87th Congress, 1st Session - - - - - - - House Document No. 176, Volume 1

TRANSPORT REQUIREMENTS FOR THE GROWTH OF NORTHWEST NORTH AMERICA

LETTER FROM THE CHAIRMAN, ALASKA INTERNATIONAL RAIL AND HIGHWAY COMMISSION, TRANSMITTING THE FINAL REPORT OF THE ALASKA INTERNATIONAL RAIL AND HIGHWAY COMMISSION, PURSUANT TO PUBLIC LAW 884, 84TH CONGRESS

VOLUME 1

MAY 25, 1961.—Referred to the Committee on Interior and Insular Affairs and ordered to be printed with illustrations

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U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1961

70243 O

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Washington 25, D.C. – Price per set of three volumes, $11.50

LETTER OF TRANSMITTAL

ALASKA INTERNATIONAL
RAIL AND HIGHWAY COMMISSION
1809 G STREET NW.
WASHINGTON 25, D.C.

May 25, 1961

Dear Mr. Speaker:

There is transmitted herewith the final report of the Alaska International Rail and Highway Commission. This report is submitted to the Congress in accordance with the provisions of Public Law 884 of the 84th Congress, as amended.

The Commission was directed to make a thorough and complete study of additional rail and highway transport facilities connecting the United States with Central Alaska to determine: first, economic and military advantages; second, the most feasible and direct routes relating to the economic benefits to the forty-eight continental United States, Canada and the new State of Alaska; and, third, the most feasible feeder rail and highway routes connecting coastal ports with these facilities. The Commission was directed to give particular attention to the feasibility of rail and highway facilities between the Northwest Region of the forty-eight states and Alaska, and to report to the Congress the results of its studies no later than June 1, 1961. The report includes recommendations of routes and facilities determined most feasible and beneficial, with estimates of construction costs and economic benefits to the United States, Canada and Alaska, as provided in the Act.

Detailed economic studies conducted by direction of the Commission analyze location, availability and extent of natural resources. The report forecasts resource and industrial development which may reasonably be expected during the next two decades, including a review of world markets and competitive sources of these products.

Since the study involved substantial areas within Canada, the Commission is fully aware of the need for consultation with officials of the Government of Canada. Recommendations include suggestions to the Congress that the Secretary of State be directed to initiate negotiations with the Government of Canada and the Secretary of Commerce be directed to establish a technical staff in the office of the Under Secretary for Transportation, leading to the achievement of the objectives set forth in this report. Specific projects for consideration during negotiations should include: exploration of methods to insure growth of the Merchant Marine of both countries; the construction of a coordinated hard-surfaced highway system to serve Alaska, British Columbia and the Yukon and provide a second and shorter highway between the Pacific Northwest Region and Alaska; and, the extension of the Alaska Railroad to the Yukon border to connect with a Canadian railway at the border and provide a link to the continental rail network.

Respectfully submitted,

Warren G. Magnuson, USS
Chairman

The Honorable
Sam Rayburn
Speaker of the House of Represenatives

PREFACE

For many years, residents of North America have urged construction of surface transportation facilities, both rail and highway, from the forty-eight States, northward across Canada to the central portion of what is now the forty-ninth State of the Union. These facilities would not only provide Alaska with closer communications ties to the forty-eight continental states, but would also support the industrial and area development of that portion of western Canada served by these facilities.

The Commission chose to employ the services of an experienced and reputable research organization, the Battelle Memorial Institute, to conduct an economic study of the area, rather than providing a staff for that purpose. As a result, their report constitutes the major source of data on which the Commission's conclusions and recommendations are based. Although the Commission is convinced that Battelle's forecasts of economic growth and other developments are conservative, there has been no attempt to modify their predictions, except as noted specifically in this report.

The Commission has been mindful to avoid infringement of the sovereignty of Alaska, the Government of Canada and the Canadian Provinces concerned by confining its study and recommendations to interstate, interprovincial and international transport facilities connecting the forty-eight continental states with Central Alaska, and by feeder highways to the port cities in Southeastern Alaska. The term "Central Alaska" is defined as that portion generally referred to as the Rail Belt.

Battelle and the Commission have adopted differing concepts to justify the economic feasibility of building additional or improved transport facilities northward across Canada and eastward to the Alaskan coastal cities. The most basic is that of direct costs versus direct benefits, expressed in terms of either operating revenues, increased expenditures by residents and visitors or taxes to government subdivisions. This concept has governed the Battelle effort.

This strict concept is due to the terms of reference provided by the Commission for the conduct of an economic study, which specify that "The report should ... objectively evaluate ... increase in national income and population -- traffic and transportation revenues and taxes ... and ... economic feasibility of improved or additional transportation facilities from correlated cost and revenue estimates --". Under this concept, economic feasibility is computed from cost-benefit ratios. Costs include capital investment plus operations, interest and amortization. Benefits are limited to direct revenues and taxes generated by increased Gross National Product, including expenditures by additional population and visitors to the area.

A second and broader concept would recognize increased tangible and intangible values of real estate and industrial properties adjacent to or served by additional facilities, which might provide justification for investment of public funds, or grants of public lands to private investors. Such assets would not appear as direct benefits resulting from use of public highways or government-owned railroads, but they are real, nevertheless. This concept guided the Commission conclusions.

