ECONOMIC REPORT

OF THE

ALASKA HIGHWAY

BUREAU OF TRANSPORTATION ECONOMICS

OTTAWA

1948

ECONOMIC REPORT

ON THE

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Terms of Reference

To appraise the probable net annual cost of maintaining the Alaska Highway as an artery of Commerce for Northwestern Canada, as distinct from its employment as an instrument of national security.

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Summary Conclusions

1. The total annual cost of maintaining the Canadian section of the Alaska highway, Dawson Creek-Mile 1221, inclusive of the airport access roads, will probably be of the order of $2,850,000. An additional $355,000 will probably be required to maintain the Canadian section of the Haines lateral highway on a year-round basis. Therefore, the total annual maintenance cost of all Canadian sections of the Alaska highway, will probably amount to some $3,205,000.

2. The annual potential freight traffic which may move over the Alaska highway and the Haines lateral, during the next few years, is estimated at 51,000 tons. The movement of this tonnage indicates the performance of 28,281,000 ton-miles, and 9,685,000 vehicle-miles per year. Of this annual potential traffic, it is estimated that 10,000 tons, 7,500,000 ton-miles, and 5,000,000 vehicle-miles will be military traffic. Therefore, the annual potential freight traffic from which revenue may accrue is estimated at 41,000 tons, 20,781,000 ton-miles, and 4,685,000 vehicle-miles.

3. The annual potential passenger traffic, during the next few years, is estimated at 36,000 passengers. The movement of these passengers may result in the annual performance of 49,000,000 passenger-miles, and 14,000,000 vehicle-miles.

4. Revenue from gasoline taxes, based on an average of 8¢ per gallon over the entire highway, and an average of 8 miles and 18 miles per gallon

for freight and passenger vehicles respectively, will probably amount to $110,000 per year. Additional yearly revenue from vehicle registration fees, drivers' licences, and miscellaneous transportation taxes is estimated at $75,000. Therefore, total revenue from the above sources, which are the only existing sources of revenue, may amount to $185,000.

5. Of the estimated total revenue of $185,000, probably not more than $44,000 from gasoline taxes and $25,000 from vehicle registration fees and other miscellaneous sources, or a total of $69,000, would represent the revenue accruing to the Dominion Government; the remaining $116,000 accruing to British Columbia.

6. The net annual cost of maintaining the Canadian sections of the Alaska highway, based on total estimated cost and total estimated revenue, therefore, should be of the order of $3,020,000.

7. Additional revenue might be raised through the levying of special user taxes. One of two alternative types of tolls might be levied. Either a toll per vehicle-mile, applied to all types of vehicles; or alternatively, a combination toll per passenger-mile for passenger traffic, and per ton-mile for freight traffic. A moderate toll of not more than two cents per vehicle-mile, or one cent per passenger-mile and ton-mile may possibly be economically feasible, without seriously decreasing the estimated volume of traffic projected in this survey.

8. A straight toll of one cent per vehicle-mile would result in approximately $187,000 of additional revenue, and two cents per vehicle-mile, $374,000. This would reduce the net annual maintenance cost to $2,833,000 and $2,646,000 respectively.

9. A combination toll of one cent per ton-mile for freight traffic and one cent per passenger-mile for passenger traffic would produce $652,000 of additional revenue. The net annual maintenance cost, if this form of toll were levied, would amount to $2,368,000.

10. The total annual commercial freight carried over the Alaska highway, exclusive of the Haines cut-off, during the next few years, will probably amount to 28,000 tons. Estimated revenue from freight traffic, exclusive of toll charges, should total approximately $75,000. On the assumption that 50% of the highway's maintenance costs may be allocated to freight traffic, the net annual cost attributable to freight traffic is estimated at $1,350,000. Therefore, the estimated cost to the Government attributable to the movement of each ton of freight over the main Alaska highway is approximately $48.00. If a one cent per vehicle-mile toll were levied, the highway maintenance cost for moving each ton of freight would be reduced to $47.00. A toll of two cents per vehicle-mile would further reduce this cost per ton to approximately $46.00. If a toll of one cent per ton-mile were levied, the net annual cost of maintaining the Alaska highway, exclusive of the Haines cut-off, attributable to freight traffic, would be of the order of $1,174,000. The cost per ton of freight moved over this section of the highway, therefore, would amount to some $42.00 per ton.

11. The estimated total annual commercial freight traffic which will probably move over the Haines cut-off during the next few years is some 13,000 tons. It is further estimated that the net annual cost of maintaining the Haines highway, attributable to freight traffic, will probably be a minimum of $200,000 per year. Therefore, the cost to the Dominion Government, on the basis of each ton of freight carried over this highway, is indicated at approximately $15.00. If a toll of one cent per vehicle-mile were levied, the net annual maintenance cost, attributable to freight traffic, might be reduced to probably $180,000, which in turn would reduce the per ton cost to the Dominion Government to $14.00. If a two cent per vehicle-mile toll were levied, the cost per ton to the Dominion Government might be further reduced to $12.00 per ton. If a toll of one cent per ton-mile were levied, the cost per ton would approximate $13.00.

Respectfully submitted,

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Bureau of Transportation Economics,
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SECTION I

Description of the Alaska Highway

(A) Purpose for the Highway's Construction

The Alaska highway was originally conceived as a commercial overland route through northwestern Canada to Alaska, supplementing the all-water route from Seattle to Alaska. It was subsequently constructed as a strategic military route principally to service the chain of airfields throughout Northwestern Canada and Alaska, linking the production lines of North America, and particularly the air industry, with the Russian mainland; and secondarily, as an alternative form of transportation to Alaska in the event of Japanese submarine warfare cutting the historic ocean supply routes. The underlying policy in the highway's construction, therefore, was military necessity, in which the time factor dictated its location, and economic factors affecting the subsequent commercial utilization of the highway played a very minor role. No consideration was given to selecting the most scenic route as a future attraction to tourists. Similarly, no attempt was made to traverse all areas of economic importance within the Yukon, but only those which happened to lie along the route chosen. As such two of the Yukon's most important economic regions, the Mayo and Dawson areas, lie well off the direct route of the Alaska highway.

(B) Route

The highway begins at Dawson Creek, British Columbia, which is designated mile 00, running north to Fort St. John at mile 48. From Fort St. John it continues northwestward to the upper valley of the Cameron River, then across the Sikanni Chief and down the Prophet River to a crossing of the Muskwa at Fort Nelson, mile 308. From Fort Nelson it ascends the valleys of the Muskwa and tributary Tetsa to Summit Lake, 88 miles west of Fort Nelson, where it crosses the divide of the Rockies at an elevation of approximately 4,251 feet, the highest point along the highway. Descending

the west slope of the Rockies the road follows MacDonald Creek and Racing River, and ascends the Toad River valley to a low divide which it crosses to the Muncho Lake Basin. From Muncho Lake, it descends the valley of the Trout River to the confluence of that river with the Liard, crosses the Liard at this point, and follows its north bank to Watson Lake at mile 634.

From Watson Lake to Whitehorse it follows the Rancheria River to the divide between the Mackenzie and Yukon drainage basins, then down the Swift River and across a low divide to the Morley River which it follows to Lake Teslin. It crosses the Teslin River near the foot of the lake, and continues southeast along an old trail to Marsh Lake, following this lake and the Lewes River to Whitehorse, at mile 918.

From Whitehorse the route, rather than following the Yukon River to Dawson City and then westerly to the Yukon-Alaska boundary, a route which might have had important economic effects on the Yukon, takes a more direct route via Kluane Lake and White River to the Yukon-Alaska boundary at mile 1,221. From the boundary line it proceeds to the headwaters of the Tanana River, follows the north bank of the river to the mouth of the Tok River, which it crosses, following the south bank to a junction with the Richardson highway at Big Delta.

As an adjunct to the main Alaska highway the Haines lateral runs from the tidewater of the Lynn Canal at the town of Haines, Alaska, horth-westerly 154 miles joining the Alaska highway at Johnston's Crossing, mile 1,016.

The length of the highway within Canada, including the section of the Haines lateral, totals 1,335 miles of which 713 or 53.3% lie within British Columbia, and 622, or 46.7%, within the Yukon Territory. The United States section of the Alaska highway proper totals 247 miles of which 207 miles lie north of the Canadian boundary between mile 1,221 and the junction with the Richardson highway 99 miles distant from Fairbanks, and 40 miles within Southwestern Alaska constituting part of the Haines lateral.

(C) Physical Condition of Highway - February, 1948

The Alaska highway throughout its entire length is a crushed gravel surface, which compares favourably with the best of gravelled highways within the Dominion. The grade varies from 22 feet to 36 feet, and the travel surface of 20 feet is reasonably uniform along the whole highway. The following description of the highway presents a detailed picture of the road by sections:

Mile 00 (Dawson Creek to Mile 55 (Fort St.John-Mile 48) -- Minimum grade of 36 feet - high class construction.

Mile 55 to Mile 207 -- Grade 36 feet - good construction.

Mile 207 to Mile 238 -- This section has a 28-foot grade. The road follows the straightened 'pioneer' road and the curvature is slightly excessive and the alignment is not well designed.

Mile 238 to Mile 245 -- Grade 28 feet - the road curvatures on this section are not well designed and there are several minor slide areas. Roughly 80% of drainage structures require replacement.

Mile 245 to Mile 270 -- Grade 24 to 26 feet - this section of the road has excessive curvature, and is badly located. It runs through an area of undrained muskeg, and an estimated minimum of 6 miles of the road should be re-located in the near future. Considerable difficulty was experienced during the 1947 spring breakup. In the opinion of the army engineers the entire 25 miles should be re-located as a long term project at an estimated cost of $25,000 per mile. The drainage structures are bad, and some 80% require replacement.

Mile 270 to Mile 300 -- Grade 24 to 26 feet - fair construction, but the general drainage necessitates heavy maintenance. Again about 80% of the drainage structures should be replaced.

Mile 300 to Mile 335 (Fort Nelson-Mile 308) -- Grade 28 feet - the road curvature is excessive, and this section must be re-gravelled in 1948-1949. In addition, to prevent excessive maintenance, a large part of drainage structures should be replaced.

Mile 335 to Mile 360 -- Grade 30 feet - the average gradient is 4%. It is a typical mountain road with several hair-pin turns with deep side gorges. It requires guard rail protection.

Mile 360 to Mile 496 (Liard River) -- Grade 30 feet - the road runs through mountainous terrain and has a few steep curves and gradients. From mile 370 to 420 the gradient averages 4%. At mile 368 it has been constructed in a shifting side hill silt with no possibility of re-location. Approximately 1/4 of mile 368 presents excessive maintenance during breakup and continues until August. Maintenance crew continually employed during this period.

Mile 496 to Mile 640 (Watson Lake-Mile 635) -- Grade 34 feet - this section of the road follows the valley of the Liard River. Most of it runs through gravel side hills which cause slide conditions in the spring, but present few maintenance problems, and costs are not excessive.

Mile 506 to Mile 525 -- Grade 32 feet - the profile of this section of the highway is only 2 feet above the ground water level. The majority of the drainage structures require replacement, and during late May and early June it is subject to gum boils and heavy maintenance costs. To correct the problem, this section of the highway requires high-grading at a considerable expense.

Mile 640 to Mile 760 -- The grade is 32 feet. This section of the road runs through a mountainous gravel terrain. There are some gradients of 7% up to a mile in length. Spring slides cause excessive maintenance.

Mile 760 to Mile 830 -- The grade of this section is 28 feet. There are numerous winding curves. At mile 804 the temporary timber bridge is suitable for one-way traffic only, and has a maximum load limit of 18 tons gross or 8 tons per axle. This bridge, which requires heavy maintenance costs and also a stand-by barge for emergency purposes, is the weakest link on the highway. Replacement cost will probably be a minimum of $1,000,000.

Mile 830 to Mile 917 -- Grade 28 feet - well constructed road.

Mile 917 to Mile 937 (Whitehorse-921) -- Grade 26 feet - road of good construction but has numerous curves.

Mile 937 to Mile 1016 -- Grade 30 feet - well designed road of minor curves and easy gradients.

Mile 1016 to Mile 1028 -- Grade 30 feet - there are several sections over a mile in length of gradients averaging 6%.

Mile 1028 to Mile 1040 -- Grade 28 feet - this section has several steep gradients of 7%, and bad drifting conditions in the winter.

Mile 1056 to Mile 1083 -- The grade on this section is 24 feet. The road is well constructed, but is subject to washouts in the spring by flash floods. Slim's River bridge at mile 1058 is a temporary wooden trestle. It is subject to frost heave which limits the load to 24 tons gross. It should be replaced by a permanent structure at an estimated cost of $300,000 to $400,000.

Mile 1083 to Mile 1130 -- Good road of 28 foot grade.

Mile 1130 to Mile 1132 -- Grade 28 feet - this section runs through the Donjek River valley. The seven temporary wooden trestles bridging the river channels are subject to washouts by flash floods, ice breakups, and driftwood during high water in the summer. A new 1600-foot bridge is required 3 miles downstream from the present site. This will involve the construction of 6 miles of new road through muskeg, perma frost and volcanic ash terrain. The project which has just been started is a 3-year job for 50 to 60 men working 8 months a year.

Mile 1132 to Mile 1170 -- Grade 24 feet - this stretch of road is very twisty with minor sharp curves, and continuous changes in gradient. While none of these are excessive, maintenance costs are high due to regrading and straightening requirements.

Mile 1170 to Mile 1206 -- Grade 22 feet - this section traverses many miles of perma frost which is less than 1 foot from the surface of the ground in July and August. It requires heavy maintenance costs due to the continuous filling required. The road follows the ground profile, and the army engineers feel that a number of grade changes should be eliminated by filling at mile 1169. Sliding banks cause substantial maintenance costs. On this section a large number of drainage structures require replacement.

Mile 1206 to Mile 1221 -- Grade 22 feet - this section has excessive curvature. The road is too close to the water surface and has been built in a muskeg and swamp area. The swamp area would require very heavy costs to drain. As a long-run project to reduce maintenance costs this complete section should be redesigned and rebuilt.

Haines Lateral

Mile 159 (1016) -- Compared with the main Alaska highway the Haines adjunct may be classed as a secondary road. It is simply the original 'pioneer' road which has been improved. The grade varies from 18 to 20 feet, with a travel surface of 16 feet. It is a rolling road, closely following the ground profile and numerous stream beds. This results in a considerable number of washouts during the period June to August. While this condition does not close the road it necessitates maintenance costs. All bridges on the Haines lateral are of temporary wooden construction,

and some are of doubtful design and will limit the load to a maximum of 18 tons. The drainage structures have been partially replaced, but a considerable amount of work has still to be done before the road can be considered adequate for all-weather operations. The principal bottleneck on the road is from mile 46 to mile 43 which traverses a high steep side hill, and, due to perma frost conditions, is continually running and sliding necessitating excessive maintenance. This stretch of the road requires a four-mile diversion at an estimated cost of $25,000 per mile.

Winter Conditions -- From mile 158 to mile 156 there are a series of glaciers where underground water from the surrounding muskeg slopes flows up over the road forming ice to a depth of 10 to 12 feet and a width of 200 yards. Relocation of this section is not possible, and if the road is to be kept open all year round extensive drainage will have to be undertaken, because once the ice condition forms, it can only be reopened by the sun.

From mile 159 to mile 90 winter snow clearance presents no problem.

From mile 90 to mile 55 the road traverses a high 2-mile wide mountain valley above the timber line along which the average annual snowfall measures some 10 to 20 feet with occasional 35 to 40 foot drifts. This section presents a very real maintenance problem in the winter as

the wind blows almost continuously, and the dry, sugary-texture snow drifts readily causing serious road blockage. There are no cut-banks to dispose of the snow. It must be thrown back on the side of the mountain from which it drifts on to the road again. Similar conditions exist along the Richardson highway in Alaska, and the White Pass and Yukon railway. No attempt is made to keep the Richardson highway open during the winter, and the railway company has solved its problem by coupling a rotary plow engine on to the train, because the railway has found from experience that a lapse of less than 2 minutes, between the passage of the plow and the train along certain sections of the line, would make the movement of the train impossible. A permanent solution to the snow problem along this section will only be ascertainable after several years of observation. As a temporary measure, the erection of snow fences would ease the problem. As a long-run solution, however, a 25-mile diversion of the road would appear to be necessary.

From mile 55 to Haines there is no serious maintenance problem. Mile 54 is a long steep winding grade of 8% to 9% with one bad hairpin turn, and mile 40, the border between Alaska and Canada, has a sub-standard bridge which will require replacement. A section of the road in the United States which has recently been re-located is winding and has a narrow grade of 16 feet.

Section II

An Estimate of the Alaska Highway's Annual Maintenance Cost

(A) General

Maintenance costs for the Alaska highway will be directly influenced by certain historical aspects of the road's construction, by the type of terrain the highway traverses, and by the level of activity in highway construction and maintenance in western and northwestern Canada at any given time.

The highway was constructed as a top priority military undertaking with the time factor a crucial consideration. For this reason it was pushed through in record time, but with little consideration for commercial alignment, and at times without critical consideration of the engineering problems peculiar to the terrain traversed, a typical example of this being evidenced in the removal, along sections of the highway, of the natural insulation against perma frost conditions - a factor which is now creating heavier maintenance costs than would otherwise have been necessary. The general standard of drainage was completely inadequate for much of the muskeg and swamp land through which the highway was built. Sections of the road were constructed only slightly above the ground water level with all the attendant problems of washouts. Culverts were built to meet minimum requirements, and have proved insufficient to serve the needs of the highway. As a time-saving device sections of the highway were built with excessive curvature and gradients. Shortage of steel and an uncertainty of the highway's future commercial use gave rise to a large amount of temporary timber bridging. The number of timber bridges on the Canadian section of the Alaska highway, exclusive of the Haines adjunct, totals 94, of a total length of 15,674 feet. Of this total length, 1,298 feet, or less than 10%, is of truss construction with a minimum life of 20 years with normal maintenance. The remaining 14,376 feet are temporary timber trestles,

some of which are well designed and show no signs of deterioration, but a large number of which require replacement.

Prior to the completion of the highway the military raison d'etre for its construction had ceased to exist, and the northern end was completed to a lower standard than had been initially planned - many miles of it simply being an improved 'pioneer' road.

The characteristics of the weather and terrain of northwestern Canada present major maintenance problems. Extreme winter weather, combined with a light snowfall along certain sections of the highway, result in little natural insulation, causing a high degree of frost penetration, which, in the spring, means heavy maintenance costs, particularly where the water level is close to the surface and the drainage is inadequate. Many miles of the highway traverse muskeg and swamp land necessitating extensive drainage facilities. Other sections of the road, built in slide areas, require heavy maintenance to keep the road open for traffic. Perma frost occurs along many miles of the highway, and where this is close to the surface continuous filling operations are essential. Gumbo silt along sections of the road, which fills the drainage ditches and flows on to the road, causes heavy maintenance costs. Icing conditions along sections of the highway, caused by alternate flooding and freezing of water running over the road, requires constant attention to prevent damage to drainage structures, and serious impediment to or complete stoppage of traffic. Canadian army engineers have encountered 150 of these along the highway. This number has now been reduced to 50 by improved drainage. Spring flash floods present another serious problem along sections of the highway, causing washouts of parts of the road. Their cumulative effects can only be controlled by extensive drainage improvements. Spring floods also cause considerable maintenance of bridge structures. Timber trestle bridgesover shifting gravel sand have not stood up well under conditions of high water. Flood conditions have not reached serious proportions since 1943, but it is the opinion of the army engineers that the high bridge approach fills will not stand up to abnormal

flood conditions, and should flood conditions of the 1943 character reoccur many temporary bridges will go out.

The level of activity in highway construction and maintenance throughout Canada, and particularly western and northwestern Canada, will influence maintenance costs along the Alaska highway. At the present with all Canadian provinces catching up on their backlog of highway maintenance, and new highway construction shelved during the war, labour and equipment costs are extremely high. To attract labour for northwestern Canada's highway construction and maintenance requirements, the wage level must be abnormally high, not only to compensate for the high cost of living, but also for frontier living conditions and lack of amenities. Equipment has been in very short supply since the end of the war, and this condition has been aggravated by the Dominion Government's dollar conservation policy. What equipment is available is inferior in quality and high in price. The Canadian army engineers are using equipment, part of which had been taken over from the United States army, and this is proving very expensive to keep in working order -- a minimum of $250,000 a year in spare parts alone is required.

That section of the Alaska highway running from Haines, Alaska, to the main highway at mile 1016 presents its own special maintenance problems, the most serious of which is winter maintenance under conditions of severe snow drifting and icing conditions.

Thirty-five miles of the Haines highway from mile 55 to mile 90 traverses a wide mountain valley above the timber line. This section, lacking any natural snow protection and subject to almost continuous wind, causes severe snow drifting conditions. To aggravate the problem, there is no cut-bank to dispose of the snow. Consequently, as quickly as the snow is removed from the highway it drifts back on to the road again. Estimates of the average depth of these snowdrifts vary from 10 to 40 feet, depending upon the severity of the winter. During February, 1948, an army reconnaissance unit travelled over the highway by dog sled and on foot. This unit reported a maximum depth of 10 feet of hard-packed snow with a

minimum depth of from 2 to 2½ feet. The snow fall in northwestern Canada during the winter of 1948 has been the lightest in twenty-five years. Mr. H. Hammond, a trapper who spent from October 16, 1947 to February 7, 1948, along the Haines highway recorded, in his diary, an estimated snow fall of 18 feet along the highway during the period. During the winter of 1946 the United States army engineers attempted to keep the Haines road open without success. They estimated the depth of snow drifts at 30 feet. In the opinion of the Canadian army, winter freighting over the highway will only be possible by a convoy of trucks following closely behind a rotary plow.

Ice sheeting also causes excessive winter maintenance. Between mile 156 and mile 158 in the glacial ranges, underground water from surrounding muskeg slopes flows over the road forming ice to a depth of 10 to 12 feet and a width of 200 yards.

Generally speaking, the Haines cut-off is a secondary road compared with the main Alaska highway. It is a pioneer road which has been improved. A recent United States report on the Haines lateral highway by the Hon. R.B. Chipperfield and the Hon. B.J. Jonkman of the Committee on Foreign Affairs stated that:

> "to expedite construction, departure was made from the location recommended by the Public Road Administration, and much of the road has been so placed that maintenance is difficult and costly."

It follows closely the ground profile and many streams, which result in numerous washouts from June to August, entailing heavy maintenance costs. The drainage structures have been replaced to a large extent, but a considerable amount of work remains to be done on them, before the road can be considered safe in high water.

The principal bottleneck on the road is a slide area between mile 43 and mile 46. Along this section the road traverses a high steep side hill underlain by perma frost. The effect of the sun causes continuous running and sliding with heavy maintenance costs. The solution would appear to be a four-mile road diversion at an estimated cost of $25,000 per mile.

The highway's 27 bridges are all temporary wooden structures, and some are of doubtful design. Total length of these bridges is 2,015 feet.

If the standard of this highway is to be raised to that of the main Alaska highway, or if traffic increases, permanent bridges will be required.

(B) Maintenance Cost Estimate - Mile 00 to Mile 1221

The Canadian army engineers, currently responsible for the maintenance of the highway, have estimated that the basic maintenance costs of the highway which includes grading, minor drainage and repairs, and snow clearance is of the order of $1,000 per mile. This is the minimum considered necessary to maintain the highway at its present standard. To improve the highway such as bringing sub-standard sections up to standard, gravelling, carrying out permanent and emergency repairs, replacing culverts and improving drainage, regrading and realigning sections, sign posting, building guard rails, improving excessive gradients, and road profile, and replacing temporary bridges, an additional $1,000 per mile would be necessary.

The overall length of the Canadian section of the Alaska highway, including the access roads to the airports, is approximately 1,425 miles. Therefore, to maintain the highway at its present standard will cost some $1,425,000 per year. To carry out necessary improvements to the highway will cost an additional $1,425,000 annually, bringing the total maintenance cost up to $2,850,000 annually.

To give perspective to this estimate, the following independent views should prove of interest.

Information supplied by Mr. I.P. Taylor, Chief Engineer of the Alaska Road Commission, and Mr. F. Metcalfe, Alaska Territorial Highway Engineer regarding maintenance costs of the United States section of the Alaska highway, was to the effect that during 1941 the average maintenance cost of Alaska highways was from $750 to $800 per mile. Since the end of the war, they have been attempting to maintain these highways at a similar cost, but it is proving insufficient to maintain them at their present standard. In Mr. Taylor's opinion, a minimum of $1,000 to $1,200 per mile is necessary for basic maintenance of the United States section of the Alaska highway, and if the necessary improvements are to be made it will

cost anywhere from $1,500 to $2,500 per mile depending upon the nature of the improvements carried out.

Two western Canadian contractors, with a knowledge of highway construction and maintenance problems in northwestern Canada, stated that they could not give an estimate of the probable annual maintenance costs of the Alaska highway without a careful study of the present condition of the highway. They both expressed the opinion, however, that independent contractors might have difficulty obtaining the necessary equipment and labour to adequately maintain the complete highway at the present time.

Mr. J.M. Wardle, Director of the Surveys and Engineering Branch of the Department of Mines and Resources, estimated in 1943 that maintenance costs for the highway would probably amount to "$1,000 per mile for routine surface maintenance and an additional $1,000 for emergency repairs and reconstruction".

The maintenance of the Alaska highway raises problems very different from those to be found in the more highly developed areas of Canada. It also involves supplying the maintenance crews with accomodation and basic furniture; some public utilities; vehicle and equipment repair; hospitalization; and transportation of heavy equipment, engineer and construction materials and other commodities. The army, because of its ability to supply amenities of various types to its labour, has been able to attract civilian labour at wages from $50 to $200 less per month than civilian contractors working in northwestern Canada. Of even greater significance it has had a smaller turnover of labour than have the civilian contractors. The army's maintenance cost estimates include salaries, maintenance, clothing, etc., for army personnel.

The military authorities estimate that 635 persons are required to maintain the Alaska highway under present conditions as indicated in the following table:

Duties	No. of Personnel
Basic Road Maintenance.....	180
Crews for major repairs of road and bridges and for half of the permanent construction required.....	120
Operation of utilities at Fort Nelson and Whitehorse and in 18 road camps; maintenance repair and construction of single and married quarters; provision of fire protection, etc.....	75
Operation of rail and road heads; contract buying of supplies; handling of gas, oil, lubricants, and other fuels; distribution of bridging and road stores, supplies, etc., along the highway and the operation of two transport garages.....	80
Provision of hospital and dental facilities presently beyond the scope of civilian hospitals.....	20
Purchase, storage, binning and issuing of spare parts, barrack stores, etc.....	50
Workshops at Fort Nelson and Whitehorse with small shops at Watson Lake and mile 1083 to do second and third line repairs to vehicles and equipment including motor rebuilds.....	50
Headquarters, including clerical staff; supervision; finance; pay; messing and billeting of single personnel.....	60
TOTAL.....	635

The above establishment would appear to be much higher than required by private civilian contractors. A large proportion of the above services, however, cannot properly be considered as maintenance, but rather ancillary services to the maintenance crews and equipment. As has been pointed out above, the maintenance cost estimate includes only the salaries paid to civilian employees and an estimated cost for army employees.

In considering the question of Army vs. Civilian maintenance of the Alaska highway, the United States Interim Report H.R. 1705 stated that:

> "Various methods of maintenance were tried out to determine the most efficient and economical method. During the winter of 1943-44 the southerly sector of 620 miles was maintained by labour hired directly by the Army, while the remainder of the highway was maintained by contract with three separate contractors, each responsible for designated sections of the highway. After a trial period of several months, the War Department found that maintenance by directly employed labour was the more economical method, because it permitted a more flexible organization and eliminated a large amount of overhead."

The number of pieces of equipment used by the army in maintaining the highway totals 505. This included vehicles used in hauling engineering equipment, and essential bridge stores, but no equipment used for the hauling of supplies by the Service Corps, and for general maintenance at Whitehorse. The types of equipment and the number in service are listed below:

Type of Equipment	No. of Pieces
Trucks (including Snow Plow).....	222
Transport Trailers.....	6
Motor and Crawler Cranes, Draglines and Shovels.....	25
Motor Patrols.....	62
Pull Blades.....	12
Angle Dozers, Bull Dozers and Tractors.....	43
Carryall Scrapers.....	12
Rotary Plows.....	15
Lighting Plants.....	58
Pumps, Heaters, Steamers, etc.....	50
TOTAL.....	505

The above equipment, which includes a number of obsolete pieces, could be reduced by approximately 15% if new equipment replacements were available. Additional reductions could be made if reserves of equipment kept in isolated areas were removed. This, however, could only be done at the loss of a certain amount of efficiency to the highway's maintenance programme.

The maintenance of the Alaska highway at the moment by civilian contractors would undoubtedly create a considerably tighter labour and equipment market in the highway construction and maintenance industry in the western provinces, the Northwest Territories, and the Yukon Territory.

(C) Maintenance Cost Estimate - Haines Lateral

The United States Army has estimated that the maintenance of the Haines lateral on a year-round basis would require 290 men, and an average of 130 pieces of maintenance equipment. Records of the United States Army's annual cost estimates are not available. The Alaska Study Mission

of the Committee on Foreign Affairs refer to an estimate of $750,000 per year or an average of approximately $5,000 per mile in its report. This figure is not given, however, in the form of a firm estimate.

The Canadian Army engineers are of the opinion that to maintain the Canadian section of the Haines lateral on a year-round basis a considerable amount of grade improvement, relocation, gravelling, and bridge repair and replacement will be required. The initial cost of this work has been estimated at $275,000. The balance of the work would be carried out by normal maintenance crews during the summer season. In addition to this, equipment necessary for the year-round job, which is not available from the main highway, is estimated at another $385,000. The cost of the construction of a base shelter for men and equipment, a temporary shelter, and reconditioning of two existing camps, is estimated at an additional $50,000. The construction of a telephone line for control and safety of maintenance crews during the winter period is estimated at $130,000. Total nonrecurring costs, therefore, to place the Haines lateral in a position to handle increased traffic on a year-round basis is estimated at $840,000.

Personnel required for the maintenance of the Haines lateral on a year-round basis will be, in the opinion of the army, 30 men located in four permanent camps and two intermediate shelters, and 35 pieces of snow-clearing and maintenance equipment.

The annual recurring cost for the maintenance of the Canadian section of this highway is estimated at $235,000 per annum or approximately $1,950 per mile. This would cover basic maintenance. Probably another $1,000 per mile or a total of $2,950 per mile or $355,000 would be required if major improvements were carried out.

