vancouver, are very high.

In March 1967, to encourage shipment consolidation and increased shipment size in general, the Company introduced a new tariff. The tariff consolidated a multiplicity of items and provided a range of incentive rates for heavy loading.

TABLE 13

PERCENTAGE OF EMPTY FREIGHT CAR MILES,
ALL CANADIAN RAILWAYS AND SELECTED "MINERAL" LINES

	All Canadian Railways	White Pass & Yukon Railway	Quebec North Shore	Cumberland	Algoma Central	Roberval & Saguenay	Napierville Junction	Northern Alberta
1962	37	20	49	47	38	49	44	40
1963	37	14	49	48	40	47	49	39
1964	35	20	49	49	38	46	45	40
1965	35	21	49	49	39	48	43	39
1966	36	20	49	47	33	49	41	43

Source: Dominion Bureau of Statistics, Railway Transport Part IV, 1966 (Operating and Traffic Statistics).

TABLE 14

ANALYSIS OF SEASONALITY
WHITEPASS & YUKON RAILWAY AND CANADIAN CLASS I & II RAILWAYS

(The Maximum and Minimum Revenue Months are expressed as a Percentage of the Total Year's Revenue)

	White Pass (north bound rail traffic only)		Freight Car Revenue aggregate of Class I & II Canadian Railways	
	Maximum	Minimum	Maximum	Minimum
1961			July 12.2%	Jan. 7.8%
1962	July 11.5%	Dec. 5.2%	Nov. 10.6%	Feb. 8.0%
1963	March 10.0%	Dec. 6.0%	May 11.0%	Feb. 7.9%
1964	June 13.0%	Jan. 4.1%	June 9.0%	Feb. 7.7%
1965	June 10.6%	Jan. 5.1%		
1966	August 11.0%	Jan. 5.3%		
1967	July 11.0% (for 11 months)	Feb. 7.2%		

The average percentage difference between seasonal highs and lows as shown above:

White Pass and Yukon Railway	5.9% average seasonal range
Aggregate	2.9% average seasonal range

TABLE 15

A. DISTRIBUTION OF SHIPMENTS ACCORDING TO REVENUE

	1961	1962	1963	1964	1965	1966
Less than carload	12.5%	12.5%	14.0%	13.2%	11.0%	10.0%
Mixed carload	22.5	23.0	25.0	22.7	22.0	19.0
Straight carload	25.0	24.0	38.0	30.0	37.5	40.0
Volume carload	22.0	23.0	12.0	15.0	15.5	8.8
Carload	21.5	21.7	21.7	20.8	16.0	20.0
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

B. DISTRIBUTION OF SHIPMENTS ACCORDING TO WEIGHT

	1961	1962	1963	1964	1965	1966
Less than carload	10.0%	10.0%	9.7%	17.5%	9.8%	8.0%
Mixed carload	18.0	22.0	20.5	17.0	18.2	13.0
Straight carload	28.0	26.3	33.0	30.0	40.0	48.0
Volume carload	24.0	20.0	16.2	18.5	15.0	12.5
Carload	19.5	20.0	18.8	17.0	15.2	17.5
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Company Records, White Pass and Yukon Railway.

TABLE 16

DISTRIBUTION OF NUMBER OF SHIPMENTS ACCORDING TO SIZE
WHITE PASS AND YUKON RAILWAY

Shipment Size (Pounds)	June 1966	June 1967
0 - 100	15.0%	21.0%
100 - 1,000	62.0	48.0
1,000 - 2,000	10.0	8.0
2,000 - 5,000	7.5	7.0
5,000 - 10,000	2.0	3.0
Over 10,000	4.0	10.0
	100.0%	100.0%

Source: White Pass and Yukon Route Waybills for the months of June 1966 and 1967.

TABLE 17

DESTINATION OF NORTHBOUND GENERAL FREIGHT TRIPS, 1964

	Destination (number of trips)					
Origin	Fort St. John	Fort Nelson	Watson Lake	Whitehorse	Alaska	Total
Edmonton-Calgary	85	85	469	625	156	1,420
Vancouver	37	42	74	237	74	464
Can. Prairies	11	11	-	36	31	89
Total	133	138	543	898	261	1,973

Source: Calculated from data in the Stanford Research Institute Report. Note comparative rates in Table 27A.

Table 16 supports the belief that the tariff is having its desired effect. The result of the tariff was to reduce general merchandise rates by approximately 6%. The full extent of the cost and rate savings will not be known till the tariff has been in operation for a longer period of time.

ii. Highway Transportation

The diversities of companies performing transportation into and out of the Yukon via the Alaska highway precludes an estimate of the 1967 volume of total traffic. However, information obtained from the major carriers of general freight combined with the results of the Stanford Research Institute's Report enable the significant characteristics of the movement to be outlined.

Origin and destination: A significant amount of petroleum moves into the Yukon by the Alaska Highway, for 1964 it was estimated as over 11,000 tons. Some of this comes from Edmonton but four fifths comes from Taylor Field at Fort St. John. Most of the petroleum travels only as far as Fort Nelson, but up to 24 per cent moves into the Yukon, of which more than two thirds goes to Watson Lake.

The movement of general freight also shows the importance of trucking via the Alaska Highway in the southern areas. (Table 17) While Whitehorse was the major single destination its importance to trucking is less than proportional with the population distribution in the Yukon and far less than the importance of Whitehorse to the White Pass and Yukon railway. In 1964 the number of trips to Watson Lake via the Alaska Highway were 61% of the Whitehorse trips.

During 1967 Watson Lake was an even more important destination for traffic because of the special need of the Canada Tungsten Mine for construction materials. However, it is evident that as a result of the trucking services, communities in the southern and central section of the Alaska Highway have a choice between two distribution systems for certain freight.

Commodity mix: The analysis of the White Pass and Yukon traffic shows the tonnage of certain perishables (meat) has declined absolutely, the tonnage of other high valued freight has shown a relative decline when compared to the total movement of general freight. The service differential which can be offered by trucking, even out of Vancouver, can more than compensate for a higher freight rate when storage costs, inventory and service factors are taken into account. The ability of trucking to achieve second or third day delivery in Whitehorse from Edmonton makes the service ideal for commodities such as perishables (particularly meat and packing house products, fresh and frozen produce), replacement parts for industrial equipment and many high value goods which are ordered on request by a dealer to lessen his inventory risk. In addition, building products and cement and small quantities of beer and lumber are hauled.

Backhaul: The backhaul problem faced by the truckers is serious. Unlike the railway the heavy volume of traffic is northbound. For example, in 1967 the weight of southbound freight hauled by Canadian Freightways was only 27% of the northbound volume. General merchandise backhaul is very limited and generally of low value (for example empty beer bottles) so that the main companies back haul mine products.

Loiselle Transport carries asbestos fibre from Cassiar, B.C. to railhead at Fort St. John and Canadian Freightways hauls tungsten concentrates for Canada Tungsten from Watson Lake to Vancouver.

Seasonality: Trucking also appears to be afflicted with a significantly greater problem of seasonality than the White Pass and Yukon railway. Table 18 shows the range in the White Pass and Yukon Company's Highway Division revenue for the period 1962 to 1967. In 1967 the minimum month, January, for Canadian Freightways accounted for only 3.3% of the year's total freight; July the maximum month accounted for 14.8%. This seasonality, together with the backhaul problem, pose obvious problems in equipment utilization.

TABLE 18

ANALYSIS OF SEASONALITY
WHITE PASS & YUKON COMPANY, HIGHWAY DIVISION

(The maximum and minimum revenue months are expressed as a percentage of the total year's revenue)

White Pass Trucking Revenue*

	Maximum			Minimum	
1962	June	18.0%		December	1.9%
1963	February	17.0%		October	3.1%
1964	March	19.0%		January	5.0%
1965	November	25.0%		January	1.8%
1966	September	13.0%		June	5.3%
1967 (for 11 months)	July	15.6%		November	3.0%

The average percentage difference between seasonal highs and lows as shown above.

Trucking revenue 14.6% average seasonal range.

*Revenue allocated to trucking from through hauls and local business.

Source: Company Records, White Pass and Yukon Railway

TABLE 19

PERCENTAGE DISTRIBUTION OF SHIPMENTS BY WEIGHT TO WHITEHORSE, Y.T. 1967
CANADIAN FREIGHTWAYS LTD.

	1-100 lbs.	100-1000 lbs.	Over 1000 lbs.
From Edmonton	46	45	9
From Vancouver	39	53	8

Source: Canadian Freightways Ltd., Company Records.

Shipment size: Because the truckers serve the service-orientated section of the transportation market, they have a higher proportion of small shipments than the railway, Table 19. During 1967 between 8 and 9 per cent of Canadian Freightway's shipments were over 1,000 lbs; in June 1967, 28% of the railways shipments were over this weight.

iii. Air Transport

Airline movements of freight into the Yukon are insignificant by weight, Table 8. However, the value of the items transported makes the services of significance and the performance of the freight service is partially a reflection of the overall level of airline service.

Origin and Destination: The flow pattern of air freight is dominated by Whitehorse and Vancouver, Tables 20 and 21. However, the freight originating in Alberta or moving via Alberta is important because the freight from B.C. and flying via Prince George is combined with the eastern provinces freight at Fort St. John. This may result in freight being bumped at this station. It is partly because of this that about one third of the freight flies as express, Table 22.

Commodity mix: The commodities carried are largely perishables or emergency shipments, Table 23.

Back haul: The origin and destination statistics indicate that back haul is very limited as would be expected for a premium transportation mode.

Seasonality: In spite of occasional surges in demand from mining developments Canadian Pacific Airlines (CPA) is not faced with serious seasonal variations in cargo volumes, Table 24. Of far more concern to the airline is the daily pattern which peaks heavily at the end of the week, Table 25. It is at this time that the problem of bumped freight is most severe.

TABLE 20

ORIGIN OF AIRFREIGHT INTO THE YUKON 1963-1966

'000 lbs.

Origin	1963	1964	1965	1966
Alberta (Edmonton)	126.9	108.6	131.0	149.2
Vancouver	303.1	304.8	312.5	383.2
Rest of B.C.	14.4	17.2	15.3	17.6
	444.4	430.6	458.8	550.0

Source: Canadian Pacific Airlines

TABLE 21

DESTINATION OF PACKAGES FROM YUKON TO ELSEWHERE
COMBINED TOTAL FOR JANUARY 1-7, MARCH 5-11, JUNE 18-24, 1967

	No.	Percentage
To Vancouver	173	71%
To Alberta	38	16%
To Rest of B.C.	6	2%
to Rest of Canada	17	7%
To United States	10	4%

Source: Canadian Pacific Airlines

TABLE 22

DIVISION BETWEEN EXPRESS AND FREIGHT CARGO, FROM EDMONTON AND VANCOUVER TO THE YUKON, 1963-1966

	1963		1964		1965		1966	
From	Express	Freight	Express	Freight	Express	Freight	Express	Freight
Edmonton	27%	73%	36%	64%	36%	64%	31%	69%
Vancouver	19%	81%	22%	78%	25%	74%	32%	68%

Source: Canadian Pacific Airlines

TABLE 23

AIR CARGO COMMODITIES TO YUKON EX VANCOUVER FOR FOUR SELECTED WEEKS, 1967

Products	% of Total Packages per Major Product Type (averaged for above weeks)	Average Weight including Heavy Pieces
1. General Merchandise	23%	19 lbs.
2. Machinery, Aircraft Parts	20%	33 lbs.
3. Newspapers	14%	22 lbs.
4. Car, Truck, Tractor Parts	14%	17 lbs.
5. Films, Video Tapes	8%	29 lbs.
6. Unknown	6%	17 lbs.
7. Flowers	2%	25 lbs.

Source: Canadian Pacific Airlines

TABLE 24

MONTHLY TOTALS OF DIFFERENT TYPES OF CARGO
ON BOARD CPA PLANE, FLIGHT 21, BOUND FOR WHITEHORSE,
DEPARTING FROM VANCOUVER - FOR 1966

Month	No. of Flights per month	Baggage Weights (lb.)	Mail Weights (lb.)	Express Weights (lb.)	Freight Weights (lb.)	Company Mat. (lb.)	Total
December	30[b]	39,300[a]	35,400	15,400	59,800	2,800	152,700
November	30	42,700	26,000	15,300	50,500	3,100	137,600
October	28	50,000	32,300	15,700	47,600	2,600	148,200
September	28	55,500	22,000	12,900	46,300	2,900	139,600
August	27	60,200	20,700	14,000	37,300	2,800	135,000
July	26	50,000	20,100	13,900	33,700	800	118,500
June	27	57,400	28,700	13,800	39,100	2,200	141,200
May	29	58,800	29,500	13,700	46,600	2,000	150,600
April	26	50,700	12,600	19,900	38,500	3,500	125,200
March	27	45,600	7,400	13,200	38,500	2,000	106,700
February	24	42,600	6,200	12,900	33,900	3,200	98,800
January	25	54,435	7,100	14,500	33,100	2,200	111,300

a. Rounded off to the nearest 100 lbs.

b. These flights contain considerable material that is destined for Prince George, Fort St. John or Dawson Creek.

Source: Canadian Pacific Airlines

TABLE 25

WEEKLY DISTRIBUTION OF FREIGHT CARGO CARRIED IN SELECTED WEEKS, 1967 FROM VANCOUVER TO THE YUKON

	February 5-11		February 19-25		June 18-24		October 15-21	
	lbs.	%	lbs.	%	lbs.	%	lbs.	%
Sun.	350	3.5	980	6.1	390	2.6	320	2.0
Mon.	810	5.3	540	3.4	790	5.2	590	3.8
Tues.	2,010	13.1	1,790	11.1	2,430	16.0	1,300	8.3
Wed.	2,200	14.3	2,760	17.1	2,360	15.6	3,100	19.8
Thurs.	2,350	15.3	3,490	21.7	3,230	21.2	2,990	19.0
Fri.	2,750	17.9	2,210	13.8	2,400	15.8	3,150	20.1
Sat.	4,890	31.7	4,290	26.7	3,560	23.4	4,260	27.2
	15,400	100.1	16,060	99.9	15,160	99.8	15,710	100.2

Source: Canadian Pacific Airlines

Shipments size: Ninety-eight per cent of the shipments and seventy-four per cent of the freight weight is accounted for by shipments of less than 51 lbs.

While the characteristics of the scheduled services can be readily described, an important aspect of aviation service is the operation of unscheduled services by fixed wing and rotating wing aircraft. It is exceedingly difficult to describe these services in quantitative terms. Table 26 shows the percentage increase in aircraft movements at airports reported in the aviation centre statistics. These statistics make the rapidly increasing use of aircraft, especially the helicopter for geological exploration, evident. The averages mask the very great increase which took place at Whitehorse in 1966 (50% increase over 1965) and which has continued since that time, Appendix 3.

Another measure of the volume of air service is the passenger, origin and destination statistics, which indicate that between 1962 and 1966 there was a cumulative increase of 50% in traffic through the Whitehorse airport with one-half of the increase occurring in 1965 and 1966. The years 1967 and 1968 will also show a very substantial increase in air travel into and out of the Yukon territory. Appendix 4 provides statistics of passenger movements.

C - TRANSPORTATION RATES, SERVICE AND COMPETITION

The description of commodity flow has already indicated that the significant competition for the water rail route is effectively confined to certain commodities and is particularly significant in the area of Watson Lake. This pattern is accounted for, firstly by rate levels and secondly by service differentials.

TABLE 26

AVERAGE ANNUAL PERCENTAGE INCREASE IN AIRCRAFT MOVEMENTS, 1962-1966

Airport	Total Movements Including Scheduled	Other Commercial	Helicopters
Whitehorse, Y.T.	13.96	18.82	12.42
Watson Lake, Y.T.	3.46	3.6	13.88
Teslin, Y.T.	-7.34	-3.82	7.52
Yellowknife, N.W.T.	13.46	26.26	20.68
Hay River, N.W.T.	15.52	71.88	253.32
Norman Wells, N.W.T.	21.66	19.74	1,082.8
Inuvik, N.W.T.	23.8	31.5	270.0
Fort St. John, B.C.	26.04	158.38	17.2
Fort Nelson, B.C.	14.14	107.3	47.0

Source: Statistical Appendix 3

i. Rate levels: The rates for general freight travelling on the three transportation routes to the Yukon are compared in Table 27. While Canadian Freightways has only one rate for more than 90% of the goods sent to the Yukon, and Canadian Pacific Airlines, similarly, has only one air express and one air freight rate, a problem for comparison does arise due to the many different rates existing on the White Pass & Yukon system.

The sample rates that are used, therefore, for the White Pass & Yukon system are a low (item 80) a medium (item 55) and a high level rate (item 25). More specifically, item 80 includes machinery, item 55 is packaged groceries such as vegetables, hardy fruits and household sundries (packaged, dry or in glass), while item 25 includes a large number of goods ranging from adding machines, carpets, furniture and refrigerators to sail boats.

