

APPENDIX J

ALASKA HIGHWAY  
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Part 1 - IMPRESSIONS OF THE HIGHWAY

This will be a synopsis of observations and notes taken during an inspection by car some six weeks ago of over one thousand miles of the road.

The highway was found to be in much better condition than was anticipated in view of various reports. This was largely due to improvement in weather conditions and the fact that the contractors had been able to finish up many miles of rough grading. I would say the highway will be a good gravel road of a higher standard in grades and alignment than might be expected in view of its remote location.

I was favourably impressed with the original road section thirty-six feet wide which extends from Dawson Creek to a point north of Fort St. John and stretches of which are also found at one or two other points where grading on the final location was done last year. For the balance of the distance a twenty-six foot width is the objective and during the inspection widths of road were found to vary from twenty to twenty-six feet. Where alignment of lower standard existed it was usually on sections where, in order to ensure completion this year, the pioneer road had been improved and widened rather than a new road built on a better location.

At the time of the inspection in September, seven hundred and twenty-seven miles of road were regarded as finished with gravel surfacing to the specification required. Estimated mileage in Canada is twelve hundred and fifty-seven miles. The depth of gravel on many sections of road was less than expected and ranged from three to six inches and over. There seems no reason why the grading program cannot be completed by November 30th of this year, if fall weather conditions are reasonably good. I think Mr. Curtiss 2/ mentioned a few moments ago that he believed the grading had already been completed.

Some of the larger bridges cannot be completed this year and which include those over the Tetza, Racing and White Rivers. The bridge over the second crossing of the Liard River will probably not be completed before January 1944.

The two main problems in the construction of the highway were transportation and drainage; the latter includes protection from floods, treatment of permanently frozen ground and ice troubles.

As would be expected with the heavy construction and other traffic, the road is very dusty during dry weather. During the inspection the dust

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nuisance was very noticeable for the entire mileage covered, with the exception of the last one hundred miles north of Whitehorse.

The scenic value of the highway is limited, particularly in the southern sections and there is better scenery a thousand miles nearer the centres of population. This is no reflection on the highway since it was primarily built as a military road to connect airports. In the total length of the highway there are many sections of scenic interest, the first of these being found some fifty-five miles west of Fort Nelson. The great distance to be traversed, however, is not justified by the scenic attractions.

The large permanent bridges being constructed are first-class, with concrete abutments and steel trusses. In two cases a suspension type of superstructure has been adopted. Some of the shorter truss bridges are of wood construction and are also quite satisfactory.

The impression given by the smaller drainage structures was not so favourable. Several trestle bridges were being constructed over streams of high velocity during flood by placing posts on mud sills and it is thought some of the bents will be washed out.

In at least two cases high approach fills have restricted the river channel and will be subject to damage unless there is some protection work above them. There seemed a lack of adequate side ditching and cross drainage. The lack of culverts or small bridges was particularly noticeable in the Muncho Lake area where the road crossed alluvial fans of gravel. Apparently the intention here was to observe the first runoff and judge from it where openings should be placed in the road grade.

Our practice in Canada in similar circumstances is to place large culverts or simple bridges at frequent intervals in the hope that the water will find its way through some of these without any damage to the grade.

Sections of the road along certain streams, such as the Toad and Tetsa Rivers, are low in relation to the stream bed and there is a possibility that the stream could change its channel during flood and cause considerable damage.

These remarks are not intended as a reflection on the judgment of any of the Engineers on the project but merely summarize the impressions that were given from the construction standpoint. No doubt United States Engineers on the project are fully aware of the weak points of the highway and will adopt remedies as these are required. It is considered that next season, 1944, will be an important one in this respect as it will reveal the troublesome points along the road. It will likely be a critical year so far as the type of construction and location of the road are concerned.

There has been considerable speculation on the type of construction followed in the frozen ground area and where muskeg and gumbo soil are encountered. Where the natural cover has been disturbed and deep ditches excavated on each side of the road, it is thought considerable settlement and breakdown of the road surface will take place until a new permanent frost line (permafrost) is established.

On the inspection trip a point beyond the White River crossing, and 276 miles northwest of Whitehorse, was reached this being the end of the passable road at that time. Construction through virgin muskeg country was under way with a tractor pushing down trees along the right of way to act as corduroy and then covering these with from two to three feet of gravel, the natural ground cover being left undisturbed. In this section permanently frozen ground was found from eighteen to thirty inches below the surface. It was thought that one more step in this procedure might be advisable and that is the placing of a layer of clay just under the surface of the road. The purpose of this would be to seal the road grade so that rain falling in the open season would not percolate through the grade to the permanent ice surface and cause thawing and settlement.

The question has been raised as to whether the section of road northwest of Whitehorse should not be relocated so that the bad muskeg areas would be avoided and better material for road construction encountered. Any major revision in this respect would involve the abandoning of from one hundred and forty to two hundred and forty miles of highway on the present route with the construction of some two hundred and thirty or two hundred and ninety miles of new road, depending on what new route was adopted. In view of the great expense involved in a revision of this magnitude I would say that the responsible authorities will make every effort to maintain the road in its present location.

As soon as a highway is completed maintenance operations must begin and already sections of the Alaska Military Highway have reached this stage. It is believed maintenance plans would benefit if meteorological stations could be established at future maintenance camps between the airports. These would particularly record temperatures and precipitation and would be a guide as to the type of gravel aggregate best suited in each district for surfaces.