(D) Maintenance Cost Estimate - Alaska Highway Including Haines Lateral

The total estimated cost of maintaining the Alaska highway and its lateral road would be of the order of $1,660,000 for basic maintenance, and an additional $1,545,000 for major improvements, or a total of $3,205,000 or approximately $2,075 per mile for basic maintenance plus major improvements as indicated in the following table:

Section of Highway	Mileage	Basic Maintenance	Cost Per Mile	Major Improvements	Cost Per Mile
		$	$	$	$
Main Alaska Highway....	1,425	1,425,000	1,000	1,425,000	1,000
Haines Lateral (Canadian Section)...	120	235,000	1,950	120,000	1,000
TOTAL.....	1,545	1,660,000	1,075	1,545,000	1,000

Section III

Highway Operations

(A) Operators

The following seven companies are currently operating transportation services over sections of the main Alaska highway between Dawson Creek and the Alaska boundary:

(1) British Yukon Navigation Truck Lines

(2) Northern Freightways Limited

(3) Wilson Freightways Limited

(4) A. Trail Trucking

(5) George Schmidt

(6) George Prince

(7) O'Hara Bus Lines

(B) Scope of Services

All but O'Hara Bus Lines operate services between Dawson Creek and Whitehorse or along sections of the Dawson Creek-Whitehorse route.

British Yukon Navigation Truck Lines, and George Schmidt, operate from Dawson Creek to Whitehorse and intermediate points. A. Trail Trucking operate principally between Dawson Creek and Muncho Lake approximately half way between Dawson Creek and Whitehorse, with a few irregular services north to Whitehorse; Wilson Freightways, Northern Freightways and George Prince operate between Dawson Creek and Fort Nelson. The O'Hara Bus Lines operate between Whitehorse and the Alaska boundary where it links up with its parent Alaska company.

(C) Frequency of Service

1. Freight

Two of the above companies operate scheduled freight services. The British Yukon Navigation Truck Lines operate tri-weekly freight service between Dawson Creek and Whitehorse during the summer months, and weekly

services during the winter. British Yukon Navigation also provides a bi-weekly service between Dawson Creek and Fort St. John. George Schmidt operates a weekly service between Dawson Creek and Whitehorse. Wilson Freightways, Northern Freightways, and George Prince operate weekly services.

All these companies, in addition to their scheduled services, provide non-scheduled freight services as the traffic warrants. During 1947 the British Yukon Navigation Company, for example, operated 1,145 non-scheduled freight services compared with only 125 scheduled services, or approximately 10 times as many. Records of the other companies' operations are not available.

O'Hara operates an irregular freight service between Whitehorse and the Alaska boundary.

2. Passenger

Two companies, British Yukon Navigation Bus Lines and O'Hara Bus Lines operate passenger services along the highway. During 1947 the British Yukon Navigation Bus Lines operated 275 trips as indicated in the table below:

Service	No. of Trips
Dawson Creek - Whitehorse	117
Dawson Creek - Fort Nelson	24
Whitehorse - Dry Creek	101
Whitehorse - Haines	10
Charter and Excursion	23
TOTAL	275

The O'Hara Bus Lines, a subsidiary of an Alaska company, operates between Whitehorse and the Alaska boundary where it links up with the parent company. During the summer it operates a bi-weekly service, and during the winter a weekly service. On this service it carries a small amount of freight, express, and mail.

During 1947 there were no scheduled operations over the Haines highway. The British Yukon Navigation Company operated an infrequent passenger service, and a number of small privately-owned and operated freight carriers provided freight services as the traffic warranted.

Section IV

Freight Traffic Analysis

(A) Actual Tonnage - 1947

Total revenue freight tonnage moving into, out of, and locally within the Yukon Territory, and that part of northern British Columbia traversed by the Alaska highway amounted to 70,014 tons during 1947 as indicated in the table below:

Carrier	Tons	Percent of Total
Rail	40,952	58.5
Water	2,006	2.9
Highway	26,656(1)	38.1
Air	400	0.5
TOTAL	70,014	100.0

(1) Estimated on basis of March and September traffic - 1947.

1. Rail

Of this total freight tonnage, 40,952 tons or 58.5% was carried by the Yukon and White Pass Railway - 35,742 tons or 87.3% of the rail total inbound; 4,872 tons or 11.9% outbound; and 338 tons or 0.8% locally. A breakdown of this traffic by direction and by points of origination and destination is shown in the table below:

Between Skagway and	Inbound		Outbound		Total Both Directions	
	Tons	Percent	Tons	Percent	Tons	Percent
Whitehorse	24,918	60.8	3,114	7.6	28,032	68.4
Atlin	184	0.4	7	(1)	191	0.4
Mayo	2,686	6.6	1,611	3.9	4,297	10.5
Dawson	6,538	16.0	57	0.2	6,595	16.2
Lower River	777	1.9	-	-	777	1.9
Other Rail Points	639	1.6	83	0.2	722	1.8
Sub-Total	35,742	87.3	4,872	11.9	40,614	99.2
Local	-	-	-	-	338	.8
Total	-	-	-	-	40,952	100.0

(1) Less than 0.1 per cent.

2. Water

Water freight tonnage during 1947 totalled 2,006 tons indicated by type of service in the following table:

Service	Tons	Percent
Lake Local	137	6.8
Upper River Local	1,827	91.1
Lower River Local	42	2.1
TOTAL	2,006	100.0

The small amount of freight traffic moving locally within the Yukon Territory is indicative of the immaturity of the economic development of the area. Each centre within the Territory is very largely dependent upon outside sources of supply.

3. Air

It is estimated on the basis of air freight tonnages recorded for March and September 1947, shown in Appendix I, that the tonnage of air freight carried between Edmonton and stations along the northwest staging route, and locally within the area traversed by the Alaska highway totalled some 400 tons during 1947. No breakdown of this tonnage into through and local traffic is available. The two most important air freight centres, however, were Mayo and Dawson City, which for the two months analysed, accounted for approximately 70% of the traffic as indicated in the table below - a summary of Appendix II.

Through and Local Air Freight Inbound and Outbound	Tons	Percent Of Total
Dawson City	16.748	25.24
Mayo	28.914	43.57
Whitehorse	5.116	7.71
Watson Lake	5.263	7.93
Fort Nelson	5.678	8.56
Fort St. John	4.639	6.99
TOTAL	66.358	100.00

It is believed that a substantial proportion of the Mayo and Dawson City air freight was of local movement originating at Whitehorse as a distributing centre. Similarly some of the air freight recorded for stations south of Whitehorse would be of local origination. Therefore, probably not more than 200 tons of the air freight would be through freight, the balance being local.

An analysis of the directional movement of the air freight for March and September 1947 in Appendix II would indicate a northbound movement of slightly more than 85% and southbound movement of less than 15%.

Types of traffic moved by air consist principally of personal effects, perishable foods, films, raw furs, hardware and machinery parts, and various miscellaneous commodities.

4. Highway

Highway freight for the year 1947 totalled 26,656 tons. This amounted to 38.1% of the total freight tonnage and approximately 62% of the railway traffic. Over 90% of the tonnage moved over the Dawson Creek/Whitehorse section of the highway, the remainder moving between Haines and Whitehorse, and Whitehorse and Alaska.

The following table gives a breakdown of this freight by segments of the highway and the percentage relationship to total highway freight and total freight tonnage.

Between	Tons	Percent of Total Highway Freight	Percent of Total Tonnage
Dawson Creek-Whitehorse	24,168	90.7	34.5
Whitehorse-Haines	1,208	4.5	1.8
Whitehorse-Mile 1221	1,280	4.8	1.8
TOTAL	26,656	100.0	38.1

From the above table it is of interest to note that approximately twenty-five times the freight tonnage moved over the main Alaska highway as over the Haines cut-off. The smallness of the Haines-Whitehorse traffic

was undoubtedly due to the fact that only limited shipping services operated between Vancouver and Haines during 1947.

No specific breakdown of the Dawson Creek/Whitehorse tonnage, by type of traffic, is available, but it is estimated that 20,000 tons consisted of petroleum products, and the balance, 4,168 tons, of general merchandise.

Traffic moving between northwest Alaska and Canada during 1947 over the Alaska highway is indicated in the table below:

Type of Traffic	Weight (Tons)
Northbound Bonded	500
Southbound Bonded	150
Canadian Exports to Alaska	570
Canadian Imports from Alaska	60
Total	1,280

The following table indicates the traffic by type moving between Whitehorse and Haines:

Type of Traffic	Weight (Tons)
Gasoline	558
Lumber	75
General Merchandise	400
Canadian Exports	15
United States Bonded	60
Miscellaneous including oils, fuel, and diesel oils	100
Total	1,208

Practically all of the above traffic moved north to Whitehorse.

From the above tonnage analysis it is of interest to observe that in the case of rail and air traffic, the only types of transportation for which a northbound and southbound breakdown was available, from 85% to 90% of the traffic moved north, the balance being southbound traffic.

(B) Estimated Ton-Miles - 1947

The actual ton-miles of traffic moved over the Canadian section of the highway during 1947 is impossible to ascertain, because all highway carriers, with the exception of the British Yukon Navigation Truck Lines, record tonnage figures only. An estimate of the ton-miles operated, based on actual tonnages and estimated mileages, indicates that approximately 16,500,000 ton-miles were performed by the highway carriers during 1947.

Highway Carrier	Route Segment		Weight	Miles	Ton-Miles
			tons		
British Yukon Navigation.....	Dawson Creek	Whitehorse	6,623	918	6,079,914
" "	Dawson Creek	Fort Nelson	195	308	60,060
" "	(1)	(1)	840	700	588,000
George Schmidt....	Dawson Creek	Whitehorse	2,359	918	2,165,562
A. Trail Trucking.	Dawson Creek	Muncho Lake	13,000	456	5,928,000
Northern Freightways.....	Dawson Creek	Fort Nelson	733	308	225,764
Wilson Freightways	Dawson Creek	Fort Nelson	282	308	86,856
George Prince.....	Dawson Creek	Fort Nelson	135	308	41,580
All Carriers.....	Haines	Whitehorse	1,208	240	289,920
All Carriers.....	Fairbanks	Dawson Creek	650	1,221	793,650
All Carriers.....	Fairbanks	Whitehorse	630	303	190,890
Total.....	All Points		26,655	-	16,450,196

(1) The British Yukon Navigation Company operates general freight trucks between Dawson Creek and Whitehorse. While most of the traffic is destined to Whitehorse some is dropped at points along the highway. It is estimated that the average length of haul for this freight is 700 miles.

While the above estimate may be liberal because some small amount of traffic is destined for intermediate points, yet no allowance has been made in the estimate for non-recurring traffic and local movements by private individuals. On balance, therefore, it is believed that the estimate is reasonably indicative of the ton-miles performed by the highway carriers.

(C) Estimated Vehicle-Miles - 1947

It is estimated that vehicle-miles for the year 1947 were of the order of 3,000,000 as shown in the following table:

Highway Carrier	Route Segment	Estimated Vehicle-Miles	Basis of estimate
British Yukon Navigation...	Dawson Creek/ Whitehorse	582,655)	Actual
"	Dawson Creek/ Fort Nelson	43,482)	vehicle-
"	Dawson Creek Non-Scheduled	31,876)	miles.
A. Trail Trucking.....	Dawson Creek/ Muncho Lake and Whitehorse	1,300,000	Northbound Tonnage- 5,000 Southbound " -13,000 Average Load - 5 tons " Distance - 500 miles
George Schmidt.	Dawson Creek/ Whitehorse	500,000	The relationship between the actual tons of general merchandise carried, and vehicle-miles performed by British Yukon Navigation in 1947, and the actual tons carried by this company.
Northern Freightways..	Dawson Creek/ Fort Nelson	163,000	" " "
Wilson Freightways..	"	63,000	" " "
George Prince..	"	30,000	" " "
All Carriers...	Haines/Whitehorse	150,000	Northbound Tonnage-1,027 Southbound Tonnage- 181 Average Load - 3 tons " Distance - 440 miles
All Carriers...	Fairbanks/ Dawson Creek	134,000	Northbound Tonnage- 552 Southbound Tonnage- 98 Average Load - 5 tons " Distance - 1221 miles
All Carriers...	Fairbanks/ Whitehorse	54,000	Northbound Tonnage - 535 Southbound Tonnage - 95 Average Load - 3 tons " Distance - 303 miles
Total.....	-	3,052,013	-

The following table summarizes the highway freight traffic for those areas traversed by the Alaska highway during 1947:

Tons.....	26,655
Ton-Miles.....	16,500,000
Vehicle-Miles.....	3,000,000

Section V

Estimate of Potential Freight Traffic

Potential Alaska highway freight traffic may develop from one or all of the following five directions:

(a) The diversion of traffic from the ocean/rail service in the United States/Alaska trade;

(b) The diversion of traffic from the ocean/rail services in the Vancouver/Yukon Territory trade;

(c) The development of the Edmonton/Yukon Territory trade;

(d) The development of the economic resources of the area traversed by the highway;

(e) Military traffic.

(A) The United States-Alaska Trade

Total trade between the United States and Alaska during the period 1929 to 1936 averaged 664,000 long tons per year. This was made up of 316,000 tons or 47.6% northbound, and 348,000 or 52.4% southbound, as indicated by years in Appendix III. The yearly variation ranged from a high of 800,000 long tons in 1929 to a low of 500,000 in 1933. This trade is characterized by a very large variety of commodities moving north and a small number of primary products moving south, as indicated by Appendices IV and V. The fact that the northbound and southbound commodities are not complementary, limits the possibility of economies of operation from the employment of specialized transportation equipment. In addition to this uneconomic directional movement of traffic by type of commodities, there is also a seasonal unbalance of trade. Practically all the southbound movement takes place during the three-month period, July 15 - October 15; northbound traffic is fairly evenly divided throughout the 12-month period. This is indicated in the following table showing the directional traffic movement by months during 1941 using August traffic as the base month:

Month	Inbound	Outbound
January	24.3	5.7
February	29.7	3.4
March	44.6	3.4
April	51.3	2.2
May	59.4	3.4
June	79.7	10.1
July	63.5	32.6
August	100.0	100.0
September	66.2	73.0
October	81.1	43.8
November	75.0	8.9
December	49.2	5.7

Ocean services are operated the year round which entails uneconomic operations for nine months of the year. Highway transportation will be faced with the same economic problem caused by a severe unbalance in the Alaska trade. There is nothing to indicate that highway transportation would be able to alter this unbalanced directional movement of traffic, which is a trade rather than transportation problem, and thus affect the economies of operation.

A comparison of transportation charges between the United States and Alaska via the Alaska highway and the current ocean/rail service indicates a very marked differential in favour of the ocean/rail route. From the Montana border to Fairbanks, Alaska, the highway charge, assuming a minimum average rate of 10 cents per ton-mile, would be $244.20 per ton. The established ocean/rail rate, Seattle to Fairbanks, varies from $40.00 to $160.00 per ton. The ocean/rail service, therefore, provides a saving in transportation cost ranging from $84.20 to $204.20 per ton.

Highway charges from Seattle to Fairbanks via the Hart Highway (when officially opened) would be $257.00 per ton based on an assumed rate of 10¢ per ton-mile. In this case the ocean/rail rate would have an even greater cost advantage; the saving ranging from $97.00 to $217.00 per ton.

The following table summarizes these comparative charges:

Between	Route	Distance	Cost	
			Per Ton	Per Ton-Mile
		miles	$	¢
Montana-Fairbanks	Alaska highway via Alberta	2,442	244.20	10.0
Seattle-Fairbanks	Alaska highway via Vancouver & Hart highway	2,570	257.00	10.0
Seattle-Fairbanks	Ocean/Rail	2,056 (1)	40.00-160.00	1.94-7.78

(1) The ocean distance is 1,586 miles, and the rail distance 470 miles.

During 1947 total bonded traffic moving from Fairbanks to the United States amounted to 650 tons, 500 tons southbound and 150 tons northbound. Northbound tonnage consisted almost entirely of scarce commodities carried by private individuals for personal purposes. Southbound tonnage was principally surplus war assets moved to the United States also by private individuals. Much of this was carried in surplus war assets vehicles which were being driven south, and consequently, comparative transportation costs by alternative forms of transport were not considered.

From the above analysis it is felt that future through traffic from the United States via the Alaska highway will be negligible because of the much more favourable through ocean/rail rate. This type of traffic will probably not exceed 1,000 tons or approximately 1,221,000 ton-miles per year. Assuming an average load of 5 tons per trip, total vehicle-miles from through traffic along the main Alaska highway should be of the order of 244,000 per year.

The following table summarizes this estimated potential freight traffic via Dawson Creek and the main Alaska highway:

No. of Tons.....	1,000
No. of Ton-Miles.....	1,221,000
No. of Vehicle-Miles....	244,000

The through traffic potential via the Haines lateral similarly shows little scope for future development. An analysis of 88 commodities made by the economic section of the United States North Pacific Planning

Mission indicates that only three of the commodities, shown in Appendix VI, could move more cheaply by the combination ocean/highway service. These three commodities are "men's and boys' wool suits", the ocean/highway rate for which is $8.30 per ton (or 8.9%) less than the comparative ocean/rail rate; "Electrical Resistance Wire" which shows a differential of $6.50 per ton (or 8.32%); and "Dynamite" which is less by $12.10 per ton (or 14.32%). The other 85 commodities show differentials varying from $1.30 to $157.30 per ton (or 1.5% to 68.18%) in favour of the ocean/rail service. Of these 85 commodities, one shows a differential in favour of ocean/rail transportation in excess of $100.00 per ton; one between $75.00 and $100.00 per ton; ten between $50.00 and $75.00 per ton; twenty-seven commodities between $25.00 and $50.00 per ton; forty commodities between $10.00 and $25.00 per ton; and six commodities less than $10.00 per ton. From the above analysis the strong competitive position of the ocean/rail service from a cost standpoint is clearly illustrated.

The table below indicates the comparative ocean/rail and ocean/highway rates:

Between Seattle-Fairbanks by	Distance Miles	Cost	
		Per Ton $	Per Ton-Mile $
Ocean/Rail	2,056(1)	34.60 - 101.60	1.7 - 4.9
Ocean/Highway	1,772(2)	78.10 - 139.90	4.7 - 8.4

(1) Ocean (1,586 miles); rail (470 miles).
(2) Ocean (1,107 miles), highway (665 miles).

From the above table it will be observed that the minimum ton-mile rate ocean/highway is only slightly less than the maximum ton-mile rate ocean/rail in spite of the substantially shorter haul. The ocean/highway service would probably be from 24 to 36 hours faster.

The present competitive position of these two services would be altered somewhat by either a reduction of the highway rate of 10¢ per ton-mile, or by an increase in the ocean rates. From a cost standpoint a reduction of 1 cent per ton-mile in the highway rate would allow the ocean/

highway service to compete for 8 of the 88 commodities, while a reduction of 2 cents would allow the joint ocean/highway service to compete for 13 of the 88 commodities. There would appear to be little scope for any sizeable reduction in the highway rate, however, because of the one-way nature of the haul, resulting in a uneconomic utilization of equipment. The fact that southbound traffic via the highway is negligible means that the 10¢ per ton-mile rate results in low mileage revenue to the carrier. The ocean rate to northwest Alaska ports is from 10 to 50 per cent higher than to the southwest Alaska ports. An increase in the ocean rate, therefore, would result in a higher absolute rate increase to northwest Alaska ports. Because of the existing marked differential between the ocean/rail and ocean/highway rates the increase in the ocean rate would have to be substantial to alter the present competitive position.

Apart from the economic position, the technical condition of the facilities at Haines will affect the ocean terminal of the United States/Alaska trade. Haines is, at present, without adequate dock and wharfage facilities, bonded and storage warehouses, and accommodation for ships' crews.

For the above reasons it is difficult to see how ocean/highway services via Haines will offer serious competition to the established ocean/rail service via Seward in the near future. An ocean/highway service offering a combination through rate might affect the existing competitive position, but at present no such service is planned.

During 1947 a total of 60 tons of bonded freight moved between southwest and northwest Alaska over the Haines lateral and the main Alaska highway. It is estimated that the maximum through freight moving from the United States to Alaska via Haines and the Alaska highway during the next four to five years will not exceed 1,500 tons per year.

On the assumption that 1,500 tons per year moved via the Haines highway total ton-miles over the Canadian section would be of the order of 480,000. Assuming an average load of 5 tons per trip and virtually a one-way haul total vehicle miles would be approximately 192,000.

The following table summarizes this estimated potential freight traffic via ocean and the Haines cut-off.

No. of Tons	1,500
No. of Ton-Miles	480,000
No. of Vehicle-Miles.....	192,000

The table below summarizes the estimated potential annual United States/Alaska traffic via the Alaska highway:

No. of Tons	2,500
No. of Ton-Miles	1,701,000
No. of Vehicle-Miles	436,000

(B) Vancouver-Yukon Territory Trade

a. Vancouver-Whitehorse

An analysis of the comparative cost of shipments moving between Vancouver and Whitehorse by the ocean/rail and projected ocean/highway service indicates a considerable scope for the development of the latter service via Haines. Of the 39 commodities and commodity groups analyzed in Appendix VII, only four - "Cylinders", "Cement", "Refinery Second Hand Pipe" and "Lard" - show a more favourable cost by the ocean/rail service, while one, "Fresh meat", shows a differential in favour of the ocean/rail service for less-than-carload shipments, but not for carload shipments. The remaining 35 commodities show differentials in favour of the proposed ocean/highway rate varying from $0.60 to $46.00 per ton for carload shipments, and from $2.40 to $52.30 for less-than-carload shipments. Of these 35 commodities, two show a carload rate differential of over $40.00 per ton in favour of the proposed service; seven from $30.00 to $40.00 per ton; twelve from

$20.00 to $30.00 per ton; six between $10.00 and $20.00 per ton; and eight less than $10.00 per ton. Of the L.C.L. shipments two commodities "Fresh Meat" and "Lard" show rate differentials in favour of the ocean/rail service, and sixteen the ocean/highway. Four commodities show differentials in favour of the proposed service of more than $40.00 per ton; two commodities from $30.00 to $40.00 per ton; six commodities from $20.00 to $30.00 per ton; three commodities from $10.00 to $20.00, and one commodity less than $10.00 per ton.

From the above analysis it would appear that practically all the rail tonnage would, from a cost standpoint, be diverted to the proposed ocean/highway service. A number of factors, however, will affect this broad generalization. In the first place there is still considerable uncertainty as to whether an ocean/highway service will become operative. The British Columbia Steamship Company, the propelling force behind the proposed service, has stated that it is only prepared to undertake the service if granted a "protected" licence, by which it means a prohibition against the British Yukon Navigation Truck Lines operating a competitive ocean/highway service. This request has been refused by the Yukon Territory Highway Commission on the grounds that the highway is being maintained by Dominion Government funds and, therefore, operating rights cannot be granted exclusively to any single operator along any section of the highway. Secondly, there is active competition over the rest of the highway; and thirdly, the residents of the Territory have gone on record in favour of competition. Under these circumstances it is still uncertain whether the proposed ocean/highway service will come into operation.

A second consideration is whether the proposed rates would prove sufficiently profitable to permit the company to continue operations for any length of time. An analysis of the proposed rates would indicate that the highway rate is in excess of 10¢ per ton-mile after allowance is made for the current average ocean rate of $20.00 per ton from Vancouver to Haines. Highway operations over the Haines cut-off will have low fuel costs,

the gasoline price at Haines being approximately 21 cents per Imperial gallon as compared with an average of 55 cents per gallon along the main Alaska highway. Oil costs 50 cents per quart as compared to an average of $1.10 along the highway. Wages, however, are 6 cents per vehicle mile as compared with 2.5 to 5 cents in northern Alberta. Repair, maintenance and overhead costs would probably average 10 cents per vehicle mile. Cargo handling costs at Vancouver, but not at Haines and Whitehorse, are included in the through rate. On this basis the estimated cost of a round trip from Haines to Whitehorse with a 3-ton truck, the type currently used, carrying fuel purchased at Haines for the round trip would be $85.36, as indicated in the table below:

Items	Cost
	$
Wages (520 miles at 6¢ per vehicle mile)	31.20
Fuel - Gasoline (21¢ per Imperial gallon, 10 miles to gallon)	10.92
Oil (15% of gasoline cost)	1.64
Repairs, Maintenance and Overhead (8¢ vehicle mile)	41.60
TOTAL	85.36

From the traffic analysis in Section III it was established that Vancouver/Whitehorse traffic is approximately 85% inbound and 15% outbound. Therefore, on the assumption of a 100% capacity payload inbound and a 10¢ per ton-mile charge, revenue inbound would amount to $78.00. Revenue outbound, assuming a 15% payload, would amount to approximately $12.00. Revenue in both directions would amount to some $90.00 per trip, compared with total expenses of $85.36. The profit per round trip of 520 miles, therefore, would amount to $4.64 or $0.89 per vehicle-mile.

The above cost estimate is considered to be conservative. Fuel costs have been based on the landed price at Haines without customs duty of 1 cent and Yukon Territory tax of 6 cents per Imperial gallon. No consideration has been given to the probable increase in fuel price to this area

in line with increases generally in Canada and the United States. Wages at 6 cents per vehicle mile may be on the low side considering the area in which the operations are being carried out.

The experience of other operators indicates a ton-mile cost substantially in excess of 10 cents. The Barnes Construction Company, which has been engaged in moving the Imperial Oil Refinery from Whitehorse to Edmonton, has estimated its highway costs at 18 cents per ton-mile. This operation, however, has involved a 1,600 mile empty back haul. The Canadian Army selected one operation for cost purposes and estimated a per ton-mile cost of 16.7 cents. O'Sullivan Contractors removing the pipe line from the Canol project to Carcross have estimated their cost at 20 cents per ton-mile. The British Yukon Navigation Company, operating between Dawson Creek and Whitehorse, incurred a substantial loss during its first year's operations at rates of 10 cents per ton-mile for carload and 15 cents per ton-mile for less-than-carload shipments.

It would appear, therefore, that the establishment and maintenance of a rate of 10¢ per ton-mile between Haines, Alaska, and Whitehorse, Yukon Territory, is questionable.

The ocean/highway service has only been operated on a trial basis up to the present, and only a small range of commodities have been carried. It would appear from an analysis of the proposed ocean/highway tariffs that they have been based on the percentage reductions of the prevailing ocean/rail rates considered necessary to divert the traffic. Whether these rates will prove economic remains to be seen.

Viewing the other side of the competitive picture it is hardly probable that the combination ocean/rail service will permit any large diversion of its traffic without revising its rate structure. In anticipation of the proposed service the railway at present is reviewing its entire rate structure. A through rate on fresh meat is to be introduced this summer for the first time. Commodity rates are to be broadened and extended. Up to the present there has been a commodity rate for each type

of grocery. These are now to be lumped together and given a commodity rate, lower than what a number of grocery commodities have taken in the past. The pipe line from Skagway to Whitehorse will be able to handle fuel oil supplies at a considerably lower rate than the through ocean/highway rate Consideration is now being given to the use of the pipe line for gasoline and other oil products. This gives some indication of the steps which the railway is taking to meet the threat of competition and possible diversion of traffic to the ocean/highway route.

Based on the foregoing, it appears reasonable to assume that all commodities moving by the ocean/rail service at an adverse cost differential of $15.00 per ton or less will continue to move by this form of transportation. Also, all fuel oil transportation, because of the lower pipe line rates, should remain with the railway. The balance should represent the potential diversion to the highway.

During 1947 total revenue freight carried by the White Pass and Yukon Railway amounted to 40,952 tons. Of this total, 40,614 tons or 99.2% either originated or terminated at Vancouver, and could have used the alternative ocean/highway service. Actual tonnage moved over the highway during 1947 amounted to 1,208 tons.

Of the total rail tonnage, 28,032 tons or 68.4% moved between Vancouver and Whitehorse; 24,918 tons northbound, and 3,114 tons southbound, as indicated in Appendix VIII. Of this traffic it is estimated, on the basis of the foregoing analysis, that approximately 6,000 tons, 5,600 tons northbound and 400 tons southbound, would be diverted to the ocean/highway service.

The two principal factors which affect the traffic to the Yukon Territory are the scale of mining activity, and the size of the army establishment. The mining industry has been steadily increasing since the end of the war with the easing of the labour market. Gold production in 1946, for example, increased to 56,428 ounces or by 43.1% from 39,424 ounces in 1945. During 1947 gold production was less than during 1946. This was

due, however, to adverse weather conditions, and it is anticipated that the 1948 production will exceed that of 1946. Increased activity is also noticeable in the silver-lead mining industry in the Mayo area.

The army establishment in the Whitehorse district has become an important factor in the level of business activity. Should the army leave the area, business would fall off sharply. Similarly should the army establishment be increased, business activity, and in consequence, freight traffic would increase.

On the assumption that the army remain in Whitehorse at its present strength, it is estimated that with the increase in mining activity, the maximum increase in freight traffic to and from the area should be some 25% over the 1947 level, which would increase the potential highway freight to 7,500 tons a year, or 1,650,000 ton-miles over the Canadian section of the Haines highway.

On the assumption of approximately 85% of the traffic moving inbound, and the average vehicle load being 3 tons, vehicle-miles would total some 935,000.

b. Vancouver-Dawson City

Of the 33 commodities and commodity groups in the Vancouver-Dawson City trade analyzed in Appendix IX, the ocean/highway service has favourable shipping costs for 23 carload and 12 less-than carload movements; the ocean/rail 10 carload and 2 less-than-carload movements. The actual carload differentials in favour of the ocean/highway service range from $3.90 to $46.00 per ton; and the less-than-carload differentials from $5.30 to $53.20. Of those commodities indicating a carload differential in favour of the ocean/highway service two indicate a difference of $40.00 or more per ton; three between $30.00 and $40.00 per ton; five between $20.00 and $30.00 per ton; ten between $10.00 and $20.00 per ton, and three less than $10.00 per ton.

It is felt that the railway, by the adjustment of its rates, could hold all traffic showing rates of no more than $15.00 per ton in favour of the ocean/highway service.

During 1947 a total of 6,595 tons of freight moved between Vancouver and Dawson City, 6,538 tons northbound and 57 tons southbound. Of this total it is estimated that approximately 3,000 tons could be diverted to the ocean/highway service on the basis of the above rate analysis. The maximum increase in traffic will probably not exceed more than 25% during the next few years as a result of the increased mining activity in the area, giving a maximum potential ocean/highway freight movement of 3,750 tons, and 825,000 ton-miles.

Vehicle-miles generated by traffic, on the basis of a one-way haul and an average of 3 tons per vehicle, would amount to 550,000.

c. Vancouver-Mayo

An analysis of the 25 commodities and groups of commodities moving in both directions between Vancouver and Mayo during 1947, listed in Appendix X, indicates that for 14 of them the proposed ocean/highway service would offer a favourable shipping cost differential varying from $2.10 to $43.60 per ton. Of these commodities, one shows a differential of over $40.00 per ton; two between $30.00 and $40.00 per ton; two between $20.00 and $30.00 per ton; seven between $10.00 and $20.00 per ton; and two of less than $10.00 per ton.