It is only the high level rate which may be considered price competitive to the trucking rate. Table 27 shows that this competitiveness is strongest for the Vancouver to Watson Lake route. Except for the full truck load rate, where trucking is less expensive, the truck rate is on the average only about 20% higher than the rail rate. For the Vancouver to Whitehorse route, however, the truck rate is about 50% higher than the high level White Pass & Yukon rate. This rate difference of 50% is also applicable for Vancouver to Dawson and Mayo.

For the air route, while freight is much less expensive than express, the freight rate for 100 lbs. and 500 lbs. to all four Yukon destinations is about 150% more expensive than the truck rate and about 250% more expensive than the rail rate. Even to Watson Lake the air freight rate is about 200% higher than the rate on the rail route. However, the rates on air shipments becomes more

TABLE 27

COMPARISON OF FREIGHT RATES FOR THE THREE TRANSPORTATION ROUTES INTO THE YUKON (per cwt.), 1967

A. Vancouver to Watson Lake

Weight (lbs.)		White Pass & Yukon Item 80	White Pass & Yukon Item 55	White Pass & Yukon Item 25	Truck	Air Freight[a.]	Air Express
10		(5.50	5.50	6.30	7.81	6.60	4.30
50	Note	(5.50	5.50	6.30	7.81	11.85	21.50
100		(5.50	5.50	6.30	7.81	19.35	43.00
500		4.30	5.10	6.30	7.60	18.50	43.00
1 M		3.96	4.51	5.71	7.29	*	*
10 M		3.51	4.16	4.96	5.95	*	*
36 M[d.]		(2.95	3.55	4.25	4.00	*	*
		(2.75	3.35	4.05			

B. Vancouver to Whitehorse

10		(4.50	4.50	5.50	8.25[a.]	6.60	4.90
50		(4.50	4.50	5.50	8.25	11.85	24.50
100		(4.50	4.50	5.50	8.25	19.35	49.00
500		3.50	4.30	5.50	8.07	18.50	49.00
1 M		3.25	3.80	5.00	7.81	*	*
10 M		2.75	3.40	4.20	6.38	*	*
36 M[d.]		(2.50	3.10	3.80	5.15	*	*
		(2.30	2.90	3.60			

continued next page

TABLE 27 (cont'd)

COMPARISON OF FREIGHT RATES FOR THE THREE TRANSPORTATION ROUTES INTO THE YUKON (per cwt.), 1967

C. Vancouver to Mayo

Weight (lbs.)		White Pass & Yukon Item 80	Item 55	Item 25	Truck[c.]	Air Freight[b.]	Air Express
10		(5.00	5.80	7.00	10.83	8.35	6.20
50	Note	(5.00	5.80	7.00	10.83	15.35	31.00
100		(5.00	5.80	7.00	10.83	24.95	62.00
500		5.00	5.80	7.00	10.32	24.10	62.00
1 M		4.70	5.25	6.45	10.06	*	*
10 M		3.80	4.45	5.25	7.88	*	*
36 M[d.]		(3.30	3.90	4.60	6.65	*	*
		(3.10	3.70	4.40			

D. Vancouver to Dawson City

10		(5.60	6.40	7.60	11.25	9.10	7.20
50	Note	(5.60	6.40	7.60	11.25	16.85	36.00
100		(5.60	6.40	7.60	11.25	27.75	72.00
500		5.60	6.40	7.60	10.57	26.90	72.00
1 M		5.25	5.80	7.00	10.31	*	*
10 M		4.25	4.90	5.70	8.13	*	*
36 M[d.]		(3.60	4.20	4.90	6.90	*	*
		(3.40	4.00	4.70			

Source: Published rates of White Pass and Yukon Route; Canadian Freightways Ltd.; and Canadian Pacific Airlines.

a. Some commodity rates exist into Whitehorse, eg. vehicle parts, tires, but they only give lower rates than those shown for small size shipments. Minimum rate is class rate at 36,000 lbs. for all other movements.

b. In order to have the rates on an equal service basis, the air freight includes a charge for pickup and delivery, a minimum of $1.35, or 50¢ per 100 lbs.

c. The truck rates to Mayo and Dawson are made up of the Canadian Freightways rate to Whitehorse, plus an additional charge for further shipment by another company.

Continued on next page

Footnotes to Table 27 - (cont'd)

d. If a shipper loads a container to 24,000 lbs. or pays the difference in weight deficiency, 20¢ per 100 lbs. discount is given by the White Pass & Yukon Railway.

* A single air shipment of this size is extremely unlikely due to plane limitations. (Note: a company shipment of 2 crates is in the case of air cargo regarded as two shipments.)

Note: The minimum charge for shipments of 100 lbs. or less is laid down in Rule 115 of Tariff G.F.O. #800; C.T.L., (F) #87. White Pass & Yukon Railway.

TABLE 27A

A COMPARISON OF TRUCK FREIGHT RATES BETWEEN

VANCOUVER, EDMONTON AND THE YUKON TERRITORY

Minimum Shipments 0-499 lbs.	Vancouver	Edmonton
Whitehorse, Y.T.	$ 21.90*	$ 7.25

L.T.L. Shipments
500 to 36,000 lbs.

Minimum Weights	5,000	20,000	5,000	20,000
Whitehorse,Y.T. cents per 100 lbs.	695	543	550	485
Watson Lake, Y.T.	643	476	480	375

T.L. Shipment 36,000 lbs.	Vancouver	Edmonton
Whitehorse, Y.T. cents per 100 lbs.	515	subject to negotiation
Watson Lake, Y.T.	400	

Highway Mileage

	Dawson Creek	Watson Lake	Whitehorse
Vancouver	740	1,375	1,658
Edmonton	374	1,009	1,292

Tariff References

Canadian Freightways Ltd. as of July 1st, 1968	#8	items 220 and 930
	#9	items 365 and 325

* Note increase in rate for minimum shipments (Table 27) Vancouver to Whitehorse from $8.25 to $21.90; Weight of minimum shipments increased from 100 lbs. to 499 lbs. Applies to Class 100, 85 and 70 merchandise.

competitive as the shipments size decreases; where a high cost per pound has to be paid, air freight may even offer a lower rate for small sized packages.

A further comparison of rates can be made by relating the revenue per ton a mile for each route, Table 28. The figures show that the truck rate per mile is almost the same as that of the White Pass & Yukon Rail route. This is even though the latter includes an 850 nautical mile (980 land miles) ocean haul.

As a comparison, average revenue per ton mile of domestic freight in the United States for 1964 was 1.3¢ for rail, 6.5¢ for motor carriers, 0.3¢ for inland waterways and 21.7¢ for domestic trunk airlines[7].

Further comparisons of freight rates are beneficial. Table 29 shows the average revenue per ton mile for selected commodities on the White Pass & Yukon railway and for all Canadian railways. In spite of the long total haul, 1090 miles, and the long sea haul, 980 miles, the rates on the White Pass & Yukon route in some cases are substantially higher than the Canadian average. However, the most significant feature is the substantial variation in the level of rates by commodities.

The minimum ton mile rate on general merchandise moving north is well above the average Canadian revenue from class-rated traffic. On the other hand the rates on southbound mine products are very similar to the non-competitive commodity rates for Canadian railroads. Since the White Pass & Yukon is faced with special characteristics, especially low total tonnage, significant variations from the Canadian rail average are to be expected; however, such

TABLE 28

REVENUE PER TON-MILE RANGES FOR THE THREE TRANSPORTATION STREAMS FROM VANCOUVER INTO THE YUKON, 1967.

Transport Stream	Origin and Destination	Distance (in miles)	Rate Range	Revenue per ton-mile Range
Truck	Van. to W. Lake	1470	$4.00 - 7.81	5.4¢ - 10.6¢
W.P.& Y.	Van. to W. Lake	1370	$2.95 - 6.30	4.4¢ - 9.2¢
Truck	Van. to Whitehorse	1750	$5.15 - 8.23	5.9¢ - 9.4¢
W.P.& Y.	Van. to Whitehorse	1090	$2.50 - 5.50	4.6¢ - 10.1¢
Air	Van to W. Lake and Whitehorse	1264	$19.35 - 18.50	30.6¢ - 29.3¢

Source: Table 27

TABLE 29A

AVERAGE REVENUE PER TON/MILE
ALL CANADIAN RAILWAYS

Category of rate	1961	1962	1963	1964	1965
Normal rated traffic					
Class	4.28¢	4.34¢	3.95¢	4.03¢	3.95¢
Commodity	1.73	1.75	1.57	1.50	1.44
Competitive rated traffic					
Competitive	2.51	2.48	2.55	2.50	2.61
Agreed	2.21	2.12	1.93	1.87	1.84

Source: Waybill Analysis, 1965; Board of Transport Commissioners, Ottawa, 1966

TABLE 29B

WHITE PASS AND YUKON RAILWAY
Revenue per ton/mile 1967 for selected South and Northbound movements using highest minimum weights and lowest rates

Commodity	Weight	Revenue per ton/mile (¢)
Asbestos	Container load	1.54[a.]
Copper & lead-zinc concentrates	Container load	1.45
Bagged Cement[b.]	100,000 lbs.	2.80
General Merchandise[b.] (Item 25)	36,000 lbs.	7.00

a. For volumes up to 80,000 tons per year the rate Whitehorse - Vancouver is $17.00 per ton.

b. Movement Vancouver - Whitehorse, distance, 1,090 statute miles.

Source: White Pass and Yukon Railway Freight Tariffs.

variation between rates do not appear to be rationally explained in cost differences. Such variations could not exist if it were not for the effective protection from competition which the White Pass & Yukon experiences because of the high cost of trucking service via the circuitous Alaska Highway. Further protection from competition on northbound movements is by long-term contracts entered into by mining companies to ship inbound via the rail route in return for lower rates than those which would otherwise have applied on outbound freight.

The effect of the rate differentials is that the northbound traffic, although much less in volume than the southbound traffic, is by far the most important source of revenue, Table 30.

Since all the freight is containerized and this may be done by the shipper, there is little scope for variation in costs. A pre-loaded container of 36,000 lbs. of canned goods pays $918; a southbound pre-loaded container of asbestos weighing 40,000 lbs. pay $340. The tariffs are evidently based on a more severe application of differential pricing than is found elsewhere in Canada.

In fact, the majority of northbound containers contain significantly less freight than those that are southbound; it is estimated that 80% of the northbound loaded containers have net loads of 12 tons or less and approximately 80% of southbound containers have net loads of from 22 to 24 tons. In spite of this there is a surplus of containers moving north.[8]

ii. Service levels: The distribution strategy that causes firms to select certain modes of transport involves more than just the published cost of transport. A recent survey was conducted by "Traffic Management" magazine in the United States "to determine what factors led to the selection of a carrier."[9] They concluded that time in transit was the most important factor

TABLE 30

WHITE PASS & YUKON RAILWAY FREIGHT REVENUE
($000)

	1962	1963	1964	1965	1966	1967[b.]
General merchandise[a.]	1,370.0	1,091.6	1,060.5	1,052.0	1,508.3	1,522.0
Gas and oil[a.]	278.5	333.3	249.6	313.3	346.6	364.7
Asbestos[a.]	436.3	479.6	490.4	471.2	637.0	681.9
Ore concentrate[a.]	189.0	186.1	230.4	206.6	172.5	287.5
TOTAL	2,273.8	2,090.6	2,030.9	2,043.1	2,664.4	2,856.1[c.]
Passengers	240.5	316.8	307.2	311.9	436.2	412.9

a. Rounded to the nearest hundred

b. Preliminary figures

c. The rail freight revenue is that portion of the total freight revenue allocated to the rail movements.

Source: White Pass & Yukon, Rail Traffic Statements.

followed by on-time performance, shipment tracing and in the fourth place freight charges. The advantages that arise to the user of different transport systems due to shorter time in transit occur mainly in six categories. These are interest on capital invested in shipments en route; storage and warehousing costs; size of inventories needed; obsolescence; flexibility in adapting to changing marketing demands; and, lastly, better service and greater customer satisfaction. The significance of these factors varies, of course, for the various transport users and the different products transported.

The number of days that freight is in transit for the three transportation routes from Vancouver into the Yukon is shown in Table 31. In each case, in-transit time is indicated as a range of days. The minimum number of days is the least time taken from the pick-up at origin until delivery at destination. This occurs when the optimum day is chosen for the pick-up of the shipment. The maximum number of days occurs when the day furthest from a departure date is chosen as day one. The time in transit is then computed from this day until the shipment reaches its destination.

The range of in-transit times offered by the White Pass & Yukon is unusually wide. The minimum time is calculated on the basis of a perishable commodity which can be delivered to the railway on Thursday, the day before the "Frank H. Brown" sails and which is the first freight to be transported from Skagway to Whitehorse. Some of this freight would be available for delivery late on Monday. Shipments of non-perishables for points beyond Whitehorse are normally moved from Skagway immediately after the perishables so that freight to these points can be consolidated. Consequently, the minimum in-transit time to Watson Lake and Mayo

TABLE 31

TIME IN-TRANSIT BY MODE, VANCOUVER TO YUKON POINTS, 1967

Transportation Route	Time Range	Destination Whitehorse	Watson Lake	Mayo
White Pass & Yukon:	Min.	5	7	7
	Max.	27	27	27
Trucking:	Min.	5	5	8
	Max.	7	10	10
Air:	Min.	1	1	1

(plus one day for earlier delivery in Vancouver) applies to other goods as well as the perishables. The maximum in-transit time is calculated on the basis of a shipment just missing one sailing and having to wait for ten days at Skagway prior to moving by rail to Whitehorse, (as might occur in summer). Obviously, the majority of non-perishable freight falls between these two extremes; the majority of freight has an in-transit time (as defined) of less than two weeks. Because of the infrequent boat service ordering and scheduling is tied to the bi-monthly service.

While the infrequent service causes relatively large orders to be placed and, therefore, large inventories to be held, the slow rate of arrival of shipments from Skagway prevents a radical peaking in shipment arrivals. This is desired by some receivers who lack storage space, for example, Tourist Services. However, with the exception of perishables the inability to obtain specific containers in a particular sequence does create inventory and service problems.

Trucking service is also significantly affected by the frequency of trips. Third day delivery of goods shipped from Edmonton to Whitehorse is quite reliable. However, from Vancouver the service is provided by trans-shipment at Dawson Creek. Daily service is maintained from Vancouver to Dawson Creek, but only a twice-weekly service is provided from that community to Whitehorse and once-weekly from Dawson Creek to Watson Lake. Service to Mayo is further affected by the infrequent service from Whitehorse; the service ties in more conveniently with the White Pass & Yukon rail schedule than with trucking movements. The result is that within the area north of Whitehorse, the service of the water/rail route can be just as good as the trucking route if the best day for shipment

is selected. Thus, north from Watson Lake, not only does the price differential improve in favour of the White Pass & Yukon but the rail service becomes more competitive.

The air freight service could achieve an effective minimum of one day even to Mayo on a summer schedule. Freight given to C.P.A. one evening would be available for distribution the next afternoon or evening. A maximum time during the summer schedule is mainly dependent on freight being bumped an occurrence all too common currently with the D.C.6.B. It is hoped that the incidence will be reduced substantially when the new Boeing 737 is brought into service.

The effect of the transportation services available to consignees in Whitehorse is to cause much higher total distribution costs than is experienced in British Columbia. A substantial quantity of stock items shipped via the White Pass & Yukon have a total lead time, from ordering the item to its receipt, well over twice the lead time in a town such as Prince George. Consequently, average inventories may be 25% or more above the level which would be expected in British Columbia, but service levels are still lower. Higher inventory levels imply higher cost for heating and labour as well as the additional capital and obsolescence costs of the inventory itself.

Unfortunately, insufficient information is normally available even from one firm to enable an estimate of the cost which can rightfully be placed on the service provided by a transportation company.

iii. Competition: The study of transportation rates and service explains the dominant position held by the White Pass & Yukon rail route. With the

exception of service-orientated items which can be shipped from Edmonton, for example - meats, or shipments for which service is critical and this need cannot be met by the rail route because of the schedule, the White Pass & Yukon has an effective monopoly within the Yukon territory. It is only along the southern part of the Alaska Highway that the position of the trucking industry is sufficiently strong to give real competition.

The best example of this competition is afforded by the transportation policy of Canada Tungsten Mining Corporation Limited actually located in the North West Territories but served by Watson Lake. That Company has a contract with the White Pass & Yukon to haul in fuel oil with a back haul of copper concentrates and with Canadian Freightways to haul in general supplies and back haul tungsten. The truck haul is preferred for tungsten, which has a value of about $2 per lb., because the time-saving afforded by that mode is worth more than the somewhat higher freight rate charged, compared with that which would apply via the rail route. All haulage from Watson Lake to the Mine is performed by a separate contractor, K and J Trucking.