Such a broad concept influenced the decision to build the western extension of the government-owned Canadian National Railway to the Pacific Coast. Furthermore, the same philosophy applied to the United States' contributions of public lands to the rail systems in the west in the latter part of the Nineteenth Century. Similar views have justified huge appropriations of funds which have been invested in the Federal Aid Highway System in all the states.

Congress had the broad concept in mind when it authorized construction of the Alaska Railroad from the Pacific Coast northward to the interior. Over the years since 1914, Congress has invested about $185 million in that route without requiring payment of interest or repayment of capital investment. Justification for this lenient policy is established in the Act of March 12, 1914, which states in part: "... operate railroads ... to be so located as to ... aid in the development of the agricultural and mineral or other resources of Alaska, and the settlement of the public lands therein, ..."

The Act establishing the Commission directs the Commission "... to ... study ... the economic and military advantages ... the most feasible and direct routes ... in relation to the economic benefits to be derived therefrom by the United States, Canada and Alaska; ... of additional highway and rail transportation facilities connecting continental United States with Central Alaska; ..." Since the Act does not define the term "economic", as related to the feasibility of additional or improved transport facilities, the following definition has been adopted by the Commission in this report; cost-benefit ratios for purposes of determining economic feasibility of additional or improved transport facilities shall include, but not be limited to: all direct and indirect costs, such as construction, maintenance, interest, amortization and taxes; all direct and indirect benefits, such as operating and non-operating revenues, rental of rights-of-way and tax benefits as related to the area's total share of Gross National Product, values of lands and industrial properties located at or near the facility and expenditures by residents and visitors to the area.

Warren G. Magnuson, USS
Chairman

May 15, 1961

Carl L. Junge
Executive Director

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1809 G STREET NW.
WASHINGTON 25, D.C.

May 1961

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SECTION A

CONCLUSIONS AND RECOMMENDATIONS

The economic study of Northwest North America by the Battelle Memorial Institute constitutes the major effort in performing duties prescribed by the Act establishing the Commission. Resources development was forecast in relation to future transportation needs. Therefore, Battelle's study report provides the primary data upon which these conclusions and recommendations are based. Data on resources and markets, as related to transport requirements and documented in the Battelle report, augmented by research by the Commission staff, have formed the bases for findings and conclusions by the members of the Commission and, in turn, for recommendations to the Congress.

A broad interpretation of the directive from the Congress of the term "transportation facilities" includes waterborne and airborne commerce, in addition to highway and rail transport. The former is recognized as a vital factor, now and in the future, to serve a substantial portion of the transport needs of the area. The latter is also recognized as a factor, but this study in no way considers the capabilities, adequacy or future requirements of air facilities.

1. CONCLUSIONS BY THE COMMISSION

a. Natural Resource Industries. Annual value of production in these industries is forecast to increase by 1980 as follows:

Fuels - Oil, Gas and Coal, increase of $418 million

Forest Products - Lumber, Plywood, Pulp and Paper, $283 million

Fish and Fish Products, $22 million

Agriculture and Livestock, $55 million

These increases in production values will require over 9,000 additional workers in Alaska and 18,000 in Canada, earning $93 million and $88 million, with total population increases of 55,800 and 108,000, respectively.

Metals and Minerals

Production from known occurences in Alaska is forecast to increase in annual volume by 1980 by some $67 million, requiring 2,000 more basic workers, earning $13 million and accounting for an increase in population of 12,000 persons. In the Canadian portion of the area, production may increase by about $100 million by 1980, requiring about 3,000 new workers earning $16 million, resulting in a population increase of 18,000. Many of these developments are highly conjectural - both in Alaska and Canada. However, some of the best known deposits which Battelle foresees may be developed in the next twenty years are located on or near tidewater. Their movement to markets would probably not require interior transport facilities except for those specifically mentioned by Battelle in the Yukon Territory.

b. Hydroelectric Power. Power sites as yet undeveloped total 27.5 million

kilowatts installed capacity. Development of only a few of these would do much to stimulate industrial activity related to natural resources. To name two of the largest, Rampart on the Yukon, now under study by the U. S. Army Engineers, is rated at 4.7 million kw and the Peace River Project at 3 million kw installed capacity.

c. Visitors and Tourism. The tourist business offers the most likely short-term opportunity to improve economic conditions in the area. Visitors' dollars are spent at retail and benefit all levels of society. Hawaii, Puerto Rico and many foreign countries have demonstrated that the traveling public will respond to attractive, adequate and continuing sales promotion.

If improved travel and lodging facilities are provided, the annual visitors to Alaska by 1980 are forecast to increase by 650,000 and to western Canada by 425,000, in addition to 560,000 new visitors en route to Alaska. Annual expenditures in Alaska from this source might thus increase by $230 million by 1980, resulting in the need for 14,000 new workers, earning $87 million in new payrolls and an increase in population of 88,000 persons.