It is again assumed, as in the case of the Whitehorse and Dawson City traffic, that the railway could adjust its rates to successfully compete for all traffic carried at a rate difference of not more than $15.00 per ton in favour of the ocean/highway service.

During 1947 a total of 4,297 tons moved between Mayo and Vancouver, 2,686 tons northbound and 1,611 tons southbound. It is estimated that of this tonnage 750 tons would be the maximum diversion to the ocean/highway service. It is felt that the maximum increase over the next few years should not exceed 250 tons. Estimated highway traffic for the Vancouver-Mayo trade, therefore, should be of the order of 1,000 tons, all of which would be northbound. Ton-miles of freight, therefore, would amount to some 220,000; vehicle-miles, assuming an average vehicle load of 3 tons, would amount to some 146,520.

Consolidating the three individual estimates of potential highway traffic between Haines and Whitehorse, Dawson City, and Mayo, gives a total potential highway movement in the Vancouver-Yukon Territory trade of 12,250 tons, 2,695,000 ton-miles, and 1,631,500 vehicle-miles, as indicated in the table below:

Between	Tons	Ton-Miles	Vehicle-Miles
Vancouver-Whitehorse.....	7,500	1,650,000	935,000
Vancouver-Dawson.....	3,750	825,000	550,000
Vancouver-Mayo.....	1,000	220,000	146,500
TOTAL.....	12,250	2,695,000	1,631,500

(C) Edmonton-Yukon Territory Trade

Potential freight traffic along the Alaska highway generated by Edmonton, Alberta, as a wholesale centre for the Yukon Territory, will depend upon comparative transportation costs via Edmonton and Dawson Creek, and Vancouver and Haines or Skagway; and also comparative wholesale prices in Edmonton and Vancouver.

Transportation from Edmonton to the Yukon Territory consists of either the all highway route, or, the combination of rail service Edmonton-Dawson Creek and highway service Dawson Creek to the Yukon.

Transportation costs via the all highway route, Edmonton-Whitehorse, a distance of 1,478 miles at a carload rate of 10¢ per ton-mile would amount to $147.80 per ton and at 15 cents per ton-mile less-than-carload would amount to $221.70 per ton. An analysis of the commodities moving between Vancouver and Whitehorse during 1947, shown in Appendix VII, indicates that the Edmonton-Whitehorse highway rate would not be competitive with a single rate for commodities moving either via ocean/rail, or ocean/highway from Vancouver. Only one commodity, fresh fruits and vegetables, moved via ocean/rail from Vancouver at a carload rate in excess of $100.00 per ton.

A small amount of carload traffic took rates higher than Class C, some of which would probably be more than $100.00 per ton; and 1,469 tons of less-than-carload traffic moved between Vancouver and Whitehorse, a small amount of which would probably be at rates of more than $100.00 per ton. It is felt, however, that the amount of traffic which would move at the assumed highway rate would be negligible when it is considered that the highest projected ocean/highway rate is $89.00 per ton, or $58.80 per ton less than the all highway rate from Edmonton.

The Northern Alberta Railway's class distributing rates from Edmonton to Dawson Creek vary from $7.00 per ton for Class 10 traffic to $31.00 per ton for Class 1 traffic. Combination rail/highway rates, Edmonton-Whitehorse, would, therefore, vary from $98.80 to $122.80 per ton, and with handling charges at Dawson Creek would probably approximate $100.00 to $125.00 per ton. An analysis of each commodity entering into the Vancouver-Yukon Territory trade during 1947 indicated that approximately 65% would take Class 5 carload rates and Class 3 less-than-carload rates on the Northern Alberta Railway, or, $14.20 and $20.80 per ton respectively, or, a combination rail/highway carload rate of $106.00 per ton and $112.60 per ton less-than-carload. The foregoing rail rates were effective as of March, 1948. Since then the Board of Transport Commissioners has allowed an increase in rail rates of 21%, which will probably affect these rates; the actual increase is as yet unascertainable.

Seventeen commodities would take special commodity rates. Four of these, flour, brick, potatoes and coal, would move over the Northern Alberta Railway at commodity rates lower than $7.00 per ton, the 10th class distributing rate. The following table compares the rail/highway shipping costs on these four commodities, Edmonton to Whitehorse, with the ocean/rail and ocean/highway services from Vancouver.

Commodity	Combination Rail/highway rate Edmonton-Whitehorse		Through Ocean/rail rate Vancouver-Whitehorse		Through Ocean/highway rate Vancouver-Whitehorse	
	Per Ton	Per Ton-Mile(1)	Per Ton	Per Ton-Mile(2)	Per Ton	Per Ton-Mile(3)
	$	¢	$	¢	$	¢
Brick.....	95.40	6.9	50.60	5.2	50.00	4.5
Potatoes..	95.40	6.9	72.90	7.5	51.40	4.7
Coal.....	95.60	6.9	75.10	7.8	54.00	4.9
Flour.....	98.40	7.1	53.00	5.5	47.00	4.3

(1) 1,378 miles.
(2) 968 miles.
(3) 1,103 miles.

From the above analysis it is clear that on the basis of transportation costs, Vancouver has a marked advantage over Edmonton, as a distributing centre for the Yukon Territory. Edmonton's future participation in the Yukon trade will be entirely dependent upon the level of wholesale prices in Vancouver compared with Edmonton. Edmonton wholesale prices of 1 to 5 cents per pound less than Vancouver would mean lower prices of $20.00 to $100.00 per ton at Whitehorse. To compete with Vancouver, the Edmonton wholesale prices would have to be at least 3¢ per pound or $60.00 per ton less than Vancouver on an average to offset Edmonton's initial transportation cost disadvantage. While Edmonton is making every effort to capture part of the Yukon trade by maintaining a close liaison with the Whitehorse Board of Trade, Vancouver is just as alive to Edmonton's new potential competitive position, and through its Board of Trade is carefully watching comparative wholesale price levels in Edmonton of those commodities which enter into the Yukon trade.

Edmonton has a slight advantage over Vancouver for those commodities moving from points east of Sudbury to Edmonton and Vancouver on Canadian Railway class rates. Class rates to Edmonton, as of March 1948, ranged from $23.60 per ton for 10th class traffic to $90.60 per ton for 1st class traffic, compared with $29.60 to $110.40 per ton to Vancouver or a rate differential of from $6.00 to $19.80 per ton in favour of Edmonton. Little traffic moves on class rates, however, probably not more than 15%.

During 1947 a total of 24,168 tons of freight moved between Dawson Creek and Whitehorse, or along segments of this route. Of this total, approximately 20,000 tons consisted of petroleum products, some 12,000 tons of which originated at Edmonton, the balance being southbound traffic. Of the remaining 4,168 tons it is estimated that 75% or approximately 3,000 tons was general freight originating at Edmonton. Of this traffic some 500 tons moved from Edmonton to Whitehorse. The balance of the general freight, 1,168 tons, may be classed as locally generated freight.

During 1947 Whitehorse merchants, facing shortages of all types of consumer's goods, were prepared to pay the higher transportation costs resulting from Edmonton purchases. There is no economic basis, however, for estimating a higher through general freight tonnage from Edmonton to Whitehorse in the immediate future than the 1947 level of 500 tons. This volume of traffic would produce 459,000 ton-miles, and assuming an average truck load of 5 tons, approximately 100,000 vehicle-miles. General freight between Edmonton and points along the highway to Watson Lake are estimated at 2,500 tons during 1947. It is felt that this traffic will not exceed 4,000 tons in the immediate future under normal conditions of development. Assuming a maximum of 4,000 tons and an average haul of 500 miles, ton-miles would amount to 2,000,000. Assuming an average truck load of 5 tons, vehicle-miles would amount to 400,000.

Tonnage of petroleum products moved over the main highway totalled 20,000 during 1947. Of this total approximately 7,000 moved between Dawson Creek and Whitehorse, 5,000 tons southbound, and 2,000 tons northbound, and 13,000 between Dawson Creek and Watson Lake, the bulk of it to the Muncho Lake district. It is estimated that 70% of this, or approximately 9,000 tons, moved northbound and the balance 4,000 tons southbound. Estimated ton-miles, therefore, would amount to 12,926,000. Estimated vehicle-miles, assuming an average load of 5 tons per truck, would amount to 1,818,000.

No allowance has been made in the above estimate for any increase in the tonnage of petroleum products along the main Alaska highway. In December, 1947, the White Pass and Yukon Railway commenced the operation of its pipe line from Skagway to Whitehorse. Up to the present only fuel oil has been moved via the pipe line, but plans are in hand for moving other types of petroleum products. This will probably completely service the requirements of the Whitehorse, Dawson and Mayo areas. Therefore, any increase in petroleum traffic south of Watson Lake will probably be offset by a decrease in traffic to Whitehorse.

Total traffic along the main Alaska highway, originating in Edmonton, is estimated at 24,500 tons, 15,385,000 ton-miles and 2,318,000 vehicle-miles, summarized in the table below:

Route	Type of Freight	Tons	Ton-Miles	Vehicle-Miles
Dawson Creek /Whitehorse....	General	500	459,000	100,000
	Petroleum Products	7,000	6,426,000	918,000
Dawson Creek /Watson Lake...	General	4,000	2,000,000	400,000
	Petroleum Products	13,000	6,500,000	900,000
TOTAL		24,500	15,385,000	2,318,000

(D) The Development of Local Traffic

The development of local traffic along the Alaska highway will depend upon the growth of economic activity and the development of new centres of population along the highway. Appendix XI summarizes the population and economic resources of the areas traversed by the Alaska highway.

During 1947 local freight moving within the Yukon Territory and that part of British Columbia traversed by the Alaska highway totalled 3,564 tons made up of 1,170 tons of local highway traffic, and 2,394 tons of local rail/lake/river traffic as shown in the following table:

Transportation Agency	Tons	Percent
Highway (Dawson Creek/Whitehorse).....	1,168	32.8
" (Whitehorse/Alaska Boundary)..	2	(1)
Rail.....	338	9.5
Lake.....	187	5.2
Upper River.....	1,827	51.3
Lower River.....	42	1.2
Total.....	3,564	100.0

(1) Less than 0.1.

The very small freight tonnage which moves locally within the Yukon Territory, and the areas traversed by the Alaska highway is an indication of the economic immaturity of the Territory. Each community is almost directly dependent upon outside sources of supply and not upon a distributing centre nearby. While this type of economic development has been mainly due to the fact that the economy of these areas has been based on a small number of primary commodities, the market for which has been outside the areas, it has to a certain extent been due to the lack of any transportation facilities in most of the territory.

There are indications that the Alaska highway will alter the position to some extent. Fresh meat from Peace River producers has been moving from Dawson Creek along the Alaska highway as far north as Whitehorse. Coal, from the Peace River district, has moved via the highway to Muncho Lake at mile 456. Vegetables, butter and milk products have also moved in small quantities from the Peace River area as far north as Whitehorse. Timber, in small quantities, has moved locally along sections of the highway. Minerals, with the exception of coal, have shown little propensity to move by highway. This has largely been due to the fact that the greater part of the mineral developments has been carried on in the Yukon Territory and highway rates cannot compete with the very low through commodity rate of $25.20 per ton outbound for ore concentrates offered by the ocean/rail/river service. Furs have moved either by the rail and ocean

service or the Mackenzie river system. With the Alaska highway opening up new trapping areas, it is probable that the highway will carry some of these products to rail or river heads. The high price of furs in recent years has diverted a large part of the fine fur production to air transportation. A substantial drop in their market price would probably force them to again use surface transport agencies in which case the highway would participate.

Locally generated Alaska highway freight traffic totalled in 1947 slightly more than 1,000 tons. It is estimated that the maximum increase in this traffic during the next few years should not exceed 1,000 tons, giving a total local freight movement by highway of 2,000 tons. This traffic, on the basis of 1947 experience, should move on an average of approximately 500 miles. Ton-miles, therefore, would amount to 1,000,000. Assuming an average load of 5 tons per truck, and a directional flow of 75% northbound and 25% southbound total vehicle-miles would amount to 300,000. The following table summarizes the potential local traffic.

Tons.....	2,000
Ton-Miles.....	1,000,000
Vehicle-Miles.....	300,000

(E) Military Traffic

A final source of traffic will be military freight moving between Dawson Creek and Whitehorse. It is estimated that some 800 tons per month or 10,000 tons per year is moved. This traffic is practically a one-way movement. The R.C.A.F. portion of this freight is dropped off at each station along the highway, therefore, it is estimated that the average distance would be approximately 750 miles. Ton-miles, therefore, would amount to 7,500,000, and vehicle-miles some 5,000,000 assuming an average load of 3 tons and a one-way haul.

The following table summarizes the potential military traffic:

Tons.....	10,000
Ton-Miles.....	7,500,000
Vehicle-Miles.....	5,000,000

Summary

From the five individual estimates derived in this section, it is estimated that the maximum freight potential for the Alaska highway during the next few years should be of the order of 51,250 tons per year. Ton-miles should amount to 28,281,000 and vehicle-miles 9,685,500. A summary of this estimate is shown in the table below:

Traffic	Tons	Ton-Miles	Vehicle-Miles
Through U.S.A./ Alaska.....	2,500	1,701,000	436,000
Through Vancouver/Yukon Territory.....	12,250	2,695,000	1,631,500
Through Edmonton/Northern British Columbia and Yukon Territory.....	24,500	15,385,000	2,318,000
Local.....	2,000	1,000,000	300,000
Military.....	10,000	7,500,000	5,000,000
Total.....	51,250	28,281,000	9,685,500

Section VI

Passenger Traffic

Since the completion of the Alaska highway, tourist traffic has been prohibited due to the uncertainty of the condition of the highway, and the inadequacy of the facilities for tourist accommodation, and vehicle services. In February, 1948, all restrictions were removed.

The future growth of passenger traffic over the Alaska highway will depend upon the development of:

(a) the tourist trade;

(b) through non-tourist traffic;

(c) local traffic.

(A) Factors Affecting Through Passenger Traffic

There are at the moment two gateways to the Alaska highway -- Edmonton and Vancouver. The first of these is the more direct route via the Northern Alberta Edmonton-Dawson Creek highway. The second is via Skagway, Alaska, by boat, then to Whitehorse, Yukon Territory by rail, and from Whitehorse to points along the highway by various bus lines. Two additional alternatives from the Vancouver gateway may be possible in the near future. The first of these is via the Hart highway, now under construction, and the second by ferry boat to Haines, Alaska, and the Haines lateral to the maim highway.

The Edmonton gateway has the advantage of being the best-known approach, and to the majority of the public, the only known route. This, however, would be a short-lived advantage in the face of publicity for more attractive routes. A second advantage of the Edmonton route, and a more significant one, is its more direct approach from the mid-west and north-eastern United States to northwestern Canada and Alaska. Appendix XIII shows that the all-highway route from Chicago to Fairbanks via Edmonton will have a distance advantage of approximately 1,000 miles and a travel

time advantage of 6 days for the round trip compared with the route via Vancouver and the Hart highway. The trip via Edmonton will also be cheaper than any of the alternative routes via Vancouver. For a party of 3 the out-of-pocket cost (lodging, meals, fuel and miscellaneous expenses), is estimated at $257.52 per person, and total costs (out-of-pocket costs plus vehicle maintenance and depreciation) $386.66 per person as shown in Appendix XVI. The cheapest alternative route via the Hart highway, when completed, is estimated at $298.16 per person out-of-pocket expenses, and $446.70 per person total costs.

The principal deterrent to this route will be the Edmonton-Dawson Creek approach road to the Alaska highway. The highway, apart from being circuitous and monotonous, is a dirt road along certain sections which, during heavy summer rains, becomes impassable for days. In the opinion of some who have made this trip under adverse weather conditions, the average American tourist will probably abandon his trip before reaching Dawson Creek. The Alberta Government is aware of this and has been working on the highway in recent years. During 1946 grading and gravelling from Sturgeon Lake westward, and gravelling on the road between Grand Prairie and Beaver Lodge were done, but it is still well below the standard of the Alaska highway, and will probably fall far short of the expectations of the American tourist. The section of the highway, moreover, between the Alberta border and Dawson Creek presents a problem over which the Alberta Government has no control. It lies within British Columbia Territory and is a British Columbia maintenance problem. Its condition is poor and the British Columbia Government with a backlog of more urgent work on hand has no plans for adequate maintenance in the near future. It is the weakest link in the Edmonton-Dawson Creek highway. With travel restrictions removed, the summers of 1948 and 1949 will do much to mold the reputation of the Alaska highway and its approach roads to the American tourist. During this period, the standard of the Edmonton-Dawson Creek highway will be well below that of the Alaska highway and the Hart highway will not have been opened.

The route via Vancouver, Skagway, and the White Pass and Yukon Railway has the advantage of being one of the world's most scenic ocean trips. The ocean cruise, through the inside passage, is well known throughout the United States and has catered for many years to a large number of American tourists. Comfortable trips by bus lines radiating both north and south from Whitehorse to any part of the Alaska highway are now available. In addition to the regular bus services, special excursion trips are available to the tourist similar to those in Canada's national parks. Another advantage, as indicated in Appendix XIII, is that this route, provided a car ferry service becomes operative, would mean a distance saving of approximately 500 miles for the round trip, over the shortest all-highway route.

The principal tourist disadvantage is the inconvenience of being without a private motor car. To the average American tourist travel by private automobile is a pre-requisite for a successful vacation. Then again this trip is a more time-consuming journey, under normal conditions, than the journey by private automobile. To many potential tourists, moreover, the purpose for making the trip will be the satisfaction of having driven through one of North America's remaining frontier areas.

A third route leading to the Alaska highway is from Vancouver via the Hart Highway, which should be completed in the spring or fall of 1950. This will give a direct highway route from Vancouver which will serve that concentration of population lying along the entire west coast of North America, an area having in excess of 8,000,000 privately-owned motor cars. Until Canadian highways leading to Edmonton are brought up to the United States standard, there will be a strong attraction for mid-west tourists to take the longer trip to Vancouver then via the Hart highway to the North, rather than the shorter less amenable route via Edmonton. The Hart highway, moreover, will offer more in the way of scenic attractions than Canadian approach routes to Dawson Creek.

A fourth (potential) route is by ferry boat to Haines, Alaska, either from Vancouver or Prince Rupert, then via the Haines cut-off to the main Alaska highway. This route would have the advantage of permitting the tourist to combine the scenic ocean voyage via the inside passage, and at the same time avoid the monotonous highway trip from Edmonton to Whitehorse, which for most of its length has little scenic attraction. The trip from Haines to Whitehorse, moreover, traversing glacial mountain ranges is noted for its beauty. Whether such services will be available in quantity for some considerable time, however, is still a moot point. Ferry facilities proposed during the war by certain American interests lie dormant at the moment, because of the cost involved in providing a short seasonal ferry service. The only United States service of this type which appears probable in the near future is a local service by a Juneau, Alaska, company which plans to operate an eight-car ferry between Juneau and Haines to connect the Alaskan panhandle with southwestern Alaska. This service is contingent upon the United States Government constructing adequate wharfage facilities at Haines. An official of the Alaska Territory has intimated that probably $50,000 - $75,000 would be appropriated for such construction for the purpose of connecting southwest and northwest Alaska. The British Columbia Coast Service is planning to augment its existing Alaska service, either during the summer of 1949 or 1950, with a third Princess ship which will have a capacity for 40 cars. This will be a composite freight, mail, passenger service, the only type of service, in the company's opinion, which can be operated economically to the Yukon Territory in its present stage of economic development. The Alaska terminal for this service has not been decided as yet. Operations to Haines are dependent upon the availability of dock and wharf facilities including customs and bonded warehouses. In the opinion of the manager of the British Columbia Coast Service minimum costs of adequate wharfage facilities at Haines to make possible the type of ferry services which the company has planned will be of the order of $250,000.00. Without such facilities the company will continue to operate to Skagway,

and move the automobiles to Whitehorse by railway. This latter alternative would be more expensive and less attractive to the tourist.

From the tourist standpoint a ferry service from Prince Rupert would offer obvious advantages. The scenic attractions of the ocean voyage via the inside passage are from Prince Rupert north, and the motor trip to Prince Rupert would be over the scenic British Columbia route through Hazelton. The present standard of this highway, however, leaves much to be desired, and it would be a longer and more expensive trip.

The main Alaska highway itself has certain disadvantages which must be considered in appraising the potential tourist attractions. The highway throughout its length is an untreated surface subject to extremely dusty conditions in hot weather. American and many Canadian tourists accustomed to hard-surfaced or dust-treated highways will find travelling conditions very unpleasant. The scenic attractions of the highway, via Edmonton, are only reached after hundreds of miles of dreary and monotonous travel. The accommodation along the highway is clean and comfortable but, apart from Dawson Creek, Fort St. John and Whitehorse, does not exceed 40 beds at any point as indicated by Appendix XIV. The price of accommodation is reasonable compared with United States prices. Food is in adequate supply and well prepared and again compares favourably with United States prices. Gasoline and oil services for automobiles are adequate, the greatest distance between refuelling points being 100 miles. Over large sections of the road completely inadequate repair facilities exist. Between mile 00 (Dawson Creek) and mile 308 (Fort Nelson) there are two intermediate repair stations for major repairs which might meet minimum requirements, but from mile 308 to mile 918 (Whitehorse) there are only three minor repair stations as shown in Appendix XV. These three stations offer only limited services, such as tire repairs and replacement of fan belts, and are all concentrated within a stretch of 50 miles between mile 392 and mile 442. For all practical purposes, therefore, for over 500 miles between Summit Lake, B.C., and Whitehorse, Y.T., there are no repair facilities of any description. The

adverse effect of this on the tourist traffic is not difficult to imagine. From Whitehorse to the Alaska boundary there is one intermediate repair station which should meet minimum requirements. Beyond the Alaska boundary, between Scottie Creek and Richardson, there is a stretch of 230 miles in which there are no repair facilities.

The time factor, and cost of the trip over the Alaska highway, will also be limiting factors to the potential tourist trade. The following table, a summary of Appendix XIII, indicates that the shortest driving time required to complete a round trip from Chicago to Alaska would be 23 days:

Route from Chicago via	Number of Days	
	One Way	Round Trip
Vancouver - Haines; Return in Same Direction	11-1/2	23
Edmonton - Fairbanks; Return via Haines	12	23-1/2
Vancouver - Haines; Return via Edmonton	11-1/2	23-1/2
Edmonton - Fairbanks; Return in Same Direction	12	24
Vancouver - Haines; Return via Dawson Creek and Hart highway	11-1/2	25-1/2
Vancouver - Hart highway; Return via Haines	14	25-1/2
Edmonton - Fairbanks; Return via Dawson Creek and Hart highway	12	26
Vancouver - Hart highway; Return via Edmonton	14	26
Vancouver - Hart Highway; Return in Same Direction	14	28

A trip from Seattle would take a minimum of 13 days, provided boat connections were coordinated, as indicated in the table below:

Route from Seattle via	Number of Days	
	One Way	Round Trip
Seattle - Fairbanks via Haines; Return in Same Direction	6-1/2	13
Seattle - Fairbanks via Prince Rupert; Return in Same Direction	7-1/2	15
Seattle - Fairbanks via Hart highway; Return via Haines	9	15-1/2
Seattle - Fairbanks via Hart highway; Return Prince Rupert	9	16-1/2
Seattle - Fairbanks via Hart highway; Return in Same Direction	9	18

The length of the average North American's vacation is from 14 to 21 days. Therefore, in the case of the round trip from Chicago, travel time alone will exceed the potential tourist's normal vacation period. From Seattle the trip could be completed within the alloted vacation.

The cost of a tourist trip to Alaska will be considerable as is indicated in the table below, a summary of Appendices XVI to XXIV:

Route	Cost Per Person -Party of Three-	
	Out-of-Pocket	Total
	$	$
From Chicago via:		
Edmonton-Dawson Creek; Return via Same Route	257.52	386.66
Edmonton-Dawson Creek; Return via Hart highway	277.83	416.68
Seattle-Hart highway; Return via Same Route	298.16	446.70
Edmonton-Dawson Creek; Return via Prince Rupert	303.28	428.87
Seattle-Haines; Return via Edmonton	304.68	414.31
Seattle-Haines; Return via Hart highway	324.90	444.31
Seattle-Prince Rupert; Return via Same Route	349.03	471.08
Seattle-Haines; Return via Prince Rupert	350.44	456.52
Seattle-Haines; Return via Same Route	351.85	441.96
From Seattle via:		
Vancouver-Hart highway & Return	191.81	276.70
Vancouver-Prince Rupert-Haines; Return via Hart highway	217.25	288.88
Vancouver-Haines; Return via Hart highway	218.65	274.32
Vancouver-Prince Rupert-Haines; Return via Same Route	242.70	301.06
Vancouver-Haines and Return via Same Route	245.50	271.96

From surveys made in the United States it has been established that the average person's annual expenditure on vacation travel amounts to some 5% of his net annual income. This would, therefore, limit travel to Alaska via the Alaska highway from the Mid-West States to persons of an annual income of approximately $5,000 to $6,000 per year, based on the out-of-pocket costs of making the round trip. Lower income groups would

probably have to save for two or more years to accumulate the necessary funds for the trip. For a family of three the minimum out-of-pocket cost would range from $772.56 from Chicago via Edmonton, and $1,055.55 via Vancouver and Haines. From Seattle out-of-pocket expenses would range from $575.43 to $736.50. These estimates are based on a minimum expenditure of $1.50 per person per day for miscellaneous items which is extremely low for tourists.

In spite of the major deterrents to tourist travel over the Alaska highway there are a number of attractions. Probably one of the highway's strongest attractions is the publicity which was given the road during its wartime construction. Detailed descriptions of the country, particularly the scenic sections, were widely circulated in print and pictures which aroused the curiosity of a large number of Americans. While the route runs through many miles of monotonous country there are sections of striking beauty. The Teslin Lake area for example is extremely picturesque, as also is the trip from Whitehorse to Kluane Lake which runs through many miles of glacial mountains and numerous lakes and mountain streams. Apart from the scenic attractions, the Yukon Territory offers numerous historic sites of interest to the traveller. For the tourist seeking outdoor sports the trip would provide ample scope for hunting and fishing. For those planning a photographic trip again there are spendid opportunities.

With only limited ferry facilities in view, and no plans for any large scale development of this type of service, it is assumed that the majority of the tourist travel will both enter and leave the highway at its southern terminus Dawson Creek.

The Alaska highway has been closed to tourist travel, therefore there are no statistics on which to estimate the potential tourist traffic over the highway. The only information available for this purpose is inquiries received by the Edmonton and Whitehorse R.C.M.P. headquarters from potential tourists. During 1947 an average of 100 letters per week or approximately 5,000 for the full year were received by the R.C.M.P.,

requesting information regarding the condition of the highway, accommodation, recreational and sporting facilities, etc. Little information is available indicating the inquirers' reaction to the information received apart from a few replies indicating a continued interest in the trip. It is of interest to note that practically all inquiries were from United States residents, enquiries being received from the residents of 38 states and the District of Columbia (Appendix XXV).

(B) Estimate of Passenger Traffic

a. Tourist

1. Private Automobile

With the restrictions lifted on the highway it is estimated that probably 2,000 cars or 40% of those making inquiries during 1947 will make the trip up the highway. This estimate is based on cost and travel time considerations, on the condition of the highway, accommodation, facilities and other related factors. Assuming all these cars made the trip as far north as Fairbanks and returned in the same direction, vehicle-miles over the Canadian section of the highway for the round trip would amount to 4,884,000. On the further assumption of an average of 3 passengers per vehicle, passenger-miles would amount to 14,652,000. An additional 400 tourist cars would represent the maximum potential by ferry to Haines in the foreseeable future. On the assumption that these tourists travelled to Fairbanks and returned via Dawson Creek this would amount to a further vehicle-mile potential of some 615,000, and assuming 3 persons per car on an average, passenger-miles would total 1,845,000.

Northwest Alaska will also generate a considerable amount of tourist travel particularly to Whitehorse and Haines. The population of northwest Alaska is substantially larger than it was in 1939. Its distance from the United States, limited local vacation facilities, and its close proximity by highway to the Yukon Territory and Southwest Alaska should encourage inter-territorial travel. As an indication of this, Whitehorse anticipated 200 cars from Fairbanks during its 1948 winter carnival.

It is not unreasonable to assume 1,000 tourist cars moving between Alaska and the Yukon Territory annually. This would amount to a further 634,000 vehicle-miles; and assuming an average of 3 passengers per car, 1,902,000 passenger-miles. The proposed ferry service between Juneau and Fairbanks might generate an additional 400 cars on a year-round basis, which would amount to approximately 254,000 vehicle-miles over the Canadian section of the highway, and on previous passenger assumptions approximately 762,000 passenger-miles.

It is estimated, therefore, that the potential tourist traffic for the Alaska highway by private car should be of the order of 3,800 cars, 6,515,000 vehicle-miles, and 19,545,000 passenger-miles, as summarized in the table below:

Source of Traffic	No. of Cars	No. of Vehicle-Miles	No. of Passenger Miles
Dawson Creek - Northwest Alaska & Return.....	2,000	4,884,000	14,652,000
Vancouver- Northwest Alaska; Return via Dawson Creek.....	400	615,000	1,845,000
Northwest Alaska - Yukon Territory.....	1,000	634,000	1,902,000
Northwest Alaska - Southwest Alaska.....	400	254,000	762,000
TOTAL.....	3,800	6,387,000	19,161,000

2. Bus

Another source of tourist traffic will be generated by the bus services radiating north and south from Whitehorse. Excursion trips are operated for the convenience of the boat passengers making the Vancouver-Alaska cruise. Prior to the war the British Yukon Navigation operated river and lake excursion trips for these passengers. The general feeling among those responsible for excursion services in the Whitehorse area is that the majority of tourists will now prefer a highway trip, because of the interest in the highway, and the fact that more of the territory can be covered in a shorter period of time.

During 1947 the British Yukon Navigation Company Bus Lines operated 23 excursions southbound from Whitehorse and the O'Hara Bus Lines 5 northbound. The average round trip was 250 miles. The number of passengers carried was approximately 500. Therefore, it is estimated that vehicle-miles numbered some 7,000, and passenger-miles 125,000. It is anticipated that this traffic will increase substantially. The Canadian Pacific Steamship Company's cruise capacity should be approximately 5,000 per season by 1949, and space has been reserved for the next two years. It has been estimated that 60% of these or 3,000 will probably wish to take a trip along the highway. On the assumption that the average excursion round trip is 250 miles, this type of traffic should generate 750,000 passenger-miles, and assuming 20 passengers per bus, 37,500 vehicle-miles.