Some of the requirements of Cassiar Asbestos in northern British Columbia are also met by trucking via Loiselle Transport, but the majority of the asbestos is shipped via the White Pass & Yukon route. Further north along the Alaska Highway, the dependence of the communities as well as the mines on the rail route is almost complete, with the exception of service items as noted above.

The cost advantage of the White Pass & Yukon in shipping out low-value ores from the majority of the Yukon results in the practice of firm contracts being signed between the Mining companies and the railway. These contracts are

confidential; they are not filed with the Canadian Transport Commission nor are they published in any way. It is understood that some of the contracts are long term, perhaps as long as, or longer than, ten years, and may tie the companies to shipping in-bound via the White Pass & Yukon. Confidential contracts also exist for trucking firms, for example, the contract between Canadian Freightways and Canada Tungsten. However, the latter is without term and can be ended by either party upon notice. This does not seem to be usual in the contracts of the White Pass & Yukon; it does not apply to the Canada Tungsten and White Pass & Yukon contract on fuel oil and copper concentrates.

While a study of competition is bound to concentrate on the position of the White Pass & Yukon, it is necessary to consider the position of other firms and other modes of transport.

It appears that the trucking industry is competitive. The dominance of two carriers on the Alaska Highway results from the small size of the market; these firms are aware of the possible inroads which could be made by small carriers into particular services, for example, meat has been hauled in truck loads by a small carrier, Tamac. Motor carriers, in effect, are not regulated so that no artificial protection is provided from that source.

For airline service the policy of the Canadian Transport Commission provides C.P.A. with an effective monopoly on the main channel into the Yukon from the south. Competition from the circuitous route, Seattle-Juneau-Whitehorse, is not significant. This monopoly exists because of the Canadian Transport Commission policy and it must be in the wisdom of that Commission that it is

held desirable to allow a single carrier to operate from a competitive base (Vancouver) via two quite different routes (via Prince George, and via Prince Rupert) into Whitehorse rather than allow one carrier to operate on one route and a different carrier on the other. It would seem that the only significant cost implication of a policy allowing competition, if a carrier such as P.W.A.* were allowed to operate one of the routes, would be the possible duplication of terminal facilities at Whitehorse.

The existence of what is regarded as an effective monopoly by the White Pass & Yukon for general freight and mine products in much of the Yukon, and C.P.A. for inter-regional passenger travel to and from the rest of Canada, naturally gives rise to some vociferous complaints from Yukon residents. These complaints are real and they do reflect strongly held views; how much significance can be attached to them is difficult to determine, and how they should be weighed is a matter for Government policy. Some attempt should be made here to place the complaints within a rational framework.

Firstly, complaints are always registered against a company which enjoys a monopolistic position even though the company may be providing the most efficient service commensurate with reasonable profitability. This is a problem which can only be weighed as a policy decision. Is some competition and possibly the higher cost associated with it worth the public value of competition?

Secondly, complaints may be levelled against the level of service provided or the rates charged by a monopolist. It then becomes a question of whether the

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* Pacific Western Airlines

monopolist is providing the service in an efficient manner and earning a reasonable return. Because of the special impact of transportation on the economy it is normal for Government to accept the responsibility, at least in cases of monopoly, of investigating these questions. These matters can only be decided on the basis of the cost and profitability of alternate performance levels. However, in the case of the Yukon, questions about the reasonableness of the White Pass & Yukon tariff and confidential contracts are not answered. The need of C.P.A. to increase its fares to the Yukon in 1968 has not been substantiated to public satisfaction.

It is not suggested that the latter issues can be dealt with here, but it is desirable to examine how this situation arises and what action might be taken to remedy it. Consequently, the transportation regulatory environment affecting the Yukon will be described in section 3, as a part of the description of Government policy in relation to transportation development.

SECTION 3

FRAMEWORK FOR TRANSPORTATION DEVELOPMENT

A - GOVERNMENT POLICY

Two aspects of Government policy have a significant influence on transportation development; they are the regulations placed on firms providing transportation services and the policy or policies which guide Government investment in the transportation infrastructure.

1. Regulatory policies

   i. White Pass & Yukon Railway:

   Because it serves the port of Skagway the White Pass & Yukon is engaged in international movements of freight, however, this does not appear to create any special difficulties. The Company is one of the few operations which has exemption from the Jones Act so that freight originating in the United States and destined for the port of Skagway can be shipped on the "Frank H. Brown".

   Of more significance than the international nature of the movement is the Canadian regulatory position. Prior to the National Transportation Act 1967, the White Pass and Yukon enjoyed certain exemptions from rate regulation, Railway Act, section 336.4.E. It is also possible that because of the unique international and inter-modal nature of the service the jurisdiction of the Board of Transport Commissioners over rates has been in some doubt. For example, enquiries of the Board about rates

by the Yukon Development & Research Institute brought the response that the Board did not have jurisdiction[10].

Certainly, there appear to have been no rate cases since the days of the gold rush; this, in itself, is surprising in an area where there is so much concern about the level of freight rates. If the lack of cases has arisen because of uncertainty of jurisdiction this is certainly dispelled by the National Transportation Act. The broad powers under that act (sections 15 and 16) as well as specific sections dealing with the Railway Act (sections 44, 47 and 53) appear to provide adequate powers of regulatory control. It seems only through the exercise of these powers that the reasonableness of the general rate level and the rate structure can be judged.

ii. Trucking:

The trucking industry in the Yukon is not really regulated. Entry of firms <u>can</u> be controlled through restriction of licenses issued; the regulations governing the granting of public service vehicle licenses are given in appendix 5. In effect, once a company has a license it can obtain any number, and there are very few instances where a license has been declined to a new carrier. Licenses may either be for public service vehicles - open licenses - or for restricted service vehicles - in effect contract carriage. Rates should be filed but there is no policing of rates and it is doubtful that even filed rates are up to date.

Since the majority of common carrier trucking involves inter-provincial transport, the attitude of the regulatory authorities in

British Columbia and Alberta is important. While there is entry control, particularly by British Columbia, neither Province is concerned with the control of inter-provincial rates. To obtain a contract license (limited freight vehicle license in British Columbia) it is not necessary to disclose the terms of a contract on an inter-provincial haul.

The limited application of regulation and the financial structure of the trucking industry ensure ease of entry into the industry and there appears to be no danger of inefficiency arising because of monopoly or even oligopoly controls.

iii. Aviation:

The economic regulation of aviation services, scheduled and charter, has been performed by the Air Transport Board and since 1967 by the Air Transport Committee of the Canadian Transport Commission. Because of the small size of charter firms and the nature of exploration and survey work using charter aircraft, the Air Transport Board policy controlling charter services has not given rise to any evident problems.

However, the Board policies do appear more important to the level of competition experienced by scheduled carriers and, therefore, the level of service provided. Two aspects of the scheduled services provided by Canadian Pacific Airlines are open to question. First, is it necessary for C.P.A. to hold a monopoly since they are serving Whitehorse via two routes. The only additional point at which Pacific Western Airlines would have to provide terminal facilities were it to

operate from Vancouver to Whitehorse via Prince Rupert would be at Whitehorse. This "duplication" of facilities at Whitehorse might not be too high a price to pay for competition. The analogy with C.P.A's position and arguments on a trans-continental route is obvious.

Secondly, C.P.A. applied in April 1968 for a 10% increase in fares on all domestic routes. They also applied for a youth standby fare and group travel fares; the latter is not to apply to the B.C. - Yukon services. The granting of a nationwide percentage increase in fares within a region in which a carrier has a monopoly can be expected to lead to a public reaction. Canada has all too much experience with this.

The equitability of an airline applying an across-the-board rate increase when enjoying a regulated monopoly is as much open to doubt as when the same action is taken by a railway.

The Whitehorse route (that is distinct from the B.C. - Yukon operations in total) does have some characteristics which might lead to high and increasing costs. The most significant of these would seem to be the relatively short stage link of the route via Prince George. However, the route has several characteristics which should make it profitable, and increasingly so. The most important of these is the high utilization apparently achieved both in the movement of passengers and freight. The weight problem on the route via Prince George is such that it is common to re-fuel at all stops except Watson Lake, an occurrence that contributes to the poor service level. The introduction of

the more direct service via Prince Rupert in 1967 has improved the service by providing an alternate to the "milk run" but does little to dispel doubts existing about the profitability of the route and, therefore, the need for the increase in rates.

It would seem to be in the interest of C.P.A. if the increase is necessary on this route, and to fulfil the function of the Canadian Transport Commission from the perspective of the Yukon residents, if the Air Transport Committee were to carry out an examination of the costs of the Yukon service specifically, or let it be known if this has been done already.

The Yukon route has come to be regarded as one which has had terrible service but which is still highly profitable. Given the monopoly position of the Company and the traffic conditions it appears to be a reasonable expectation. Only the Air Transport Committee is empowered to look into all of the matters necessary to determine the accuracy of this viewpoint and the justification for the fare increase.

It is also interesting to note that for an area to which access by land is slow and almost hazardous, but which can be rewarding for the tourist, promotional group fares have not been introduced.

2. Investment Policy

It is extremely difficult to determine precisely which level of Government and which Government Department is, in fact, supporting public investment in the Yukon because of financial transfers from one account to another.

Without knowing the specific amount spent under the various cost-sharing programs it is not possible to re-allocate the amounts shown in Government accounts. Therefore, the expenditures are shown as reported from published accounts in Appendix 6.

The Government investment policy in transportation can be divided into two parts, road policy and airport policy.

i. Road Policy:

A substantial road development program has been authorized by the Department of Indian Affairs and Northern Development. There are four basic components to the northern roads program[11].

- Tote trails are low standard roads designed to provide access to a resource project which is in the exploration or development stage. Winter roads are included in this category. Tote trail contributions are financed and administered by the territorial government which may pay up to 50% of the cost of construction but not exceeding $20,000.

- Initial access roads are low standard roads designed to provide access to a resource project which is in the exploration or development stage. This category, however, is intended for cases where, because of the length, terrain or difficulty of construction, total cost is such that the maximum permissible contribution under the tote road category would be insufficient. The amount of Federal assistance will not exceed 50% of the actual road cost,

or 5% of the Company's expenditure on exploration or development of the project. The maximum yearly contribution is limited to $100,000 if the project is exploratory in nature, and $500,000 if the project is primarily development. The location of the initial access road must be approved by the Minister of Indian Affairs and Northern Development.

- Permanent access roads are low standard roads designed to provide permanent access from an existing permanent road to a resource project which has been brought to the pre-production state. The Department of Indian Affairs and Northern Development may authorize a Federal contribution of up to two-thirds of the cost of construction, but not exceeding 15% of the actual capital invested by the Company prior to the commencement of commercial production or exploitation, or $40,000 per mile, whichever is the lesser. The location of the permanent access roads must be approved by the Minister of Indian Affairs and Northern Development.

- Area development roads are to lead into resource potential areas and are planned to fit in with and extend the overall network plan. The Federal Government pays the cost of construction and shares the maintenance cost with the territorial government on the basis of a Federal contribution of 85%. Within the Yukon the area development roads are being planned on a basis of "loop concept" to place every point within the territory within 200 miles of a road. While it is rare to find criticism of the road development program

two observations may be made. Firstly, it appears that an excessive amount of work in the allocation of funds to particular projects is carried out by the Department of Indian Affairs and Northern Development outside of the Yukon. Not only does the Department establish the size of the budget, for example, for maintenance of development roads, but they also select projects. Both tasks and the transmittal of the information to the territorial department of engineering are accomplished through the publication of the estimates of the Department of Indian Affairs and Northern Development. Since these funds, in practice, are re-allocated by the territory it seems futile to establish priorities from outside of Whitehorse. Amongst other things the existing system creates an undesirable image for territorial employees of distant civil servants allocating funds between projects with which they are not familiar. One particular project whose evaluation by the Department should be examined and which should be re-evaluated in the light of the experience during the year 1967-68 is the tramway/ferry system across the Yukon River at Dawson City.

The second question which arises is whether excessive reliance is being placed in road construction on the hope that development will subsequently take place. To sink money in a fixed place may make less sense than providing more flexible transportation as afforded, for example, by aviation. The argument that a minimum road system is needed can only be debated in the matter of extent. However, perhaps insufficient recognition is generally given to the ability to construct roads quickly once resources are established. For example, the Watson Lake to Canada Tungsten

Mine road was built in two years by relying on aerial reconnaissance and by constructing the road from both ends. This was done by flying in a stripped D-4 tractor by Otter, assembling and making an air-strip to fly in the necessary equipment for full work to proceed from the remote location.

Government policy also affects the cost of trucking service through the regulations and charges which are imposed on vehicle operations. While the trucking industry will always complain about certain aspects of motor vehicle regulations it is generally only because of their complaints that the regulations are updated.

Carriers hauling in both British Columbia and the Yukon face two types of problem. The first concerns vehicle weight limits; for example, in British Columbia the maximum gross vehicle weight for the trucks operated by the Highway Division, Cassiar-United Keno Hill, is 75,300 lbs. However, the vehicles are normally operated at between 83,000 and 86,000 lbs. and pay an overweight fee to take advantage of the maximum gross vehicle weight in the Yukon of up to 95,000 lbs. The second problem concerns taxes. There is no licence reciprocity and the fuel tax (11¢ per gallon in the Yukon and 15¢ per gallon in British Columbia) is paid in British Columbia on the basis of use and in the Yukon on the basis of purchase. The result is that fuel purchased in Whitehorse but used in British Columbia is double taxed. It is expected that the latter situation may be corrected shortly by the Territorial Government. Efforts should be made to obtain reciprocity agreements between the Yukon and the Provinces.

The differences in political controls, together with differences in road conditions and equipment, result in significantly different truck

haulage costs between Whitehorse and Cassiar and Whitehorse and United Keno Hill Mine. The average vehicle costs were 72.08¢ and 56.64¢ per vehicle mile respectively in 1967; the total cost per ton mile for the haul was 6.3 cents from Cassiar and 4.7 cents from United Keno Hill.

ii. Airport Policy:

The absence of an effective aviation policy is the main deficiency of government policy. Both the Department of Transport and the Department of Indian Affairs and Northern Development have applicable policies.[12] However, the Department of Transport has not financed the construction of an air-strip in the Yukon since 1956 and the Department of Indian Affairs and Northern Development's policy statement recommending an annual average expenditure of about $80,000 on exploratory aerodromes has not resulted in noticeable activity.

An explanation for the failure of the Department of Transport Policy is that airports in the Yukon must compete for funds nationally. The funds are generally inadequate to provide for the level of need within the Yukon. Further this "competition" is associated with a detailed evaluation process which together with "application time" can cause a working season to be missed. An application for assistance on an airport at Ross River dated October 10, 1966 had still not been settled in July 1967.[13] The airport was finally constructed with territorial funds. Nevertheless, between 1956 and 1967 the expenditures of the Department of Transport on air services in the Yukon (civil aviation, telecommunications and

meteorological branches) has amounted to 21.7 million dollars of which almost two thirds was on operations and maintenance[14].

The failure of the Department of Indian Affairs and Northern Development program appears to rest in part, at least, in the requirement that the private interests being served pay half of the cost of an airport up to a full cost of $40,000 and then all of the excess. It is not possible to identify any expenditures by the Department in the annual accounts.*

It seems to be much easier to invest several million dollars in a road in the hope that traffic will develop than to invest several thousands of dollars in an airstrip under the same expectations. This is in spite of the fact that aviation is playing an increasing role in exploration. Airstrips provide a base from which helicopters can serve substantial areas. Because of the importance of helicopter services in exploration, appendix 7 is provided to give some cost data.

In general, while attempting to investigate the role of Government policy and investment in transportation in the Yukon, a significant lack of knowledge about the decision-making process was evident both on the part of civil servants and persons within industry dealing with Federal departments. There appeared to be a lack of familiarity with the persons making decisions and the way they go about making those decisions. Too often the attitude which seemed to have developed was that "the unseen hand" will tell us in due course.

* The Department of Indian Affairs and Northern Development states that $24,500 has been spent on Resource Airports in the period 1958-68.

The concentration of decision-making outside of the Yukon, particularly in the Department of Indian Affairs and Northern Development, not only has undesirable repercussions on personal attitudes but it is bound to affect the quality and nature of decisions made inside and outside of the Yukon. Greater responsibility for the allocation of a budget between projects might well rest with the territorial government.

> "The allocation of powers and spending authority among such Government units is an extremely important aspect of the institutional framework. Different arrangements lead to different outcomes, affecting not merely material benefits but also other values resulting from the alternatives we choose" [15].

The importance of Government policy in the development of transportation in the north has resulted in a large number of studies being carried out. The reports provide an important departure point for the evaluation of future investment alternatives.