By 1980, expenditures in Canada are forecast to increase $155 million by Canada and Alaska bound travelers. This increased activity would require 7,000 new workers, earning $35 million annually by then. Together with their families and other service industry workers and their dependents, total population in western Canada might increase because of these visitors by some 42,000 persons by 1980.

d. Southeastern Alaska Ferry System. A marine highway serving ports from Prince Rupert, British Columbia to Haines and Skagway, Alaska, is a vital part of the coordinated highway system designed to produce benefits to Canada and Alaska. This project is recognized by the Commission as a State of Alaska responsibility. Neither the Commission nor Battelle made detailed feasibility studies of the proposed ferry system, but relied on reports made for the State of Alaska. Since its exact cost has not been determined, and it is assumed that it will be self-supporting from revenues produced by fares, it is not included in the total cost of the coordinated highway system recommended by the Commission.

e. Coordinated Highway and Ferry System. A coordinated network of highways with connecting ferry service joining the Alaska State Primary Highway System and the cities of Southeastern Alaska with the highway and rail networks of British Columbia and the North American Continent is required for the development of tourism and industry in the area. Consisting of rock and dust-free highways, with ferry service along the Inside Passage, the system would afford the greatest and most immediate opportunity for economic benefits to be derived from substantially increased visitor trade and commerce from outside the area.

The hardsurfaced Hazelton-Atlin-Alaska Border Highway would provide an essential artery east of the coast mountains, 300 miles shorter between Pacific Coast cities and Yukon-Alaska points. Feeder highways to Petersburg and Juneau, with ferry service to Prince Rupert and cities in Southeastern Alaska would provide alternate routes and varying distances for travelers and access to deep water ports for Canadian producers. Paving the Alaska Highway would attract tourists from east of the Rocky Mountains and serve the industrial and recreational areas of northeast British Columbia. Both paved routes would attract visitors to the vacation lands of western Canada and Alaska.

The total estimated cost of such a highway system, exclusive of the Southeastern Alaska Ferry System is $236.5 million 1/ of which about 87 percent would be on Canadian soil.

Funds invested in these facilities and costs of maintaining approximately 583 miles of new highways (not including the Stewart-Cassiar Project, now under construction) would be offset by potential additional revenues derived from expenditures by additional visitors entering the area by highway, earnings of additional workers and increased additional taxes. The estimated increase in tax revenues of $55 million annually by 1980 (47 percent to the United States - 53 percent to Canada) is almost 2.5 times the annual cost of amortizing the capital investment in twenty years, paying interest on the bonds and maintaining the coordinated system. Stating it differently, the time for recovery of the capital costs invested in the system at 5 percent interest, would be 13 years.

f. The Pacific Northern Railway. A privately financed Canadian corporation proposes construction of a new rail line from Summit Lake, about 31 miles north of Prince George on the Pacific Great Eastern Railway, 697 miles across British Columbia to the Yukon border and 460 miles through Whitehorse to the Alaska border, to connect with the Alaska Railroad. The Commission assumes that this corporation, having applied to British Columbia for a license to operate within the province, and to the federal government to operate in the Yukon Territory, considers the construction and operation of this facility to be economically feasible, based on revenues from traffic expected to originate in the area. Additional through traffic to or from Alaska should materially increase revenues to support this operation.

Specifications and estimated costs of the proposed PNR were obtained from the report of a survey made in 1959 by Colonel S. H. Bingham (retired), Consulting Engineer of New York, for the Wenner Gren B. C. Development Company of Vancouver, B. C. The report describes the route through British Columbia, estimates construction costs and states that the reconnaisance survey was extended through the Yukon to the Alaska border for the purpose of selecting a satisfactory route to connect with the Alaska Railroad. Whether or not the PNR is constructed, it is assumed that Canadian interests would provide a rail connection to the Alaska-Yukon border from some location on the existing Canadian rail network, but only in the event that the Alaska Railroad is extended to the border.

g. An Alaska-Continental Rail Network. A rail connection between the Alaska Railroad and the Canadian-United States rail network would be created by the extension of Canada's rail system northward through British Columbia and the Yukon Territory, when linked with a southern extension of the Alaska Railroad. Such a system would provide an all-rail freight service with any point on the continental rail network.

Preliminary studies demonstrate that revenues from existing freight traffic will nearly meet the operating costs of a 298 mile extension of the Alaska Railroad to the Yukon border. Approximately 150,000 tons annually, or about 20 percent of inbound tonnages to the Alaska Rail Belt might be susceptible to all-rail shipment. Under favorable tarrifs, shippers would be inclined to specify such an all-rail movement to Alaska. Competitive all-rail freight rates between Pacific Coast cities and interior Alaska points such as Fairbanks, plus in-transit privileges in those cities should not only generate additional tonnages, but should also tend to reduce costs of delivering goods to Alaska. The continued growth of Alaska, plus

1/ $3 million difference with Battelle report results from Alaska Highway paving north of Charlie Lake completed in 1960.

the development of new resources, will tend to reduce or eliminate any operating deficits on the Alaska Railroad extension.

The capital required for the construction of an ARR extension would have to be provided by funds to be appropriated by the U. S. Congress. Based on $300,000 per mile average costs, $89.4 million would have to be invested. Capital recovery would accrue to Alaska and the federal Treasury as appreciation of public domain (99 percent public owned) through creation of tax producing income and the value of lands and industrial properties to be served by the railroad.