Potential tourist travel, both by private car and bus, over the Alaska highway is summarized in the table below:

Source	No. of Trips	No. of Passengers	Passenger-Miles	Vehicle-Miles
Private Car.....	3,800	11,400	19,161,000	6,387,000
Bus.....	150	3,000	750,000	37,500
TOTAL.	3,950	14,400	19,911,000	6,424,500

b. Non-Tourist

Through travel from Canada and the United States to northern British Columbia, Yukon Territory, and Alaska will also generate a considerable amount of passenger traffic.

During the 10-month period March through December 1947, 7,594 passengers were granted permits to travel northbound over the highway. A breakdown of the reasons given the R.C.M.P. to obtain the permits is listed in the following table:

Reasons for Applications	Number	Percent
Employment	2,797	36.8
Returning to homes in Alaska	1,619	21.3
Homesteaders and Settlers	1,493	19.7
Business	1,089	14.3
Members of U.S. Forces and Families	359	4.8
Prospecting and Mining	158	2.1
Alaska University Students	40	0.5
Hunting in Northern B.C	39	0.5
All Categories	7,594	100.0

Of this total 5,110 or 67.3% were destined for Alaska, the remaining 2,484 to northern British Columbia and the Yukon Territory. The average trip, therefore, would probably be 1,000 miles. Passenger-miles are estimated at 7,594,000 or an average of 759,400 per month. For the full year, it is estimated that passenger-miles would total some 9,113,000. Passengers recorded southbound for the full year 1947 totalled 8,148 or approximately the same as the northbound movement. It is estimated, therefore, that total passenger-miles in both directions amounted to some 18,000,000. During the next few years the maximum increase should not exceed 25% of the 1947 level or some 22,500,000 passenger-miles.

During 1947 the number of private motor vehicles passing through the customs north of Whitehorse totalled 4,195 made up of 2,682 southbound and 1,513 northbound. It is estimated that an additional 1,500 passed through the customs at the southern terminus of the highway destined for northern British Columbia and the Yukon Territory or approximately 5,500 moved over the Alaska highway. It is further estimated that the average trip would be 1,000 miles. Therefore, vehicle-miles for 1947 are estimated at 5,500,000. Allowing for a maximum increase of 25% over the next few years the number of vehicles should amount to some 6,875, and vehicle-miles 6,875,000.

The following table summarizes the non-tourist through passenger traffic estimates derived above:

Source of Traffic	No. of Vehicles	No. of Vehicle-Miles	No. of Passenger-Miles
Through Non-Tourist.....	6,875	6,875,000	22,500,000

c. Local Passenger Traffic

1. Private Car

A final source of passenger traffic will be generated by local passenger traffic moving within the southern and northern termini of the highway. This type of travel will be made up of both private automobile and bus travel.

Local traffic will include not only service and pleasure trips by residents living along the highway, but also travel by survey parties, government employees and officials, settlers, prospectors, and mining officials on business and for recreation, food, clothing and equipment; and travel by service and road maintenance personnel for similar purposes. The majority of this traffic will be two-way traffic, and will undoubtedly be heaviest at each end of the highway because it is here that is found the concentration of population, and the most highly developed transportation facilities.

Dawson Creek and Fort St. John areas at the southern end of the highway and the Whitehorse area at the northern end of the highway will generate the greater part of the traffic.

The number of private motor vehicle registrations in the Whitehorse area numbered 263 on February 15th, 1948. The maximum number of registrations anticipated for 1948 is 350. It is felt that with the easing of motor vehicle supplies this might increase to 500 within a few years. Assuming an average of 2,000 miles per vehicle per year exclusive of town travel, and 3 passengers per car, it is estimated that some 100,000 vehicle-miles and 300,000 passenger-miles of travel would be generated by the Whitehorse area. Vehicle registrations for northern British Columbia are not

available. It is estimated, however, that probably 50% more local travel might be expected from the southern terminus or 150,000 vehicle-miles and 450,000 passenger-miles. All other local traffic would probably amount to no more than 10% of the Dawson Creek, Fort Nelson, and Whitehorse local travel combined, or an additional 25,000 vehicle-miles, and 75,000 passenger-miles.

Total local traffic generated by private automobiles is, therefore, estimated at 825,000 passenger-miles and 275,000 vehicle-miles.

2. Bus

During 1947 the British Yukon Navigation Bus Lines operated a total of 275 trips, and 300,599 vehicle-miles. Assuming a load factor of 50% it is estimated that passenger-miles would amount to approximately 4,000,000. The O'Hara Bus Lines operated 119 trips, for a total of 37,842 vehicle-miles. Again assuming a load factor of 50% with a 26-passenger bus, passenger-miles would amount to approximately 500,000. Total local bus traffic during 1947 is estimated, therefore, at 4,500,000 passenger-miles. Actual vehicle-miles totalled 338,441. Allowing for a maximum increase of 25% during the next few years vehicle-miles would amount to some 425,000 and passenger-miles 5,600,000.

Estimated local traffic is summarized below:

Source of Traffic	Vehicle-Miles	Passenger-Miles
Private automobile.....	275,000	825,000
Bus.....	425,000	5,600,000
TOTAL.....	700,000	6,425,000

Total potential passenger traffic from all sources which will probably move over the Alaska highway during the next few years is summarized in the following table:

Source of Traffic	Vehicle-Miles	Passenger-Miles
Tourist	6,424,500	19,911,000
Through Non-Tourist	6,875,000	22,500,000
Local	700,000	6,425,000
TOTAL	13,999,500	48,836,000

Total Traffic - Freight and Passenger

The following table summarizes the estimates derived for the annual freight and passenger traffic which will probably move over the Alaska highway during the next few years:

Route Segment	Distance	TYPE OF TRAFFIC												
		FREIGHT				PASSENGER						TOTAL		
		Through		Local & Military		Through				Local				
						Tourist		Other						
		Vehicle Miles	Ton Miles	Vehicle Miles	Ton Miles	Vehicle Miles	Pass. Miles	Vehicle Miles	Pass. Miles	Vehicle Miles	Pass. Miles	Vehicle Miles	Ton Miles	Pass. Miles
		(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)
Dawson Creek -Mile 1221	1221	244	1,221	-	-	5,372	16,116	6,875	22,500	700	6,425	13,191	1,221	45,041
Haines -Mile 1221	317	192	480	-	-	1,015	3,045	-	-	-	-	1,207	480	3,045
Haines -Whitehorse -Mile 1221	154	1,631	2,695	-	-	-	-	-	-	-	-	1,631	2,695	-
Dawson Creek -Whitehorse	918	1,018	6,885	5,300	8,500	-	-	-	-	-	-	6,318	15,385	-
Dawson Creek -Watson Lake Area	283	1,300	8,500	-	-	-	-	-	-	-	-	1,300	8,500	-
Whitehorse (Excursion)	125(1)	-	-	-	-	37	750	-	-	-	-	37	-	750
TOTAL		4,385	19,781	5,300	8,500	6,424	19,911	6,875	22,500	700	6,425	23,684	28,281	48,836

(1) Estimated

Section VII

Estimated Revenue - Alaska Highway

From the previous two sections it has been estimated that potential freight vehicle-miles should be of the order of 9,685,500, and passenger vehicle-miles 13,999,500 or a total of 23,685,000 vehicle-miles. Of the freight vehicle-miles an estimated 5,000,000 were accounted for by military traffic. Inasmuch as gasoline purchased by military vehicles is tax free, only 4,685,000 freight vehicle-miles would be revenue producing.

(A) Estimated Revenue - Gasoline Tax

The current level of the gasoline tax in the Yukon Territory and British Columbia is 6 and 10 cents respectively. Approximately 50% of the highway lies within each of the two taxation areas. Therefore, the gasoline tax for the through highway will be assumed to average 8 cents per gallon.

Assuming an average of 8 miles per gallon per freight vehicle, revenue from gasoline sales to freight users of the highway would amount to:

4,685,000	-	freight vehicle-miles
$ 0.01	-	revenue per freight vehicle-mile
$46,850.00	-	revenue from freight carriers' gasoline purchases

Assuming an average of 18 miles per gallon per passenger vehicle, revenue from gasoline sales to passenger traffic would amount to:

13,999,500	-	passenger vehicle-miles
$ 0.00444	-	revenue per passenger vehicle-mile
$62,157.78	-	revenue from passengers' gasoline purchases

Total revenue from gasoline taxes by highway users would, therefore, amount to approximately $110,000.00.

The Dominion Government's share of this revenue would probably amount to not more than 40% of the total, or $44,000.00, because of the lower prevailing gasoline tax in the Yukon Territory. The balance of the revenue would accrue to the British Columbia Government through operations in British Columbia Territory.

Another factor which must be considered, but for which no allowance

has been made in the above estimate, is the fact that little revenue might accrue from freight operations over the Haines lateral. The truckers might very well purchase sufficient gasoline in Haines, United States, to complete the round trip, without making purchases in Canadian territory.

(B) Estimated Revenue - Vehicle Registration, Drivers' Licences and Miscellaneous Transportation Fees

The highway operations will yield additional revenue, both Provincial and Dominion, from motor vehicle registration licences, drivers' permits, and miscellaneous transportation fees.

During the fiscal year April 1, 1946 to March 31, 1947, revenue accruing to the Yukon Territorial Council from the above sources totalled $6,702.00. From April 1, 1947 to February 15, 1948, these taxes totalled $15,610.00. Much of this increase, however, was due to the non-recurring work being carried out by the Barnes Construction Company, and O'Sullivan contractors in the Territory. Eliminating this non-recurring revenue, and allowing for the increased traffic projected in this survey, it is estimated that revenue from the above sources should amount to some $75,000 -- $25,000 from the Yukon Territory at the northern end of the highway and $50,000 from the British Columbia section.

Total potential revenue from the Alaska highway, therefore, would amount to $185,000 as indicated in the following table:

Area	Revenue		
	Gasoline Tax	Licences	Total
	$	$	$
Yukon Territory.....	44,000.00	25,000.00	69,000.00
British Columbia Territory	66,000.00	50,000.00	116,000.00
TOTAL.....	110,000.00	75,000.00	185,000.00

The total maintenance cost of the Canadian section of the Alaska highway has been estimated at $3,205,000.00. Therefore, the net annual maintenance cost or the excess of cost over the above sources of revenue,

would amount to $3,020,000.00 based on the total revenue, and $3,136,000.00 on what has been estimated as the Dominion Government's share of the revenue.

(C) Estimated Revenue from Highway Toll Charge

A potential source of revenue from the highway would be through the levying of either a vehicle-mile, or a passenger-mile and ton-mile toll.

Revenues to be derived from this form of special user charge on all but military traffic are indicated in the table below:

Level of Toll	Estimated Revenue from Toll Per			
	Vehicle-Mile	Passenger-Mile	Ton-Mile	Total Passenger and Ton-Mile
¢	$	$	$	$
1	186,845.00	488,360.00	207,810.00	696,170,00
2	373,690.00	976,720.00	415,620.00	1,392,340.00
3	560,535.00	1,465,080.00	623,430.00	2,088,510.00
4	747,380.00	1,953,440.00	831,240.00	2,784,680.00
5	934,225.00	2,441,800.00	1,039,050.00	3,480,850.00

The following table shows the amount by which total annual costs would exceed total annual revenues, if a vehicle-mile toll of specified amounts were levied.

Level of Toll	Estimated Revenue			Estimated Cost	
	Toll	Gasoline, Drivers' Licences, etc.	Total	Total	Net
¢	$	$	$	$	$
1	186,845.00	185,000.00	371,845.00	3,205,000.00	2,833,155.00
2	373,690.00	185,000.00	558,690.00	3,205,000.00	2,646,310.00
3	560,535.00	185,000.00	745,535.00	3,205,000.00	2,459,465.00
4	747,380.00	185,000.00	932,380.00	3,205,000.00	2,272,620.00
5	934,225.00	185,000.00	1,119,225.00	3,205,000.00	2,085,775.00

The following table indicates the amount by which total annual costs would exceed total annual revenues if a passenger-mile and ton-mile toll of specified amounts were levied:

Level of Toll	Estimated Revenue			Estimated Cost	
	Toll	Gasoline, Drivers' Licences, etc.	Total	Total	Net
¢	$	$	$	$	$
1	696,170.00	185,000.00	881,170.00	3,205,000.00	2,323,830.00
2	1,392,340.00	185,000.00	1,577,340.00	3,205,000.00	1,627,660.00
3	2,088,510.00	185,000.00	2,273,510.00	3,205,000.00	931,490.00
4	2,784,680.00	185,000.00	2,969,680.00	3,205,000.00	235,320.00
5	3,480,850.00	185,000.00	3,665,850.00	3,205,000.00	+ 460,850.00

From the above two tables it is clear that even at a 5¢ per vehicle-mile toll, which would amount to $45.90 for the Dawson Creek/Whitehorse haul, there would still be a very substantial net annual maintenance cost - in excess of $2,000,000. A toll of 4 cents per passenger-mile and ton-mile, amounting to a charge of $36.72 per passenger and ton of freight, would, with other sources of revenue, come within approximately $235,000 of the estimated annual cost. A 5 cent toll per passenger-mile and ton-mile would not only cover total costs but in addition would show a profit of some $461,000.

This, however, is on the basis of the traffic estimates derived above. Tolls of from 3 to 5 cents per passenger-mile and ton-mile would probably be prohibitive, and would decrease tonnage very materially if not completely closing the highway as an alternative supply route.

Tolls as a source of revenue either to help cover maintenance costs or amortize capital expenditures have been used very sparingly in modern highway financing, because of the cost involved in administering their collection, and the general feeling that they are detrimental to the full development of highway transportation.

For some time the United States charged a user toll for the Richardson highway in Alaska, but it was abandoned because the administration costs exceeded the revenue, and it was most unpopular. Generally speaking, the United States has found that such tolls are uneconomic in the sense that administration costs absorb most of the revenue.

In Canada there are several such tolls, principally for the purpose of amortizing bridge expenditures. The British Columbia Government, in the face of strong opposition, charges a toll for the use of the Cariboo highway between Vancouver and Prince George which is ear-marked for the maintenance of the Alexandria Bridge, and the canyon section of the highway.

Should a toll be given favourable consideration as a source of revenue for maintaining the Alaska highway generous concessions, if not complete exemption, would have to be offered local residents, otherwise settlement and economic development in the areas traversed by the highway will be discouraged.

What would be the probable effect of toll charges on potential Alaska highway through traffic?

The following table indicates the cost per passenger and per ton for tolls of varying levels over selected segments of the highway:

Level of Toll	Per Passenger		Per Ton	
	Dawson Creek/ Mile 1221 & Return Same Direction	Dawson Creek/ Mile 1221 & Return Via Haines	Dawson Creek/ Whitehorse	Dawson Creek/ Ft. Nelson
¢	$	$	$	$
1	24.42	15.38	9.18	3.08
2	48.84	30.76	18.36	6.16
3	73.26	46.14	27.54	9.24
4	97.68	61.52	36.72	12.32
5	122.10	76.90	45.90	15.40

There is every indication that a ton-mile charge would be actively resisted as a discriminatory act by both the residents of the Yukon Territory and that part of British Columbia traversed by the Alaska highway, in spite of a similar charge on the Vancouver/Prince George highway. As for the toll's economic effect on traffic, it is felt that provided it did not exceed 2 cents per ton-mile traffic would still move south of Watson Lake at approximately the level estimated in this survey. Little, if any, traffic, however, would move north of Watson Lake. Over the Haines highway such a toll would undoubtedly have to be passed on to the shipper in the form of higher freight

charges. It is possible that a 2 cents per ton-mile toll might be passed on to the shipper without seriously decreasing the traffic, but it would certainly limit the range of the proposed ocean/highway service's competitive ability. It has been shown above that a 2 cent per ton-mile toll, if combined with a similar passenger-mile toll, would still leave a net annual cost for maintaining the highway of some $1,625,000.

The effect of such a toll on passenger travel might be more serious. At 1 cent per passenger-mile, the tax for a round trip via Dawson Creek would be approximately $25.00. It is felt that this tax might be absorbed by the potential passenger without any serious decrease in traffic, but any higher toll would virtually stifle potential passenger travel.

Summary

On the basis of the freight and passenger traffic derived in this survey, it is estimated that without a special user tax the net annual cost of maintaining the Alaska highway and the Haines lateral on a year-round basis would be of the order of $3,000,000. By levying a 2 cent per vehicle-mile toll the net annual cost would amount to $2,650,000; and by levying a 2 cent per passenger-mile and ton-mile toll it would amount to $1,625,000, as indicated in the table below:

Source of Revenue	Estimated		
	Total Annual Revenue	Total Annual Cost	Net Annual Deficit
	$	$	$
"A" Gasoline Tax, Drivers' Licences, etc.....	185,000	3,205,000	3,020,000
"B" "A" plus 2¢ per vehicle-mile toll.....	558,690	3,205,000	2,646,310
"C" "A" plus 2¢ per passenger-mile and ton-mile toll	1,951,030	3,205,000	1,253,970

Section VIII

Economic Effect of the Alaska Highway on Northwestern Canada

(A) Northwestern British Columbia

To northwestern British Columbia the Alaska highway represents the first effective transportation link the area has had with both the Yukon Territory and Canada proper. Prior to the highway's construction, the area between Dawson Creek and Fort St. John was served only by a dirt road. North of Fort St. John scattered stretches of winter and pack trails constituted the only means of transportation. Such economic development as had taken place, therefore, was on a very small scale. Since the highway's completion economic activity has increased considerably. In 1946, for example, some 85,000 acres of farming and mixed farming land was under cultivation, and there were indications that further expansion at the rate of probably 20,000 acres per year might take place. Cattle shipped numbered approximately 5,000 in 1946; and lumber sales totalled some $200,000. The grain and cattle production was shipped principally to Dawson Creek. Lumber was marketed both north and south.

The rate of economic development within this area will, in the future, depend upon the level of transportation charges along the highway. These are high at the moment, and will probably remain so for some time to come, because of the small volume and unbalanced directional movement of traffic, together with the high costs of operation in this territory. The pattern of economic activity throughout the territory, therefore, will probably be one of slow, but continuous, growth over a period of years.

The great distances separating the territory's resources from their market, compared with the more accessible productive regions of Canada, will probably limit its economic growth. This geographical disadvantage on outbound traffic can and is being partially overcome by the facilities afforded by the Alaska highway, but the basic problem still remains in the

form of high transportation costs. The Alaska highway will serve the communities' transportation requirements, but the amount and type of their purchases from outside sources will tend to be limited to necessities until such time as transportation costs can be reduced. Freight traffic with outside sources, therefore, will be relatively small for some time to come.

The highway should develop a greater degree of economic dependence within the area itself. There is, for example, a growing dependence on local supplies of agricultural, lumber, and certain types of fuel products. The Yukon Territory in 1947 began to show an interest in northwestern British Columbia as a market for some of its supplies - fresh meat being the most notable example.

Local traffic is still considerably less than through traffic, but few of the many diversified types of commodities used within this large expanse of territory are produced locally. As the population of the area increases, the market for local production will similarly expand, and, this in turn will generate more local traffic along the highway. The growth of population, however, will probably be of the gradual rather than the mushroom pattern, as has been evidenced in other parts of the Dominion.

The total annual cost of maintaining the Canadian section of the Alaska highway between Dawson Creek and Mile 1221, inclusive of the airport access roads, has been estimated at some $2,850,000. On the assumption that 50% of this cost is incurred by commercial freight traffic, the cost attributable to freight would approximate $1,425,000. It has been estimated that freight vehicle-miles, exclusive of military freight, will total approximately 3,562,000. Revenue from gasoline sales, therefore, will probably amount to $15,000 per year. It has been estimated that the annual revenue from vehicle licences, drivers' permits, and miscellaneous transportation fees should amount to approximately $75,000 for the entire highway. Of this, it is felt that $60,000 would accrue from operations along the Dawson Creek - Mile 1221 section. Therefore, the net annual cost to the Dominion Government for this section of the highway, attributable to freight traffic,

is estimated at$1,350,000 per year. Total commercial freight moved over the highway during the next few years will probably amount to some 28,000 tons. Therefore, the cost to the Dominion Government for each ton of freight moved over the Dawson Creek - Mile 1221 section will approximate $48.00.

On the assumption that a toll of 1¢ per vehicle-mile were levied, an additional $35,000 per year might be raised, which would reduce the net annual maintenance cost, attributable to freight traffic, to $1,315,000 for this section of the highway, and the cost per ton of freight to approximately $47.00. If a toll of 2¢ per vehicle-mile were levied, an additional $70,000 might accrue, which would reduce the net annual cost, attributable to freight traffic, to $1,280,000, and the cost to the Dominion Government for each ton of freight to $46.00 per ton.

It has been estimated that some 17,606,000 ton-miles of commercial freight will probably be performed annually over this section of the highway. If a toll of 1¢ per ton-mile were levied, an additional $176,000 per year might be raised, which would reduce the net annual cost of maintaining this section, attributable to freight traffic, to $1,174,000. The cost to the Dominion Government of each ton of freight moved over the highway would then approximate some $42.00.

(B) Yukon Territory

To the Yukon Territory the Alaska highway, particularly the Haines lateral, will serve as a competitive form of transportation. There are indications that this section of the Alaska highway might affect substantial reductions in transportation charges for a wide range of commodities.

A comparison of the average freight revenue per ton-mile of the White Pass and Yukon railway and the Alaska railway shows the higher transportation charges borne by the Yukon Territory compared with northwest Alaska. In 1939 the average revenue per ton-mile for the White Pass and Yukon railway was approximately 8.457 cents compared with 5.874 cents for the Alaska railway, or 43.9% greater. During the war the White Pass and

Yukon's average ton-mile freight revenue increased sharply under United States military control. Since the end of hostilities it has continued to remain appreciably higher than the 1939 level. In 1946, for example, it averaged 12.04 cents or some 42.3% higher than the 1939 level. Information for 1947 is not available as yet for the complete year, but on the basis of the figures for the first eleven months' operations an average ton-mile freight revenue in excess of 25.0 cents is indicated.

Information is not available from which to trace the trend, since 1939, in the average ton-mile freight revenue for the Alaska railway. It is felt, however, that it is still appreciably lower than for the White Pass and Yukon. It is possible that there is some sound justification for the higher average ton-mile freight revenue over the White Pass and Yukon, but this is not apparent, from an analysis of the operating conditions of the two railways. Both operate through similar terrain with the same winter maintenance problems; carried in 1939 approximately the same tonnage, and the same types of commodities; were faced with the same problem of unbalanced directional flow of traffic; and had similar (United States) wage rates.

One reason for the higher average ton-mile revenue of the White Pass and Yukon is probably the shorter average haul, the overall distance of the railway being only some 25% of that of the Alaska railway. A more significant reason, however, has probably been the competitive force of the Richardson highway which parallels the route of the Alaska railway. The White Pass and Yukon railway, on the other hand, has enjoyed a monopoly since its construction.

There would appear to be little doubt that highway operations over the Haines cut-off, even during the summer months, will force the White Pass and Yukon railway to reduce its present rates for a wide range of commodities. As noted in Section IV, there is evidence that some adjustments are already under consideration, a direct result of the limited highway operations carried out during the summer of 1947.

From Appendix XXVI it is estimated that the cost of transportation based on

the 1947 ocean/rail freight,to Whitehorse, Dawson City, and Mayo, amounted to approximately $2,852,000. If the same freight had have been carried via the ocean/highway service at its proposed rates the transportation cost is estimated at $2,439,000. This would represent a saving in transportation costs of $413,000 or approximately 14%.

The estimated saving to each of the above three Yukon points via the proposed ocean/highway service is indicated in the table below:

Estimated Transportation Costs Via	Whitehorse	Dawson City	Mayo
	$	$	$
Ocean to Skagway, Rail to Whitehorse, River to Dawson City and Mayo.....	1,881,000	643,000	328,000
Ocean to Skagway, Highway to Whitehorse, River to Dawson City and Mayo.....	1,527,000	521,000	391,000
Estimated Saving.....	354,000	122,000	- 63,000

The above estimates must be considered as rough indications of possible savings rather than actual savings. A number of factors unascertainable until the highway service becomes operative might reduce these estimates substantially.

Under competitive transportation conditions freight will move both by the ocean/rail and ocean/highway services whichever combination offers the more attractive rates and quality of service. Under these conditions, the estimated saving to the three Yukon points based on the 1947 ocean/rail tonnage would amount to some $554,000, or approximately 19.0% as indicated in the following table:

Estimated Transportation Cost Via	Whitehorse	Dawson City	Mayo
	$	$	$
Ocean to Skagway, Rail to Whitehorse, River to Dawson City and Mayo.....	1,881,000	643,000	328,000
Most Favourable Service	1,515,000	502,000	281,000
Estimated Saving.....	366,000	141,000	47,000

Again it must be emphasized that the above estimated savings are only rough indications of what would probably be the level of saving based on the current ocean/rail and proposed ocean/highway rates, rather than the actual saving under competitive conditions. The proposed ocean/highway rates pose a number of uncertainties; and the ocean/rail rates might undergo certain adjustments which would probably reduce the above estimates materially.

The maintenance cost of the Haines lateral on a year-round basis has been estimated at $355,000 annually. The net annual cost, attributable to freight traffic, after allowing for revenue from gasoline taxes, drivers' licences, vehicle licences, and miscellaneous transportation fees, will probably amount to a minimum of $200,000 annually. It has been estimated that probably 13,000 tons of freight will move over the Haines cut-off annually during the next few years, if kept open on a year-round basis. Therefore, the cost to the Dominion Government for each ton of freight moved over this section of the Alaska highway may approximate $15.00 per ton.

The movement of the above tonnage indicates the performance of 1,800,000 vehicle-miles and 3,000,000 ton-miles.

If a toll of one cent per vehicle-mile were levied an additional $20,000 revenue might accrue, which would reduce the net annual cost to $180,000, and the cost to the Government of moving each ton of freight to approximately $14.00 per ton. If this toll were increased to two cents per vehicle-mile the additional revenue raised might amount to $40,000. This would reduce the net annual maintenance cost, attributable to freight traffic,

to $160,000, and the cost to the Dominion Government of moving each ton of freight to approximately $12.00.

If a ton-mile toll rather than a vehicle-mile toll were levied, $30,000 revenue might be raised, at one cent per ton-mile. This would reduce the net annual cost to $170,000, and the cost to the Dominion Government per ton of freight to approximately $13.00.

The effect which the probable savings in transportation costs will offer the residents of the Yukon Territory is more difficult to determine. There are indications, however, that little, if any, of the savings resulting from the highway operations over the Haines cut-off during the summer of 1947 were enjoyed by the general public in the form of lower prices. This is the general complaint of the residents of the Territory.

The following table shows the level of retail mark-up at Whitehorse over the landed price, for a selected group of commodities as of February 20, 1948:

Commodity	Cost at Whitehorse Including Transportation	Retail Price Whitehorse	Per Cent Mark-up
	¢ per pound	¢ per pound	
Potatoes, Netted Gems.....	7.035	7.95	13.0
Baked Beans, 20 oz. tin...	16.00	24.00	50.0
Tomatoes, 20 oz. tin.....	19.20	24.00	25.0
Salmon, ½ lb. tin.....	73.20	88.00	20.2
Stew, 16 oz. tin.....	25.20	30.00	19.0
Spaghetti, 20 oz. tin.....	12.00	19.20	60.0
Rice, bulk 1 pound.....	20.375	24.00	17.8
Apple Juice, 20 oz. tin...	12.00	16.00	33.3
Peaches, 20 oz. tin.....	12.00	28.00	133.3
Heinz Catsup, 16 oz. tin..	31.485	45.00	42.9
Oranges, Medium doz.....	17.985	35.00	94.6
Butter.....	73.485	80.00	8.9
Soup, 10 oz. tin.....	23.20	32.00	37.9
Dried Beets, 20 oz. tin...	11.20	16.00	42.9
Coffee.....	56,805	65.00	14.4
Gasoline (Imperial Gallon)	46.3	56.00	23.1

The transportation cost for the above commodities, as a percentage of the Whitehorse retail price, varied from 3.6% to 45.9% and averaged 9.9%, compared with the retail mark-up which ranged from 8.9% to 133.3% and averaged 29.9%.

The ratio of transportation charges and retail mark-up to Vancouver wholesale prices is indicated in the table below:

Commodity	Vancouver Wholesale Price Per Lb.	Trans-portation Charge Per Lb.	% of Vancouver Wholesale Price	Retail Mark-up Per Lb.	% of Vancouver Wholesale Price
	¢	¢	%	¢	%
Potatoes.....	3.39	3.645	107.5	0.915	27.0
Baked Beans (tin).	12.80	3.20	25.0	3.20	62.5
Tomatoes (tin)....	16.00	3.20	20.0	4.80	30.0
Salmon (tin).....	70.00	3.20	4.6	14.80	21.1
Stew (tin).....	22.004	3.20	14.5	4.80	21.8
Spaghetti (tin)...	8.80	3.20	36.4	7.20	81.8
Rice.....	17.00	3.375	19.9	3.625	21.3
Apple Juice (tin).	8.80	3.20	36.4	4.00	45.5
Peaches (tin).....	8.80	3.20	36.4	16.00	181.8
Catsup (tin).....	27.00	3.20	16.6	13.515	50.1
Oranges.....	13.50	4.485	33.2	17.015	126.0
Butter.....	69.00	4.485	6.5	6.515	9.4
Soup.....	20.00	3.20	16.0	8.80	44.0
Dried Beets (tin).	8.00	3.20	40.0	4.80	60.0
Coffee.....	53.00	3.805	7.2	8.195	25.5

It has been observed in analyzing the comparative ocean/rail and proposed ocean/highway rates that the ocean/highway service might offer a more favourable service for a wide range of high-valued commodities. To many of the low-valued commodities, on the other hand, the railway will probably continue to offer the more economical service. Therefore, if the proposed ocean/highway service should result in any large scale diversion of the ocean/rail traffic, the latter service might counter with one of the following alternatives.