B - PREVIOUS REPORTS

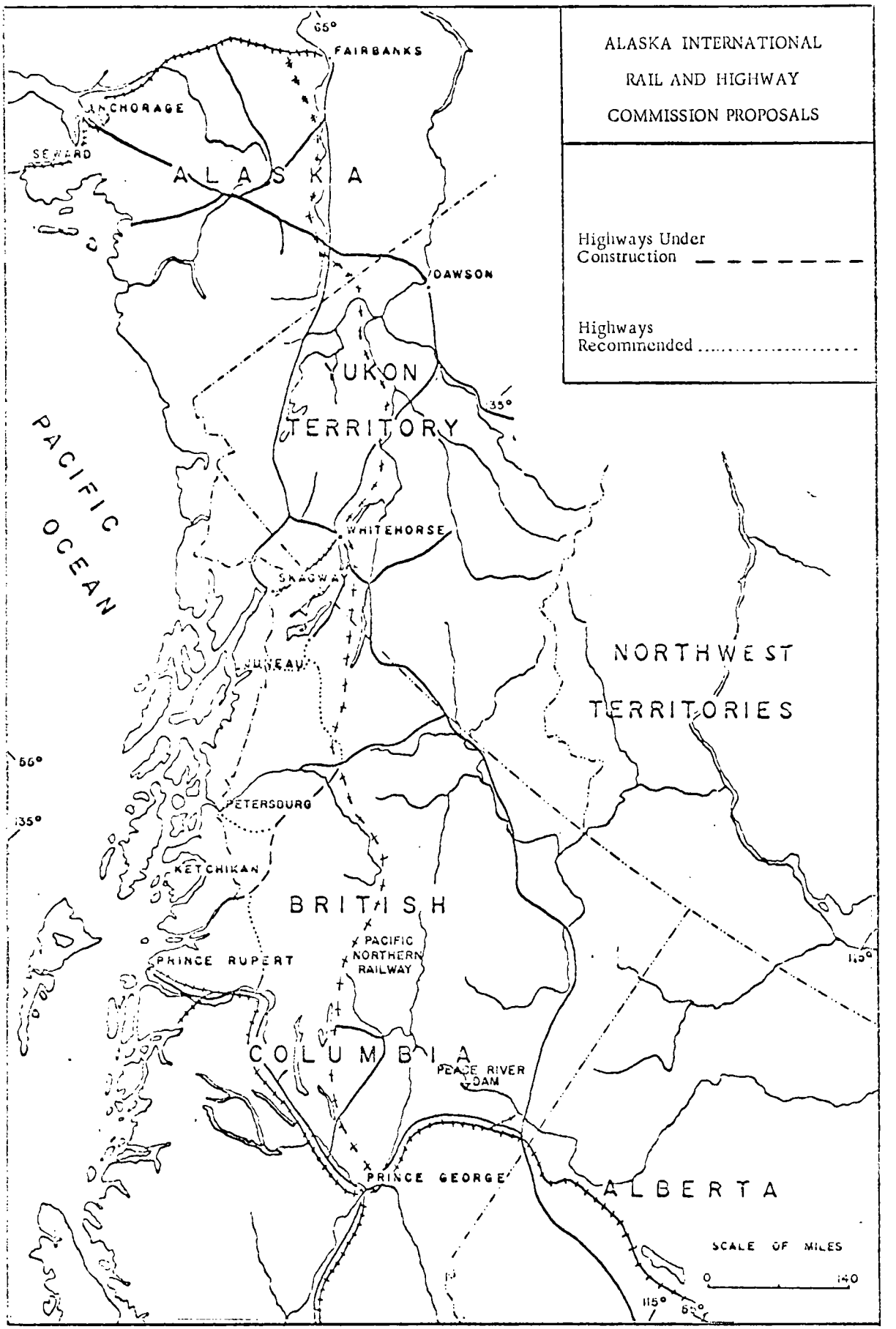
Proposals to establish routes to and through Alaska date back to the middle of the nineteenth century. However, while the early proposals indicate the interest which had been aroused in northern transportation routes, none of them had any real significance. The first significant study of a route to Alaska was the report of the Commission to Study the Proposed Highway to Alaska which reported in 1933[16]. The Commission recommended the construction of a road from Hazelton, B.C., north behind the coast range to Whitehorse. However, the report was very superficial and the matter rested officially for several years.

In 1938 the British Columbia-Yukon-Alaska Highway Commission was established.[17] The report, made public in 1942, considered alternate highway routes. The United States favoured the coastal route to Alaska but the Canadian Commission favoured a route via the Rocky Mountain Trench. Although in a less favoured region for resource development the cost of construction and maintenance of a road in the Trench would be much less than for a road close to the coast.

However, the construction of the Alaska Highway was finally undertaken because of the Japanese threat to United States sovereignty in the North Pacific. The highway, 1,525 miles long, was consequently constructed with the utmost urgency, following a chain of airports which Canada had constructed to the Yukon and Alaska. The road does not follow any route which had been recommended by the earlier studies, and is only close to mineralized areas north of Watson Lake. Before the end of the war another study was under way - the North Pacific Planning Project.[18] This report provides the first serious description of northern resources and "foresaw" transport development more than proposing specific projects. The report anticipated the construction of a railway to Alaska.

The first report which combined a detailed inventory of the resource base, carried out engineering surveys and gave substantial attention to transportation economics was the Alaska International Rail & Highway Commission.[19] The Commission recommended the construction of a railway and a highway network, Figure 3. However, the rail recommendation was based on an erroneous assumption that the Wenner Gren proposal for the construction of the Pacific Northern Railway into the Yukon would go ahead.[20] Further the railway was expected to require a subsidy to cover the capital cost at least, a subsidy which could be

FIGURE 3


ALASKA INTERNATIONAL
RAIL AND HIGHWAY
COMMISSION PROPOSALS
Highways Under Construction
Highways Recommended
65°
FAIRBANKS
ANCHORAGE
SEWARD
ALASKA
DAWSON
YUKON
TERRITORY
PACIFIC
OCEAN
WHITEHORSE
SKAGWAY
JUNEAU
NORTHWEST
TERRITORIES
60°
PETERSBURG
KETCHIKAN
BRITISH
PACIFIC
NORTHERN
RAILWAY
PRINCE RUPERT
COLUMBIA
PEACE RIVER
DAM
PRINCE GEORGE
ALBERTA
SCALE OF MILES
0
140
115°

used more advantageously to reduce the freight rates via the coastal shipping route.

The recommendation for the construction of a road network estimated to cost over $240,000,000 at that time, also left much to be desired. The general methodology followed in the benefit-cost analysis and the application of the analysis only to the complete road program, detracted from the value of the recommendation. The lack of Canadian participation in the policy formation procedure must also detract from the value of the report from a Canadian viewpoint.

Some aspects of the Commission's recommendations have been re-examined by subsequent studies. For example, the Stanford Research Institute has evaluated the paving of the Alaska Highway. The Travacon report has examined the specific issue of transportation costs associated with a rail extension beyond Whitehorse and the cost of transportation from Whitehorse to the coast at Skagway and Haynes. However, no further consideration has been given to the broader concept of the completion of a road behind the coastal range with branch roads to the coast, for example to Juneau. Because of the support which exists in British Columbia for this concept,[21] and the benefit which it would bring directly and indirectly to the Yukon, it should be re-considered in the light of current developments.

As noted, the Stanford Research Institute and the Travacon reports both had specific objectives and because of this used specific criteria. These reports need to be re-examined in the light of broader terms of reference. This is particularly important in the light of resource developments which are not incorporated within the reports; this is especially true of the Stanford Research Institute report. The re-examination should take cognizance of the

regional, economic and social development objectives implicit in the area development road program. It should recognize, also, the extent of financial obligation which is accepted by the Federal Government in the operation and even construction of railways in other parts of Canada. In particular, the agreement between the Department of Transport, the Canadian National Railway, Pine Point Mines Ltd., and the Consolidated Mining and Smelting Company of Canada Limited, should be used as a model reflecting the extent of financial responsibility which the Federal Government may be prepared to accept. Until the cost of transportation to tidewater can be reduced significantly no major change will take place in the Yukon economy.*

A notable absence in the studies is consideration of transport investment other than in the infrastructure through roads or railways. Both the studies and, as noted previously, investment policies have given little attention to airport investment. Also, little attention appears to have been given to port development, a critical issue within this region because of the limited number of port sites, the general limit on space at these sites and the fact that the sites lie within the United States.

The location of the ports within the United States does raise some issues associated with the applicability of the Jones Act; however, exemptions from this Act have been granted in the past. The issue here would seem to be that the Federal Government must attempt to ensure that examptions will be made in the future when necessary. Other difficulties, associated with customs procedures for example, arise occasionally but it has been very difficult to

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* Asbestos from Clinton Creek to Vancouver (1,500 miles) costs about $39.00 per ton (rate plus trucking cost); asbestos hauled 2,886 miles from western to eastern Canada costs $28.00 per ton.
(Board of Transport Commissioners, Waybill Analysis, 1965)

pinpoint problems. Federal Departments have had discussions with American Authorities from time to time and the results of recent deliberations should be determined.* There does not seem to be much basis for claims for a Canadian corridor and even less probability of one ever being obtained.

A further implication of ports being within the United States is that they are removed from the jurisdiction of the Canadian National Harbours Board. This may create disadvantages in the financing of transportation facilities for the shipment of raw materials. While the Federal Government is sufficiently concerned about the export of coal to Japan that it agrees to finance the port development in Vancouver to facilitate this trade, the export of mineral ores from the Yukon has to depend entirely on commercial operations. Some compensation for this situation might be justified even if it takes the form of a low interest, long-term loan to the White Pass & Yukon Railway for the construction of harbour facilities, with a commensurate reduction in the freight charges.

The intent of this recommendation is not met by the responsibility of the Federal and Territorial Governments for road costs. To some extent this responsibility is comparable to that of government for road development generally in Canada, and in part reflects the specific objectives of northern and resource development. The benefit of the latter would be offset if the Government were to withhold the type of assistance which may be provided elsewhere, namely, in port investment and operation.

C - FACTORS IN THE EVALUATION OF TRANSPORTATION INVESTMENTS

Government investment in transportation by definition is dependent on Government policy. However, the formulation of Government policy is influenced

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* See, for example, Financial Post, July 2, 1966, p.7.

by the reports received from specialists; the reports frequently have an economic or engineering orientation. Too often, therefore, recommendations are made on the basis of specific criteria not appropriate alone for the formulation of Government policy. If insufficient supplementary information is available, either within that report or others, it may be exceedingly difficult for a policy to be formulated on adequate or balanced data.

The Government is concerned with many effects which may be associated with a transportation investment; net economic benefits to the nation, regional economic effects, social implications, political and strategic effects. Many of these effects can only be weighed through the political process but, at least, information must be available on them to allow for their appraisal. The studies of transportation investment in the Yukon have not provided this type of information.

For example, the Travacon study is simply a study of the least cost means of transporting specified mineral products to tidewater. It does not encompass the wider implications of alternate transportation policies. It does not attempt to assess the extent to which a railway or road in this region might achieve regional development objectives more effectively than an area development road, let us say to Fort McPherson.

Transportation must be planned as an integrated part of a development strategy working towards specific economic and social goals. At least, alternate investment allocations must be evaluated recognizing the broad implications arising from them. "Evaluating the need for a transport project has meaning only as it is looked upon as one element in a combination of measures aimed at development."[22]

An experience reported by many economists with experience in developing economies is also worthwhile noting. "To provide only for the transport facility, leaving the rest to chance, is an unnecessary gamble."[23]

On major project developments in the Yukon it may very well be desirable for the Government to enter into contract agreements with private firms to bring resources into development. This might apply on a project where the exploration costs are high and subsequent utilization might depend on expensive transportation investments. The iron ore deposits of the Yukon might be an obvious example. The precedent for such co-operation exists in this country, for example, the oil exploration in the Arctic.

SECTION 4

RECOMMENDATIONS

Transportation companies operating in the Yukon serve a small dispersed population in a harsh environment distant from centres of supply and markets. These conditions must mean that transportation and living costs will be high and that resources which would be developed if located elsewhere will remain idle.

Economic development in the Yukon has been primarily dependent on mining. If this continues, as is likely, the reduction of transportation cost is vital. There is no doubt that this can be most effectively achieved by upgrading the transportation routes direct to tidewater, at the right time and to the appropriate standard. The review of the existing transportation services suggests that the following matters should be considered for further investigation.

Recommendations for further study:

(i) The Stanford Research Institute, the Travacon and in part the Alaska International Rail & Highway Commission Reports should be re-evaluated in the light of current resource development forecasts and in terms of different criteria. If the conclusions of the Travacon Report are not significantly affected by the current forecast, attempt to determine the conditions necessary before a railway extension becomes feasible.

It appears likely that the most meritorious projects will be the upgrading and extension of the White Pass & Yukon Railway and the completion of a road system behind the Alaska Panhandle to join with the British Columbia highway system at Hazelton.

(ii) The quality of service which can be provided by the transportation routes should be studied in the light of the resource forecast.

(iii) Carry out a "cost of living" survey covering at least basic shopping items, as might be done by the Dominion Bureau of Statistics. This would provide a measure of the extent to which transportation costs, and other regional costs, are reflected in consumer prices or are absorbed by manufacturers and suppliers.

(iv) Re-evaluate the desirability of constructing a bridge across the Yukon River at Dawson City.

Recommendations for Government policy consideration:

(i) That the reasonableness of the charges of the White Pass & Yukon route should be investigated by the Canadian Transport Commission.

(ii) That the need of Canadian Pacific Airlines to increase fares on the Yukon route be substantiated by the Canadian Transport Commission.

(iii) That the Canadian Transport Commission consider the feasibility of allowing competition on the scheduled service to the Yukon by granting one route to Pacific Western Airlines.

(iv) That the Department of Indian Affairs and Northern Development re-appraise the expenditures on remote area development roads and air-strips with a view to determining whether expenditures on the latter have been adequate.

(v) That the Federal Government examine means of implementing an assistance program in lieu of assistance through the construction and operation of a port.

(vi) That the Department of Indian Affairs & Northern Development should make the Yukon Territory responsible for the allocation of budgets between specific projects.

(vii) That truck reciprocity should be established between the Yukon and the Provinces and that the Yukon fuel tax should be placed upon the same collection basis as applied in the Provinces.

APPENDIX 1

MOTOR VEHICLE LICENCES - A

PUBLIC SERVICE VEHICLE OPERATORS INCLUDING BUS OPERATORS IN THE YUKON TERRITORY FROM APRIL 1, 1967 TO FEBRUARY 1968

Name	Address	No. of Vehicles
Alaska Highway Express Ltd.	12536 - 71st St., Edmonton, Alta.	6
Alaska Highway Tours Inc.	Empress Theater Bldg. Fairbanks, Alaska	12
Andrei, Nick	Carmacks, Yukon	1
Arctic Tire Co. Ltd.	Box 938, Whitehorse, Yukon	3
Ball, James E.	Watson Lake, Yukon	2
Bartz Transport Ltd.	Edmonton, Alta.	2
Beloud, Bun	Haines Junction, Yukon	4
Bjorkman, Ralph	Watson Lake, Yukon	1
Bradley, Conway M.	Mile 1169, Alaska Highway, Yukon	1
Brewster, Arthur	Haines Junction, Yukon	1
Brewster, Jack	Haines Junction, Yukon	3
Burton, Arthur	Keno, Yukon	2
Canadian Coachways Ltd.	Whitehorse, Yukon	26
Canadian Freightways Ltd.	Calgary, Alta.	17
Canadian Pacific Transport Co. Ltd.	Vancouver, B.C. (94 W. Pender St.)	1
Chapil, F.F.	Dawson, Yukon	2
Chaykowski, Romaine	Box 460, Whitehorse, Yukon	1
Christy, J.H.	Watson Lake, Yukon	3
Consolidated Freightways	Washington, U.S.A.	1
Cook, J. Fred	Dawson City, Yukon	1
Davignon, Philip	Johnson's Crossing, Yukon	1
Dawson Construction Ltd.	Box 1158, Whitehorse, Yukon	2
Gauthier, Raoul	Mayo, Yukon	1