It is recognized that such an all-rail land link may cause serious disruption of waterborne traffic patterns The importance of continuing adequate water carrier service, particularly to ports not otherwise served, must not be disregarded. Accordingly, any decision by the Congress to extend the Alaska Railroad should be coupled with a program looking towards a solution of the waterborne transportation problem. Because of geographical reasons, this study might well be made jointly with the Canadians, and should be timed so as to permit a satisfactory transition when the rail link is completed.

h. State and Province Sovereignty. Care to avoid infringement of the sovereignty of Alaska and the Canadian Provinces has precluded consideration of intrastate or intra-provincial transport systems, except as they are part of interstate interprovincial or international arteries, and then only with due deference to facilities which are under construction or have been planned. The Commission concludes that three projects fall into this category, in addition to intra-state and intra-provincial systems; the Cassiar-Stewart Highway Project, the Southeastern Alaska Ferry System and the Pacific Northern Railway.

i. Military and Civil Defense Aspects. While the Department of Defense stated that existing transportation facilities, including rail, "... are adequate to support foreseeable military requirements ...", the Department indicates that additional rail and highway facilities are desirable, and that an additional rail route would "... have a military significance ... /and/... would offer an additional land line of communications to tidewater Alaska,..." The Office of Civil and Defense Mobilization attaches considerable significance to this viewpoint.

Having considered these views and other factors, the Commission concludes that additional military and civil defense benefits will be derived from a rail connection between the Alaska Railroad and the continental network.

j. Alphalt-Surface-Treatment. Penetration-type asphalt surfacing of highways with low traffic density and in areas within the permafrost zone has proven less costly than hot-mix asphaltic concrete. Due to changing thermal conditions in the area, highway surfaces become distorted and require frequent reconstruction. This procedure is economically justified with the lighter, less costly surface treatments. For this reason, the Commission has adopted the recommendations of Battelle that asphalt-surface-treatment type hardsurfacing be adopted for the coordinated highway system until such time as traffic density requires higher type and costlier pavement.

k. Summary of Costs.

Total Cost Estimates, Coordinated Highway and Rail Network

Hazelton-Atlin-Alaska Border Highway	$88,128,800	
Haines Cut-Off Highway Relocation	16,500,000	
Petersburg Feeder Highway	23,784,900	
Juneau Feeder Highway, Including Taku Inlet Ferry	37,600,000	
Alaska Highway Hardsurfacing	70,500,000	
COORDINATED HIGHWAY SYSTEM TOTAL	$236,513,700	2/
Alaska Railroad Extension to Yukon Border	89,400,000	3/ 4/
HIGHWAY AND RAIL SYSTEM TOTAL	$325,913,700	

2/ Source, Battelle report, March 15, 1961. $3 million difference from Battelle figure results from Alaska Highway paving north of Charlie Lake completed in 1960.

3/ Distance and cost estimate from Smith report, Exhibit IX, Section H.

4/ Alaska portion 298 miles. Estimate excludes the $250,990,000 for the Pacific Northern Railway within British Columbia and excludes an extension through Whitehorse to the Alaska border, about 460 miles.

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2. RECOMMENDATIONS TO THE CONGRESS

a. There is need for coordination of existing and future water, rail and highway transportation facilities serving the area adjacent to the Pacific Coast on both sides of the United States-Canadian border, especially to assure continued waterborne service to Pacific ports not otherwise served.

b. There is need for additional rail and highway facilities, and for current strengthening of maritime services, for realization of the economic potential of the United States and Canadian regions of the North Pacific.

c. The construction of additional rail and highway facilities is justified because of economic benefits and defense needs.

d. Because new rail and highway facilities would be largely on Canadian soil, and because Canadian plans for new facilities may not be integrated fully into this report, negotiations with the Government of Canada should be initiated for the purpose of creating a coordinated water, rail and highway development program to provide economic, civil defense and military benefits to both countries.

e. Specific projects for consideration in the negotiations with the Government of Canada should include but not be limited to the following, numbered without reference to priority:

(1) An exploration of known or prospective methods for mutual benefit of the United States and Canada, designed to insure growth, modernization, efficiency and stability of the Merchant Marine, which has long been, and will continue to be, an essential transportation mode for this region.

(2) Establishment of all-rail service between the Alaska Railroad and the Canadian-U. S. continental rail network, by the extension of the Alaska Railroad from Rex to the Yukon border, to connect with Canadian railways through British Columbia and the Yukon.

(3) Construction and hardsurfacing a Hazelton-Atlin-Alaska Boundary Highway utilizing 194 miles of the Stewart-Cassiar Highway Project now under construction, to shorten the highway distance between the Seattle-Vancouver area and the Yukon Territory and Alaska.

(4) Construction of hardsurfaced feeder highways from the Hazelton-Atlin-Alaska Border Highway to the Alaskan port cities of Petersburg-Wrangell and Juneau, to be served by the Southeastern Alaska-British Columbia Ferry System.