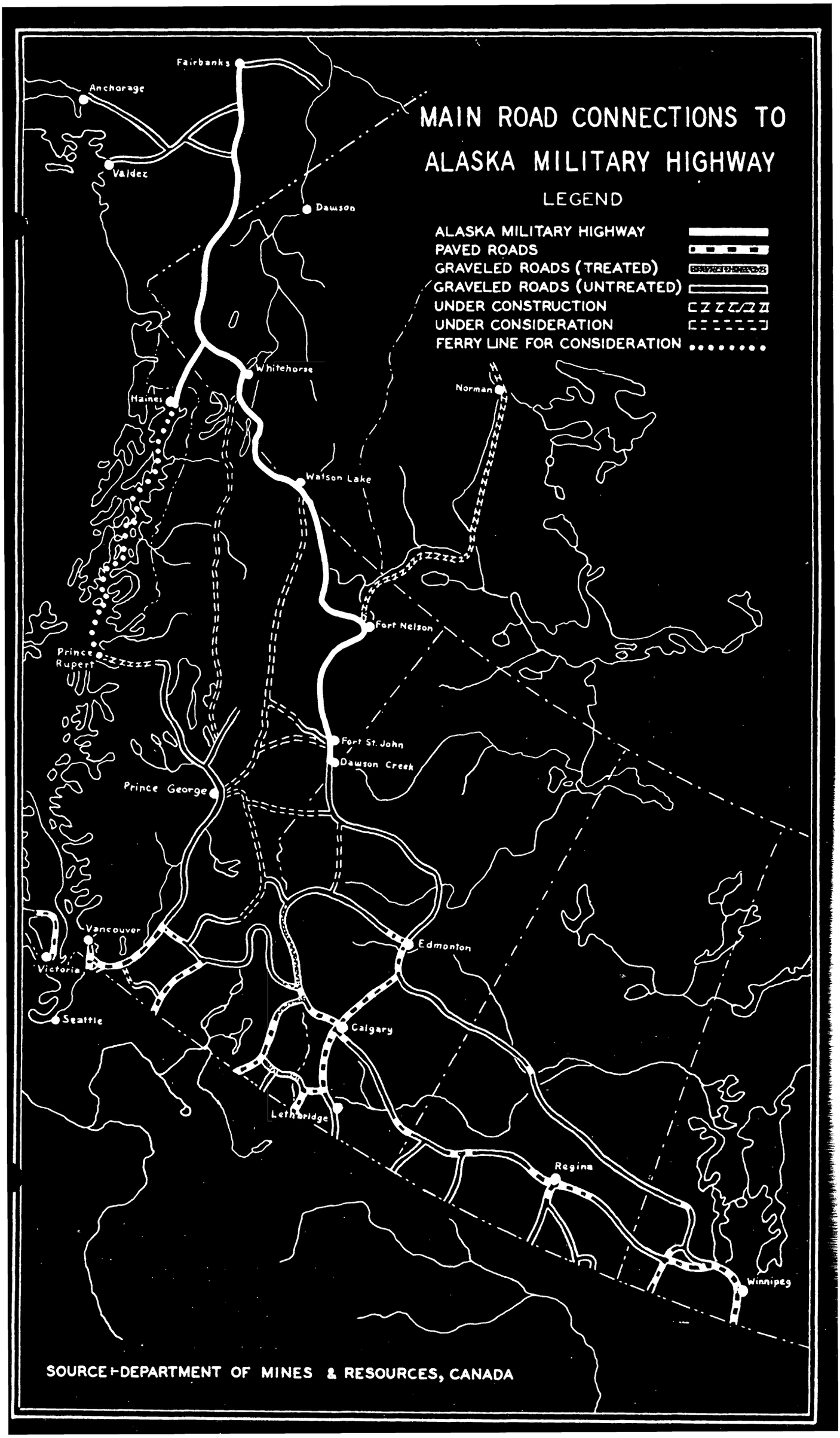
It has been intimated that the ocean/rail service might seek permission to suspend its service during the winter months when traffic is light and operating costs are heavy. This would permit the ocean/rail service to reduce its rates substantially during the summer months, and so hold its traffic in the face of the competitive ocean/highway service, as there would appear to be little doubt that the railway's policy has been one of covering losses incurred during winter operations with profits during spring, summer, and autumn operations. This policy, while offering

more economical operations for the ocean/rail service, would reduce the quality of transportation services to the Yukon Territory.

A second alternative which might be considered by the ocean/rail service would be a complete readjustment of its rate structure to meet the ocean/highway service. It would appear that ocean/rail rates have been based on the principle of charging according to what the traffic will bear. The low-valued commodities have probably been carried at rates less than the full cost of providing the service in the interests of developing the area, while the high-valued commodities have probably been contributing more than their share of full costs. If the rates on the high-valued commodities have to be reduced to compete with the proposed ocean/highway rates, the ocean/rail service may find it necessary to increase the rates on the low-valued commodities. Such a policy would probably adversely affect the mining industry which has enjoyed a very low rate of $25.20 per ton on the outbound movement of ore concentrates to Vancouver and United States points.

A third alternative open to the ocean/rail service might be to completely abandon its service, and substitute it with its own ocean/highway service. This is highly improbable, because of the large capital investment in the railway with little alternative use outside the industry. The operation of a supplementary ocean/highway service, on the other hand, is a distinct possibility.

In assessing the net annual cost of maintaining the Haines cut-off, as an artery of commerce to the Yukon, consideration must be given to the indirect benefits of lower transportation costs to the Yukon Territory on the one hand, and the adverse effects on the ocean/rail service operated at no cost to the Dominion Government and providing a more economic service to a large number of low-valued commodities, on the other hand.


MAIN ROAD CONNECTIONS TO
ALASKA MILITARY HIGHWAY
LEGEND
ALASKA MILITARY HIGHWAY
PAVED ROADS
GRAVELED ROADS (TREATED)
GRAVELED ROADS (UNTREATED)
UNDER CONSTRUCTION
UNDER CONSIDERATION
FERRY LINE FOR CONSIDERATION
Fairbanks
Anchorage
Valdez
Dawson
Whitehorse
Haines
Norman
Watson Lake
Fort Nelson
Prince Rupert
Fort St. John
Dawson Creek
Prince George
Vancouver
Victoria
Seattle
Edmonton
Calgary
Lethbridge
Regina
Winnipeg
SOURCE - DEPARTMENT OF MINES & RESOURCES, CANADA

DISTRIBUTION OF AIR EXPRESS AND GOODS TRAFFIC
BETWEEN EDMONTON AND SPECIFIED POINTS BY DIRECTIONAL MOVEMENTS
MARCH AND SEPTEMBER, 1947

Appendix I

ORIGINATION AND DESTINATION POINTS	SOUTHBOUND				NORTHBOUND				TOTAL			
	Express		Goods		Express		Goods		Express		Goods	
	March 1947	September 1947	March 1947	September 1947	March 1947	September 1947	March 1947	September 1947	March 1947	September 1947	March 1947	September 1947
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Dawson	.319	.093	2.100	1.051	1.180	.305	11.700	-	1.499	.398	13.800	1.051
Mayo	.336	.217	0.100	0.316	1.328	.642	15.900	10.075	1.664	.859	16.000	10.391
Whitehorse	.616	.459	-	-	2.124	1.917	-	-	2.740	2.376	-	-
Watson Lake	.616	.447	-	-	2.217	1.983	-	-	2.833	2.430	-	-
Fort Nelson	.659	.526	-	-	2.330	2.163	-	-	2.989	2.689	-	-
Fort St. John	.418	.365	-	-	1.709	2.147	-	-	2.127	2.512	-	-
TOTAL	2.964	2.107	2.200	1.367	10.888	9.157	27.600	10.075	13.852	11.264	29.800	11.442

DISTRIBUTION OF AIR EXPRESS AND GOODS TRAFFIC
BETWEEN EDMONTON AND SPECIFIED POINTS BY DIRECTIONAL MOVEMENTS
MARCH AND SEPTEMBER, 1947

Appendix II

ORIGINATION AND DESTINATION POINTS	SOUTHBOUND			NORTHBOUND			TOTAL			PERCENT OF TOTAL
	Express	Goods	Total	Express	Goods	Total	Express	Goods	Total	
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	%
Dawson	.412	3.151	3.563	1.485	11.700	13.185	1.897	14.851	16.748	25.24
Mayo	.553	0.416	0.969	1.970	25.975	27.945	2.523	26.391	28.914	43.57
Whitehorse	1.075	-	1.075	4.041	-	4.041	5.116	-	5.116	7.71
Watson Lake	1.063	-	1.063	4.200	-	4.200	5.263	-	5.263	7.93
Fort Nelson	1.185	-	1.185	4.493	-	4.493	5.678	-	5.678	8.56
Fort St. John	.783	-	.783	3.856	-	3.856	4.639	-	4.639	6.99
TOTAL	5.071	3.567	8.638	20.045	37.675	57.720	25.116	41.242	66.358	100.00
PERCENT OF TOTAL			13.02			86.98			100.00	100.00

UNITED STATES - ALASKA TRADE

Appendix III

(Thousands of Long Tons)

Year	U.S. To Alaska	Alaska to U.S.	Total
1929	350	450	800
1930	339	431	770
1931	283	479	762
1932	236	309	545
1933	240	260	500
1934	306	196	502
1935	333	323	656
1936	444	336	780
Average 1929 - 1936	316	348	664

SOURCE: U.S. Maritime Commission.

SHIPMENTS FROM UNITED STATES TO ALASKA (1936)

Appendix IV

(Figures in Long Tons)

Commodity	UNITED STATES TO				Total
	Southeast Alaska	Southwest Alaska	Alaska Peninsula	Bering Sea	
Refrigeration Products	801	568	186	15	1,570
Beer, Wines & Liquors	681	532	66	200	1,479
Provisions	3,647	2,398	627	1,765	8,437
Livestock	36	1,090	145	-	1,271
Animal Feeds	1,038	1,964	129	91	3,222
Lumber and Products	9,744	11,551	15,778	5,361	42,434
Coal and Coke	11,338	3,789	3,367	3,763	22,257
Petroleum Products	75,009	9,504	8,564	7,988	101,065
Iron & Steel Products	4,381	1,689	907	586	7,563
Cement, Stone, Brick & Sand	2,744	2,296	264	649	5,953
Salt	1,877	738	2,494	426	5,535
Paper Boxes & Cartons	6,517	2,141	3,154	1,168	12,980
Tin Cans	18,641	5,564	11,462	4,161	39,828
Machinery and Parts	1,855	2,401	389	949	5,594
Autos, Trucks & Tractors	155	520	-	147	822
Explosives	808	386	2	-	1,196
Misc. Mfr. Products	3,068	1,097	1,162	677	6,004
Misc. Commodities N.S.	57,267	29,655	10,773	9,897	107,592
Tanker Petroleum Products.	55,273	13,036	5,915	7,283	81,507
TOTAL	254,880	90,919	65,384	45,126	456,309

SOURCE: U.S. Maritime Commission.

SHIPMENTS FROM ALASKA TO THE UNITED STATES (1936)

Appendix V

(Figures in Long Tons)

Commodity	UNITED STATES FROM				Total
	Southeast Alaska	Southwest Alaska	Alaska Peninsula	Bering Sea	
Refrigerator Products....	11,794	6,674	1,389	2,809	22,666
Canned Goods	88,016	22,116	57,388	14,827	182,347
Fish, dry, salt, etc.....	3,583	3,134	3,547	2,245	12,509
Whole & Sperm Oil	-	-	3,205	-	3,205
Other Fish Oils	15,115	3,141	32,026	3,442	53,724
Lumber	3,858	-	-	-	3,858
Lime	90,901	-	-	-	90,901
Ore & Concentrates	5,155	22,664	555	145	28,519
Coal	50	865	-	-	915
Fertilizer	8,167	2,941	4,464	-	15,572
Miscellaneous	4,806	1,736	1,298	593	8,433
TOTAL	231,445	63,271	103,872	24,061	422,649

SOURCE: U.S. Maritime Commission.

In the above list 5 items representing only 30% of the total tonnage, are not products or by-products of fisheries. Since 1938 practically no ore has been moved south with the closing of the Kennecott mine at Juneau, Alaska. Little, if any, lime has been moving in recent years.

Comparative Seattle-Alaska Freight Charges Via Seward and the Alaska Railway and Via Haines and the Alaska Highways

Appendix VI

No.	Commodity	Joint Ocean-Rail Rate[1] Seattle-Fairbanks Per Ton	Ocean Rate[1] Seattle-Haines Per Ton	Estimated Highway Rate Haines-Fairbanks Per Ton	Estimated Ocean-Highway Rate Seattle-Fairbanks Per Ton	Differential in favour of Ocean-Rail Per Ton	Per Cent Differential Per Ton
1	Bacon	$63.20	$12.60	$66.50	$79.10	$15.90	20.10
2	Lard	63.20	17.60	66.50	84.10	20.90	24.85
3	Cheese	63.20	12.00	66.50	78.50	15.30	19.49
4	Belting, Power Transmission	73.40	15.40	66.50	81.90	8.50	10.38
5	Men's Shoes	101.60	41.40	66.50	107.90	6.30	5.84
6	Harness, leather	73.40	48.40	66.50	114.90	41.50	36.12
7	Corn, for poultry feed	34.60	10.00	66.50	76.50	41.90	54.77
8	Wheat Flakes, prepared	63.20	59.20	66.50	125.70	62.50	49.72
9	Linseed Cake, livestock feed	34.60	10.00	66.50	76.50	41.90	54.77
10	Soup, canned	63.20	11.00	66.50	77.50	14.30	18.45
11	Baked Beans, canned	63.20	11.60	66.50	78.10	14.90	19.08
12	Wheat Flour	34.60	13.80	66.50	80.30	45.70	56.91
13	Peanuts, unshelled	73.40	61.80	66.50	128.30	54.90	42.79
14	Cooking Fats, other than Lard	63.20	12.00	66.50	78.50	15.30	19.49
15	Chocolate, Baker's	63.20	14.20	66.50	80.70	17.50	21.69
16	Whiskey	73.40	24.60	66.50	91.10	17.70	19.43
17	Rubber Boots	84.60	24.20	66.50	90.70	6.10	6.73
18	Automobile tires, casings	73.40	43.20	66.50	109.70	36.30	33.09
19	Garden Hose	63.20	27.20	66.50	93.70	30.50	32.55
20	Wood Turpentine	63.20	14.80	66.50	81.30	18.10	22.26
21	Linseed Oil	63.20	15.00	66.50	81.50	18.30	22.45
22	Cigarettes	84.60	44.80	66.50	111.30	26.70	23.99
23	Finished Cotton Cloth	84.60	19.40	66.50	85.90	1.30	1.51
24	Cotton Work Shirts	101.60	59.20	66.50	125.70	24.10	19.17
25	Cotton Women's Dresses	101.60	57.00	66.50	123.50	21.90	17.73
26	Cotton Woven Belting	40.00	15.20	66.50	81.70	41.70	51.04
27	Jute Bags, for ore	62.00	15.80	66.50	82.30	20.30	24.67
28	Manila Rope	63.20	13.60	66.50	80.10	16.90	21.10
29	Men's and Boy's wool suits	101.60	26.80	66.50	93.30	8.30	8.90
30	Women's Silk Hosiery	101.60	49.60	66.50	116.10	14.50	12.49

NOTE: Figures underlined denote a differential in favor of the Ocean-Highway Service.

(1) Freight charges 1944.

Continued....

Comparative Seattle-Alaska Freight Charges Via Seward and the Alaska Railway and Via Haines and the Alaska Highways

Appendix VI

Continued....

No.	Commodity	Joint-Ocean[1] Rail Rate Seattle-Fairbanks Per Ton	Ocean Rate[1] Seattle-Haines Per Ton	Estimated Highway Rate Haines-Fairbanks Per Ton	Estimated Ocean-Highway Rate Seattle-Fairbanks Per Ton	Differential in favor of Ocean-Rail Per Ton	Per Cent Differential Per Ton
31	Linoleum	$63.20	$12.00	$66.50	$78.50	$15.30	19.49
32	Mattresses	73.40	164.20	66.50	230.70	157.30	68.18
33	Oak Flooring	63.20	11.60	66.50	78.10	14.90	19.08
34	Davenport, upholstered, crated	101.60	107.20	66.50	173.70	72.10	41.51
35	Lubricating Oil, cylinder	52.00	12.00	66.50	78.50	26.50	33.76
36	Globes and Shades, electric light	101.60	97.40	66.50	163.90	62.30	38.01
37	Electrical Porcelain	63.20	11.60	66.50	78.10	14.90	19.08
38	Abrasive Wheels	63.20	12.80	66.50	79.30	16.10	20.30
39	Asbestos Pipe covering and Cement	63.20	66.80	66.50	133.30	70.10	52.59
40	Concrete Reinforcement Bars	47.00	11.60	66.50	78.10	31.10	39.82
41	Iron, Sheets, Galvanized	63.20	12.60	66.50	79.10	15.90	20.10
42	Tin Plate	63.20	11.60	66.50	78.10	14.90	19.08
43	Iron and Steel Structural Shapes	63.20	11.60	66.50	78.10	14.90	19.08
44	Oil Line Pipe, Seamless	63.20	52.80	66.50	119.30	56.10	47.02
45	Wrought Iron Welded Pipe	63.20	11.60	66.50	78.10	14.90	19.08
46	Wire Rope	63.20	20.60	66.50	87.10	23.90	27.44
47	Woven Wire Fencing	63.20	17.80	66.50	84.30	21.10	25.03
48	Wire Netting for Fishtraps	63.20	12.40	66.50	78.90	15.70	19.90
49	Wire Nails	63.20	11.60	66.50	78.10	14.90	19.08
50	Bathtubs, enameled	63.20	39.20	66.50	105.70	42.50	40.21
51	Metal Bed Springs	59.60	13.20	66.50	79.70	20.10	25.22
52	Wood and Coal Heating Stove	63.20	47.20	66.50	113.70	50.50	44.42
53	House Heating Radiators	63.20	11.60	66.50	78.10	14.90	19.08
54	Steel Band Millsaws	63.20	11.60	66.50	78.10	14.90	19.08
55	Domestic Oil Burners	63.20	26.00	66.50	92.50	29.30	31.68
56	Door Locks and Lock Sets	73.40	18.80	66.50	85.30	11.90	13.95
57	Sprocket Chains	40.00	11.60	66.50	78.10	38.10	48.78
58	Aluminum Utensils	89.60	63.20	66.50	129.70	40.10	30.92
59	Copper Wire, insulated	73.40	11.60	66.50	78.10	4.70	6.02

Continued ....

Continued .....

Comparative Seattle-Alaska Freight Charges Via Seward and the Alaska Railway and Via Haines and the Alaska Highways

Appendix VI

No.	Commodity	Joint Ocean-Rail Rate Seattle-Fairbanks Per Ton (1)	Ocean Rate Seattle-Haines Per Ton (1)	Estimated Highway Rate Haines-Fairbanks Per Ton	Estimated Ocean-Highway Rate Seattle-Fairbanks Per Ton	Differential in favor of Ocean-Rail Per Ton	Per Cent Differential Per Ton
		$	$	$	$	$	
60	Electrical Resistance Wire	84.60	11.60	66.50	78.10	6.50	8.32
61	Electric Transformers, 500 KVA or Less.	40.00	18.80	66.50	85.30	45.30	53.11
62	Electric Motors, 20 KW	40.00	15.60	66.50	82.10	42.10	51.28
63	Electric Refrigerator, domestic	73.40	50.00	66.50	116.50	43.10	37.00
64	Electric Incandescent Lamps	84.60	76.60	66.50	143.10	58.50	40.88
65	Electric Vancuum Cleaners, domestic....	63.20	37.80	66.50	104.30	41.10	39.41
66	Electric Cooking Ranges, domestic.....	73.40	54.20	66.50	120.70	47.30	39.19
67	Radio Receiving Sets	84.60	55.60	66.50	122.10	37.50	30.71
68	Diesel Engines, Stationary	40.00	16.80	66.50	83.30	43.30	51.98
69	Concrete, Mixers, S.U.	63.20	30.20	66.50	96.70	33.50	34.64
70	Power Shovels, and Excavators	40.00	51.80	66.50	118.30	78.30	66.19
71	Sewing Machines, domestic.....	84.60	32.80	66.50	99.30	14.70	14.80
72	Air Compressors, portable	40.00	18.20	66.50	84.70	44.70	52.77
73	Standard Typewriters	84.60	31.00	66.50	97.50	12.90	13.23
74	Cash Registers	73.40	18.40	66.50	84.90	11.50	13.55
75	Cream Separators, farm use	63.20	25.40	66.50	91.90	28.70	31.23
76	Mowers, farm use, K.D.	20.00	18.80	66.50	85.30	65.30	76.55
77	Tracklaying Tractors, under 35 H.P.....	40.00	17.20	66.50	83.70	43.70	52.21
78	Tracklaying Tractors, 60 H.P. & Over...	40.00	14.80	66.50	81.30	41.30	50.80
79	Motor Truck, 1-1/2 Ton	97.60	55.00	66.50	121.50	23.90	19.67
80	Passenger Automobile, Med. Wt.....	97.60	55.00	66.50	121.50	23.90	19.67
81	Passenger Automobile, Engines	63.20	16.80	66.50	83.30	20.10	24.13
82	Aircraft Engines, radial type	63.20	55.00	66.50	121.50	58.30	47.98
83	Marine Engines, diesel	63.20	12.40	66.50	78.90	15.70	19.90
84	White lead in oil.....	63.20	11.60	66.50	78.10	14.90	19.08
85	Laundry soap	63.20	11.00	66.50	77.50	14.30	18.45
86	Pianos, upright for home use	101.60	73.40	66.50	139.90	38.30	27.38
87	Amunition, Metallic Cartridge.....	73.40	11.60	66.50	78.10	4.70	6.02
88	Dynamite	96.60	18.00	66.50	84.50	12.10	14.32

NOTE: Figures underlined denote a differential in favor of the ocean-highway service.

(1) Freight Charges 1944.

Appendix VII

COMPARATIVE TRANSPORTATION COSTS BETWEEN VANCOUVER AND WHITEHORSE

VIA OCEAN AND RAIL AND PROPOSED OCEAN AND HIGHWAY SERVICES

Commodity	Through Ocean-Rail Rate		Projected Through Ocean-Highway Rate(1)		Differential in favor of Ocean-Highway Rate		% Differential in favor of Ocean-Highway Rate	
	C.L. $ Per Ton	L.C.L.	C.L. $ Per Ton	L.C.L.	C.L. $ Per Ton	L.C.L.	C.L.	L.C.L.
Fresh Meat	89.70(2)	104.30(2)	89.00(7)	117.00	.70	12.70	0.80	10.85
Fruits & Vegetables	108.20	121.40	75.00(7)	89.00	33.20	32.40	30.68	26.69
Lard	67.50	75.10	75.00(7)	89.00	7.50	13.90	10.00	15.62
Beverages	89.70	104.30(2)	50.00	55.00	39.70	49.30	44.26	47.27
Insulating Material	76.10	84.70	50.00(8)	60.00	26.10	24.70	34.30	29.16
Hardware	76.10	84.70	50.00	55.00	26.10	29.70	34.30	35.06
Building Material	67.50	75.10	54.00(8)	60.00	13.50	15.10	20.00	20.11
Steel	67.50	75.10	47.00	52.00	20.50	23.10	30.37	30.76
Castings	67.50	75.10	54.00	-	13.50	-	20.00	-
Cylinders	33.80	37.60	54.00	-	20.20	-	37.41	-
Roofing	76.10	84.70	43.00(8)	50.00	33.10	34.70	43.50	40.97
Oil Tanks	89.70	104.30	54.00	60.00	35.70	44.30	39.80	42.47
Brick	50.60	56.40	50.00	54.00	.60	2.40	1.11	4.26
Pipe	67.50	75.10	47.00(8)	54.00	20.50	21.10	30.37	28.10
Heaters	89.70	104.30	54.00	-	35.70	-	39.80	-
Asphalt	67.50	75.10	47.00	54.00	20.50	21.10	30.37	28.10
Calcium	67.50	75.10	54.00	-	13.50	-	20.00	-
Wagons	76.10	84.70	54.00(4)	65.00	22.10	19.70	29.04	23.26
Flour	53.00	-	47.00	51.00	6.00	-	11.32	-
Sugar	52.00	-	47.00	53.00	5.00	-	9.62	-
Potatoes	72.90	-	51.40	-	21.50	-	29.49	-
Canned Goods	64.00	-	50.00	55.00	14.00	-	21.88	-

Continued .....

Appendix VII

COMPARATIVE TRANSPORTATION COSTS BETWEEN VANCOUVER AND WHITEHORSE

VIA OCEAN AND RAIL AND PROPOSED OCEAN AND HIGHWAY SERVICES

Continued .....

Commodity	Through Ocean-Rail Rate		Projected Through Ocean-Highway Rate(1)		Differential in favor of Ocean-Highway Rate		% Differential in favor of Ocean-Highway Rate	
	C.L. $ Per Ton	L.C.L.	C.L. $ Per Ton	L.C.L.	C.L. $ Per Ton	L.C.L.	C.L.	L.C.L.
Canned Milk	52.00	-	50.00	55.00	2.00	-	3.85	-
Lumber	58.30(3)	-	57.00	61.00	1.30	-	2.23	-
Lubricating Oil	76.10	84.70	55.00	60.00	21.10	24.70	27.73	29.16
Stove Oil	67.50	75.10	55.00	60.00	12.50	15.10	22.73	20.11
Diesel Fuel	76.10	-	55.00	60.00	21.10	-	27.73	-
Gasoline	56.70	-	55.00	60.00	1.70	-	3.00	-
Tractors	50.60(4)	60.60	48.00(4)	-	2.60	-	5.14	-
Trucks	80.50(4)	88.10	53.00(4)	-	27.50	-	34.16	-
Cement	38.10	-	43.00	51.00	4.90	-	11.40	-
Machinery	89.70	104.30	50.00	55.00	39.70	49.30	44.26	47.27
Coal	75.10	-	54.00	-	21.10	-	28.10	-
Refinery-Second Hand Pipe	50.60	60.60	54.00	-	3.40	-	6.30	-
Furniture	89.70(5)	104.30	45.00(8)	52.00	44.70	52.30	49.83	50.14
Class A	67.50	75.10	54.00	-	13.50	-	20.00	-
Class B	76.10	84.70	54.00	-	22.10	-	29.04	-
Class C	89.70	104.30	54.00	-	35.70	-	39.80	-
Class C Higher	100.00(6)	-	54.00	-	46.00	-	46.00	-

NOTE: Underlined figures denote differential in favor of ocean-rail service.

(1) Includes estimated handling charges of $5.00 per ton, but no insurance charges. All freight subject to owner's risk; (2) Combination of ocean and rail charges - no through rate; (3) Finished lumber - lower rates for rough lumber; (4) Subject to heavy lift penalty; (5) Furniture not released for valuation and not "Knocked Down" take higher rates; (6) Estimated; (7) Includes refrigeration charge of 40% of rate; (8) Per 40 cu. ft.

WHITEPASS AND YUKON RAILWAY TONNAGE - 1947

Appendix VIII

Commodity	SKAGWAY TO						SKAGWAY FROM						Local	Total Through and Local
	White-horse	Atlin	Mayo	Dawson	Lower River	Other Rail Points	White-horse	Atlin	Mayo	Dawson	Lower River	Other Rail Points		
Carload - Class Rates														
Meat Fresh	257	-	-	125	42	31	-	-	-	-	-	-	-	455
Fruits & Vegetables	386	-	31	-	-	-	-	-	-	-	-	-	-	417
Lard	5	-	-	-	-	-	-	-	-	-	-	-	-	5
Beverages	950	24	30	213	-	-	-	-	-	-	-	-	-	1,217
Insulating Material	69	-	-	-	-	-	-	-	-	-	-	-	-	69
Hardware	78	-	68	72	-	-	6	-	-	-	-	-	-	224
Building Material	109	-	13	30	-	-	67	-	-	-	-	-	-	219
Steel	286	-	-	38	-	-	-	-	-	-	-	-	-	324
Iron	20	-	-	-	-	-	-	-	-	-	-	-	-	20
Machinery	-	-	-	-	-	-	12	-	-	10	-	20	8	50
Castings	16	-	-	43	8	-	-	-	-	-	-	-	-	67
Gasoline	-	-	-	-	-	-	-	-	-	-	-	-	12	12
Diesel Fuel	-	-	-	-	-	-	18	-	-	-	-	-	12	30
Cylinders	38	-	-	-	-	-	15	-	-	-	-	-	-	53
Lumber	-	-	-	-	-	7	353	-	-	-	-	-	36	396
Roofing	28	-	-	48	-	-	-	-	-	-	-	-	-	76
Oil Tanks	17	-	-	-	-	-	41	-	-	22	-	-	-	80
Brick	68	-	-	-	-	-	-	-	-	-	-	-	-	68
Pipe	25	-	12	14	-	-	-	-	-	-	-	-	-	51
Heaters	8	-	-	-	-	-	-	-	-	-	-	-	-	8
Asphalt	15	-	-	-	-	-	-	-	-	-	-	-	-	15
Calcium	9	-	-	-	-	-	-	-	-	-	-	-	-	9
Wagons	4	-	-	-	-	-	-	-	-	-	-	-	-	4
Medical Supplies	-	-	-	28	-	-	-	-	-	-	-	-	-	28
Dog Feed	-	-	10	12	-	-	-	-	-	-	-	-	-	22
Piling	55	-	-	-	-	-	-	-	-	-	-	-	-	55
Coal	-	-	-	-	-	-	-	-	-	-	-	-	5	5
Ties	-	-	-	-	-	-	129	-	-	-	-	50	31	210
Furniture	-	-	-	-	-	-	7	-	-	-	-	-	-	7
Bottles	-	-	-	-	-	-	16	-	-	12	-	-	-	28
Launch	-	-	-	-	-	-	-	-	-	-	-	-	5	5
Class A	251	26	61	224	17	17	-	-	-	-	-	-	-	596
Class B	177	7	9	128	9	1	-	-	-	-	-	-	-	331
Class C	90	4	6	68	5	-	-	-	-	-	-	-	-	173
Class C Higher	31	3	2	19	-	-	-	-	-	-	-	-	-	55

Continued .....