Name	Address	No. of Vehicles
Geddes, Edward	Teslin, Yukon	1
General Enterprises	Whitehorse, Yukon	9
R.D. Gillespie Construction	Dawson, Yukon	3
Gleason, R.W.	Box 2544, Whitehorse, Yukon	1
Godfrey, Harry R.	Watson Lake, Yukon	2
Gordies Trucking Ltd.	Edmonton, Alta. (Box 1112, Whitehorse Y.T.)	10
Gould, John	Dawson City, Yukon	1
Graham, R.L.	Box 461, Whitehorse, Yukon	4
Harper, Lorne D.	Box 271, Whitehorse, Yukon	1
Henkes Body Shop	Whitehorse, Yukon	1
Highway Distributors Ltd.	Watson Lake, Yukon	1
Holway Construction	Whitehorse, Yukon	2
Huebschwelen, George	Whitehorse, Yukon	2
Hutton, Oliver	Mayo, Yukon	6
K & J Trucking	Watson Lake, Yukon	4
Kaps Transport Ltd.	Box 659, Whitehorse, Yukon	9
Ken's Construction	Whitehorse, Yukon	1
King, Norman o/a City Deliveries	207 Black St. Whitehorse, Yukon	2
Kluppert, Conrad J.	Dawson City, Yukon	1
Klondike Express	Dawson City, Yukon	5
Klondike Motors	Dawson City, Yukon	3
Klondike Transport	Dawson City, Yukon	4
W. Knauf, leased to Loiselle Transport		1
Liden, Louis and/or Vera	Carmacks, Yukon	2
Lyle, D. (Mail haul only, Watson Lake to Airport)	Watson Lake, Yukon	1
McKenna, Wayne	209 Steel St., Whitehorse, Yukon	1

Name	Address	No. of Vehicles
McWatter, Donald L.	Keno City, Yukon	1
Magnuson, Manne	Atlin, B.C.	1
Mease, Chuck	Box 2685, Whitehorse, Yukon	1
Murphy, J.P.	Box 816, Whitehorse, Yukon	1
Northern Airways Limited	Carcross, Yukon	1
Olson, Harold M.	Whitehorse, Yukon	4
Pacific Northwest Ltd.(Yukon)	Whitehorse, Yukon	3
Rempel Trail Transport Ltd.	Edmonton, Alta.	1
Rushfell Transport Limited	Box 129, Cassiar, B.C.	1
Russell Transport (Yukon) Ltd.	Box 838, Whitehorse, Yukon	3
Scandia Trucking Ltd.	Clover Bar, Alta.	1
Carl Scanlon, o/a Carlene's	Carmacks, Yukon	2
Strachan Trucking	Dawson City, Yukon	1
Estate of Wm. Stuart	Box 2644, Whitehorse, Yukon	3
B. Warnsby & M. Stutter - Brainstorm Freighting (contract hauling within Dawson)	Dawson City, Yukon	1
Tamac Freight Lines	Edmonton, Alta.	3
Taylor & Drury Motors Ltd.	Whitehorse, Yukon	2
Thomas, Willibine	Swift River, Yukon	1
H.M. Trimble & Sons	Calgary, Alta.	3
Twilight Service Ltd. leased to Highway Distributors		1
Van Bibber, Alex	Champagne, Y.T.	1
Val Scheck Transport		2
Van Marnel Construction	Whitehorse, Yukon	5
Van Genne & Son Trucking Ltd. leased to H.M. Trimble		1

Name	Address	No. of Vehicles
Clyde Wann Motors Ltd.	Morley River, Yukon	1
Warren Nelson Transport	Dawson Creek, Yukon	5
Watson, M.R.	Carcross, Yukon	1
Watson Lake Motors	Watson Lake, Yukon	1
Watt, John V	Whitehorse, Yukon	2
White Pass & Yukon Route	Box 1089, Whitehorse, Yukon	38
Yellow Cabs (Y.T.) Limited	Whitehorse, Yukon	21
Yukon Esso Ltd.	Watson Lake, Yukon	1
Yukon Motors Ltd.	Box 998, Whitehorse, Yukon	2
Yukon Moving & Storage	Box 3019, Whitehorse, Yukon	1
Yukon Territorial Ventures	Box 2544, Whitehorse, Yukon	2

In addition to these permanent registrations 517 single trip Freight Permits have been issued, 206 of them for through transport only.

Source: Registrar of Motor Vehicles, Whitehorse, Y.T.

MOTOR VEHICLE LICENCES - B

RESTRICTED PUBLIC SERVICE VEHICLE OPERATORS FROM APRIL 1, 1967 TO FEBRUARY 1968

Name	Address	No. of Vehicles
Art Bell Trailer Towing Ltd.	Burnaby, B.C.	11
W.G. Carson	Ross River, B.C.	2
Dawson City Motors Ltd.		1
John Des Rosiers	Transport Cafe, Alaska Highway	1
Destruction Bay Lodge	Mile 1083, Alaska Highway	1
Dubinsky, Margaret	Mile 1054, Alaska Highway	1
Duncan, Walter J.	Telsin, Yukon	2
Omar Peel & Don Fraser, o/a City Deliveries	Box 2753, Whitehorse, Yukon	2
Garvis, Charles K.		1
G.M.C. (1966)		1
A.J. Gleason	Box 2544, Whitehorse, Yukon	1
Huebschwerlen, Peter	Box 2868, Whitehorse, Yukon	1
James & Wm. Jarvis	Box 2585, Whitehorse, Yukon	4
Karman, Edward	Haines Junction, Yukon	1
Keenan, Edward	208 Alexander, Whitehorse	1
Kerik, Stephen	Watson Lake, Yukon	2
Klipert, Hilbert	Mayo, Yukon	1
Ledergerber, B.	Beaver Creek, Yukon	1
Yvon Lemieux - Ivan Bourque o/a B & L Delivery	Keno City, Yukon	1
Mid-West Tankers Ltd.	Box 5858, Edmonton, Alta.	1
Moginson, Gerald	Mile 1093, Alaska Highway	4
C.C. Const. Morgans Movers	Box 2691, Whitehorse, Yukon	1

Name	Address	No. of Vehicles
Moser, John L.	Haines Junction, Yukon	1
McCrae Inn Limited	Box 1178, Whitehorse, Yukon	1
Northern Industrial Carriers Ltd.	Edmonton, Alta.	6
Peel, James	Whitehorse, Yukon	1
Polaris Moving & Storage Ltd.	Box 902, Whitehorse, Yukon	5
Rattray's Limosine Service	Cassiar, B.C.	3
J. Ronaghan Trucking Ltd.	Clover Bar, Alta.	1
R.M. Schneider o/a Polaris Moving & Storage	Box 902, Whitehorse, Yukon	5
Shearer, James	606 Wheeler St., Whitehorse, Yukon	1
Terry, Douglas	777.7 Alaska Highway	2
Tourist Auto Service	Box 2018, Whitehorse, Yukon	1
Twilite Service Limited	Watson Lake, Yukon	1
Vanderveen, Pieter	Destruction Bay, Yukon	1
Waite's Transport Limited	228 - 37 Ave. N.E., Calgary, Alta.	2
Williams, Hollis	Alaska Highway, Yukon	1
Yakielashek, M.G.	Mile 1118, Alaska Highway	1
Yaklin, E.A.		1
Yukon Chrysler	Whitehorse, Yukon	1
Yukon Wheel Alignment Ltd.	Box 1040, Whitehorse, Yukon	1

Source: Registrar of Motor Vehicles, Whitehorse, Y.T.

APPENDIX 2

TABLE 2-1

COMMERCIAL AIR SERVICES PROVIDED AT THE MAJOR NORTHWEST CANADIAN POINTS BY TYPE OF SERVICE*, SEPTEMBER 1967

	Scheduled 1,8	Non-Scheduled 2,3,9-2, 9-3	Charter 4,9-4	Contract 5	Specialty 7	Total
1. Yukon Territory						
Dawson	2	1	2		1	6
Mayo	1		1		1	3
Old Crow		2				2
Ross River		1	1		1	3
Stewart River		1				1
Teslin			1		1	2
Watson Lake	1		4		3	8
Whitehorse	5	1	6		5	17
	9	6	15		12	42
2. Northwest Territories (District of Mackenzie)						
Aklavik		1				1
Arctic Red River		1				1
Contwoyto Lake		1				1
Coppermine		2				2
Fort Franklin		1				1
Fort Good Hope		1				1
Fort McPherson		1				1
Fort Norman		1				1
Fort Simpson	1		1		1	3
Fort Smith	1	1	4		4	10

TABLE 2-1 (Continued)

COMMERCIAL AIR SERVICES PROVIDED AT THE MAJOR NORTHWEST CANADIAN POINTS BY TYPE OF SERVICE*, SEPTEMBER 1967

	Scheduled 1,8	Non-Scheduled 2,3,9-2, 9-3	Charter 4,9-4	Contract 5	Specialty 7	Total
2. Northwest Territories cont.						
Hay River	1	1	4		4	10
Inuvik	1	2	6		5	14
Norman Wells	1	1	1		1	4
Port Radium		1				1
Sawmill Bay			1		1	2
Tuktoyaktuk		1				1
Wrigley	1					1
Yellowknife	1	3	11		11	26
	7	19	28		27	81
3. Northern British Columbia						
Alice Arm		1	3		2	6
Atlin		1				1
Dawson Creek	2	1	4		5	12
Fort Nelson	1		2		2	5
Fort St. John	2		8		16	26
Telegraph Creek		1				1
Tulsequah		1				1
Stewart		2				2
	5	6	17		25	54

Source: Directory of Canadian Commercial Air Services, Parts I and II, Air Transport Board, Ottawa, September 1967 Amendments.

* Explanation of classification of service contained in Appendix.

TABLE 2-2

COMMERCIAL AIR SERVICES PROVIDED IN NORTHWESTERN CANADA BY COMPANY*

September 1967

1. Yukon Territory

Company	Classification of Service	Points Served
B.C. Yukon Air Service Ltd. Watson Lake, Y.T.	4BC	Watson Lake
	9-4	"
	7RF	"
Canadian Pacific Airlines	1	Vancouver-Whitehorse, via Kitimat, Sandspit, Terrace, Smithers, Prince George, Prince Rupert.
	1	Edmonton-Watson Lake, Whitehorse, Mayo, Dawson (also Grande Prairie, Fort St. John, Fort Nelson, Dawson Creek.)
	8 (1)	Whitehorse-Fairbanks direct/ via Dawson.
	4A (2)	Whitehorse
	9-4	"
	7RF	"
Frontier Helicopters Ltd. Watson Lake, Y.T.	4(C) (2)	Watson Lake - restricted to 200 mile radius from this base.
	7RF	Watson Lake
Great Northern Airways Ltd. Whitehorse, Y.T.	3	Dawson, Stewart River, Old Crow (also Inuvik and Sachs Harbour)
	3	Whitehorse, Ross River.
	4AB	Dawson
	4BC	Whitehorse
	4B (2)	Mayo
	4B (2)	Ross River
	7RF	Dawson
	7RF	Whitehorse
	7RF	Mayo
	7RF	Ross River
	7FT	Whitehorse
	9-4	Dawson
	9-4	Whitehorse

TABLE 2-2 (Continued)

COMMERCIAL AIR SERVICES PROVIDED IN NORTHWESTERN CANADA BY COMPANY*
SEPTEMBER 1967 cont.

1. Yukon Territory cont.

Company	Classification of Service	Points Served
Klondike Helicopters Ltd. Calgary, Alta.	4(C) (2)	Whitehorse
	7RF	"
Trans-North Turbo Air Ltd. Whitehorse, Y.T.	4(C) (2)	Whitehorse
	7RF	"
Watson Lake Flying Services Ltd., Watson Lake, Y.T.	4BC (2)	Watson Lake
	7RF	"
Wien Alaska Airline Inc. Fairbanks, Alaska	9-3	Old Crow, Fairbanks, Whitehorse
	8	Whitehorse, Fairbanks
	8	Whitehorse, Juneau
Yukon Airways Ltd. Whitehorse, Y.T.	4BC (3)	Teslin
	7RF	"

(1) Suspended (2) No protection at this base
(3) Restricted

2. Northwest Territories (District of Mackenzie)

Aklavik Flying Service Ltd. Inuvik, N.W.T.	4B	Inuvik)
	9-4	") Suspended
	7RF	")
Carter Air Service, Hay River, N.W.T.	4B(1)	Hay River
	7RF	"
Gateway Aviation Ltd. Edmonton, Alta.	4B (1)	Fort Smith
	4BC(1)	Yellowknife
	7RF	Yellowknife
	7RF	Fort Smith
Great Northern Airways Ltd. Whitehorse, Y.T.	3	Inuvik, Sachs Harbour (also Dawson, Stewart River, Old Crow)
	4B (1)	Inuvik
	7RF	"
Keir Air Transport Ltd. Edmonton, Alta.	2 (2)	Hay River (Fort Vermilion, High Level, Peace River)
	4BC(1)	Hay River
	7RF	"

TABLE 2-2 (Continued)

COMMERCIAL AIR SERVICES PROVIDED IN NORTHWESTERN CANADA BY COMPANY*
SEPTEMBER 1967 cont.

2. Northwest Territories cont.

Company	Classification of Service	Points Served
Klondike Helicopters Ltd. Calgary, Alta.	4(C)(1)	Fort Smith
	7RF	"
Koenen's Air Service, Yellowknife, N.W.T.	4B	Yellowknife
	9-4	"
	7RF	"
Minto Airways Ltd.	4B	Sawmill Bay (Great Bear Lake) Restricted to one "Norseman" and one "Cessna" 206 only and traffic for Great Bear Lodge.
	7RF	Sawmill Bay
Northward Aviation Ltd. Edmonton, Alta.	2(2)	Arctic Red River, Fort McPherson Aklavik, Inuvik, Tuktoyaktuk
	2(2)	Norman Wells, Fort Norman, Fort Good Hope, Fort Franklin (no protection)
	3(2)	Yellowknife, Port Radium, Coppermine.
	3(2)	Yellowknife, Contwoyto Lake
	4B(1)	Norman Wells
	4B	Fort Smith
	4B	Hay River
	4B(1)	Inuvik
	4B	Yellowknife
	7RF	Fort Smith
	7RF	Hay River
	7RF	Yellowknife
	7RF	Norman Wells
	7RF	Inuvik
	9-4	Inuvik
Northern Mountain Airlines Ltd. Prince George, B.C.	4B	Hay River
	4B	Fort Smith
	4B(1)	Fort Simpson
	7RF	Hay River
	7RF	Fort Smith
	7RF	Fort Simpson

TABLE 2-2 (Continued)

COMMERCIAL AIR SERVICES PROVIDED IN NORTHWESTERN CANADA BY COMPANY* SEPTEMBER 1967 cont.

2. Northwest Territories cont.

Company	Classification of Service	Points Served
North West Territorial Airways Ltd. Vancouver, B.C.	4AB	Yellowknife - Restricted to one DC-3 only
	9-4	Yellowknife
	7RF	Yellowknife
	7AC	Yellowknife
Pacific Western Airlines Ltd. Vancouver, B.C.	1	Edmonton - Yellowknife, Hay River, Fort Smith, Fort Simpson, Norman Wells, Inuvik, Wrigley, (also Peace River, Fort McMurray, Resolution, Uranium City/Beaver Lodge, Calgary, Dawson Creek, Fort Chipewyan, Rainbow Lake)
	2(4)	Edmonton - Yellowknife, Coppermine, Fort Smith (also Cambridge Bay)
	4A(3)	Yellowknife
	7RF	Yellowknife
	7AIRA	Yellowknife
Ptarmigan Airways Ltd. Yellowknife, N.W.T.	4B(1)	Yellowknife
	7RF	"
Reindeer Air Service Ltd. Reindeer Station, N.W.T.	4BC(1)	Inuvik
	7RF	"
	7AIRA(2)	"
Sioux Narrows Airways Ltd. Winnipeg, Man.	4B	Yellowknife - Restricted to summer operations only
	7RF	Yellowknife
Wardair Canada Ltd. Edmonton, Alta.	4AB	Yellowknife
	9-4	"
	7RF	"
	7AC	"

(1) No protection at this base

(2) Restricted to certain types of aircraft

(3) Restricted

(4) Restricted to Group A aircraft protection between Yellowknife and Fort Smith.

TABLE 2-2 (Continued)

COMMERCIAL AIR SERVICES PROVIDED IN NORTHWESTERN CANADA BY COMPANY*
SEPTEMBER 1967 cont.

3. Northern British Columbia

Company	Classification of Service	Points Served
Airexec Services Ltd. Fort St. John, B.C.	4B(1)	Fort St. John
	9-4	"
	7RF	"
Canadian Pacific Airways Vancouver, B.C.	1	Vancouver - Fort St. John via Prince George (also Kamloops, Williams Lake)
	1	Edmonton - Dawson Creek, Fort St. John, Fort Nelson (also Watson Lake, Whitehorse, Mayo, Dawson)
	4A(1)	Fort St. John
	9-4	"
	7RF	"
Coast Range Airways Ltd. Atlin, B.C.	3	Atlin, Telegraph Creek, Tulse-quah
	4BC	Atlin
	4(C)(1)	"
	9-4	"
	7RF	"
	7FT	"
Fort St. John Aviation Ltd. Fort St. John, B.C.	4(C)(1)	Fort St. John
	7RF	"
	7FT	"
Gateway Aviation Ltd. Edmonton, Alta.	4B	Dawson Creek
	4B(1)	Fort Nelson
	7RF	Dawson Creek
	7RF	Fort Nelson
	9-4	Dawson Creek
Hill Aviation Fort St. John	4C(1)	Fort St. John
	7RF	"
	7FT	"
	7APS	"
	7AIRA	"
Northward Aviation Ltd. Edmonton, Alta.	4B(1)	Dawson Creek
	7RF	"
North Cariboo Flying Service Ltd., Fort St. John, B.C.	4B(1)	Fort St. John
	7RF	"

TABLE 2-2 (Continued)

COMMERCIAL AIR SERVICES PROVIDED IN NORTHWESTERN CANADA BY COMPANY*
SEPTEMBER 1967 cont.