(5) Relocation of a portion of the Haines Cut-off Highway through the mountain passes, in order that it could be kept open during the winter season to provide a year-round northern connection for the ferry service and hardsurfacing the highway.

(6) Upgrading, minor relocation and line improvements of the Alaska Highway from the present paving, 790 miles to a junction with the Hazelton-Atlin-Alaska Border Highway at Jakes Corner and asphalt-surface-treatment of the entire distance.

f. The Congress should express its desire that the Department of State, assisted as appropriate by other agencies of the Government, undertake negotiations with the Government of Canada leading to the achievement of the objectives set forth in this report.

g. The Congress should express its desire that the Department of Commerce establish a technical staff in the office of the Under Secretary of Commerce for Transportation to be responsible, insofar as possible under existing statutes, for carrying out the economic and administrative policy actions necessary to implement programs and projects resulting from the recommendations of this Commission. This will include, but not be limited to, continuing economic research, preparation of necessary legislation and such interagency coordination as required.

3. VIEWS OF INDIVIDUAL MEMBERS

a. Dissenting Views of Representative Thomas M. Pelly

I must register dissent from the recommendations of the Commission adopted at the meeting of May 3, 1961.

In this connection, I wish to record my views strongly opposing the expenditure of public funds to construct an extension of the Government-owned Alaska Railroad to the Alaska-Canada border.

Rather, I support the conclusions of the Battelle Memorial Institute, arrived at after careful lengthy study for the Commission, in favor of a system of highways in Alaska connecting with tidewater.

The recommending of a rail link by the Commission was arrived at without due and proper study of the adverse effect of Government-owned railroad competition on other forms of privately-owned transportation.

Also, and of even greater concern to me, would be the adverse effect of a rail extension on Alaska's coastal communities and areas outside of the so-called rail belt, which stand to suffer diminished or complete loss of scheduled steamship service.

In my opinion the nature and extent of this adverse effect should be analyzed before making a recommendation favoring an extension of the Government railroad which the Battelle Report has said was not economically feasible.

Therefore, pending such further study, I am compelled to disagree with the recommendation for negotiation with Canada and likewise setting up a technical staff to implement this report.

b. Views of Chairman Warren G. Magnuson, USS

I am inclined to give weight to Congressman Pelly's individual views relating to the extension of the Government-owned Alaska Railroad to the Canadian border. I feel that a railway connection between the Alaska Railroad and the continental rail network will be accomplished ultimately and that a rail link is essential for the comprehensive development of Pacific-North American transportation.

However, I do agree with Mr. Pelly to the extent that the recommendations in the Battelle report which favor an integrated system of highways connecting with tidewater should have priority in our efforts to reach our ultimate goal.

SECTION B

CHRONOLOGY OF STUDIES

Residents on both sides of the United States-Canadian border have recognized, for many years, the need for rail and/or highway facilities connecting the rail and highway networks across Northwestern Canada to Alaska. Studies have been conducted by both governments since 1932, and efforts to establish overland communications date back to the middle of the Nineteenth Century.

1. 1849 - GILPIN PLAN

William Gilpin, later to become Governor of Colorado, first envisioned a railroad to Alaska following the Rocky Mountain Trench and thence across the Bering Straits through Siberia to connect with the Asiatic and European rail networks. His plan was first recorded in speeches made in 1849 followed by a more comprehensive plan for world-wide coverage of most of the continents of the world, published in 1890. 1/

In 1896, one Harry DeWindt attempted the location of a route from New York to Paris, but failed in his endeavor to obtain native guides and equipment to take him westward along the polar shores of eastern Siberia. A second attempt, in 1901, was successful. Even at this early time, the question of economic feasibility of such a railroad loomed larger in the minds of would-be promoters than the engineering difficulties.

DeWindt's book on his travels states in part:

> "All things considered, I cannot see what object would be gained by the construction (at present) of a Franco-American railway. That the latter will one day connect Paris and New York I have little doubt, for where gold exists, the rail must surely follow and there can be no reasonable doubt regarding the boundless wealth and ultimate prosperity of those great countries of the future; Siberia and Alaska. Most certainly it would be possible with unlimited capital, for this stupendous engineering feat would assuredly entail an expenditure (on the Siberian side alone and not including a Bering Straits tunnel) of fifty to sixty millions sterling. It seems to me that the question is not so much 'Can the line be laid?' as 'Would it pay?"

Little benefit resulted from this survey, except continued interest on the part of both U. S. and Canadian citizens looking towards a land link with the then Territory of Alaska.

Some writers have claimed that the late E. H. Harriman made an expedition to Alaska in 1899 to determine the feasibility of rail connections with the forty-eight United States. The facts seem to be that he organized a cruise on one of his own vessels as a rest cure. Members of his family and a party of fifty leading scientists accompanied him to the Seal Islands (now Pribilofs) and to the Northwest. Results of this cruise are recorded in a series of ten volumes, the plates for which are in the possession of the Smithsonian Institution in Washington.