WHITEPASS AND YUKON RAILWAY TONNAGE - 1947

Appendix VIII

Commodity	SKAGWAY TO						SKAGWAY FROM						Local	Total Through and Local
	White-horse	Atlin	Mayo	Dawson	Lower River	Other Rail Points	White-horse	Atlin	Mayo	Dawson	Lower River	Other Rail Points		
Carload - Commodity Rates														
Flour	283	19	50	152	-	-	-	-	-	-	-	-	-	504
Sugar	81	-	-	56	-	-	-	-	-	-	-	-	-	137
Potatoes	46	-	-	107	-	-	-	-	-	-	-	-	-	153
Feed	-	-	12	47	-	-	-	-	-	-	-	-	-	59
Canned Goods	379	17	39	249	2	-	-	-	-	-	-	-	-	686
Canned Milk	174	-	39	201	-	-	-	-	-	-	-	-	-	414
Reagents	-	-	41	-	-	-	-	-	-	-	-	-	-	41
Lumber	859	-	-	301	-	-	-	-	-	-	-	-	-	1,160
Scraper Unit	-	-	-	11	-	-	-	-	-	-	-	-	-	11
Lubricating Oil	143	-	28	34	-	-	-	-	-	-	-	-	-	205
Stove Oil	11,543	-	74	119	9	181	-	-	-	-	-	-	-	11,926
Diesel Fuel	1,167	-	1,011	984	195	55	-	-	-	-	-	-	-	3,412
Gasoline	4,463	-	242	677	5	198	-	-	-	-	-	-	-	5,584
Tractors	127	-	-	100	22	-	-	-	-	-	-	-	-	249
Trucks	28	-	-	11	-	-	44	-	-	-	-	-	-	83
Cement	569	-	23	-	-	-	-	-	-	-	-	-	-	592
Machinery	227	-	29	19	-	-	-	-	-	-	-	-	-	275
Mining Machinery	-	-	166	267	12	-	-	-	-	-	-	-	-	445
Explosives	-	-	16	-	-	-	-	-	-	-	-	-	-	16
Ore Sacks	-	-	19	-	-	-	-	-	-	-	-	-	-	19
Coal	424	-	20	-	-	15	-	-	-	-	-	-	-	459
Dredge Buckets	-	-	-	168	-	-	-	-	-	-	-	-	-	168
Refinery	-	-	-	-	-	-	2,362	-	-	-	-	-	-	2,362
Ore	-	-	-	-	-	-	-	-	1,611	-	-	-	-	1,611
TOTAL TONS CAR LOAD	23,449	100	2,051	4,565	326	560	3,070	-	1,611	44	-	70	109	35,955
MISCELLANEOUS L.C.L. SHIPMENTS	1,469	84	635	1,973	451	79	44	7	-	13	-	13	229	4,997
GRAND TOTAL	24,918	184	2,686	6,538	777	639	3,114	7	1,611	57	-	83	338	40,952

Appendix IX

COMPARATIVE TRANSPORTATION COSTS BETWEEN VANCOUVER AND DAWSON CITY VIA OCEAN, RAIL AND RIVER AND PROPOSED OCEAN, HIGHWAY AND RIVER SERVICES

Commodity	Ocean-Rail River Rate $ Per Ton		Ocean-Highway[1] River Rate $ Per Ton		Differential in favor of Ocean-Highway Rate $ Per Ton		% Differential in favor of Ocean-Highway Rate	
	C.L.	L.C.L.	C.L.	L.C.L.	C.L.	L.C.L.	C.L.	L.C.L.
Fresh Meat	117.40[2]	133.20	126.50[5]	154.50	9.10	21.30	7.19	13.79
Beverages	117.40	133.20	75.00	80.00	42.40	53.20	36.12	39.94
Hardware	90.20	98.40	75.00	85.00	15.20	13.40	16.85	13.62
Building Material	101.40	109.20	79.00[6]	84.00	22.40	25.20	22.09	23.08
Steel	90.20	98.40	72.00	77.00	18.20	21.40	20.18	21.75
Castings	90.20	98.40	79.00	-	11.20	-	12.42	-
Roofing	104.00	115.40	68.00[6]	-	36.00	-	34.62	-
Pipe	90.20	98.40	72.00[6]	79.00	18.20	19.40	20.18	19.72
Medical Supplies	117.40	133.20	79.00	-	38.40	-	32.71	-
Flour	59.00	-	72.00	77.00	13.00	-	18.06	-
Sugar	58.00	-	72.00	78.00	14.00	-	19.44	-
Potatoes	80.30	-	76.40	-	3.90	-	4.86	-
Feed	60.20	-	79.00	-	18.80	-	23.80	-
Canned Goods	74.60	-	75.00	-	.40	-	.53	-
Canned Milk	58.00	-	75.00	-	17.00	-	22.67	-
Lumber	68.30[3]	91.30	82.00	86.00	13.70	5.30	16.71	5.81
Scraper Unit	73.20	75.60	79.00	-	5.80	-	7.34	-
Lubricating Oil	92.80	104.00	80.00	85.00	12.80	19.00	13.79	18.27
Stove Oil	92.80	104.00	80.00	85.00	12.80	19.00	13.79	18.27
Diesel Fuel	92.80	104.00	80.00	85.00	12.80	19.00	13.79	18.27
Gasoline	92.80	104.00	80.00[4]	85.00	12.80	19.00	13.79	18.27
Tractors	79.40[4]	86.00	73.00[4]	-	6.40	-	8.06	-
Trucks	103.20[4]	111.40	78.00	-	25.20	-	24.42	-
Machinery	90.20	98.40	75.00	80.00	15.10	18.40	16.76	18.70
Mining Machinery	62.20	64.60	75.00	80.00	12.80	15.40	17.07	19.25
Dredge Buckets	62.20	64.60	79.00	-	16.80	-	21.27	-
Class A	90.20	98.40	79.00	-	11.10	-	12.32	-
Class B	104.00	115.40	79.00	-	25.00	-	24.04	-
Class C	117.40	133.20	79.00	-	38.40	-	32.71	-
Class C Higher	125.00	150.00	79.00	-	46.00	-	36.80	-
Iron	90.20	98.40	84.50	89.50	5.70	8.90	6.32	9.04
Oil Tanks	117.40	133.20	91.50	-	25.90	-	22.06	-
Bottles	117.40	133.20	91.50	-	25.90	-	22.06	-

NOTE: Underlined figures denote differential in favor of ocean-rail service.

(1) Includes estimated handling charges of $5.00 per ton, but no insurance charges; (2) Combination of ocean and rail rates - no through rate; (3) Finished lumber - lower rate for rough lumber; (4) Subject to heavy lift penalty; (5) Includes refrigeration charge of 40% of rate; (6) Per 40 cu. ft.

Appendix X

COMPARATIVE TRANSPORTATION COSTS BETWEEN VANCOUVER AND MAYO VIA OCEAN, RAIL AND RIVER AND PROPOSED OCEAN, HIGHWAY AND RIVER SERVICES

Commodity	Through Ocean-Rail River Rate		Through Ocean-Highway and Local River Rate(1)		Differential in Favor of Ocean-Highway Rate		% Differential in Favor of Ocean-Highway Rate	
	C.L. $ Per Ton	L.C.L.	C.L. $ Per Ton	L.C.L.	C.L. $ Per Ton	L.C.L.	C.L.	L.C.L.
Fruits and Vegetables...	139.90(2)	151.60	112.00(3)	126.00	27.90	25.60	19.94	16.89
Beverages	130.60	147.10	87.00	92.00	43.60	55.10	33.38	37.46
Hardware	101.40	109.20	87.00	92.00	14.40	17.20	14.20	15.75
Building Material	101.40	109.20	92.00	97.00	9.40	12.20	9.27	11.17
Pipe	101.40	109.20	84.00	91.00	17.40	18.20	17.16	16.67
Dog Feed	71.40	-	91.00	-	19.60	-	21.54	-
Class A	101.40	109.20	91.00	-	10.40	-	10.26	-
Class B	114.80	126.20	91.00	-	23.80	-	20.73	-
Class C	130.60	146.40	91.00	-	39.60	-	30.32	-
Flour	70.20	-	84.00	88.00	13.80	-	16.43	-
Feed	71.40	-	91.00	-	19.60	-	21.54	-
Canned Goods	85.60	-	87.00	92.00	1.40	-	1.61	-
Canned Milk	69.00	-	87.00	92.00	18.00	-	20.68	-
Reagents	84.20	86.40	91.00	-	6.80	-	7.47	-
Lubricating Oil	104.00	115.20	92.00	97.00	12.00	18.20	11.54	15.80
Stove Oil	104.00	115.20	92.00	97.00	12.00	18.20	11.54	15.80
Diesel Fuel	104.00	115.20	92.00	97.00	12.00	18.20	11.54	15.80
Gasoline	104.00	115.20	92.00	97.00	12.00	18.20	11.54	15.80
Cement	57.10	-	80.00	88.00	22.90	-	28.63	-
Machinery	89.10	-	87.00	-	2.10	-	23.57	-
Mining Machinery	84.20	-	87.00	92.00	2.80	-	3.22	-
Explosives	165.10	-	127.00	132.00	38.10	-	23.08	-
Ore Sacks	53.40	-	91.00	-	37.60	-	41.32	-
Coal	61.80	-	91.00	-	29.20	-	32.09	-
Ore	25.20	-	91.00	-	65.80	-	72.31	-

NOTE: Underlined figures denote differential in favor of ocean-rail services.

(1) Includes estimated handling charges of $5.00 per ton, but no insurance charge; (2) There are various rates for particular types of fruits and vegetables. Some are lower and some higher than the above rate; (3) Includes Refrigeration charge of 40% of the rate; (4) Per 40 cu. ft.

APPENDIX XI

POPULATION AND ECONOMIC RESOURCES OF THE AREAS TRAVERSED BY THE ALASKA HIGHWAY

The population located either along the Canadian section of the Alaska highway, or within reasonable access to it, totals some 16,895, as indicated in Appendix XII. Of this total, 8,650 are resident in northeastern British Columbia, 825 in northwestern British Columbia, and 7,420 in the Yukon Territory. Of this total, approximately 75% or 12,000 are located in three principal centers -- Dawson Creek, Fort St. John, and Whitehorse. Approximately 20% or 3,000 of the total population are Indians. The Alaska highway, therefore, will serve a population of an average-sized Canadian town. The Cordillera region of Northern British Columbia and the Yukon is an area of mountains, plateaus and valleys. Much of the land mass is muskeg, swamp and heavy bush. Such blocks of agricultural land as do exist are scarce. Population statistics show that past settlement has been scattered in small areas where groups of people are exploiting some particular resource. It is not anticipated, therefore, that there will be any rapid growth in the overall population picture in the near future, but rather a gradual and continuous growth as economic development progresses.

Economic Activity

Northeastern British Columbia lies within the Great Plains region. The southern section of this area is the more densely populated and of greater economic significance due to farming, ranching and coal mining. The northern section is little developed economically other than for its fur trapping activity by semi-nomadic Indians. The economic activity of the northwestern area of British Columbia consists almost entirely of gold mining and fur trapping.

The Yukon Territory which forms the extreme northwest part of the Canadian mainland embraces approximately 6% of the total area of the Dominion. The Yukon Plateau, a large basin-like area, drained by the Yukon

river, is the most highly developed economic section of the Territory. It is rich in mineral deposits, which are the basis of its economy, and also derives considerable income from the fur trade, some from its agriculture and lumber resources, and a small amount from commercial fishing.

Mineral Resources

Gold mining is the principal economic activity of northwestern British Columbia. Between 1941-1945 this area produced a total of $3,741,469 as shown in the table below:

Year	Value of Production
	$
1941	1,449,341
1942	1,401,357
1943	314,005
1944	255,539
1945	321,227
1941-1945	3,741,469

The decline in production from 1942 was not due to exhaustion of deposits, but rather to the diversion of labour to more essential war employment. Gold production in this area is almost entirely from placer mines, the most important operations being those of the Columbia development, about 25 miles from Atlin. The only lode mines in production are the Engineer Mine and Taku River Mine. Their production, however, is small. Other operators in this district are also doing development work, and producing a certain amount. Minor gold operations are carried on in the Telegraph Creek area, but these are on a very limited scale. Between 1943 and 1945 the total value of production in this area amounted to only $4,179.

The Yukon Territory has substantial deposits of minerals; the principal mineral deposits being placer and some lode gold in the Dawson area, copper in the Whitehorse belt, silver-lead in the Mayo district, coal in Carmacks basin, and scattered deposits of antimony, tungsten, zinc, arsenic, manganese, iron, mercury, tin, and platinum in various lode and

placer deposits throughout the territory. The major production of minerals in the Territory has resulted from a few deposits. It is doubtful whether any area has been thoroughly prospected, and little drilling has been done. Prospecting has been handicapped by the remoteness of the Territory, and possibly transportation costs have made some potential deposits uneconomic. Much of the geology of the area is favourable for the occurrence of minerals, and the variety and wide spread distribution of the placer and lode prospects suggest the possibility of further expansion in mineral development.

Since the end of hostilities marked progress has been evident in many aspects of the Territory's mining activity. Gold production, for example, which in 1945 totalled 39,424 ounces increased to 56,428 ounces, or by 43.1% in 1946. The value of the gold production increased from $1,379,859 in 1945 to $1,974,649 in 1946, or also by 43.1%. The Yukon Territory's gold production in 1946 represented approximately 1.5% of the Dominion's total.

During 1946, 107 new leases were issued to mining companies and individuals. On both Livingstone and Cyr creeks 15 claims were staked and operations were begun during 1947. New ground was staked on Sheldon, Wolverine, and Moose Creeks, and at the headquarters of Donjek river. During 1946 a significant increase in activity in the Mayo district was also evident. The Keno Hill Mining Co. made plans for operating their 87 claims. Production which totalled some 2,000 tons during 1947 is expected to reach 8,000 tons within the very near future. The Yukon North-West Exploration Limited now hold 16 claims situated on the northwest slope of Keno Hill. A small amount of high grade ore has been found showing 600 ounces of silver per ton, indicating the possibility of a workable body of ore. The Boyle Mining Company is carrying out prospecting on claims held 50 miles northwest of Keno, an area known to have large deposits of lead. Noranda Mining Co. has acquired several groups of claims on Keno Hill where a large amount of high grade ore has been blocked out. The "Vanguard" mineral claim on Keno Hill has uncovered a vein of 400 ounce ore.

The facilities of the Alaska highway has opened up several promising mining areas. The Brown-McDade Mines Ltd. has blocked out a sufficiently large body of ore in the Aishihik Lake area to warrant potential operations. Considerable interest has been shown in mineral deposits on the Aishihik airport, and a total of 42 claims have been staked for development. Hudson Bay Exploration and Development Company, Limited, has increased its interests in land at the head of Logjam Creek, and Western Ranges Prospecting Syndicate has staked a group of 19 claims in the area adjoining the Hudson Bay Exploration Claims. Trans-Continental Resources, Limited, continues to acquire and stake claims in the Taghish Lake area. Conwest Exploration Limited has an option on a group of claims in the Victoria Creek area close to Brown-McDade property. A group of claims have also been optioned on Mount Freegold for development. The Muncho Prospecting Syndicate have acquired claims in the Canyon Lake area in addition to their holdings west of Guiltana Lake.

During 1947 mineral production was lower than had been anticipated due to one of the driest years experienced in the Yukon Territory. Production for the first nine months totalled some 33,407 ounces compared with 56,428 ounces for the full year of 1946. This, however, is regarded as only a temporary set back, and production during 1948 is expected to exceed the 1946 level. In the Dawson District stripping and thawing operations are now being carried out with larger crews than at any time since before the war.

New activity along the highway includes the staking of 16 claims at mile 703 by Western Rangers Syndicate. This company is also carrying out active prospecting on a group of claims held between mile 702 and the British Columbia border. A group of claims covering a silver-lead deposit has been staked on the south shore of Moose Lake, approximately 20 miles north of mile 700. Two new discoveries were staked north of the Alaska highway, east of Wolf Lake, by the Great Northern Exploration Company.

The following table indicates the approximate value of mineral production in northern British Columbia and the Yukon Territory up to the end of 1945:

	Northern British Columbia		Yukon	
	Ounces	Pounds	Ounces	Pounds
Placer Gold.....	717,689		9,714,397	
Lode Gold.....	2,441,510		-	
Silver.....	51,741,257		45,057,223	
Copper.....	663,558,719		13,050,000	
Lead.....		38,870,660		95,030,969
Zinc.....		5,842,959		-
Mercury.....		4,151,000		-
Tungsten.....		625,000		21,590
Antimony.....		-		1,000
TOTAL...	718,459,175	49,489,619	67,821,620	95,053,559

In appraising the potential mineral resources of the North Pacific Region a recent survey of the Dominion Government's Department of Mines and Resources has stated that:

> "In addition to present mines and former producers, there are now more than a thousand mineral prospects in the North Pacific Region, many of which would be developed if they could be readily reached by transportation and, particularly in Yukon, a number of mineral deposits have been discovered carrying values that would be commercial in more accessible areas. Notable among these are large silver-lead deposits in the Mayo district; gold, silver, lead, copper, and antimony in zinc, manganese, bismuth, quartz crystals, fluorite, and Iceland spar. The Cassiar-Omineca batholith and the eastern flank of the Coast Range batholith are to a large extent unprospected and contain large areas of favourable ground. The geological features of a great part of the North Pacific Region and the variety and widespread distribution of the prospects promise expansion and development in the future."

In addition to the above minerals, there are numerous occurrences of non-metallic deposits throughout these areas. Extensive deposits of high grade bituminous coal occur widely distributed throughout the northern and northeastern parts of British Columbia. The coal deposits of the Peace River district are among British Columbia's most important undeveloped coal reserves. Valuable deposits have been discovered in areas reasonably adjacent to Dawson Creek, the entrance to the Alaska highway, and lying astride the Hart highway now under construction by the British Columbia Government. During 1946 the Pine River field produced some 7,000 tons. A recent survey of the coal reserves of the Peace River district made for the Royal Commission

on Coal estimated a total of 1,040,480,000 short tons. At the other end of the highway, in the Yukon Territory, coal has been found in widely scattered sections. In two areas, Whitehorse and Wheaton, good bituminous coals have been found. Most of the coal which has been mined has been in the Carmacks district due to its greater accessibility to the local market.

Agriculture

The northeastern corner of the province of British Columbia, east of the Rocky Mountains lies within the Great Plains Region. The southern portion of these plains are excellent agricultural lands and have successful grain-growing and ranching districts. During 1945 field crop production included:

Crop	Production	
	Bushels	Pounds
Spring Wheat	554,000	-
Winter Wheat	5,200	-
Oats	616,000	-
Barley	84,000	-
Flax	10,000	-
Rye	200	-
Alfalfa	-	126,000
Alteswede Clover	86,000	-

Fort St. John, 50 miles northwest of Dawson Creek via the Alaska highway, is the centre of an extensive farming area which radiates 35 to 40 miles in all directions. Approximately 85,000 acres are now under cultivation, and this is rapidly expanding each year. Dawson Creek is also the centre of a grain-growing and mixed farming area. There are potential agricultural lands west of Fort Nelson in the Liard basin, the Takhini-Dezadiash valley, and in the Champagne district some 100 miles north of Whitehorse. A recent survey of agricultural lands in the North Pacific Region placed the cultivable land suitable for settlement at 15,020,000 acres. Of this, some 1,365,000 acres are reasonably accessible to the Yukon Territory as indicated in the following table:

Area	Acreage
Lower Kachika.....	200,000
Prophet-Muskwa.....	150,000
Fort Nelson area.....	195,000
Fontes River.....	20,000
Toad River.....	300,000
Yukon Territory.....	500,000
All Areas.....	1,365,000

In addition to the above, it is estimated that there are 635,000 acres of open grazing and wild meadow lands.

These estimates excluded some promising scattered parcels of land, and certain sub-marginal lands which might be utilized as mining and other economic activities develop. Mining and lumbering operations in remote areas have induced the occupation of land and the production of crops in conditions and on soils commonly regarded as sub-marginal. The value of fresh agricultural produce in remote areas and the cost of bringing such products in might considerably extend the limit of agricultural activities.

It has been estimated that the agricultural land suitable for settlement in the North Pacific Region could support a population of approximately 265,000 based on the fact that the agricultural land of the three Prairie Provinces of some 100,358,400 acres supports a population of 2,420,000. The estimated 1,365,000 acres of land reasonably adjacent to the Alaska highway which constitutes roughly 15% of the agricultural land suitable for settlement in the North Pacific Region might support a population of some 40,000 persons. It is improbable, however, that this land would be taken up before the available land in the more southerly sections of the North Pacific Region was settled. The agricultural produce, which would find a ready market in the north country, will be fresh vegetables and fresh meats. Any development of cattle or garden produce of the available arable land along the highway would result in expanded traffic for the Alaska highway.

Wild Life

The area adjacent to the Alaska highway abounds in fur, game, and other wild life products. Wooded terrain, tundra, and marsh areas make up the wild-life producing territories.

Fur

The Alaska highway has been built through a productive fur region. Prior to the construction of the highway practically every square mile of the region was being used -- there were no untrapped areas. The highway has simplified fur trapping by expediting travel. The Haines cut-off has opened up new trapping grounds, previously untouched, which have proved encouraging.

Fine furs such as marten, mink, weasel, and lynx, are to be found along the highway. Marten is possibly the least plentiful and is only found in the more remote areas. These fine fur animals are characterized by low average populations, high value per pelt, and pronounced cyclical fluctuations in numbers. Cheaper furs include squirrel, muskrat, and red fox. These furs produce a low return for a large amount of work.

The major economic activity of the northern section of north-eastern British Columbia is fur trapping, from which practically the entire population derives its livelihood. In the Yukon Territory the fur trade occupies a place second only to mining in the economy of the area. The table hereunder shows the value of pelts of fur-bearing animals produced in the Yukon Territory in 1943 and 1944:

	1943	1944
No. of Pelts.....	52,897	78,005
Value ($).....	338,035	467,188

The fur production of the Yukon Territory represents approximately 1.6% of the Dominion's total.

A small amount of scientific fur farming is also carried on. The following table shows the value of pelts produced on fur farms from 1941 to 1943:

	1941	1942	1943
No. of Farms.....	10	6	5
Value of Fur Bearing Animals ($)..	5,757	2,355	4,240

Forest Products

The British Columbia Forest Reserve undertook an extensive reconnaissance in 1944, covering approximately 25,000,000 acres, principally in the northeast corner of the province tributary to the Alaska highway and to the Liard River drainage area. Of the area covered productive forest land was found to constitute approximately 4,000,000 acres or 16 per cent of the total area. The productive area is largely restricted to valley bottoms, the balance of the land consisting of muskeg, highland barrens, or land covered with scrub timber not suitable for commercial use. Estimates by type in the area traversing the Alaska highway is shown in the table below:

Species	Potential(1)
	1000 F.B.M.
Spruce.....	511,800
Lodge Pole Piece.....	67,800
Hemlock.....	-
Balsam.....	7,600
All Regions.....	587,200

(1) Part of the valley of the Liard, together with the valley of Fort Nelson River with its various tributary streams, the Fontas, Sikanni Chief, Prophet, Muskwa and Toad Rivers.

These potential timber stands have been classified by the British Columbia authorities as presently inaccessible. Mr. H.L. Holman of the Dominion Forest Service in a report on the area in 1943 expressed different

views. He stated that:

> "it seems reasonable, therefore, to draw the conclusion that merchantable stands of spruce occur at frequent intervals along the valleys of all these rivers, 'Fort Nelson, Sikanni Chief, Fontas, Prophet, Muskwa' and that, considering the hundreds of miles of river valleys involved, there is tremendous reserve of timber here which is of good quality and easily accessible."

Referring to the West Liard area he stated that:

> "while the valley of the Toad may contain merchantable stands of spruce and lodge pole pine for some distance up from the Liard, such stands do not appear in the upper reaches of the river where it is traversed by the highway. . . Between Lower Crossing and Lower Post, a distance of over 100 miles, the highway follows the main Liard River on the north, or left side, keeping to the river benches for the most part. The forest along the route is by no means uniform. On the river bottoms and lower benches, as well as in all valleys, it is often exceptionally heavy, almost rank and luxuriant in some places, and many good stands of merchantable spruce can be found in such locations."

Yukon timber resources are characterized by a combination of a small number of species and a relatively slow rate of growth. White spruce is the predominant species found almost everywhere in the Yukon, and the only one being used to any important extent commercially. It furnishes practically all the saw lumber used locally, and the bulk of the fuel wood for the river steamers. It has been estimated by Mr. Holman that there are approximately 1,140,000 acres of merchantable timber in the Yukon Territory and on the assumption of 5,000 F.B.M. per acre, the potential reserve is of the order of 5,700,000,000 board feet, of which some 90% is white spruce.

Water Power Resources

At the southern end of the highway undeveloped water power resources are indicated at three locations on the Peace River. The first is at the confluence of the Finlay and Parsnip rivers where the Peace River breaks through the Rocky Mountains. No estimate of this power potential has been made as yet. The second site is located at Peace River Canyon just west of Hudson Hope. Estimates of this site places the potential at 118,000 h.p. at ordinary minimum flow and 412,000 h.p. at ordinary six months' flow. The third site is located at Vermilion Chutes about fifty

miles east of Fort Vermilion. The potential power available at this site is estimated to be 25,000 h.p. at ordinary minimum flow, or 70,000 h.p. at ordinary six months' flow. These potential power resources would appear adequate to meet any future requirements of the agricultural development of the farming area traversing the southern end of the Alaska highway.

The Liard river which rises in the Yukon Territory and flows south into British Columbia offers adequate power resources for any future requirements of the area from Fort Nelson to Whitehorse. In the 200-mile reach of the Liard in British Columbia it is felt that there is a descent of some 1,000 feet in which there are numerous canyons. While no firm estimate of the power potential in this area has been made it would appear that the Liard offers potential power resources in excess of 400,000 h.p. at ordinary minimum flow, and 1,500,000 h.p. at ordinary six months' flow. Tributaries of the Liard such as the Frances, Dease, Turnagain and Coal are potential power resources. Local requirements based on mineral resources of this region would appear to have adequate power resources to meet any future demand.

The Yukon river watershed in Canada, although large, is lacking in major waterpower potential. This is due to the fact that concentrations of head in the form of falls or rapids are confined, for the most part, to the mountain sources of the various tributaries. Gradients are even on the Yukon itself and throughout the greater part of the tributary system. The extreme winter temperatures resulting in low river flows in the winter and the frozen sub-soil contribute to this area's lack of water power resources.

Tributaries of the Yukon river indicate power resources of moderate amounts. The Lewes River offers power of an estimated minimum of 1,800 h.p. per year about 4 miles from Whitehorse. On the Stewart River some 40 miles above Mayo power capacity of an estimated 7,300 h.p. at ordinary minimum flow or 21,800 h.p. at ordinary six months' flow could be developed. The Mayo river falls about 300 feet between Mayo Lake and Stewart River and power resources of 2,400 h.p. at ordinary minimum flow

or 7,200 h.p. at ordinary six months' flow are indicated. With storage in Mayo Lake a dependable capacity of 14,100 h.p. might be obtained. On Janet Creek a small tributary of the Stewart river about 15 miles above Mayo an estimated 240 h.p. at ordinary minimum flow and 720 h.p. at ordinary six months' flow could be developed. Pelly River also has small potential power resources. At Hoole Canyon a power potential of 800 h.p. at ordinary minimum flow, and 2,800 h.p. at ordinary six months' flow is indicated. The future market for power in the Yukon Territory is probably the greatest along the whole highway in view of the activity in the mining sites in this area. The only developed water power in the area adjacent to the Alaska highway is on the Klondike River, owned by the Yukon Consolidated Gold Corporation with an installed horse-power of 15,000 h.p.

Undeveloped water power resources in areas reasonably adjacent to the Alaska highway are indicated in the table below:

River	Location	Estimated H.P. Capacity	
		At Ordinary Minimum Flow	At Ordinary Six Months' Flow
Peace.....	Peace River.....	(1)	
Peace.....	Fort Vermilion.....	25,000	70,000
Peace.....	Hudson Hope.....	118,000	412,000
Peace.....	Alaska Highway Bridge	(1)	
Sikanni Chief...	Mile 162 A.H.....	(1)	
Muskwa.....	Mile 303 A.H.....	(1)	
Racing.....	Mile 419 A.H.....	(1)	
Liard.....	Mile 496 A.H.....	400,000	1,500,000
Smith.....	Mile 508 A.H.....	(1)	
Coal.....	Mile 535 A.H.....	(1)	
Hyland.....	Mile 606 A.H.....	(1)	
Teslin.....	Mile 838 A.H.....	(1)	
Lewes.....	Whitehorse.....	1,800	
Stewart.....	Mayo.....	7,300	21,800
Mayo.....	Minto Bridge.....	2,400	7,200
McQuestin.....	Haggart.....	(1)	
Yukon.....	Dawson.....	(1)	
Pelly.....		800	2,800
Janet Creek.....		240	720

A.H. - Alaska Highway. (1) No estimate available.

POPULATION OF AREA TRAVERSED BY ALASKA HIGHWAY

Appendix XII

AREA	LOCATION	POPULATION			
		Town	Surrounding District	Sub-Total	Total
Northeastern British Columbia.....	Dawson Creek.....	700	5,000		
	Fort St. John	200	2,500		
	Fort Nelson	100	150	8,650	8,650
Yukon Territory	Carmacks	-	160		
	Champagne, Whitehorse and Carcross Areas	-	600		
	Fort Selkirk, White and MacMillan Areas	-	280		
	Granville, Bonanza Basin and Eldorado Areas	-	850		
	Klondike Valley, Glacier Creek and Forty Mile Areas....	-	120		
	Mayo and Keno Areas	-	80		
	Old Crow Area	-	185		
	Teslin Lake and Ross River Areas	-	370		
	Yukon and Stewart River Areas	-	75		
	Dawson City	700	-		
	Whitehorse	4,000	-	7,420	7,420
Northwestern British Columbia.....	Atlin	300	350		
	Telegraph Creek	100	75	825	825
TOTAL		6,100	10,795		16,895

ESTIMATED TRAVELLING TIMES OF TOURIST TRIPS

BETWEEN SPECIFIED POINTS

Appendix XIII

CHICAGO-FAIRBANKS, VIA GLENDIVE, MONTANA; EDMONTON, DAWSON CREEK, WHITEHORSE, AND RETURN SAME ROUTE

Segment	Mileage	Estimated Travelling Time
Chicago-Edmonton, via Glendive, Montana	1,996	5 days
Edmonton-Dawson Creek	560	2 days
Dawson Creek-Whitehorse	918	3 days
Whitehorse-Fairbanks	609	2 days
Total One Way	4,083	12 days
Return	8,166	24 days

CHICAGO-FAIRBANKS, VIA GLENDIVE, MONTANA; EDMONTON, DAWSON CREEK, WHITEHORSE, AND RETURN VIA HAINES

Segment	Mileage	Estimated Travelling Time
Chicago to Fairbanks as above	4,083	12 days
Fairbanks to Haines	665	2 days
Haines-Vancouver	843	3-1/2 days
Vancouver-Seattle	143	1 day
Seattle-Chicago	2,122	5 days
Total Return	7,856	23-1/2 days

CHICAGO-FAIRBANKS VIA SEATTLE, VANCOUVER, PRINCE RUPERT, HAINES, WHITEHORSE AND RETURN

Segment	Mileage	Estimated Travelling Time
Chicago-Seattle	2,122	5 days
Seattle-Vancouver	143	1 day
Vancouver-Prince Rupert	958	3 days
Prince Rupert-Haines	370	1-1/2 day
Haines-Fairbanks	665	2 days
Total One Way	4,258	12-1/2 days
Return	8,516	25 days

CHICAGO-FAIRBANKS VIA SEATTLE, VANCOUVER, PRINCE RUPERT, HAINES, WHITEHORSE, RETURN VIA DAWSON CREEK, EDMONTON, MONTANA

Segment	Mileage	Estimated Travelling Time
Chicago-Fairbanks (as above)	4,258	12-1/2 days
Fairbanks - Whitehorse	609	2 days
Whitehorse-Dawson Creek	918	3 days
Dawson Creek-Edmonton	560	2 days
Edmonton-Chicago	1,996	5 days
Total	8,341	24-1/2 days

SEATTLE-FAIRBANKS-VIA HART HIGHWAY TO DAWSON CREEK, DAWSON CREEK, FAIRBANKS

Segment	Mileage	Estimated Travelling Time
Seattle-Vancouver	143	1 day
Vancouver-Dawson Creek (Hart Highway)	900	3 days
Dawson Creek-Whitehorse	918	3 days
Whitehorse-Fairbanks	609	2 days
Total One Way	2,570	9 days
Return	5,140	18 days

Continued.....