3. Northern British Columbia cont.

Company	Classification of Service	Points Served
Northern (Fort Nelson, B.C.) Air Service Co. Ltd. Fort Nelson, B.C.	4B(1)	Fort Nelson
	7RF	"
Okanagan Helicopters, Vancouver, B.C.	4(C)(1)	Fort St. John - Fort Nelson
	7RF	Fort St. John
	7AP	"
	7APS	"
	7AIRA	"
	7AC	"
	7A Const	"
	7AAM	"
Pacific Western Airlines Ltd. Vancouver, B.C.	1	Edmonton - Dawson Creek (including connections in N.W.T.)
	2	Prince Rupert, Alice Arm, Stewart, Dawson Creek, Prince George, Hudson Hope.
	3	Stewart, Anuk River/Scud River.
Vic Turner Ltd. Dawson Creek, B.C.	4C	Dawson Creek
	7RF	"
	7FT	"
	7AIRA	"

(1) No protection at this base.

Source: The Directory of Canadian Commercial Air Services, Air Transport Board, Ottawa, Ont. September 1967 Amendments.

* Explanation of classification of service contained in Appendix.

TABLE 2-3

CLASSIFICATION OF SERVICE

1	Class 1 Scheduled.
2	Class 2 Regular Specific Point
3	Class 3 Irregular Specific Point
4A	Class 4 Group A Charter
4B	Class 4 Group B Charter
4C	Class 4 Group C Charter
4AB	Class 4 Groups A and B Charter
4ABC	Class 4 Groups A, B and C Charter
4BC	Class 4 Groups B and C Charter
4(h)	Class 4 Helicopter
5	Class 5 Contract
6	Class 6 Flying Clubs (non-profit)
7RF	Class 7 Specialty - Recreational Flying
7FT	Class 7 Specialty - Flying Training
7AP	Class 7 Specialty - Aerial Photography restricted to Scenics
7APS	Class 7 Specialty - Aerial Photography and Survey
7AAD	Class 7 Specialty - Aerial Application and Distribution
7AIRA	Class 7 Specialty - Aerial Inspection, Reconnaissance and Advertising
7AC	Class 7 Specialty - Aerial Control
7A Const.	Class 7 Specialty - Aerial Construction
7AAM	Class 7 Specialty - Air Ambulance and Mercy Services
8	Class 8 International Schedule
9-2	Class 9-2 International Regular Specific Point
9-3	Class 9-3 International Irregular Specific Point
9-4	Class 9-4 International non-scheduled Charter
9-5	Class 9-5 International Contract
9-7	Class 9-7 International Specialty

Class 4 Charter Air Carriers

1. Fixed Wing Aircraft

Group A - carriers operating one or more aircraft each of which has a maximum authorized take-off weight on wheels in excess of 18,000 pounds.

Group B - carriers operating one or more aircraft each of which has a maximum authorized take-off weight on wheels in excess of 2,500 pounds but not greater than 18,000 pounds.

Group C - carriers operating one or more aircraft each of which has a maximum authorized take-off weight on wheels not greater than 2,500 pounds.

2. Rotating Wing Aircraft

Group A - RWA carriers operating one or more aircraft each of which has a maximum authorized take-off weight in excess of 18,000 pounds.

Group B - RWA carriers operating one or more aircraft each of which has a maximum authorized take-off weight in excess of 3,500 pounds but not greater than 18,000 pounds.

Group C - RWA carriers operating one or more aircraft each of which has a maximum authorized take-off weight not greater than 3,500 pounds.

Source: Directory of Canadian Commercial Air Services, Air Transport Board, Ottawa. September 1967 Amendments.

YUKON TERRITORY TABLE 3-1

AIRCRAFT MOVEMENT STATISTICS AT AIRPORTS WITH AND WITHOUT AIR TRAFFIC CONTROL TOWERS BY TYPE OF OPERATION, 1962 - 1966.

		ITINERANT MOVEMENTS						LOCAL MOVEMENTS			
Airport		Scheduled	Other Commercial	Private	Government Civil	Government Military	Total Itinerant Movements	Civil	Military	Total	Total Movements
Whitehorse	1966	1731	3919	5986	333	411	12440	-	-	9268	21781
	1965	1597	3048	3973	410	441	9469	-	-	5294	14863
	1964	1542	2286	3491	355	365	8039	-	-	3926	12069
	1963	1279	1958	4320	285	472	8314	-	-	5702	14045
	1962	1372	2019	4137	417	320	8265	-	-	4538	12822
Watson Lake	1966	634	111	1600	72	32	2449	679	2	681	3130
	1965	596	79	1489	135	40	2339	595	-	595	2934
	1964	572	78	1323	109	52	2134	448	-	448	2582
	1963	562	144	1359	102	31	2198	450	-	450	2648
	1962	501	94	1174	85	64	1918	748	1	749	2667
Teslin	1966	-	132	265	12	-	409	-	-	-	409
	1965	-	96	361	30	4	491	134	-	134	625
	1964	-	66	258	27	8	359	129	-	129	488
	1963	-	133	238	36	10	417	35	-	35	452
	1962	-	163	334	22	12	531	115	-	115	646

Source: Aircraft Movement Statistics: Airports with Air Traffic Control Towers Annual Reports 1964 - 1966, Aviation Statistics Centre, Ottawa.
Aircraft Movements at Airports without D.O.T. Towers, Annual Report 1965, 1966, Aviation Statistics Centre, Ottawa.

NORTHERN BRITISH COLUMBIA TABLE 3-2

AIRCRAFT MOVEMENT STATISTICS AT AIRPORTS WITH AND WITHOUT AIR TRAFFIC CONTROL TOWERS BY TYPE OF OPERATION, 1962 - 1966

		ITINERANT MOVEMENTS(1)						LOCAL MOVEMENTS(2)			
Airport		Scheduled (3)	Other Commercial (4)	Private	Government Civil	Government Military	Total Itinerant Movements	Civil	Military	Total	Total Movements
Fort St.John	1966	2597	7680	5617	182	71	16147	-	-	14624	30951*
	1965	2546	5833	7413	173	88	16053	-	-	25562	41777*
	1964	2924	3096	5419	167	194	11800	-	-	15407	27311*
	1963	2857	1835	3564	98	66	8420	-	-	9458	17878
	1962	2927	861	3125	75	67	7055	-	-	6385	13440
Fort Nelson	1966	887	3711	4458	265	129	9450	4486	30	4516	13966
	1965	1100	2226	2995	199	209	6729	621	-	621	7350
	1964	848	2406	3284	202	107	6847	444	-	444	7291
	1963	717	2135	4441	141	251	7685	727	-	727	8412
	1962	991	583	2790	124	513	5001	3007	170	3777	8178

*Includes simulated approaches.

Source: Aircraft Movement Statistics: Airports with Air Traffic Control Towers, Annual Reports 1964 - 1966, Aviation Statistics Centre, Ottawa.
Aircraft Movements at Airports without D.O.T. Towers, Annual Reports 1965, 1966, Aviation Statistics Centre, Ottawa.

(1) Defined as a movement in which an aircraft enters or leaves tower control and is known to be proceeding to or arriving from another location.

(2) Defined as aircraft which remain within the local area of the airport.

(3) Classes 1 and 8.

(4) All flights excluding scheduled unit toll services but including non-scheduled unit toll services. N.B. Statistics for airports with D.O.T. towers contain separate "unscheduled flights" column. However, in the case of the airports under review these statistics were either negligible or non-existent and have been included in "other commercial" column.

The above notes (1) (2) (3) and (4) also apply to Tables.

NORTHWEST TERRITORIES TABLE 3-3

AIRCRAFT MOVEMENT STATISTICS AT AIRPORTS WITH AND WITHOUT AIR TRAFFIC CONTROL TOWERS BY TYPE OF OPERATION, 1962 - 1966

		ITINERANT MOVEMENTS						LOCAL MOVEMENTS			
Airport		Scheduled	Other Commercial	Private	Government Civil	Government Military	Total Itinerant Movements	Civil	Military	Total	Total Movements
Yellowknife	1966	1246	3135	476	231	120	5208	1938	7	1945	7153
	1965	973	2465	223	224	91	3976	299	4	303	4279
	1964	997	1963	489	206	454	4109	493	-	493	4602
	1963	851	2048	383	153	196	3631	269	12	281	3912
	1962	848	1355	239	157	218	2817	1440	18	1458	4275
Hay River	1966	1091	3207	909	196	7	5410	1044	-	1044	6454
	1965	1048	3109	627	235	-	5019	641	-	641	5660
	1964	688	1911	914	213	8	3734	565	-	565	4299
	1963	475	1280	762	142	36	2695	1638	-	1638	4333
	1962	443	698	777	172	50	2140	1494	-	1494	3634
Norman Wells	1966	825	1968	890	202	64	3949	46	2	48	3997
	1965	615	1427	921	179	14	3156	45	4	49	3205
	1964	556	1071	533	149	10	2319	1143	2	1145	3464
	1963	456	1170	334	96	31	2081	740	-	740	2827
	1962	499	990	271	125	17	1902	16	-	16	1918
Inuvik	1966	389	1777	597	331	110	3201	228	2	230	3434
	1965	310	1773	692	346	86	3207	1403	-	1403	4610
	1964	273	934	367	288	99	1961	860	2	862	2823
	1963	192	911	316	325	136	1880	85	6	91	1971
	1962	208	690	148	368	64	1478	85	5	90	1568

Source: Aircraft Movements at Airports without D.O.T. Towers - Annual Return 1965 and 1966, Aviation Statistics Centre, Ottawa.

TABLE 3-4

YUKON TERRITORY

ITINERANT MOVEMENTS BY TYPE OF POWER PLANT, 1962 - 1966

Airport		Helicopter	Piston	Turbo-Prop	Jet	Total
Whitehorse	1966	991	10,537	736	176	12,240
	1965	532	8,070	636	231	9,469
	1964	452	6,925	591	71	8,039
	1963	-	-	-	-	-
	1962	-	-	-	-	-
Watson Lake	1966	100	2,345	2	2	2,449
	1965	64	227	4	-	2,339
	1964	114	2,010	10	-	2,134
	1963	68	2,116	14	-	2,198
	1962	59	1,717	142	-	1,918
Teslin	1966	106	303	-	-	409
	1965	100	388	3	-	491
	1964	93	266	-	-	359
	1963	125	292	-	-	417
	1962	77	454	-	-	531

Source: Aircraft Movements at Airports without D.O.T. Towers, Table 2, Annual 1966, Aviation Statistics Centre, Ottawa.

Aircraft Movement Statistics, Airports with Air Traffic Control Towers, Table 4, Annual 1966, Aviation Statistics Centre, Ottawa.

TABLE 3-5

NORTHERN BRITISH COLUMBIA

Itinerant Movements by Type of Power Plant, 1962 - 1966

Airport		Helicopter	Piston	Turbo-Prop	Jet	Total
Fort St. John	1966	1,200	14,787	95	65	16,147
	1965	987	15,001	46	19	16,053
	1964	649	11,106	37	8	11,800
	1963	-	-	-	-	-
	1962	-	-	-	-	-
Fort Nelson	1966	650	8,767	19	14	9,450
	1965	237	6,444	21	27	6,729
	1964	253	6,576	16	2	6,847
	1963	193	7,467	14	11	7,685
	1962	194	4,582	223	2	5,001

Source: Aircraft Movements at Airports without D.O.T. Towers, Table 2, Annual 1966, Aviation Statistics Centre, Ottawa.

Aircraft Movement Statistics, Airports with Air Traffic Control, Table 4, Annual 1966, Aviation Statistics Centre, Ottawa.

TABLE 3-6

NORTHWEST TERRITORIES

Itinerant Movements by Type of Power Plant, 1962 - 1966

Airport		Helicopter	Piston	Turbo-Prop	Jet	Total
Yellowknife	1966	59	4,996	120	53	5,208
	1965	12	3,939	23	2	3,976
	1964	9	4,095	1	4	4,109
	1963	40	3,583	4	4	3,631
	1962	29	2,779	9	-	2,817
Hay River	1966	656	4,745	7	2	5,410
	1965	574	4,445	-	-	5,019
	1964	45	3,684	5	-	3,734
	1963	34	2,661	-	-	2,695
	1962	48	2,092	-	-	2,140
Norman Wells	1966	386	3,195	368	-	3,949
	1965	56	3,032	68	-	3,156
	1964	34	2,285	-	-	2,319
	1963	22	2,063	2	-	2,087
	1962	7	1,894	1	-	1,902
Inuvik	1966	290	2,718	181	12	3,201
	1965	137	2,965	105	-	3,207
	1964	40	1,915	6	-	1,961
	1963	41	1,831	8	-	1,880
	1962	20	1,452	6	-	1,478

Source: Aircraft Movements at Airports without D.O.T. Towers, Table 2, Annual 1966, Aviation Statistics Centre, Ottawa.

APPENDIX 4

TABLE 4-1

DOMESTIC PASSENGER ORIGIN AND DESTINATION STATISTICS
FROM SELECTED AIRPORTS
1962 - 1966 ANNUAL TOTALS

Airport	1962	1963	1964	1965	1966
1. Yukon					
*Dawson[a.]	1,690	1,530	1,925	1,795	2,250
*Mayo[a.]	1,445	1,885	2,360	2,375	2,135
*Watson Lake	4,150	4,240	4,355	5,100	6,545
*Whitehorse	14,020	13,435	15,020	17,125	21,555
2. Northwest Territory					
Cambridge Bay	510	435	445	650	630
*Fort Simpson	1,395	1,120	1,365	1,620	1,280
*Fort Smith	8,580	9,030	9,995	11,695	9,485
*Hay River	2,840	3,515	4,430	5,795	7,290
*Inuvik	5,420	5,265	5,970	8,650	5,535
*Norman Wells	1,820	1,550	1,425	2,070	1,695
*Yellowknife	9,980	8,295	8,425	12,440	13,525
3. Northern British Columbia					
*Alice Arm	-	-	-	-	2,655
*Dawson Creek	-	1,655	2,795	3,680	4,980
*Fort Nelson	5,840	5,230	6,300	4,795	5,340
*Fort St. John	25,015	23,560	24,935	22,745	27,345
*Hudson Hope	-	-	-	-	14,125
*Stewart	-	-	-	-	2,935

Source: Airline Passenger Origin and Destination Statistics, Domestic Report, 1966, Air Transport Board, Queen's Printer, Ottawa.

* Mainline points with fairly regular service, DC3 class or larger.

a. No traffic reported for September 1965 as C.P. withdrew service.