1/ The Cosmopolitan Railway, Compacting and Fusing Together all the World's Continents", Governor William Gilpin, 1890

2. 1886 - SENATE BILL TO STUDY ROUTE TO RUSSIA AND JAPAN

The first official recognition of the need for transport to the Arctic was a Senate bill, passed on April 19, 1886, to study an overland and commercial route between the United States, Russia and Japan. The report was to include the results of a survey on the possibility of a branch line from this route to Sitka, then capital of the Territory.

Major J. W. Powell, the Chief of the United States Geological Survey, made a full report, suggesting three different routes from Montana to the Bering Straits, each from a different starting point on the Northern Pacific Railway. His information was based mainly upon Western Union Telegraph and old Hudson's Bay maps. The route followed the Peace, Yukon and Tanana Rivers to the Bering Straits. The branch line to Sitka was reported impracticable, but one was suggested from the Peace River to Wrangell via the Iskut and Stikine Rivers, a portion of which is recommended in the Battelle report.

Major Powell concluded, "The Director does not feel called upon to express any opinion as to the wisdom of constructing the railway under consideration." The report was filed and promptly forgotten.

3. 1933 - UNITED STATES COMMISSION TO STUDY PROPOSED HIGHWAY TO ALASKA

P. L. 228, 71st Congress, approved May 15, 1930, authorized appointment of a commission to cooperate with representatives of Canada in construction of a highway to connect the northwestern part of the United States with British Columbia, Yukon Territory and Alaska. The report of the Commission, submitted to the President on May 1, 1933, has been printed as Publication No. 474, Department of State Conference Series No. 14.

The Commission listed six benefits to be gained from the project from the American point of view: (a) the development of Alaska as a result of highway accessibility; (b) a contribution to the welfare of Americans living in Alaska through physical connection with the continental highway system; (c) the opening of new country giving opportunity for settlement and investment of capital and employment; (d) the connection of the Alaska highway network with that of the continental United States, providing a new and valuable area for exploration, recreation and business; (e) assistance in air commerce "along the most practicable flying route to the interior of the territory and to Asia"; and (f) the promotion of friendly relations between citizens of the United States and Canada.

The Commission proposed a route from Hazelton, British Columbia northwestward through Atlin, B. C., Whitehorse and Dawson, Yukon Territory to Fairbanks, Alaska. The line suggested was generally developed over low divides, lightly timbered or partly open country and sufficiently toward the east to take advantage of light rainfall, dry ground and open valleys. The Commission studied various possible locations following the general route to Whitehorse as well as alternates between Whitehorse and Fairbanks.

The Commission concluded that such a highway was a feasible project and could be built at a reasonable cost. Assuming the road to begin at Seattle, Washington and to end at Fairbanks, Alaska, the total length would be 2,256 miles, of which approximately 1,073 miles was in existence. "Stage-construction" was recommended, with subsequent improvements to be made as traffic required. (See location map at the end of this section.)

4. 1940 - ALASKAN INTERNATIONAL HIGHWAY COMMISSION

An Act of Congress, approved May 31, 1938, established the Alaskan International Highway Commission. This commission, again, was to study highway routes to Alaska from the Pacific Northwest region of the United States. The Canadian Government appointed a similar commission. The report of the Alaskan International Highway Commission was published in April 1949 as House Document No. 711, 76th Congress, 3rd Session.

The conclusions of the Alaskan International Highway Commission were not greatly different from those of the group which reported in 1933. The possibility of two distinct routes, however, was advanced.

Route A is essentially the same route recommended as a result of the 1933 study. Route B follows the more easterly Rocky Mountain Trench. This is one of the great natural inter-mountain troughs of North America and was used in 1865 when the Western Union Telegraph Company began surveys and construction of a telegraph line to Asia and Europe. Later, it was considered as a route for a proposed railroad from the United States to Alaska.

With respect to the advantages of the two routes, the 1940 report states:

"The United States Commission favors route A from Prince George via Hazelton or Stuart Lake to Whitehorse and thence via Kluane Lake and the Upper Tanana River to Fairbanks for the reasons: a. It permits shorter branch roads being built as possible highway outlets to towns along the coast of southeastern Alaska. b. It is more scenic, particularly near the Atlin Lakes and along the north shore of the St. Elias Range. c. It would aid in the mining development along the Upper Tanana River in Alaska. d. A road could be constructed from the Tanana River northwest to Dawson, thereby giving Dawson access to the highway and aid in the mining development of the fortymile region in Alaska.

"The Canadian Commission advances certain advantages of the eastern route (route B) from Prince George via Sifton Pass and Frances Lake to Dawson, Yukon Territory, as follows: e. It is a shorter distance to Dawson. f. It has fewer and lower passes than on route A. g. It is easier to construct, thereby costing less. h. It would afford a route into Dawson entirely within Canadian territory.

5. 1942 - RAILROAD STUDIES

The U. S. Army Corps of Engineers, in 1941-42, surveyed a route for a military railroad from Prince George, British Columbia following the Rocky Mountain Trench - Ross River - Fort Selkirk route to Rex, Alaska, on the Alaska Railroad south of Fairbanks. The report stated that a railroad using this route was feasible and would require an investment of $112 million. The survey cost approximately $1,500,000, which figure may not have included pay and allowances of Army military personnel utilized on the project.