ESTIMATED TRAVELLING TIMES OF TOURIST TRIPS BETWEEN SPECIFIED POINTS

Appendix XIII

SEATTLE-FAIRBANKS, VIA HART HIGHWAY, DAWSON CREEK RETURN VIA HAINES

Segment	Mileage	Estimated Travelling Time
Seattle to Fairbanks via Dawson Creek....	2,570	9 days
Fairbanks-Haines	665	2 days
Haines-Vancouver	843	3-1/2 days
Vancouver-Seattle	143	1 day
Total Return	4,221	15-1/2 days

SEATTLE TO FAIRBANKS VIA HAINES, RETURN SAME ROUTE

Segment	Mileage	Estimated Travelling Time
Seattle-Vancouver	143	1 day
Vancouver-Haines	843	3-1/2 days
Haines-Fairbanks	665	2 days
Total One Way	1,651	6-1/2 days
Return	3,302	13 days

SEATTLE-FAIRBANKS, VIA VANCOUVER, BOAT TO SKAGWAY, RAIL TO WHITEHORSE. WHITEHORSE TO FAIRBANKS & RETURN

Segment	Mileage	Estimated Travelling Time
Seattle-Vancouver	143	1 day
Vancouver-Skagway	858	3-1/2 days
Skagway-Whitehorse	90	1 day
Whitehorse-Fairbanks	609	2 days
Total One Way	1,700	7-1/2 days
Return	3,400	15 days

SEATTLE TO FAIRBANKS, VIA VANCOUVER, BOAT TO SKAGWAY, RAIL TO WHITEHORSE, WHITEHORSE TO FAIRBANKS RETURN VIA DAWSON CREEK, HART HIGHWAY, VANCOUVER

Segment	Mileage	Estimated Travelling Time
Seattle to Fairbanks (via boat, rail, etc.)	1,700	7-1/2 days
Fairbanks-Whitehorse	609	2 days
Whitehorse-Dawson Creek	918	3 days
Dawson Creek-Vancouver	900	3 days
Vancouver-Seattle	143	1 day
Total Return	4,270	16-1/2 days

NOTE: The above estimates have been based on 400 miles per day in the United States, 250 miles on the Edmonton and Dawson Creek Highway and 300 miles per day on the Alaska Highway.

ACCOMMODATION AND FOOD FACILITIES ALONG THE ALASKA HIGHWAY

(February 1, 1948)

Appendix XIV

Mile	Location		Type of Facilities Available	No. of Beds
00	Dawson Creek	B.C.	Hotel, Stores, Meals	75
49	Fort St. John	B.C.	Hotel, Stores, Meals	150
101	Blueberry	B.C.	Meals	4
147	Beaton River	B.C.	Store, Meals	20
171	Mason Creek Lodge	B.C.	Meals, Store	4(1)
201	Trutch	B.C.	Meals, Store	-
233	Prophet River	B.C.	Store, Meals	20
300	Fort Nelson	B.C.	Hotel, Meals, Stores	50
351	Steamboat Lodge	B.C.	Meals	10(1)
392	Summit Lake	B.C.	Meals	6
397	Rocky Mt. Auto Court	B.C.	Meals, Store	10(1)
442	Toad River Lodge	B.C.	Meals, Store	10(1)
456	Muncho Lake	B.C.	Meals	-
533	Coal River	B.C.	Hotel, Meals	10
620	Lower Post	B.C.	Store, Meals	40
632	Watson Lake (tourist camp)	Y.T.	(Tourist Camp Grounds)	(1)
634	Watson Lake	Y.T.	Store, Meals	40
710	Rancheria	Y.T.	Meals	10
777	Welcome Inn	Y.T.	Meals	Limited(1)
804	Teslin	Y.T.	Store, Meals	14
836	Porseals	Y.T.	Meals	20(1)
843	Welcome Inn #2	Y.T.	Meals	10(1)
872	John's Place	Y.T.	Meals, Store	Limited(1)
872	Judas Creek	Y.T.	(Tourist Camp Grounds)	(1)
883	Marsh Lake	Y.T.	Hotel, Meals	30
918	Whitehorse	Y.T.	Hotel, Meals, Stores	100
967.2	Mendenhall Creek	Y.T.	(Tourist Camp Grounds)	(1)
996	Canyon Creek Inn	Y.T.	Meals	10(1)
974	Champagne	Y.T.	Store	4
1,013	Pine Creek	Y.T.	(Tourist Camp Grounds)	(1)
1,016	Haines Road Jct.	Y.T.	Store, Meals	-
1,022	McIntosh's	Y.T.	Store, Meals	4
1,094	Burwash Landing	Y.T.	Hotel, Store, Meals	40
1,105	Burwash Flats	Y.T.	(Tourist Camp Grounds)	(1)
1,152	Lake Creek	Y.T.	(Tourist Camp Grounds)	(1)
1,184	Dry Creek	Y.T.	Hotel, Meals	40
1,206	Canadian Immigration and Customs (SNAG)	Y.T.		6
1,213	Mirror Creek	Y.T.	(Tourist Camp Grounds)	(1)
1,221.4	Canada-Alaska Boundary			-
1,226	Scottie Creek	Alaska	Store	-
1,270	Northway	Alaska	Store	-
1,318	Tok Junction	Alaska	Meals, Store	40
1,428	Big Delta	Alaska	Meals, Stopover	-
1,458	Richardson	Alaska	Meals	-
1,523	Fairbanks	Alaska	Hotels, Stores, Meals	-

SOURCE: Canadian Army, Whitehorse, Yukon Territory.

(1) Tourist Camp Grounds consisting of one building containing a cook stove and tables, and toilet facilities for men and women. Wood is supplied free and a considerable area is cleared for parking. Construction by the Dominion Government's Department of Mines and Resources.

REPAIR AND GAS AND OIL FACILITIES ALONG THE ALASKA HIGHWAY

Appendix XV

(February 1, 1948)

Mile	Location		Gas and Oil	Major Repairs	Minor Repairs(1)
00	Dawson Creek	B.C.	X	X	-
49	Fort St. John	B.C.	X	X	-
101	Blueberry	B.C.	X	-	-
171	Mason Creek Lodge	B.C.	X	X	-
201	Trutch	B.C.	X	-	-
300	Fort Nelson	B.C.	X	X	-
351	Steamboat Lodge	B.C.	X	-	-
392	Summit Lake	B.C.	X	-	X
397	Rocky MT. Auto Court	B.C.	X	-	X
442	Toad River Lodge	B.C.	X	-	X
456	Muncho Lake	B.C.	X	-	-
533	Coal River	B.C.	X	-	-
620	Lower Post	B.C.	X	-	-
634	Watson Lake	Y.T.	X	-	-
710	Rancheria	Y.T.	X	-	-
777	Welcome Inn	Y.T.	X	-	-
804	Teslin	Y.T.	X	-	-
836	Porseal's	Y.T.	X	-	-
883	Marsh Lake	Y.T.	X	-	-
918	Whitehorse	Y.T.	X	X	-
996	Canyon Creek Inn	Y.T.	X	-	-
1,016	Haines Road Jct.	Y.T.	X	-	-
1,094	Burwash Landing	Y.T.	X	X	-
1,184	Dry Creek	Y.T.	X	-	-
1,226	Scottie Creek	Alaska	X	-	-
1,318	Tok Junction	Alaska	X	-	-
1,423	Big Delta	Alaska	X	-	-
1,458	Richardson	Alaska	X	X	-
1,523	Fairbanks	Alaska	X	X	-

SOURCE: Canadian Army Whitehorse, Yukon Territory.

(1) Minor Repairs include only tire repair and fan belt replacements.

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP BETWEEN CHICAGO AND FAIRBANKS, ALASKA, VIA EDMONTON, DAWSON CREEK, WHITEHORSE AND RETURN VIA SAME ROUTE

Appendix XVI

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
		$	$	$	$	
Chicago-Edmonton via Glendive, Montana (1,996 miles)	Gasoline	38.48	38.48	38.48	38.48	Gasoline & Oil - The average price of gasoline in the U.S.A. is 33¢ per Imperial gallon. In Alberta it averages about 38¢ per gallon. It is assumed that the average passenger car will do 18 miles to the gallon. Oil costs assumed at 15% of the gasoline costs. Lodging - Assumed cost of $2.50 per day per person. This might be done for less by using tourist camps. Food - Assume $3.50 per day. Automobile, Maintenance, Depreciation, Tire and Tube Repairs - In 1939 these costs per vehicle mile had been estimated at 3.75¢ per mile. To allow for increased costs of 1948 this has been increased by 25% to approximately 4.5¢ per vehicle mile. Assume an average daily journey of 400 miles. Miscellaneous costs include souvenirs, post-cards, stamps, snacks, visiting historic sites, etc. Assume $1.50 per day.
	Oil	5.77	5.77	5.77	5.77	
	Lodging	12.50	25.00	37.50	50.00	
	Food	17.50	35.00	52.50	70.00	
	Maintenance, Depreciation, Tires & Tubes...	89.82	89.82	89.82	89.82	
	Miscellaneous...	7.50	15.00	22.50	30.00	
Sub-Total		171.57	209.07	246.57	284.07	
Edmonton-Dawson Creek via Grande Prairie (560 miles)	Gasoline	12.40	12.40	12.40	12.40	Gasoline - Assume an average of 40¢ per Imperial gallon. The price at Edmonton is 38¢ per Imperial gallon, but increases as one drives north and is 43¢ at Dawson Creek. Assume 18 miles to the gallon. Oil - 15% of Gasoline Costs. Lodging - $2.50 per day. Food - $3.00 per day. Depreciation, Maintenance, Tires and Tube Repairs - 5.0¢ per vehicle mile. Assume 250 miles per day, which is liberal considering the condition of the road.
	Oil	1.86	1.86	1.86	1.86	
	Lodging	5.00	10.00	15.00	20.00	
	Food	6.00	12.00	18.00	24.00	
	Maint. Dep'n, Tires & Tubes...	28.00	28.00	28.00	28.00	
	Miscellaneous...	3.00	6.00	9.00	12.00	
Sub-Total		56.26	70.26	84.26	98.26	
Dawson Creek-Whitehorse (918 miles)	Gasoline	28.05	28.05	28.05	28.05	Gasoline & Oil - Gasoline costs along the Alaska Highway currently range from 52 to 65¢ per gallon therefore an average price of 55¢ per gallon is assumed. Oil costs 15% of gasoline costs. Average daily driving distance - 300 miles. Lodging - Assume $3.00 per day per person. It varies from $1.50 to $4.50.
	Oil	4.21	4.21	4.21	4.21	
	Food	9.00	18.00	27.00	36.00	
	Lodging	9.00	18.00	27.00	36.00	

Continued .....

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Dawson Creek-Whitehorse (918 miles) (Cont'd).....	Maintenance, Depreciation, Tires & Tubes...	$ 45.90	$ 45.90	$ 45.90	$ 45.90	Food - Assume $3.00 per person per day. This is probably too conservative. Maintenance, Depreciation, Tires & Tubes - 5.0¢ per vehicle mile. Higher depreciation and maintenance allowed for the gravel highway. Miscellaneous - $1.50 per day
	Miscellaneous...	4.50	9.00	13.50	18.00	
Sub-Total		100.66	123.16	145.66	168.16	
Whitehorse-Fairbanks (609 miles)	Gasoline.....	14.36	14.36	14.36	14.36	Gasoline & Oil - The average price between Whitehorse and the Alaska boundary (303 miles) is 55¢ per Imperial gallon. Between the border and Fairbanks (306 miles) it averages 30¢. Assume 300 miles per day and 18 miles to the gallon. Oil 15% of gasoline costs. Lodging - Assume $4.00 per day Food - Assume $4.00 per day Maintenance, Depreciation, Tire & Tube Repairs - Assume 5.0¢ per vehicle mile. Miscellaneous - Assume $1.50 per day.
	Oil	2.15	2.15	2.15	2.15	
	Lodging	8.00	16.00	24.00	32.00	
	Food	8.00	16.00	24.00	32.00	
	Maintenance, Depreciation, Tires & Tubes...	30.00	30.00	30.00	30.00	
	Miscellaneous...	3.00	6.00	9.00	12.00	
Sub-Total		65.51	84.51	103.51	122.51	
Total Cost Chicago-Fairbanks (4,083 miles)		394.00	487.00	580.00	673.00	
Round Trip (8,166 miles).....		788.00	974.00	1,160.00	1,346.00	
Out-of-pocket expenses (rtn. trip)		400.56	586.56	772.56	958.56	
Cost per Passenger		400.56	293.28	257.52	239.64	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP FROM CHICAGO TO FAIRBANKS, ALASKA VIA EDMONTON AND RETURN VIA HAINES-ALASKA

Appendix XVII

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
		$	$	$	$	
Chicago-Fairbanks via Edmonton (4,085 miles)	All Expenses...	394.00	487.00	580.00	673.00	See Appendix XVI
Fairbanks-Haines	Gasoline	16.10	16.10	16.10	16.10	Gasoline & Oil - Between Fairbanks and the Canada/Alaska border (306 miles) assume a gasoline price of 30¢ per Imperial gallon. Between the border and Haines assume a price of 55¢ per Imperial gallon, (18 miles to the gallon)
	Oil	2.42	2.42	2.42	2.42	
	Lodging	8.00	16.00	24.00	32.00	Lodging - Assume $4.00 per day and 300 miles per day.
	Food	8.00	16.00	24.00	32.00	Food - Assume $4.00 per day.
	Maint. Dep'n., Tires & Tubes..	33.25	33.25	33.25	33.25	Maintenance, Depreciation, etc. - Assume 5.0¢ per vehicle mile.
	Miscellaneous..	3.00	6.00	9.00	12.00	Miscellaneous - Assume $1.50 per day
Sub-Total		70.77	89.77	108.77	127.77	
Haines-Vancouver (843 miles)	Boat Fare	67.68	135.36	203.04	270.72	Single Boat Fare, from Vancouver to Haines Alaska is $67.68. including meals. (3½ days)
	Car Ferry	50.00	50.00	50.00	50.00	Car Ferry - Rates have yet to be determined but the C.P.S. has tentatively set the rate at $50.00 per car. Miscellaneous - Assume $1.50 per day
	Miscellaneous..	5.25	10.50	15.75	21.00	
Sub-Total		122.93	195.86	268.79	341.72	
Vancouver-Seattle (143 miles)	Gasoline	2.56	2.56	2.56	2.56	Gasoline - Vancouver price 32¢ per gallon
	Oil	.38	.38	.38	.38	Oil - Assume 15% of gasoline cost.
	Lodging	2.50	5.00	7.50	10.00	Lodging - Assume $2.50 per day
	Food	3.00	6.00	9.00	12.00	Food - Assume $3.00 per day
	Maint. Dep'n., Tires & Tubes..	6.44	6.44	6.44	6.44	Maintenance, Depreciation, etc. - Assume 4.5¢ per vehicle mile.
	Miscellaneous..	1.50	3.00	4.50	6.00	Miscellaneous - Assume $1.50 per day
Sub-Total		16.38	23.38	30.38	37.38	

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Continued.....

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Seattle-Chicago (2,122 miles)	Gasoline.....	$ 40.89	$ 40.89	$ 40.89	$ 40.89	Gasoline - Price of gasoline in U.S.A. averages 29¢ per U.S. gallon.
	Oil	6.13	6.13	6.13	6.13	Assume 15 miles to gallon
	Lodging	12.50	25.00	37.50	50.00	Oil - 15% of gasoline cost.
	Food	17.50	35.00	52.50	70.00	Lodging - Assume $2.50 per person - 400 miles per day
	Maintenance, Depreciation, Tires & Tubes..	95.49	95.49	95.49	95.49	Food - Assume $3.50 per day. Maintenance, Depreciation, etc. - Assume 4.5¢ per vehicle mile
	Miscellaneous..	7.50	15.00	22.50	30.00	Miscellaneous - Assume $1.50 per day
Sub-Total		180.01	217.51	255.01	292.51	
Total Cost Fairbanks - Chicago via Haines		390.09	526.52	662.95	799.38	
Grand Total - Chicago-Fairbanks, via Edmonton return via Haines...		784.09	1,013.52	1,242.95	1,472.38	
Out-of-Pocket expenses (rtn. trip).....		455.19	684.62	914.05	1,143.48	
Cost per Passenger		455.19	342.31	304.68	285.87	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP, CHICAGO TO FAIRBANKS, VIA SEATTLE

VANCOUVER, PRINCE RUPERT, HAINES, WHITEHORSE, RETURN SAME ROUTE

Appendix XVIII

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
		$	$	$	$	
Chicago-Seattle (2,122 miles)	Gasoline	40.89	40.89	40.89	40.89	Gasoline, price of gasoline in U.S.A. averages 29¢ per U.S. gallon
	Oil	6.13	6.13	6.13	6.13	Assume 15 miles per gallon
	Lodging	12.50	25.00	37.50	50.00	Oil - 15% of Gasoline cost.
	Food	17.50	35.00	52.50	70.00	Lodging - Assume $2.50 per person per day-assume 400 miles daily.
	Maint. Dep'n.,					Food - Assume $3.50 per person per day.
	Tires & Tubes...	95.49	95.49	95.49	95.49	Maintenance, Depreciation, etc. - Assume 4.5¢ per vehicle mile
	Miscellaneous...	7.50	15.00	22.50	30.00	Miscellaneous - Assume $1.50 per person per day
Sub-Total		180.01	217.51	255.01	292.51	
Seattle-Vancouver (143 miles)	Gasoline	2.56	2.56	2.56	2.56	Gasoline, Vancouver price - 32¢ per gallon - assume 18 miles per gallon.
	Oil	.38	.38	.38	.38	
	Lodging	2.50	5.00	7.50	10.00	Oil - 15% of Gasoline Cost
	Food	3.00	6.00	9.00	12.00	Lodging, assume $2.50 per day
	Maint. Dep'n.,					Food, assume $3.00 per day
	Tires & Tubes...	6.44	6.44	6.44	6.44	Maintenance, Depreciation, etc., assume 4.5¢ per vehicle mile
	Miscellaneous...	1.50	3.00	4.50	6.00	Miscellaneous - assume $1.50 per day.
Sub-Total		16.38	23.38	30.38	37.38	
Vancouver-Prince Rupert (958 miles)	Gasoline	21.29	21.29	21.29	21.29	Gasoline, Vancouver price - 32¢ per gallon, assume 18 miles per gallon.
	Oil	3.19	3.19	3.19	3.19	
	Lodging	7.50	15.00	22.50	30.00	Oil - 15% of Gasoline cost
	Food	9.00	18.00	27.00	36.00	Assume daily journey of 300 miles
	Maintenance,					Lodging - Assume $2.50 per day
	Depreciation,					Food - Assume $3.00 per day
	Tires & Tubes...	47.90	47.90	47.90	47.90	Maintenance, Depreciation, etc., assume 5.0¢ per vehicle mile
	Miscellaneous...	4.50	9.00	13.50	18.00	Miscellaneous - Assume $1.50 per day
Sub-Total		93.38	114.38	135.38	156.38	

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Continued .....

Appendix XVIII

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Prince Rupert - Haines (Boat - 1½ days)	Boat Fare.....	$40.11	$80.22	$120.33	$160.44	Single Boat Fare - Prince Rupert to Haines is $40.11, meals includ
	Car Ferry	50.00	50.00	50.00	50.00	Car Ferry - minimum rate tentatively set at $50.00
	Miscellaneous...	2.25	4.50	6.75	9.00	Miscellaneous - Assume $1.50 per day
Sub-Total		92.36	134.72	177.08	219.44	
Haines-Fairbanks (665 miles)	Gasoline	16.10	16.10	16.10	16.10	Gasoline, Haines to Can./Alaska border (359 miles) price 55¢ per
	Oil	2.42	2.42	2.42	2.42	gallon. Gasoline, Can./Alaska border to Fairbanks (306 miles) pri
	Lodging	8.00	16.00	24.00	32.00	30¢ per gallon.
	Food	8.00	16.00	24.00	32.00	Average daily journey 300 miles, assume 18 miles per gallon
	Maintenance, Depreciation, Tires & Tubes....	33.25	33.25	33.25	33.25	Oil - Assume 15% of Gasoline Cost. Maintenance, depreciation, etc. assume 5.0¢ per vehicle mile
	Miscellaneous....	3.00	6.00	9.00	12.00	Miscellaneous - Assume $1.50 per day
Sub-Total		70.77	89.77	108.77	127.77	
Total, Chicago to Fairbanks (one way)		452.90	579.76	706.62	833.48	
Total Round Trip Chicago - Fairbanks		905.80	1,159.52	1,413.24	1,666.96	
Out-of-pocket expenses Return Trip		539.64	793.36	1,047.08	1,300.80	
Cost per Passenger		539.64	396.68	349.03	325.20	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP, CHICAGO TO FAIRBANKS, VIA SEATTLE, VANCOUVER, PRINCE RUPERT, HAINES, WHITEHORSE, RETURN VIA WHITEHORSE, DAWSON CREEK, EDMONTON AND MONTANA

Appendix XIX

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Chicago-Fairbanks one-way via Seattle		$452.90	$579.76	$706.62	$833.48	See Appendix XVIII
Fairbanks - Whitehorse (609 miles)	Gasoline.....	14.36	14.36	14.36	14.36	Gasoline, between Fairbanks and Can./Alaska border (306 miles) 30¢. Between Can./Alaska border and Whitehorse (303 miles) 55¢. Assume 300 miles per day and 18 miles to the gallon. Oil - 15% of Gasoline Costs. Lodging and Food - Assume $4.00 each item per day Maintenance, Depreciation, Tires & Tubes etc. assume 5.0¢ per vehicle mile. Miscellaneous - Assume $1.50 per day
	Oil	2.15	2.15	2.15	2.15	
	Lodging	8.00	16.00	24.00	32.00	
	Food	8.00	16.00	24.00	32.00	
	Maintenance, Depreciation, Tires & Tubes...	30.00	30.00	30.00	30.00	
	Miscellaneous...	3.00	6.00	9.00	12.00	
Sub-Total		65.51	84.51	103.51	122.51	
Whitehorse-Dawson Creek (918 miles)	Gasoline	28.05	28.05	28.05	28.05	Gasoline costs along Alaska Highway average 55¢ - assume 300 miles per day and 18 miles to the gallon. Oil Costs - 15% of gasoline Food & Lodging - Assume $3.00 each item per day Maintenance, Depreciation, Tires & Tubes etc., assume 5.0¢ per vehicle mile. Miscellaneous - Assume $1.50 per day
	Oil	4.21	4.21	4.21	4.21	
	Lodging	9.00	18.00	27.00	36.00	
	Food	9.00	18.00	27.00	36.00	
	Maintenance, Depreciation, Tires & Tubes...	45.90	45.90	45.90	45.90	
	Miscellaneous...	4.50	9.00	13.50	18.00	
Sub-Total		100.66	123.16	145.66	168.16	

Continued .....

Continued .....

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Dawson Creek-Edmonton via Grande Prairie (560 miles)	Gasoline	$ 12.40	$ 12.40	$ 12.40	$ 12.40	Gasoline, assume average cost of 45¢ per gallon. Assume 250 miles per day and 18 miles to the gallon.
	Oil	1.86	1.86	1.86	1.86	Oil - 15% of Gasoline Costs.
	Lodging	5.00	10.00	15.00	20.00	Lodging - $2.50 per day
	Food	6.00	12.00	18.00	24.00	Food - $3.00 per day
	Maintenance, Depreciation, Tires & Tubes....	28.00	28.00	28.00	28.00	Depreciation, Maintenance, etc., assume 5.0¢ per vehicle mile
	Miscellaneous....	3.00	6.00	9.00	12.00	Miscellaneous, assume $1.50 per day.
Sub-Total		56.26	70.26	84.26	98.26	
Chicago-Edmonton via Glendive, Montana (1,996 miles)	Gasoline	38.48	38.48	38.48	38.48	Gasoline - The average price in the U.S.A. is 33¢ per Imperial gallon. In Alberta it averages about 38¢. Average daily journey - 400 miles at 18 miles to the gallon.
	Oil.....	5.77	5.77	5.77	5.77	
	Lodging	12.50	25.00	37.50	50.00	Lodging - assume $2.50 per day
	Food	17.50	35.00	52.50	70.00	Food - assume $3.50 per day
	Maintenance, Depreciation, Tires & Tubes....	89.82	89.82	89.82	89.82	Maintenance, Depreciation, etc., Assume 4.5¢ per vehicle mile
	Miscellaneous....	7.50	15.00	22.50	30.00	Miscellaneous - Assume $1.50 per day
Sub-Total		171.57	209.07	246.57	284.07	
Total Cost Fairbanks-Chicago via Edmonton		394.00	487.00	580.00	673.00	
Grand Total - Chicago-Fairbanks via Vancouver return via Edmonton		846.90	1,066.76	1,286.62	1,506.48	
Out-of-pocket expenses (return trip)		470.10	689.96	909.82	1,129.86	
Cost per passenger		470.10	344.98	303.27	282.47	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP, SEATTLE-FAIRBANKS,

VIA HAINES RETURN VIA SAME ROUTE

Appendix XX

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Seattle-Vancouver (143 miles)	Gasoline.....	$2.56	$2.56	$2.56	$2.56	Gasoline - Vancouver price 32¢ per gallon.
	Oil	.38	.38	.38	.38	Oil - 15% Gasoline cost.
	Lodging	2.50	5.00	7.50	10.00	Lodging - assume $2.50 per day.
	Food	3.00	6.00	9.00	12.00	Food - assume $3.00 per day
	Maintenance Depreciation,... Tires & Tubes...	6.44	6.44	6.44	6.44	Maintenance, Depreciation, etc. assume 4.5¢ per vehicle mile
	Miscellaneous...	1.50	3.00	4.50	6.00	Miscellaneous - assume $1.50 per day.
Sub-Total		16.38	23.38	30.38	37.38	
Vancouver-Haines (843 Miles)	Boat Fare	67.68	135.36	203.04	270.72	Single Boat Fare, Vancouver to Haines is $67.68, meals included
	Car Ferry	50.00	50.00	50.00	50.00	Car Ferry - rates tentatively set at $50.00
	Miscellaneous...	5.25	10.50	15.75	21.00	Miscellaneous assume $1.50 per day.
Haines-Fairbanks (665 miles)	Gasoline	16.10	16.10	16.10	16.10	Gasoline, Haines to Can./Alaska border (359 miles) price 55¢ per gallon
	Oil	2.42	2.42	2.42	2.42	Gasoline, Can./Alaska border to Fairbanks (306 miles) price 30¢ per gal.
	Lodging	8.00	16.00	24.00	32.00	Average daily journey 300 miles at 18 miles per gallon.
	Food	8.00	16.00	24.00	32.00	Oil assume 15% of Gasoline cost.
	Maintenance, Depreciation, Tires & Tubes...	33.25	33.25	33.25	33.25	Food and Lodging assumed $4.00 each item per day.
	Miscellaneous...	3.00	6.00	9.00	12.00	Miscellaneous - assume $1.50 per day.
Sub-Total		70.77	89.77	108.77	127.77	
Total Seattle - Fairbanks		210.08	309.01	407.94	506.87	
Round trip, returning via same route		420.16	618.02	815.88	1,013.74	
Out of pocket expenses (rtn. trip)		340.78	538.64	736.50	934.36	
Cost per passenger		340.78	269.32	245.50	233.59	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP SEATTLE TO FAIRBANKS
VIA HART HIGHWAY AND DAWSON CREEK

Appendix XXI

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Seattle-Vancouver (143 miles)	Gasoline.....	$2.56	$2.56	$2.56	$2.56	Gasoline - Vancouver price 32¢ per gallon
	Oil.....	.38	.38	.38	.38	Oil - 15% of Gasoline Cost.
	Lodging	2.50	5.00	7.50	10.00	Lodging - Assume $2.50 per day
	Food	3.00	6.00	9.00	12.00	Food - Assume $3.00 per day
	Maintenance, Depreciation, Tires & Tubes...	6.44	6.44	6.44	6.44	Maintenance, depreciation, etc. assume 4.5¢ per vehicle mile
	Miscellaneous...	1.50	3.00	4.50	6.00	Miscellaneous - Assume $1.50 per day
Sub-Total		16.38	23.38	30.38	37.38	
Vancouver-Dawson Cr. via Hart Highway (900 miles)	Gasoline	20.00	20.00	20.00	20.00	Gasoline - Average 40¢ per gallon - 18 miles per gallon
	Oil	3.00	3.00	3.00	3.00	Oil - 15% of Gasoline Cost
	Lodging	9.00	18.00	27.00	36.00	Lodging - Assume $3.00 per day
	Food	9.00	18.00	27.00	36.00	Food - Assume $3.00 per day
	Maintenance, Depreciation, Tires & Tubes...	45.00	45.00	45.00	45.00	Maintenance, Depreciation, etc. Assume 5.0¢ per vehicle mile.
	Miscellaneous...	4.50	9.00	13.50	18.00	Miscellaneous - Assume $1.50 per day
Sub-Total		90.50	113.50	135.00	158.00	
Dawson Creek to Whitehorse (918 miles)	Gasoline	28.05	28.05	28.05	28.05	Gasoline cost along Alaska Highway averages 55¢ per gallon.
	Oil	4.21	4.21	4.21	4.21	Oil - Assume 15% of Gasoline Cost
	Lodging	9.00	18.00	27.00	36.00	Average daily journey 300 miles at 18 miles per gallon
	Food	9.00	18.00	27.00	36.00	Lodging - Assume $3.00 per day
	Maintenance, Depreciation,, Tires & Tubes...	45.90	45.90	45.90	45.90	Food - Assume $3.00 per day Maintenance, Depreciation, etc., 5¢ per vehicle mile
	Miscellaneous...	4.50	9.00	13.50	18.00	Miscellaneous - Assume $1.50 per day
Sub-Total		100.66	123.16	145.66	168.16	

Continued .....

Continued .....