I think Mr. J. C. Rettle mentioned in a preliminary report on maintenance operations that \$500 per mile per year might be a minimum figure. I am inclined to think this is low. In the case of our good gravel highways in southern British Columbia and Alberta, maintenance costs through mountainous sections have run from \$400 to \$600 per mile. However in maintaining these highways our basic rate for labourers was only 45 cents per hour and for skilled labourers and operators of equipment about 65 cents an hour. This is much lower than the 70 cents or 75 cents rate paid common labour on the Alaska Highway, if it can be obtained, and the rate of \$1.00 to \$1.25 per hour paid skilled labour. In addition, travelling costs for men for maintenance work in the south are negligible, while along the Alaska Highway the transportation of personnel must be paid to the work and return. Subsistence costs and freight costs are all higher in the north.

At the present time I would consequently estimate the cost of routine maintenance at \$1,000 per mile. In addition an average of another \$1,000 per mile should be available in the first year of maintenance (1944) to cover emergency repairs resulting from settlement and breakdown of road surface, washouts, loss of small bridges, etcetera. In subsequent years the latter figure could likely be greatly reduced.

The use of the Alaska Highway by motor cars is seriously prejudiced by the relatively poor connecting road between Edmonton and Dawson Creek. On the shortest route the distance is 474 miles and it is only comfortably travelled in good weather. During the spring breakup and in wet weather there are many sections where it is difficult for cars to travel.

One of the longer routes between Edmonton and Dawson Creek offers a better established road but the mileage is considerably greater.

The distance between Edmonton and Dawson Creek could be shortened by the construction of a new road northwesterly from Edmonton via Whitecourt, Alberta. This would involve some two hundred miles of new construction and about one hundred and sixty miles of reconstruction of existing road south and east from Dawson Creek. By this fairly direct route the distance from Edmonton to Dawson Creek could be reduced by approximately one hundred and twenty-five miles.

## Part 2 -- POST-WAR USE OF THE HIGHWAY

This question of the post-war use of the Highway has been mentioned several times under Part 1 above, and has also, of course, been referred to by Mr. Rettie. Dr. Camsell has also suggested that now would be an opportune time to say a few words on the "Haines Cut-off" road, and which will affect the post-war use of the highway. The latter road is 160 miles long and extends northerly from the Port of Haines, Alaska to a junction with the Alaska Highway 100 miles north of Whitehorse. I was able to motor over some fifty miles of the north end of the road in September. While there was a lot of work to do on this section I was informed that the southerly end was nearing completion. Trucks were beginning to go through between Haines and the main highway. This will be a first class gravel road when completed; with considerable scenic value--in fact the whole road will be interesting. This, coupled with its strategic location in regard to freight transportation and tourist traffic, makes it a very important road link.

In regard to freight haul I would like to give some comparative cost figures on freight to Whitehorse and vicinity from the south over alternate routes.

One route to Whitehorse is from Edmonton to Dawson Creek by rail, and then by the Alaska Highway to Whitehorse. Taking flour as a basic commodity and 10 cents per ton mile for truck haul, which, I believe, is the same figure Mr. Rettie used, the approximate cost per ton from Edmonton to Whitehorse is \$101.30. All other routes are cheaper than this.

From Edmonton to Prince Rupert by rail, then to Haines by boat, and to Whitehorse by truck, the approximate cost is \$44.80 per ton.

From Edmonton to Prince Rupert by rail, then boat to Skagway, and then via White Pass and Yukon Railway to Whitehorse, the freight cost is \$58.80 per ton.

From Edmonton to Whitehorse via Vancouver and Haines, and then by truck to Whitehorse, is \$47.30 per ton.

From Vancouver to Whitehorse via boat and the "Haines Cut-off" road, is \$39.00 per ton.

These comparative rates indicate that the Alaska Highway is not in a favourable position to compete in the haul of through freight from the outside to Whitehorse or points north. Its use will be more restricted to haul of local freight. Apparently Watson Lake or vicinity is the northerly limit of economic haul on the Alaska Highway, and unless the time element is important, freight from Edmonton, and of course Vancouver, could be transported more cheaply to all points north of Watson Lake by the water and road routes, utilizing the "Haines Cut-off" road. The possibilities of winter maintenance of this road are yet to be fully explored.

This road will also be a strong competitor to the White Pass and Yukon Railway in the case of freight now shipped by rail from Skagway to Whitehorse. The freight rate per ton on the railway is \$40.00 or more, while from Haines to Whitehorse, over 260 miles of road, the truck cost at 10 cents per ton mile would only be \$26.00.

Reference that has been made to freight transportation is, of course, very brief. In addition, there is the tourist traffic angle, and the construction of the Haines Road is again an important factor. For example, after the war motorists will be able to go by car from any part of the west to Prince Rupert by means of the new road being built between Prince Rupert and Hazelton, B. C. by the Department of Mines and Resources as a national defence project. From Prince Rupert cars could be shipped to Haines by ferry and from that point Whitehorse, Fairbanks and Valdez would all be accessible by road. Cars could return via the Alaska Highway to Edmonton. The residents of Juneau, Alaska's capital, are seeking a road, and car ferry or barge connection, with Haines, so that they will be able to drive their cars to the mainland. The effect of the new road systems in the north on the current routes of transportation over the next two or three years will be very interesting.

There has not been time for an adequate discussion of possible post-war uses of the Highway but apart from the tourist and strictly commercial standpoints, its construction will facilitate scientific investigations. Among these would be a study of seismic disturbances and trends across the vast northern areas, magnetic observations, including the declination of the compass, and gravity studies. The Highway will also permit an extension of meteorological records, and offers a convenient base for seasonal astronomic studies.

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