Because of the scarcity of steel and other materials, due to the war effort, specifications were relatively low as compared to commercial standards. Steel rails were specified in weights of 60 pounds to the yard or higher, depending upon what might be available. Ties and trestles were to be hewn from native timber close to the right-of-way. Freight depots, transit sheds and other buildings were to minimum standards. Passing sidings were spaced every 10 miles.

Improvement of the military situation in the Aleutian Islands and in the Pacific area, and the decision to construct the Alaska Highway, led to the abandonment of this project.

6. 1942 - ALASKA HIGHWAY CONSTRUCTION

The involvement of the United States in World War II and the critical military situation in the Pacific area led to the decision to build the "Alaska Highway" across Canada to Alaska. For the most part, the Alaska Highway followed neither route proposed as a result of the 1933 and 1940 studies. Instead, it followed a system of airfields strung along a route surveyed in 1935 by the Canadian Department of Transport and chosen as the practicable flying route to the Yukon.

On February 26, 1942, the Permanent Joint Board on Defense recommended that the highway be built, based on the following three major considerations: (a) the need for a traffic artery serviceable for year-round movement of through freight to Alaska by truck, (b) the need for a supply route for the airports and (c) the need for a highway as a ground guide for flyers on the Alaska run.

Construction of the Alaska Highway has removed some of the questions as to the best location of the northwestern end of the proposed highways which had been considered by the 1933 and 1940 commissions. The main body of the highway is, however, located too far to the east to provide the direct benefits to western British Columbia and the Pacific Northwest which were of concern to the earlier commissions. Neither does it permit construction of relatively short feeder roads to serve coastal cities.

7. 1943 - THE NORTH PACIFIC PLANNING PROJECT

Both the United States and Canada have sponsored studies involving natural resource development as it relates to transportation needs and the economy of the region. Since the Canadian portion of Northwest North America is the larger, the resources studied were more extensive on the Canadian side than in Alaska. Studies conducted by United States commissions were directed more specifically toward the engineering feasibility rather than toward economic development.

World War II developments in northwest Canada and Alaska had significance reaching beyond immediate defense interests. After consideration by the joint economic committees organized by Canada and the United States, the two countries, in January 1943, decided to sponsor a joint study designated as the North Pacific Planning Project. The first objective was to carry out a careful inventory of the natural resources of the region and to assess their potentialities in the future development of the northwest coastal section of North America.

Following the great improvement in the military situation in the Pacific in 1944, the United States withdrew from the project. The Canadian group, however, not only continued the study, but enlarged the area under consideration to about one million square miles. The results of this study were published in a document titled "Canada's New Northwest", which is a condensation in narrative form of the work of the Canadian section on this project. The economic data contained in this report has been of considerable value to Battelle and to the Commission in its study of resources and transportation.

In commenting on the Alaska Highway, the report noted that it established

the first overland facility to Haines and Central Alaska and served the chain of airports to establish the airpath from the heart of America to cities in Soviet Russia, the Orient and India. It concluded that there was no question of its abandonment, either from the point of economy or expediency.

The report commented that construction of substantial means of land transport to Alaska seemed inevitable. It stated, first, that a permanent hard-surfaced highway is more expensive to construct and maintain than a railway line and, second, that a railway, of prime interest to the United States for both defense and development of Alaska, would be vastly more important in the economic development of northern British Columbia and the Yukon Territory than any highway system. This opinion was based on the reasoning that a railway would give improved access to some of the most promising mineral territory in western Canada.

Since the date of that report, the Pacific Great Eastern Railway has been extended north 320 miles to Dawson Creek and Fort St. John on the Alaska Highway and to a connection with the Northern Alberta Railroad at Dawson Creek. The principal tonnages being hauled by this extension are timber, agricultural products, fertilizers and sulphur, a by-product of the natural gas wells in that area. Little, if any, minerals are available adjacent to this northern railway extension.

8. 1950 - JOINT COMMITTEE, PUBLIC LAW 391, 81ST CONGRESS

In 1949, the Congress enacted Public Law 391, 81st Congress, 1st Session, approved October 26, 1949. The Act authorized the President to negotiate and enter into an agreement with Canada for an economic survey of a railroad from the vicinity of Prince George to a connection with the Alaska Railroad, together with construction plans, cost estimates and plans for financing the construction and operation of the proposed railroad.

The following is a brief chronology of the action which took place under authority of Public Law 391:

a. December 17, 1949: The President asked the Secretaries of Interior, State and Defense to give him a joint recommendation as to how the law should be implemented. As a result, a joint committee was established representing the three departments, chaired by an Assistant Secretary of Interior.

b. October 12, 1950: The Canadian Government agreed to meet with the American Delegation on this date. A tentative agreement was reached for a joint economic study of the proposed railroad, subject to concurrence of the Canadian Cabinet. This agreement was never approved by the Canadian Government. Instead, Canadian representatives persuaded the United States representatives to submit the question to the Permanent Joint Board on Defense.

c. March, 1951: The Permanent Joint Board on Defense reported that:

"Sufficient military justification does not exist at the present time and under present circumstances for the construction of the proposed railroad to Alaska." and added that:

"for military reasons alone, further route surveys, economic surveys, and similar investigations would not be warranted at this time."

d. April 1951: The Canadian Government informed the United States that in view of the lack of military interest, a joint economic survey of the proposed railroad would serve no purpose.

e. June 1951: The President announced the conclusion of the Secretary of Interior that action on Public Law 391 should be held in abeyance until there was greater liklihood of securing Canadian participation. No further attempts were made at negotiations under the authority of Public Law 391.