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
		$	$	$	$	
Whitehorse-Fairbanks (609 miles)	Gasoline.....	14.36	14.36	14.36	14.36	Gasoline - between Whitehorse and Canadian/Alaska border (303 miles) 55¢ gallon between Canadian/Alaska border and Fairbanks (306 miles) 30¢ gallon. Assume 300 miles per day at 18 miles per gallon.
	Oil	2.15	2.15	2.15	2.15	Oil - 15% of Gasoline Costs.
	Lodging	8.00	16.00	24.00	32.00	Lodging and food assume $4.00 each item per day
	Food	8.00	16.00	24.00	32.00	
	Maintenance, Depreciation, Tires & Tubes...	30.00	30.00	30.00	30.00	Maintenance, depreciation, etc., assume 5.0¢ per vehicle mile
	Miscellaneous...	3.00	6.00	9.00	12.00	Miscellaneous, assume $1.50 per day
Sub-Total		65.51	84.51	103.51	122.51	
Total Seattle-Fairbanks (one way)..		269.07	382.25	495.43	608.61	
Total return trip Seattle-Fairbanks		538.14	764.50	990.86	1,217.22	
Out-of-pocket expenses (return trip)		465.26	691.62	917.98	1,144.34	
Cost per passenger		465.26	345.81	305.99	286.08	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP, SEATTLE TO FAIRBANKS VIA HART HIGHWAY AND DAWSON CREEK, RETURN VIA HAINES AND COASTAL STEAMER TO VANCOUVER

Appendix XXII

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
		$	$	$	$	
Seattle-Fairbanks one-way - 2,570 miles		269.07	382.25	495.43	608.61	Appendix XXI
Fairbanks-Haines (665 miles)	Gasoline	16.10	16.10	16.10	16.10	Gasoline, Fairbanks - Can./Alaska border (306 miles), price 30¢ per gal
	Oil	2.42	2.42	2.42	2.42	Border to Haines (359 miles) gas 55¢ per gallon.
	Lodging	8.00	16.00	24.00	32.00	Average daily journey 300 miles at 18 miles per gallon.
	Food	8.00	16.00	24.00	32.00	Food and Lodging $4.00 each item per day
	Maintenance, Depreciation, Tires & Tubes,	33.25	33.25	33.25	33.25	Maintenance, depreciation, etc. assume 5.0¢ per vehicle mile
	Miscellaneous.	3.00	6.00	9.00	12.00	Miscellaneous assume $1.50 per day
Sub-Total		70.77	89.77	108.77	127.77	
Haines-Vancouver (843 nautical miles)	Boat Fare	67.68	135.36	203.04	270.72	Single Boat Fare, Vancouver to Haines is $67.68, meals included
	Car Ferry	50.00	50.00	50.00	50.00	Car Ferry - rates tentatively set at $50.00
	Miscellaneous.	5.25	10.50	15.75	21.00	Miscellaneous - Assume $1.50 per day
Sub-Total		122.93	195.86	268.79	341.72	
Vancouver-Seattle (143 miles)	Gasoline	2.56	2.56	2.56	2.56	Gasoline - Vancouver price 32¢ per gallon - 18 miles per gallon
	Oil	.38	.38	.38	.38	Oil - 15% of Gasoline cost.
	Lodging	2.50	5.00	7.50	10.00	Lodging - Assume $2.50 per day.
	Food	3.00	6.00	9.00	12.00	Food - Assume $3.00 per day
	Maintenance, Depreciation, Tires & Tubes.	6.44	6.44	6.44	6.44	Maintenance, depreciation, etc., assume 4.5¢ per vehicle mile
	Miscellaneous,	1.50	3.00	4.50	6.00	Miscellaneous - Assume $1.50 per day
Sub-Total		16.38	23.38	30.38	37.38	

Continued .....

Continued .....

Appendix XXII

Route Segment	Item of Expense	Cost				
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
		$	$	$	$	
Total Fairbanks to Seattle via Haines		210.08	309.01	407.94	506.87	
Grand Total Seattle to Fairbanks via Dawson Creek return via Haines		479.15	691.26	902.97	1,115.48	
Out-of-pocket expenses return trip...		316.10	486.03	655.96	825.89	
Cost per passenger		316.10	243.02	218.65	206.47	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP, SEATTLE TO FAIRBANKS, VIA VANCOUVER, BOAT TO SKAGWAY, RAIL SKAGWAY-WHITEHORSE, HIGHWAY, WHITEHORSE-FAIRBANKS, RETURN VIA WHITEHORSE, DAWSON CREEK, HART HIGHWAY TO VANCOUVER

Appendix XXIII

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Seattle-Fairbanks, one-way, via, water to Skagway, rail to Whitehorse, etc.,		$269.07	$382.25	$495.43	$608.61	See Appendix XXI
Fairbanks-Whitehorse (609 miles)	Gasoline	14.36	14.36	14.36	14.36	Gasoline - between Fairbanks and Can./Alaska border (306 miles) 30¢. Between Can./ALaska border and Whitehorse (303 miles), 55¢. Assume 300 miles per day and 18 miles to the gallon. Oil - 15% of Gasoline Costs. Lodging and Food - Assume $4.00 each item per day Maintenance, Depreciation, Tires & Tubes, etc., Assume 5.0¢ per vehicle mile. Miscellaneous - Assume $1.50 per day
	Oil	2.15	2.15	2.15	2.15	
	Lodging	8.00	16.00	24.00	32.00	
	Food	8.00	16.00	24.00	32.00	
	Maintenance, Depreciation, Tires & Tubes	30.00	30.00	30.00	30.00	
	Miscellaneous	3.00	6.00	9.00	12.00	
Sub-Total		65.51	84.51	103.51	122.51	
Whitehorse-Dawson Creek. (918 miles)	Gasoline	28.05	28.05	28.05	28.05	Gasoline costs along Alaska Highway average 55¢ assume 300 miles per day at 18 miles to the gallon. Oil costs 15% of gasoline. Food and Lodging $3.00 each item per day Maintenance, Depreciation, Tires & Tubes, etc., assume 5.0¢ per vehicle mile
	Oil	4.21	4.21	4.21	4.21	
	Lodging	9.00	18.00	27.00	36.00	
	Food	9.00	18.00	27.00	36.00	
	Maintenance, Depreciation, Tires & Tubes	45.90	45.90	45.90	45.90	
	Miscellaneous	4.50	9.00	13.50	18.00	Miscellaneous - Assume $1.50 per day
Sub-Total		100.66	123.16	145.66	168.16	

Continued.....

Continued .....

Route Segment	Item of Expense	COST				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Dawson Creek-Vancouver (via Hart Highway) (900 miles)	Gasoline.....	$ 20.00	$ 20.00	$ 20.00	$ 20.00	Gasoline - average 40¢ per gallon - assume 18 miles to the gallon
	Oil	3.00	3.00	3.00	3.00	Oil - 15% of Gasoline costs
	Lodging	9.00	18.00	27.00	36.00	Lodging and Food - Assume $3.00 per day each item
	Food	9.00	18.00	27.00	36.00	Maintenance, Depreciation, etc., assume 5.0¢ per vehicle mile
	Maintenance, Depreciation, Tires & Tubes..	45.00	45.00	45.00	45.00	
	Miscellaneous..	4.50	9.00	13.50	18.00	Miscellaneous - Assume $1.50 per day
Sub-Total		90.50	113.00	135.50	158.00	
Vancouver-Seattle (143 miles)	Gasoline	2.56	2.56	2.56	2.56	See Appendix XXII
	Oil	.38	.38	.38	.38	
	Lodging	2.50	5.00	7.50	10.00	
	Food	3.00	6.00	9.00	12.00	
	Maintenance, Depreciation, Tires & Tubes..	6.44	6.44	6.44	6.44	
	Miscellaneous..	1.50	3.00	4.50	6.00	
Sub-Total		16.38	23.38	30.38	37.38	
Total Fairbanks to Seattle, via Dawson Creek, etc.....		273.05	344.05	415.05	486.05	
Grand Total - Seattle to Fairbanks, via water Vancouver to Skagway, rail to Whitehorse Highway to Fairbanks, return by Dawson Creek, etc.....		542.12	726.30	910.48	1,094.66	
Out-of-pocket expenses (return trip)		378.34	562.52	746.70	930.88	
Cost per passenger		378.34	281.26	248.90	232.72	

ESTIMATED TOTAL AND OUT-OF-POCKET COST OF TOURIST TRIP, SEATTLE TO FAIRBANKS, VIA VANCOUVER, BOAT TO SKAGWAY, RAIL SKAGWAY TO WHITEHORSE, HIGHWAY WHITEHORSE TO FAIRBANKS RETURN SAME ROUTE

Appendix XXIV

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
		$	$	$	$	
Seattle-Vancouver (143 miles)	Gasoline.....	2.56	2.56	2.56	2.56	Gasoline - Vancouver price 32¢ per gallon at 18 miles per gallon
	Oil	.38	.38	.38	.38	Oil - 15% of Gasoline Cost.
	Lodging	2.50	5.00	7.50	10.00	Lodging - Assume $2.50 per day
	Food	3.00	6.00	9.00	12.00	Food - Assume $3.00 per day
	Maintenance, Depreciation, Tires & Tubes...	6.44	6.44	6.44	6.44	Maintenance, Depreciation, etc. - Assume 4.5¢ per vehicle mile
	Miscellaneous...	1.50	3.00	4.50	6.00	Miscellaneous - Assume $1.50 per day
Sub-Total		16.38	23.38	30.38	37.38	
Vancouver-Skagway (858 Miles)	Boat Fare	67.68	135.36	203.04	270.72	Single Boat Fare, Vancouver to Skagway is $67.68 meals included.
	Car Ferry	50.00	50.00	50.00	50.00	Car Ferry - rates tentatively set at $50.00
	Miscellaneous...	5.25	10.50	15.75	21.00	Miscellaneous - Assume $1.50 per day
Sub-Total		122.93	195.86	268.79	341.72	
Skagway-Whitehorse via rail.	Rail Fare	12.75	25.50	38.25	51.00	Single Rail Fare, Skagway to Whitehorse estimated at $12.75
	Auto Transportation	50.00	50.00	50.00	50.00	Transportation of car estimated to be minimum of $50.00
	Miscellaneous...	1.50	3.00	4.50	6.00	Miscellaneous - Assume $1.50 per day
Sub-Total		64.25	78.50	92.75	107.00	

Continued.....

Continued .....

Route Segment	Item of Expense	Cost				Basis of Estimate
		One Passenger	Two Passengers	Three Passengers	Four Passengers	
Whitehorse-Fairbanks	Gasoline	$ 14.36	$ 14.36	$ 14.36	$ 14.36	Gasoline costs - Whitehorse to Boundary 55¢ per gallon
Whitehorse-Alaska Boundary 303M	Oil	2.15	2.15	2.15	2.15	Boundary to Fairbanks 30¢ per gallon
Alaska Bdy. to Fairbanks 306M	Lodging	8.00	16.00	24.00	32.00	Oil - 15% of Gasoline Cost
Total 609M	Food	8.00	16.00	24.00	32.00	Average daily journey 300 miles at 18 miles per gallon
						Lodging and Food $4.00 each per day
	Maintenance, Depreciation, Tires & Tubes...	30.00	30.00	30.00	30.00	Maintenance, Depreciation, etc. 5.0¢ per vehicle mile
	Miscellaneous...	3.00	6.00	9.00	12.00	Miscellaneous - Assume $1.50 per day
Sub-Total		65.51	84.51	103.51	122.51	
Total Seattle-Fairbanks (2,570 miles)		273.05	344.05	415.05	486.05	
Round Trip Seattle-Fairbanks (5,140 miles)		546.10	688.10	830.10	972.10	
Out-of-pocket expenses (return trip)		291.42	433.42	575.42	717.42	
Cost per Passenger		291.42	216.71	191.81	179.35	

States from Which Applications For Travel Permits Were Received -- 1947

Appendix XXV

Arkansas
Alabama
Arizona
California
Colorado
Connecticut
District of Columbia
Florida
Idaho
Iowa
Indiana
Illinois
Kansas
Louisana
Montana
Massachusetts
Michigan
Minnesota
Mississippi
Maryland
Missouri
New Mexico
Nebraska
New York
Nevada
New Jersey
North Carolina
Oregon
Ohio
Oklahoma
Panama Canal Zone
Pennsylvania
Texas
Utah
Virginia
Wisconsin
West Virginia
Wyoming
Washington

SOURCE: R.C.M.P. Divisional Headquarters, Edmonton.

ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY

BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVI

COMMODITY	TONS			WHITEHORSE			
	WHITEHORSE	DAWSON CITY	MAYO	OCEAN-RAIL RATE PER TON	TRANSPORTATION COST (1)	PROPOSED OCEAN-HIGHWAY RATE PER TON	TRANSPORTATION COST (2)
				$	$	$	$
Meat	257	125	-	89.70	23,052	89.00	22,873
Fruits and Vegetables	386	-	31	108.20	47,765	75.00	28,950
Lard	5	-	-	67.50	337	75.00	375
Beverages	950	213	30	89.70	85,215	50.00	47,500
Insulating Material	69	-	-	76.10	5,250	50.00	3,450
Hardware	84	72	68	76.10	6,392	50.00	4,200
Building Material	176	30	13	67.50	11,880	54.00	9,504
Steel	286	38	-	67.50	19,305	47.00	13,442
Iron	20	-	-	67.50	1,350	47.00	940
Castings	16	43	-	67.50	1,080	54.00	864
Cylinders	53	-	-	33.80	1,791	54.00	2,862
Roofing	28	48	-	76.10	2,130	43.00	1,204
Oil Tanks	58	22	-	89.70	5,202	54.00	3,132
Brick	68	-	-	50.60	3,440	50.00	3,400
Pipe	25	14	12	67.50	1,687	47.00	1,175
Heaters	8	-	-	89.70	717	54.00	432
Asphalt	15	-	-	67.50	1,012	47.00	705
Calcium	9	-	-	67.50	607	54.00	486
Wagons	4	-	-	76.10	304	54.00	216
Medical Supplies	-	28	-	-	-	-	-
Dog Feed	-	12	10	-	-	-	-
Ties	129	-	-	67.50	8,707	54.00	6,966
Furniture	7	-	-	89.70	627	45.00	315
Bottles	16	12	-	89.70	1,435	54.00	864
Flour	283	152	50	53.00	14,999	47.00	13,301
Sugar	81	56	-	52.00	4,212	47.00	3,807
Potatoes	46	107	-	72.90	3,353	51.40	2,364
Feed	-	47	12	-	-	-	-
Canned Goods	379	249	39	64.00	24,256	50.00	18,950

Continued ....

ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY

BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVI

Continued .....

COMMODITY	DAWSON CITY				MAYO			
	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	PROPOSED OCEAN-HIGHWAY RATE PER TON(3)	TRANSPORTATION COST(2)	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	PROPOSED OCEAN-HIGHWAY RATE PER TON(3)	TRANSPORTATION COST(2)
	$	$	$	$	$	$	$	$
Meat	117.40	14,675	126.50	15,812	-	-	-	-
Fruits and Vegetables	-	-	-	-	139.90	4,336	112.00	3,472
Lard	-	-	-	-	-	-	-	-
Beverages	117.40	25,006	75.00	15,975	130.60	3,918	87.00	2,610
Insulating Material	-	-	-	-	-	-	-	-
Hardware	90.20	6,494	75.00	5,400	101.40	6,895	87.00	5,916
Building Material	101.40	3,042	79.00	2,370	101.40	1,318	92.00	1,196
Steel	90.20	3,427	72.00	2,736	-	-	-	-
Iron	-	-	-	-	-	-	-	-
Castings	90.20	3,878	79.00	3,397	-	-	-	-
Cylinders	-	-	-	-	-	-	-	-
Roofing	104.00	4,992	68.00	3,264	-	-	-	-
Oil Tanks	117.40	2,582	91.50	2,013	-	-	-	-
Brick	-	-	-	-	-	-	-	-
Pipe	90.20	1,262	72.00	1,008	101.40	1,216	84.00	1,008
Heaters	-	-	-	-	-	-	-	-
Asphalt	-	-	-	-	-	-	-	-
Calcium	-	-	-	-	-	-	-	-
Wagons	-	-	-	-	-	-	-	-
Medical Supplies	117.40	3,287	79.00	2,212	-	-	-	-
Dog Feed	60.20	722	79.00	948	71.40	714	91.00	910
Ties	-	-	-	-	-	-	-	-
Furniture	-	-	-	-	-	-	-	-
Bottles	117.40	1,408	91.50	1,098	-	-	-	-
Flour	59.00	8,968	72.00	10,944	70.20	3,510	84.00	4,200
Sugar	58.00	3,248	72.00	4,032	-	-	-	-
Potatoes	80.30	8,592	76.40	8,174	-	-	-	-
Feed	60.20	2,829	79.00	3,713	71.40	856	91.00	1,092
Canned Goods	74.60	18,575	75.00	18,675	85.60	3,338	87.00	3,393

Continued ....

ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY
BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVI

Continued ....

COMMODITY	TONS			WHITEHORSE			
	WHITEHORSE	DAWSON CITY	MAYO	OCEAN-RAIL RATE PER TON	TRANSPORTATION COST (1)	PROPOSED OCEAN-HIGHWAY RATE PER TON	TRANSPORTATION COST (2)
				$	$	$	$
Canned Milk	174	201	39	52.00	9,048	50.00	8,700
Reagents	-	-	41	-	-	-	-
Lumber	1,2[illegible]3	301	-	58.30	70,659	57.00	69,084
Scraper unit	-	11	-	-	-	-	-
Lubricating Oil	143	34	28	76.10	10,882	55.00	7,865
Stove Oil	11,[illegible]5	119	74	67.50	779,152	55.00	634,865
Diesel Fuel	1,167	984	1,011	76.10	88,808	55.00	64,185
Gasoline	4,462	677	242	56.70	252,995	55.00	245,410
Tractors	127	100	-	50.60	6,426	48.00	6,096
Trucks	52	11	-	80.50	4,186	53.00	2,756
Cement	569	-	23	38.10	21,678	43.00	24,467
Machinery	239	29	29	89.70	21,438	50.00	11,950
Mining Machinery	-	267	166	-	-	-	-
Explosives	-	-	16	-	-	-	-
Ore Sacks	-	-	19	-	-	-	-
Coal	424	-	20	75.10	31,842	54.00	22,896
Dredge Buckets	-	168	-	-	-	-	-
Refinery-Second Hand Pipe	2,362	-	-	50.60	119,517	54.00	127,548
Ore	-	-	1,611	-	-	-	-
Class A	251	224	61	67.50	16,942	54.00	13,554
Class B	177	128	9	76.10	13,469	54.00	9,558
Class C	90	68	6	89.70	8,073	54.00	4,860
Class C Higher	31	19	2	100.00	3,100	54.00	1,674
Miscellaneous L.C.L.	1,469	1,973	635	100.00	146,900	54.00	79,326
TOTAL	27,950	6,582	4,297	-	1,881,122	-	1,527,071

Continued ....

Continued ....

ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY

BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVI

COMMODITY	DAWSON CITY				MAYO			
	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	PROPOSED OCEAN-HIGHWAY RATE PER TON(3)	TRANSPORTATION COST(2)	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	PROPOSED OCEAN-HIGHWAY RATE PER TON(3)	TRANSPORTATION COST(2)
	$	$	$	$	$	$	$	$
Canned Milk	58.00	11,658	75.00	15,075	69.00	2,691	87.00	3,393
Reagents	-	-	-	-	84.20	3,452	91.00	3,731
Lumber	68.30	20,558	82.00	24,682	-	-	-	-
Scraper unit	73.20	805	79.00	869	-	-	-	-
Lubricating Oil	92.80	3,155	80.00	2,720	104.00	2,912	92.00	2,576
Stove Oil	92.80	11,043	80.00	9,520	104.00	7,696	92.00	6,808
Diesel Fuel	92.80	91,315	80.00	78,720	104.00	105,144	92.00	93,012
Gasoline	92.80	62,825	80.00	54,160	104.00	25,168	92.00	22,264
Tractors	79.40	7,940	73.00	7,300	-	-	-	-
Trucks	103.20	1,135	78.00	858	-	-	-	-
Cement	-	-	-	-	57.10	1,313	80.00	1,840
Machinery	90.20	2,615	75.00	2,175	89.10	2,583	87.00	2,523
Mining Machinery	62.20	16,607	75.00	20,025	84.20	13,977	87.00	14,442
Explosives	-	-	-	-	165.10	2,641	127.00	2,032
Ore Sacks	-	-	-	-	53.40	1,014	91.00	1,729
Coal	-	-	-	-	61.80	1,236	91.00	1,820
Dredge Buckets	62.20	10,449	79.00	13,272	-	-	-	-
Refinery-Second Hand Pipe	-	-	-	-	-	-	-	-
Ore	-	-	-	-	25.20	40,597	91.00	146,601
Class A	90.20	20,204	79.00	17,696	101.40	6,185	91.00	5,551
Class B	104.00	13,312	79.00	10,112	114.80	1,033	91.00	819
Class C	117.40	7,983	79.00	5,372	120.60	723	91.00	546
Class C Higher	125.00	2,375	79.00	1,501	132.00	264	91.00	182
Miscellaneous L.C.L.	125.00	246,625	79.00	155,867	132.00	83,820	91.00	57,785
TOTAL	-	643,591	-	521,695	-	328,550	-	391,451

(1) Assuming total freight movement by ocean-rail service.
(2) " " " " " ocean-highway service.
(3) " " " " " " " to Whitehorse and local river rates beyond.

ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY

BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVII

COMMODITY	TONS			WHITEHORSE			
	WHITEHORSE	DAWSON CITY	MAYO	OCEAN-RAIL RATE PER TON	TRANSPORT-ATION COST(1)	MOST FAVOURABLE RATE	TRANSPOR-ATION COST(2)
				$	$	$	$
Meat	257	125	-	89.70	23,052	89.00	22,873
Fruits and Vegetables	386	-	31	108.20	47,765	75.00	28,950
Lard	5	-	-	67.50	337	67.50	337
Beverages	950	213	30	89.70	85,215	50.00	47,500
Insulating Material	69	-	-	76.10	5,250	50.00	3,450
Hardware	84	72	68	76.10	6,392	50.00	4,200
Building Material	176	30	13	67.50	11,880	54.00	9,504
Steel	286	38	-	67.50	19,305	47.00	13,442
Iron	20	-	-	67.50	1,350	47.00	940
Castings	16	43	-	67.50	1,080	54.00	864
Cylinders	53	-	-	33.80	1,791	33.80	1,791
Roofing	28	48	-	76.10	2,130	43.00	1,204
Oil Tanks	58	22	-	89.70	5,202	54.00	3,132
Brick	68	-	-	50.60	3,440	50.00	3,400
Pipe	25	14	12	67.50	1,687	47.00	1,175
Heaters	8	-	-	89.70	717	54.00	432
Asphalt	15	-	-	67.50	1,012	47.00	705
Calcium	9	-	-	67.50	607	54.00	486
Wagons	4	-	-	76.10	304	54.00	216
Medical Supplies	-	28	-	-	-	-	-
Dog Feed	-	12	10	-	-	-	-
Ties	129	-	-	67.50	8,707	54.00	6,966
Furniture	7	-	-	89.70	627	45.00	315
Bottles	16	12	-	89.70	1,435	54.00	864
Flour	283	152	50	53.00	14,999	47.00	13,301
Sugar	81	56	-	52.00	4,212	47.00	3,807
Potatoes	46	107	-	72.90	3,353	51.40	2,364
Feed	-	47	12	-	-	-	-
Canned Goods	379	249	39	64.00	24,256	50.00	18,950

Continued .....

Continued.....

ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY
BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVII

COMMODITY	DAWSON CITY				MAYO			
	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	MOST FAVOURABLE RATE(3)	TRANSPORTATION COST(2)	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	MOST FAVOURABLE RATE(3)	TRANSPORTATION COST(2)
	$	$	$	$	$	$	$	$
Meat	117.40	14,675	117.40	14,675	-	-	-	-
Fruits and Vegetables	-	-	-	-	139.90	4,336	112.00	3,472
Lard	-	-	-	-	-	-	-	-
Beverages	117.40	25,006	75.00	15,975	130.60	3,918	87.00	2,610
Insulating Material	-	-	-	-	-	-	-	-
Hardware	90.20	6,494	75.00	5,400	101.40	6,895	87.00	5,916
Building Material	101.40	3,042	79.00	2,370	101.40	1,318	92.00	1,196
Steel	90.20	3,427	72.00	2,736	-	-	-	-
Iron	-	-	-	-	-	-	-	-
Castings	90.20	3,878	79.00	3,397	-	-	-	-
Cylinders	-	-	-	-	-	-	-	-
Roofing	104.00	4,992	68.00	3,264	-	-	-	-
Oil Tanks	117.40	2,582	91.50	2,013	-	-	-	-
Brick	-	-	-	-	-	-	-	-
Pipe	90.20	1,262	72.00	1,008	101.40	1,216	84.00	1,008
Heaters	-	-	-	-	-	-	-	-
Asphalt	-	-	-	-	-	-	-	-
Calcium	-	-	-	-	-	-	-	-
Wagons	-	-	-	-	-	-	-	-
Medical Supplies	117.40	3,287	79.00	2,212	-	-	-	-
Dog Feed	60.20	722	60.20	722	71.40	714	71.40	714
Ties	-	-	-	-	-	-	-	-
Furniture	-	-	-	-	-	-	-	-
Bottles	117.40	1,048	91.50	1,098	-	-	-	-
Flour	59.00	8,968	59.00	8,968	70.20	3,510	70.20	3,510
Sugar	58.00	3,248	58.00	3,248	-	-	-	-
Potatoes	80.30	8,592	76.40	8,174	-	-	-	-
Feed	60.20	2,829	60.20	2,829	71.40	856	71.40	856
Canned Goods	74.60	18,575	74.60	18,575	85.60	3,338	85.60	3,338

Continued .....

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ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY

BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVII

COMMODITY	TONS			WHITEHORSE			
	WHITEHORSE	DAWSON CITY	MAYO	OCEAN-RAIL RATE PER TON	TRANSPORTATION COST(1)	MOST FAVOURABLE RATE	TRANSPORTATION COST(2)
				$	$	$	$
Canned Milk	174	201	39	52.00	9,048	50.00	8,700
Reagents	-	-	41	-	-	-	-
Lumber	1,212	301	-	58.30	70,659	57.00	69,084
Scraper unit	-	11	-	-	-	-	-
Lubricating Oil	143	34	28	76.10	10,882	55.00	7,865
Stove Oil	11,543	119	74	67.50	779,152	55.00	634,865
Diesel Fuel	1,167	984	1,011	76.10	88,808	55.00	64,185
Gasoline	4,462	677	242	56.70	252,995	55.00	245,410
Tractors	127	100	-	50.60	6,426	48.00	6,096
Trucks	52	11	-	80.50	4,186	53.00	2,756
Cement	569	-	23	38.10	21,678	38.10	21,678
Machinery	239	29	29	89.70	21,438	50.00	11,950
Mining Machinery	-	267	166	-	-	-	-
Explosives	-	-	16	-	-	-	-
Ore Sacks	-	-	19	-	-	-	-
Coal	424	-	20	75.10	31,842	54.00	22,896
Dredge Buckets	-	168	-	-	-	-	-
Refinery-Second Hand Pipe...	2,362	-	-	50.60	119,517	50.60	119,517
Ore	-	-	1,611	-	-	-	-
Class A	251	224	61	67.50	16,942	54.00	13,554
Class B	177	128	9	76.10	13,469	54.00	9,558
Class C	90	68	6	89.70	8,073	54.00	4,860
Class C Higher	31	19	2	100.00	3,100	54.00	1,674
Miscellaneous L.C.L.	1,469	1,973	635	100.00	146,900	54.00	79,326
TOTAL	27,950	6,582	4,297	-	1,881,122	-	1,515,142

Continued .....

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ESTIMATED TRANSPORTATION COST TO SPECIFIED POINTS IN THE YUKON TERRITORY

BASED ON 1947 RAIL FREIGHT TRAFFIC

Appendix XXVII

COMMODITY	DAWSON CITY				MAYO			
	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	MOST FAVOURABLE RATE(3)	TRANSPORTATION COST(2)	OCEAN-RAIL RIVER RATE PER TON	TRANSPORTATION COST(1)	MOST FAVOURABLE RATE(3)	TRANSPORTATION COST(2)
	$	$	$	$	$	$	$	$
Canned Milk	58.00	11,658	58.00	11,658	69.00	2,691	69.00	2,691
Reagents	-	-	-	-	84.20	3,452	84.20	3,452
Lumber	68.30	20,558	68.30	20,558	-	-	-	-
Scraper unit	73.20	805	73.20	805	-	-	-	-
Lubricating Oil	92.80	3,155	80.00	2,720	104.00	2,912	92.00	2,576
Stove Oil	92.80	11,043	80.00	9,520	104.00	7,696	92.00	6,808
Diesel Fuel	92.80	91,315	80.00	78,720	104.00	105,144	92.00	93,012
Gasoline	92.80	62,825	80.00	54,160	104.00	25,168	92.00	22,264
Tractors	79.40	7,940	73.00	7,300	-	-	-	-
Trucks	103.20	1,135	78.00	858	-	-	-	-
Cement	-	-	-	-	57.10	1,313	57.10	1,313
Machinery	90.20	2,615	75.00	2,175	89.10	2,583	87.00	2,523
Mining Machinery	62.20	16,607	62.20	16,607	84.20	13,977	84.20	13,977
Explosives	-	-	-	-	165.10	2,641	127.00	2,032
Ore Sacks	-	-	-	-	53.40	1,014	53.40	1,014
Coal	-	-	-	-	61.80	1,236	61.80	1,236
Dredge Buckets	62.20	10,449	62.20	10,449	-	-	-	-
Refinery-Second Hand Pipe.	-	-	-	-	-	-	-	-
Ore	-	-	-	-	25.20	40,597	25.20	40,597
Class A	90.20	20,204	79.00	17,696	101.40	6,185	91.00	5,551
Class B	104.00	13,312	79.00	10,112	114.80	1,033	91.00	819
Class C	117.40	7,983	79.00	5,372	120.60	723	91.00	546
Class C Higher	125.00	2,375	79.00	1,501	132.00	264	91.00	182
Miscellaneous L.C.L.....	125.00	246,625	79.00	155,867	132.00	83,820	91.00	57,785
TOTAL	-	643,591	-	502,742	-	328,550	-	280,998

(1) Assuming Total Freight movement by ocean-rail service.
(2) Assuming all traffic moved on the most favourable ocean-rail or ocean-highway rate.
(3) Assuming all traffic moved on the most favourable ocean-rail-river or ocean-highway rate to Whitehorse and local river rate beyond.