TABLE 4-2

PASSENGER ORIGIN AND DESTINATION STATISTICS
ALL CANADIAN CARRIAGE ONLY

YUKON TERRITORY	1965			1966		
	Out	In	Total	Out	In	Total
1. Dawson City						
Alberta	295	300	595	170	125	295
British Columbia	220	270	490	535	495	930
Newfoundland	-	-	-	5	-	5
Yukon Territory	375	265	640	415	485	900
Quebec	5	-	5	10	-	10
Ontario	35	20	55	55	50	105
Manitoba	5	5	10	5	-	5
TOTAL	935	860	1,795	1,095	1,155	2,250
2. Mayo						
Alberta	230	405	635	150	380	530
British Columbia	450	530	980	360	520	880
Yukon	320	340	660	330	270	600
Ontario	40	15	55	15	10	25
Quebec	15	10	25	15	10	25
Saskatchewan	5	-	5	10	5	15
Manitoba	-	10	10	25	20	45
Northwest Territory	5	-	5	5	10	15
TOTAL	1,065	1,310	2,375	910	1,225	2,135

TABLE 4-2 (Continued)

PASSENGER ORIGIN AND DESTINATION STATISTICS (Continued)

YUKON TERRITORY	1965			1966		
	Out	In	Total	Out	In	Total
3. Watson Lake						
Alberta	670	950	1,620	760	1,000	1,760
British Columbia	1,020	1,045	2,065	1,525	1,395	2,920
Yukon	665	460	1,125	790	675	1,465
Ontario	75	125	200	110	80	190
Northwest Territory	-	-	-	10	10	20
Nova Scotia	5	-	5	15	15	30
Quebec	15	25	40	40	55	95
Saskatchewan	5	-	5	10	15	25
Manitoba	25	15	40	15	25	40
TOTAL	2,480	2,620	5,100	3,275	3,270	6,545
4. Whitehorse						
Alberta	2,540	2,405	4,945	3,080	2,975	6,055
British Columbia	4,460	4,420	8,880	5,725	5,410	11,135
P.E.I.	5	5	10	-	5	5
Yukon	995	1,290	2,285	1,315	1,420	2,735
Ontario	260	295	555	525	420	945
New Brunswick	15	35	50	45	15	60
Northwest Territory	25	30	55	30	25	55
Nova Scotia	25	10	35	15	5	20
Quebec	50	15	65	55	70	125
Saskatchewan	55	50	105	95	125	220
Newfoundland	5	15	20	-	5	5
Manitoba	55	65	120	80	115	195
TOTAL	8,490	8,635	17,125	10,965	10,590	21,555

TABLE 4-3

WHITEHORSE:[a] C.P.A. BOARDING AND DEPLANING PASSENGERS, 1964, 1966 AND JANUARY - OCTOBER 1967

	Boarding			Deplaning		
Month	1964	1966	1967	1964	1966	1967
January	770	782	845	911	1,055	1,083
February	526	704	695	562	848	887
March	810	933	1,081	821	1,031	1,043
April	811	1,032	1,048	923	1,114	1,129
May	802	967	977	990	1,218	
June	1,043	1,189	1,261	1,153	1,356	1,451
July	1,284	1,521	1,846	1,116	1,520	1,897
August	1,157	1,710	2,004	1,357	1,549	1,763
September	1,345	1,674	1,938	1,051	1,281	1,611
October	867	1,345	1,507	818	1,034	1,228
November	681	1,067	N.A.	632	790	N.A.
December	866	1,176	N.A.	716	737	N.A.
	10,962	14,100		11,050	13,533	

a. Includes Mayo and Dawson.

N.A. Not available - 1965 not available

TABLE 4-4

WATSON LAKE: C.P.A. BOARDING AND DEPLANING PASSENGER STATISTICS, 1964, 1966 AND JANUARY - OCTOBER, 1967

	Boarding			Deplaning		
Month	1964	1966	1967	1964	1966	1967
January	127	216	217	176	231	266
February	123	171	244	112	210	195
March	150	238	266	151	241	241
April	134	262	241	140	298	285
May	170	256	275	191	343	354
June	185	283	298	302	408	368
July	251	399	364	289	404	383
August	356	464	482	345	423	454
September	351	469	506	292	393	500
October	259	361	474	206	270	436
November	154	226	N.A.	160	214	N.A.
December	228	275	N.A.	169	206	N.A.
	2,488	3,620		2,533	3,641	

TABLE 4-5

TYPE OF PASSENGERS:
PURPOSE OF TRIP, FOR ON BOARD TRAFFIC NORTH OF FT. ST. JOHN[a].

A. PURPOSE OF TRIP:

Business	65%
Visiting friends, relations	25%
Tourism[b].	10%

B. PLACE OF RESIDENCE:

Yukon Resident	13%
B.C.	34%
(Vancouver Area - 27)	
(Other B.C. - 7)	
Alberta	27%
(Edmonton - 14)	
(Calgary - 9)	
(Other Alta. - 4)	
Other Canada	16%
U.S.A.	8%
Other Country	2%

a. Source: On Board Survey by C.P.A., 1965

b. Mostly Hunting and Fishing

TABLE 4-7

DESTINATION OF ON BOARD TRAFFIC (north of Ft. St. John)[a].

Whitehorse	48%
Watson Lake	23%
Fort Nelson	11%
Mayo	10%
Dawson	8%

a. Source: On Board Survey by C.P.A., 1965

TABLE 4-6

ORIGINS AND DESTINATIONS:
PASSENGER DISTRIBUTIONS, BY PERCENTAGE,
FOR YUKON CITIES, FOR 1964, 1965, 1966.

City	Year	O/D	Columbia	Alberta	Elsewhere in Yukon	Rest of Canada	U.S.A.
DAWSON	1964	O	33%	34%	30%	3%	-
		D	32	38	28	2	-
	1965	O	22	32	41	5	-
		D	33	34	30	3	-
	1966	O	39	15	38	7	1%
		D	42	11	42	4	1
MAYO	1964	O	45	25	27	3	-
		D	37	25	34	4	-
	1965	O	42	22	30	6	*
		D	40	31	26	3	*
	1966	O	40	16	36	8	-
		D	42	31	22	5	-
WATSON LAKE	1964	O	47	24	23	6	-
		D	48	25	19	8	-
	1965	O	41	27	27	5	*
		D	43	34	17	6	1
	1966	O	44	22	23	10	1
		D	43	30	20	6	1
WHITE-HORSE	1964	O	50	29	13	8	-
		D	52	27	13	8	-
	1965	O	52	30	12	6	*
		D	51	28	15	6	*
	1966	O	52	28	12	7	1
		D	51	28	14	7	*

* less than .5%

Source: D.B.S. origin and destination Statistics, converted into totals and then percentages.

APPENDIX 5

REGULATIONS GOVERNING THE GRANTING, ASSIGNMENT OR TRANSFER OF PUBLIC SERVICE VEHICLE LICENCES

Issued pursuant to Commissioner's Order 1966-126.
Dated September 12, 1966.

Application

1. (1) These regulations shall apply to any applicant for the granting, assignment or transfer of a P.S.V. Licence, unless

(a) in the case of an individual he is a bona fide resident of the Territory, or

(b) in the case of a corporation or aggregate employer he maintains a bona fide place of business in the Territory employing thereat at least one full-time employee.

and who is currently the holder of a Territorial P.S.V. Licence for vehicles of similar category.

(2) These regulations do not apply to an application for renewal of a currently expiring P.S.V. licence by a holder in good standing.

Form of Application

2. Every applicant shall make application to the Commissioner on the appropriate form of the Schedule appended hereto.

3. A notice of the application, in the appropriate form of the Schedule appended hereto, shall be published by the applicant in two issues, at least 2 (two) days apart, of a newspaper published in and circulated throughout the Yukon Territory and the applicant shall forthwith file with the Commissioner proof of publication.

(As amended by 1966-140)

Objection and Hearing

4. Any person may object to the granting, assignment or transfer of a Public Service Vehicle licence by filing a written objection and reasons therefor with the Commissioner and by causing a copy of the objection and reasons therefor to be served upon the applicant personally or by registered mail not more than five days, not including Saturday, Sundary or Statutory Holidays, after the last publication referred to in section 3.

(As amended by 1966-140)

5. Upon receipt of an objection, the Commissioner may fix a day at least seven days after the last day of the publication referred to in section 3 for hearing representations on behalf of the applicant and on behalf of the person or persons who have filed an objection pursuant to section 4.

6. Where an objection to an application has been made pursuant to section 4, the Commissioner may appoint a Board consisting of not more than 5 members and a chairman.

7. (1) The board appointed pursuant to section 6 shall meet on the day fixed for the hearing to consider the application and the objections and shall decide whether a Public Service Vehicle licence shall be granted to the applicant and, if granted, shall stipulate the terms and conditions upon which the grant shall be made.

(2) The Board may adjourn from time to time and place to place and shall not be obliged to announce it's decision in the presence of the applicant or any other person.

(3) Upon reaching it's decision the chairman of the Board shall communicate full particulars of the Board's decision to the Commissioner.

(4) The Board's decision shall be based on a majority vote of the chairman and members thereof.

Through Freighter Licence

8. Notwithstanding anything contained in these regulations, an applicant who applies for a Public Service Vehicle licence for the purpose only of transporting goods through the Territory without loading or discharging any part of the goods inside the Territory, may be granted a Public Service Vehicle licence for that purpose.

SCHEDULE

FORM A

APPLICATION FOR PUBLIC SERVICE VEHICLE LICENCE

1. Name of Applicant:

2. Residence:

3. Number and type of motor vehicles for which application is being made:

4. Type of goods to be brought into the Territory:

5. Type of goods to be taken out of the Territory:

6. Particulars of experience in the business of freight or passenger transportation and length of time established in present business:

7. Will the proposed service be scheduled or unscheduled service?

8. Places in Territory where freight or passengers are to be discharged or picked up;

9. Details of insurance in respect of each vehicle for which a P.S.V. licence is applied:

10. Length of time it is proposed to make use of such P.S.V. licence:

11. Will application for renewal be made in a succeeding year?

12. Accompanying this application are four copies of the proposed freight or passenger tariff showing the rates to be charged, collected or enforced in connection with the proposed service.

13. Details of bonding arrangements for safe-keeping of consigned goods or C.O.D. monies.

14. Any material on which applicant relies to establish that there is insufficient similar service in the Yukon.

S C H E D U L E

FORM B

NOTICE OF APPLICATION FOR PUBLIC SERVICE VEHICLE LICENCE

Notice is hereby given that an application for a Public Service Vehicle licence has been made to the Commissioner of the Yukon Territory. Any person objecting to the granting of such licence shall file such objections and reasons therefor in writing with the Commissioner not more than five days after the last publication of this notice and serve a copy of such objection and reasons therefor on the applicant personally or by registered mail.

Name of Applicant:

Residence of Applicant:

Number and types of vehicles for which licences are being applied for:

Purpose of Application:

The day of the hearing of the application shall be not less than seven days after the last publication of this notice.

This is the time of publication.

S C H E D U L E

FORM C

APPLICATION FOR TRANSFER OR ASSIGNMENT OF PUBLIC SERVICE VEHICLE LICENCE

1. Name of Applicant:

2. Residence:

3. Name of existing P.S.V. Holder;

4. Number and type of motor vehicles for which application is made:

5. Type of goods to be brought into the Territory:

6. Type of goods to be taken out of the Territory:

7. Particulars of experience in the business of freight or passenger transportation and length of time established in present business:

8. Will the proposed service be scheduled or unscheduled service?

9. Places in Territory where freight or passengers are to be discharged or picked up:

10. Details of insurance in respect of each vehicle for which a P.S.V. licence is applied:

11. Length of time it is proposed to make use of such P.S.V. licence.

12. Will application for renewal be made in a succeeding year?

13. Accompanying this application are four copies of the proposed freight or passenger tariff showing the rates to be charged, collected or enforced in connection with the proposed service.

S C H E D U L E

FORM D

NOTICE OF APPLICATION FOR TRANSFER OR ASSIGNMENT OF PUBLIC SERVICE VEHICLE LICENCE

Notice is hereby given that an application for transfer of a Public Service Vehicle licence has been made to the Commissioner of the Yukon Territory. Any person objecting to the transfer of such licence shall file such objection and reasons therefor in writing with the Commissioner not more than five days after the last publication of this notice and serve a copy of such objection and reasons therefor on the applicant personally or by registered mail.

Name of Applicant:

Residence of Applicant:

Name of Existing P.S.V. Holder:

Number and types of vehicles for which licences are being applied for:

Purpose of Application:

The day of the hearing of the application shall be not less than seven days after the last publication of this notice.

This is the time of publication.

APPENDIX 6 TABLE 6-1

CAPITAL EXPENDITURE ON ROAD, BRIDGES AND PUBLIC WORKS BY THE YUKON TERRITORIAL GOVERNMENT, 1962 - 1967

Dollars

Construction on Major Roads	1967	1966	1965	1964	1963	1962
Stewart Crossing/ Dawson Road	164,114	165,219	-	52,606	124,805	238,462
Dawson/Boundary Road	-	22,713	-	46,322	50,011	41,624
Whitehorse/Keno Road	142,709	260,421	418,295	319,266	314,000	263,975
Canol Road	46,023	-	67,182	14,471	-	39,763
	352,846	439,353	485,477	432,665	488,316	583,824
Other Roadworks						
Road and garage equipment	406,455	425,508	240,137	381,251	232,526	N.A.
Other roads[a.]	220,753	313,508	103,919	276,023	149,960	110,304
Total roads	980,054	1,178,369	829,533	1,089,939	870,802	694,128
Airstrips	7,145	3,435	4,214	-	1,340	-
Bridges	36,949	-	42,754	23,606	27,966	2,691
Office equipment	1,855	1,331	1,071	6,191	3,404	N.A.
Other public works	80,544	50,383	48,762	76,425	220,900	110,754
	126,493	55,149	96,801	106,222	253,640	113,445
Total roads, bridges and public works	1,105,772	1,233,518	926,334	1,196,161	1,124,442	807,573

Source: Government of the Yukon Territory Public Accounts, 31st March 1963 - 31st March 1967.

a. Includes capital expenditure on secondary roads, Yukon Forestry Department roads, etc.

TABLE 6-2

CAPITAL EXPENDITURE ON ROADS AND BRIDGES 100% RECOVERABLE FROM THE FEDERAL GOVERNMENT UNDER THE ENGINEERING SERVICES AGREEMENT, 1963-1967

	Dollars
1967	391,274
1966	441,799
1965	504,583
1964	545,582
1963	492,652

TABLE 6-3

REIMBURSEMENT OF EXPENDITURE INCURRED BY THE YUKON TERRITORY, 31st MARCH 1962 - 31st MARCH 1967*

Dollars

As at 31st March	100% Recoverable	Partly Recoverable	Non Recoverable	Total
1967	112,733	1,231,707	581,895	1,926,335
1966	85,516	887,186	479,516	1,452,218
1965	59,483	761,281	535,811	1,356,575
1964	11,409	605,320	391,830	1,008,559
1963	17,735	545,885	397,310	960,930
1962	N.A.	575,106	319,044	894,150

Source: Government of the Yukon Territory Public Accounts, 31st March 1962 - 31st March 1967.

* Recoveries in the main were received under the Federal-Territorial Engineering Services Agreement whereby the Federal Government accepts financial responsibility wholly or in part for certain work carried out by the Territorial Government.

TABLE 6-4

OPERATIONS AND MAINTENANCE EXPENDITURE ON ROADS, BRIDGES AND PUBLIC WORKS BY THE YUKON TERRITORIAL GOVERNMENT, 31st March, 1962 - 31st March, 1967

Dollars

Major Road Works	1967	1966	1965	1964	1963	1962
Stewart Crossing/ Dawson Road	219,169	158,752	145,536	141,134	143,963	144,523
Dawson - Boundary Road	142,910	119,332	59,017	57,645	67,093	37,838
Whitehorse/Keno Highway	474,205	361,307	341,871	281,537	251,459	337,304
Canol Road	156,816	125,876	87,529	66,413	68,001	89,447
	943,100	765,267	633,953	546,729	530,516	609,112
Other roadworks	492,198	410,580	369,984	188,203	135,805	92,461
Total roadworks	1,485,298	1,175,847	993,937	734,932	666,321	701,573
Airstrips	8,657	10,431	8,186	6,306	7,109	5,483
Ferries	76,148	39,020	59,725	57,645	67,093	37,838
Administrative	136,799	105,130	104,379	98,144	99,005	89,649
Other public works	219,433	121,790	190,348	111,532	121,402	59,607
Total roads, bridges and public works	1,926,335	1,452,218	1,356,575	1,008,559	960,930	894,150

Source: Government of the Yukon Territory Public Accounts, 31st March 1962 - 31st March 1967.

TABLE 6-5

FEDERAL EXPENDITURE ON ROADS AND BRIDGES IN NORTHERN CANADA, 1962-1967

Dollars

As at 31st March	Northwest Highway System[a]	Development Roads[b] Yukon Territory	Development Roads[b] Northwest Territories	Total Expenditure
1962	N.A.	4,796,471	2,659,602	
1963	N.A.	3,940,271	1,850,635	
1964	N.A.	1,765,084	1,936,810	
1965	9,400,000	1,638,463	1,745,053	12,783,516
1966	5,500,000	2,682,032	1,560,434	9,742,466
1967	6,149,500	3,050,435	4,003,864	13,203,799

Source: Department of Public Works Annual Reports, 1965-1967. Public Accounts of Canada, Department of Indian Affairs and Northern Development, 1962-1967.

a. The Northwest Highway System comprises the 1,220 miles of the Alaska Highway, the 117 miles of the Haines cut-off road and a number of air-field access roads. Responsibility for maintaining this system was transferred from the Department of National Defence to the Department of Public Works on April 1, 1964.

b. The Department of Indian Affairs and Northern Development is responsible for construction (through the Department of Public Works) of development roads.

TABLE 6-6

FEDERAL EXPENDITURE ON AIRPORT RUNWAYS AND ASSOCIATED FACILITIES[c]
1962 - 1967

Dollars

$ '000s	1967	1966	1965	1964	1963	1962
Northern British Columbia	221.8	811.9	581.3	139.6	75.8	352.9
Yukon Territory	N.A.	102.6	572.7	412.6	16.3	84.9
Northwest Territories (District of MacKenzie)	155.8	9.9	8.6	433.2	376.8	1,886.9
TOTAL	377.6	924.4	1,162.6	985.4	468.9	2,324.7

Source: Public Accounts of Canada, Department of Transport, 1962 - 1967.

c. Includes runways, taxiways, terminal buildings and other facilities.

TABLE 6-7

FEDERAL EXPENDITURE ON DEVELOPMENT ROADS AND BRIDGES IN THE YUKON TERRITORY, 1962 - 1967

Dollars

	1962	1963	1964	1965	1966	1967
Watson Lake/Ross River Road	1,417,383	1,554,650	877,353	1,070,767	932,277	1,064,524
Whitehorse/Keno Road	402,148	314,489	319,266	435,166	270,432	-
Stewart Crossing/ Dawson Road	880,682	136,756	55,390	8,000	169,165	-
Canol Road	41,000	1,419	15,100	69,654	-	-
Flat Creek/ Eagle Plain Road	977,454	288,781	33,977	-	-	-
Nahanni Range Road	730,615	1,086,023	193,787	35,330	-	-
Ross River Carmacks Road	-	-	99,928	-	481,830	1,447,034
Clinton Creek Road	-	-	-	-	663,190	-
Dempster Highway	-	-	-	-	18,500	-
Boundary Road	-	-	46,355	-	40,000	-
Other	347,189	558,153	123,928	19,546	106,638	922,974
Total	4,796,471	3,940,271	1,765,084	1,638,463	2,682,032	3,050,435

Source: Public Accounts of Canada, Department of Indian Affairs and Northern Development, 1962-1967.

TABLE 6-8

FEDERAL EXPENDITURE ON DEVELOPMENT ROADS AND BRIDGES IN THE NORTHWEST TERRITORIES, 1962-1967

Dollars

	1962	1963	1964	1965	1966	1967
Mackenzie Highway	1,506,928	1,180,260	522,723	-	-	942,306
Yellowknife/ McKay Lake Road	577,203	94,226	49,944	-	-	-
Hay River/Pine Point/Fort Smith Road	-	92,040	997,768	-	-	-
Hay River/Pine Point Road	-	-	-	1,422,658	612,791	-
Pine Point/Fort Smith Road	-	-	-	-	830,000	2,205,353
Fort Smith/Pine Lake Road	-	-	-	-	-	-
Other	575,471	484,109	361,375	322,395	117,643	757,339
TOTAL	2,659,602	1,850,635	1,936,810	1,745,053	1,560,434	4,003,864

Source: Public Accounts of Canada, Department of Indian Affairs and Northern Development, 1962-1967.

APPENDIX 7

THE ROLE OF HELICOPTERS IN THE YUKON AND NORTHWEST CANADA

Within the last decade helicopters have assumed a pre-eminent position in programs of mineral exploration and development in Northwest Canada. Because of their flexibility in regard to terrain the rate of exploration has been speeded up with a more intense utilization of skilled personnel. The main users of helicopter services are mining and oil companies, government agencies such as Forest and Geological services, mapping and survey branches.

Mineral Exploration

Oil companies working in the McKenzie Basin have been restricted in certain areas to winter exploration only because of terrain. The new turbine powered helicopters can lift up to 4,000 lbs., (Bell 204B) and oil companies are able to move drilling equipment into hitherto inaccessible areas during the summer season.

On the other hand piston powered helicopters are very inefficient at low temperatures, and the advent of the turbine motor since 1963 enables machines to be used the year round. Now both mining and oil companies can work the year round in many areas where temperature formerly was a limiting factor.

Operating Costs in the North

Operating costs of helicopters are higher in the north, of course, because of distance from bases of supply and lack of road transportation. For most areas fuel must be flown to the helicopter by fixed wing aircraft, which presupposes a lake, river or a landing strip. Obviously a helicopter much be based as closely as possible to the locations of the job otherwise costly flying time builds up and pay loads must be reduced in favour of fuel.

Because of higher operating costs in the North, helicopter companies not based locally usually require a minimum three months charter plus some acceptance of indirect costs by the charterer. Indirect costs include the transportation of fuel and spare parts in case of breakdown in the field.

Short term charter rates run from $105.00 per hour for a Bell 47G2 to $450.00 per hour for a Bell 204B, while the operating costs range from $60.00 per hour to $275.00 per hour. The following table indicates the charter rates of Okanagan Helicopters Ltd., the largest company in Canada, for various types of machines in their fleet:

	Charter Period		
	1 - 29 Days Minimum 3 hours per day - rates per hour	4 - 5 Months	
Machine		Minimum per summer months	Rate per hour
Bell 47G2	$105	$ 7,840	$ 98
Hiller 12E, 12EL, Bell G3B	$140	$11,500	$130
Hiller SL-4	$154	$12,710	$149
Sikorsky S-58	$195	$13,650	$195
Bell 204B	$450	$42,125	$400

Source: Okanagan Helicopters Ltd., Vancouver, B.C.

Note: A study of the demand for helicopter service in British Columbia and the Yukon Territory made by one company indicates that 35% of their machine time was used to move passengers, 50% to move cargo and 15% for air-borne surveys. The company ascertained that large mining companies use machines approximately 500 hours per year, while small mining companies use about 40 hours per year.*

* Northern Helicopters Ltd., Vancouver, B.C. (1966).

APPENDIX 8

SUPPLEMENT TO THE TRANSPORTATION REPORT

CAPITAL INVESTMENT AND EMPLOYMENT IN TRANSPORTATION IN THE YUKON TERRITORY

Capital expenditures on transportation may be divided between the private and public sectors. In the public sector the Federal Government via the Departments of Transport, Public Works, Northern Affairs and Development construct and maintain the North-West Highway System which includes the Alaska Highway and the Haines Cut-off. Department of Transport operated airports are located at Whitehorse, Watson Lake, Teslin, Dawson City.

A substantial road development program was authorized by the Department of Northern Affairs and Natural Resources* for Northern Canada including the Yukon Territory.

There are four basic components to the Northern Roads program.

1. Communication and Network Roads are permanent highways linking population centres within the territory, and linking territories with the provinces. The Federal Government pays for construction and 85% of the maintenance cost.

2. Initial Access Roads are low standard winter or year round roads to provide established resource exploration or development project with access to a network road. The Federal Government will pay 50% of construction cost but the road must be maintained by its primary user.

3. Permanent Access Roads are to connect a resource development about to produce, to a permanent road. Federal Government pays up to two thirds of the

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* See: Department of Northern Affairs and Natural Resources Pamphlet "What the new Northern Road Network means . . ."

cost but not to exceed 15% of capital invested by a company prior to commercial production.

4. Area Development Roads are to lead into resource potential areas and planned to fit in with and extend the overall road network plan. The Federal Government pays the cost of construction and shares maintenance with the territorial government.

5. Roads connecting public airports to nearest network or local road will be constructed by the Federal Government who will also pay 85% of the maintenance costs.

It can be seen that a substantial investment has been made in the Yukon Territory by the Federal Government on roads and airports. The territorial government assumes limited responsibility for road construction and will continue to do so until its tax base broadens.

Private Investment

Private investment in Yukon transportation is, of course, dominated by the White Pass and Yukon Corporation and its subsidiaries, which had net assets after depreciation in 1966 of $18,500,000. The assets include the Vancouver terminal operation, the marine, rail and pipeline operation, the Highway Division out of Whitehorse, and Loiselle Transport Ltd.

The net capital investment in the Highway Division is calculated at $2,000,000, including 27 tractors and 53 trailers. Loiselle Transport operates 7 tractors and 10 trailers on the Alaska Highway route at an estimated capital cost of $350,000. Canadian Freightways Ltd., the Alaska Highway Express, Gordies, Tamec and Carnegie have an estimated capital investment in equipment

and terminal facilities in the Yukon of $500,000.

The remaining major private carrier in the Yukon Territory is United Keno Hill Transport Division, which operates 50 tractors and 54 trailers with the main terminal at Whitehorse. The total capital investment is estimated to be in excess of $2,000,000.

Employment and Payroll

White Pass and Yukon Corporation employs approximately 380 personnel of which 75 work in Vancouver, 130 in Alaska and 175 in the Yukon Territory. Of the 175 employees in the Yukon Territory, approximately 70 operate the Highway Division. The total payroll in the Yukon Territory in 1967 was $1,468,000.

Rail: Capital Investment and Employment, 1969-75

It is estimated that by 1970 the total volume of traffic on the White Pass and Yukon Railway will be in excess of 600,000 tons per annum.* This total will include 255,000 tons of containerable commodities and petroleum products and 380,000 tons of lead-zinc concentrates from the Anvil mine. By 1975 it is estimated that the annual tonnage will have increased to 726,000 tons. The Travacon Report has pointed out that an upgrading of the present railway track will be required to handle the 300 per cent increase in business. The estimated cost is approximately $3,000,000. In addition 80 ore cars of 30 tons capacity and three diesel locomotives will be needed to haul the Anvil concentrates. It is further estimated that 36 permanent employees and 23 temporary summer employees will be required at an annual cost of approximately $470,000 to maintain the upgraded track.+

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* Travacon Report, p. 6.30.

+ Ibid., p.6.24.

Road

It is estimated that 38 tractor trailer units will be required to haul the Anvil concentrates to railhead at a 1966 price of $36,000 per unit, or $1,370,000. To this may be added $50,000 for maintenance facilities. The employment created by the truck haul should be in the order of 60 or 70 men.

Additional facilities will be required by all trucking companies, particularly the Highway Division of the White Pass and Yukon Railway, due to a predicted 20% increase in northbound cargo between 1968 and 1973. It is quite possible that northbound traffic will increase at a more rapid rate, however, as smaller mines, such as Mount Nansen and Arctic, come into production. Thus an estimate of new capital investment in the order of $2,000,000 on trucking equipment in the next five years appears to be reasonable.

APPENDIX 9

HOVERCRAFT IN THE NORTH

The hovercraft's demonstrated ability to travel over many types of surface conditions could mean that the vehicle has considerable potential as a transport medium in Northern Canada.

Trials undertaken in and near the Mackenzie River Delta between April 22 and May 30, 1966, tested an SRN5 over a variety of surfaces, including fast ice, pressure ridges, first-year sea ice and overland, under late winter and spring conditions. Several extended sorties were made including a 500 mile trip from Tuktoyaktuk to Norman Wells, during which the hovercraft travelled through all phases of break-up on the Mackenzie River.

A commercial SRN5 operating under the conditions of these trials would be able to carry up to 5,000 lbs. of freight, something between the capacity of an Otter and a Dakota (C47).

The Report on the trials, put out by the Defence Research Board of the Department of National Defence, stated that the SRN5 could negotiate all surface conditions encountered and that, with the exception of the severest river break-up conditions, few problems were experienced.

No major difficulties were experienced in the actual transportation of the hovercraft to Tuktoyaktuk and Norman Wells, and the report states that "it should be possible, with a certain amount of local improvisation to load or unload an SRN5 from C130 aircraft virtually anywhere"

The maintenance and serviceability of the vehicle apparently presented little difficulty, the only exception being the flexible skirts which were not suitable for prolonged operation in low temperatures.

Apart from the general logistic and supply problems common to every operation in arctic regions, few difficulties were experienced, as only a small quantity of spare parts were needed, and support transportation, including a helicopter and snowmobile, were convenient but not essential.

Additional trials out of Churchill, Manitoba, to further test hovercraft under arctic conditions began in January, 1968, under a contract awarded by the Department of Transport to Hovercraft Canada Ltd., this time using a larger SRN6 model.

Although the 1966 trials have demonstrated that the hovercraft can be successfully operated in a wide range of arctic conditions, doubts exist as to whether the vehicle in its present state of development would be a commercially viable proposition in Northern Canada, or whether its advantages over existing transportation methods would be worth the financial outlay involved.

For purely supply purposes it is probably more economical to bulk supply isolated areas by sea and river during the summer months, and use aircraft during the winter for special loads, than to use hovercraft.

It has been suggested, however, that a hovercraft's most important applications in Northern Canada would be in regions where the cost of moving things is secondary to the need to move them, and in exploration and survey work. In restrictive Arctic conditions, hovercraft would probably be able to haul heavier materials and supplies, e.g. oil drilling rigs, more conveniently and economically than helicopters.

Possible future developments in this field could be the operation of a hovercraft service in the Northwest Territories. Pacific Hovercraft Ltd.

have applied to the Air Committee of the Canadian Transport Commission for a licence to operate a hovercraft between Hay River and Tuktoyaktuk via the Mackenzie River on a fortnightly schedule. However, no decision is likely to be made for some time.

FOOTNOTES

[1]·Farley Mowat, Canada North, (Toronto: McClelland & Stewart Ltd., 1967), p. 111.

[2]·David P. Morgan, "Trains Go To Alaska," Trains, (February 1963), p.19.

[3]·Stanford Research Institute, Improvement Program for the Alaska Highway, (Ottawa: Department of Northern Affairs and National Resources, 1966), p.iv-56.

[4]·C.J. Brown, "Yukon Mineral Resources and Transportation," paper presented to the Alaska Centennial Conference, Fairbanks, Alaska, 1967, p.5.

[5]·White Pass & Yukon Railway, Tariff C.F.O. 800, C.T.C. (F) #87.

[6]·Travacon Research Ltd., Economic Implications of Developing Selected Alternative Highway Routes to Tidewater from the Yukon Territory, Report to the Department of Indian Affairs and Northern Development, 1967, p.314.

[7]·M.D. Dawson, "A Technique of Air Cargo Market Research," Papers, Sixth---Annual Meeting, Transportation Research Forum, (Oxford, Richard B. Cross Co., 1965), p.289.

[8]·Travacon Research Ltd., op.cit., p.6-9.

[9]·C.C. Watson, "Railway's Big Role in Total P.D. Concept," Canadian Transportation, April 1967, p.34.

[10]·Mr. B. Hogan, personal interview, February 1968.

[11]·"Northern Resource Roads" and the "Northern Road Network Program," publications of the Department of Indian Affairs and Northern Development.

[12]·Department of Transport, and Department of Indian Affairs and Northern Development airport rating.

[13]·Yukon Territory files.

[14]·Letter, G.E. McDowell, Regional Director Air Services, Department of Transport, Edmonton, 19th March 1968.

[15]·Roland N. McKean, Public Spending, (New York: McGraw Hill, 1968), p.161.

[16]·U.S. Department of State, Report of the Commission to Study the Proposed Highway to Alaska, Conference Series No. 14, 1933.

[17]·Canada, British Columbia-Yukon-Alaska Highway Commission, Report on the Proposed Highway through British Columbia and the Yukon Territory to Alaska, (Ottawa: Kings Printer, 1942).

[18]·The North Pacific Planning Project, Canada's New Northwest (Ottawa: King's Printer, 1948).

19. U.S. Congress, Alaska International Rail and Highway Commission, Final Report, Transport Requirements for the Growth of Northwest North America, 87th Congress, 1st Session, House Doc. 176, Vols. I, II & III.

20. "Proposed P.N.R. route was mapped by air," Railway Age, Vol. CIL, No. 24, (1960), p.45.

21. Primary Resources Committee, Vancouver Board of Trade, Northern British Columbia Resource Development - 1965, Vancouver, 1965.

22. W. Owen, Strategy for Mobility, (Washington D.C.: Brookings Institution, 1964), p.54.

23. Op. Cit., p.197.

MCR 35

TRANSPORTATION FACILITIES - 1964

NORTHWESTERN CANADA

Scale: 1 inch to 50 miles

Miles 25 0 25 50 75 100 125 150 Miles

REFERENCE

- RAILWAY
- MOTOR ROAD
- WINTER ROAD
- HIGHWAY NUMBER (28)
- FERRY Fy
- SHIPPING SERVICE
- AIRPORT
- AIRFIELD
- SEAPLANE ANCHORAGE
- SCHEDULED AIR SERVICE
- NON SCHEDULED AIR SERVICE
- UNLISTED AIRSTRIP

Copies may be obtained from the Map Distribution Office, Department of Mines and Technical Surveys, Ottawa.

AIR DISTANCES BETWEEN MAIN CENTRES (in statute miles)

Edmonton (Intl) - Fort McMurray	249	Edmonton (Intl) - Grande Prairie	250
Fort McMurray - Fort Smith	234	Grande Prairie - Fort St John	103
Fort Smith - Hay River	142	Fort St John - Fort Nelson	192
Hay River - Fort Simpson	192	Fort Nelson - Watson Lake	236
Fort Simpson - Wrigley	122	Watson Lake - Whitehorse	217
Wrigley - Norman Wells	175	Whitehorse - Dawson	264
Norman Wells - Inuvik	277		
		Grande Prairie - Prince George	176
Fort Smith - Fort Resolution	99	Prince George - Smithers	193
Fort Resolution - Yellowknife	93	Smithers - Terrace	61
Yellowknife - Cambridge Bay	528	Terrace - Prince Rupert	76

Produced by the Surveys and Mapping Branch, Ottawa, 1964.