9. 1956 - ALASKA INTERNATIONAL RAIL AND HIGHWAY COMMISSION

Senator Warren G. Magnuson of Washington, responsible for many of the bills relating to transportation facilities to Alaska, and chairman of two previous commissions, was not satisfied with the results of previous efforts and introduced a bill in the 83rd Congress. Two years later, August 1, 1956, Congress enacted Public Law 884, establishing the Commission and authorizing funds totalling $75,000 and two years time to accomplish its duties. Due to delay in the appointment of its members, the Commission met for the first time on July 30, 1957.

The Commission, at its first meeting, made two basic decisions: first, that the economic portion of its study would be performed under contract by a research organization specializing in such services and hence the Commission would need only a skeleton staff; second, that neither the funds authorized for appropriation by the Congress nor the time provided for the study were adequate. As a result, the law was amended to provide a total authorization of $300,000 and the time was extended to June 1, 1961 as the deadline for submission of the final Commission Report to the Congress, thirty days after which all authority would be withdrawn.

This, the final report, directed by Public Law 884 of the 84th Congress, is submitted herewith.

SECTION C

SCOPE OF ECONOMIC STUDY AS RELATED TO TRANSPORTATION

1. EMPHASIS ON ECONOMICS

The Alaska International Rail and Highway Commission is directed to make a thorough and complete study of additional rail and highway transport facilities connecting the United States with Central Alaska, to determine; first, economic and military advantages; second, the most feasible and direct routes relating to the economic benefits to the continental United States, Canada and the new State of Alaska; and, third, the most feasible feeder routes connecting coastal ports with these facilities. The Commission is directed to give particular attention to the feasibility of rail and highway facilities between the Northwest Region of the forty-eight States and Alaska, to report to the Congress the results of its studies and to recommend routes and facilities determined most feasible and beneficial to all concerned.

The Act provides that the final report shall include estimates of the cost of construction of rail and highway facilities along the routes determined most feasible and beneficial by the Commission, together with estimates of the economic benefits to the United States, Canada and Alaska. This provision establishe s the basis for determination of a cost-benefit ratio.

For the purpose of this report, cost-benefit ratios shall include, but not be limited to: all direct and indirect costs, such a construction, maintenance, interest, depreciation, amortization and taxes; all direct and indirect benefits, such as operating and non-operating revenues, rental of rights-of-way, and tax benefits as related to the area's share of Gross National Product, value of lands and industrial properties located at or served by the facility and expenditures by residents or visitors to the area.

The determination of benefits from the investment of public funds, as is the case with highways (except toll roads), must be determined entirely from indirect benefits (except gasoline taxes and license fees). As Battelle has so aptly demonstrated, the only benefits from highways must be measured by increased expenditures by travelers from outside the region and by property, sales, excise and income taxes generated by these expenditures.

The Commission avoided infringement of state and provincial sovereignty by considering only facilities that were interstate or international in nature. Because of the location of existing facilities, it quickly became apparent that most new facilities would be located on Canadian soil. It thus became desirable, and, in fact, imperative, that close liaison and intensive cooperation be maintained with Canadian officials and citizens.

Despite the fact that the Commission was created by the U. S. Congress, consists of U. S. personnel and is required to make its report to the U. S. Congress, excellent coordination and cooperation has existed with Canadian government and civilian officials throughout the area. While a comparable Canadian commission was not appointed, the Interdepartmental Committee on Pacific Coast Transportation

at the Canadian national level provided excellen liaison with Canada's respective ministers. The same thing was accomplished at the provincial level by continuing contacts with provincial officials.

2. COMPILATION OF RESOURCES DATA

It was apparent that the determination of economic feasibility of additional transport facilities would depend upon the degree of industrial development of respective areas. Such development would, in turn, be dependent upon the location, availability and extent of natural resources, the location of markets that could absorb such products, the competitive position of each and the community development that would support such industry. The researchers soon found that they were interested in both things and people.

The Commission recognized that dozens of economic studies had been made in this area, that government agencies possessed volumes of statistics relating to all manner of resources and that commercial companies possessed detailed information supporting their plans for future development. The first chore, therefore, was to collect and analyze these data in relation to transport needs.

3. ORGANIZATION AND STUDY METHODS

The scope and extent of the proposed economic study as related to additional transportation facilities between Central Alaska and the forty-eight continental United States determined the basis for invitations extended to a number of the country's leading research organizations to conduct an economic study of the area. The submission of eighteen proposals indicated a wide variance in concept of what was required. Further variation was illustrated by the cost estimates accompanying each proposal, which varied from a low of $66,000 to a high of $450,000. In most instances, higher cost estimates reflected detailed engineering services in excess of study requirements. Obviously, the limited accuracy of benefits based on twenty year forecasts of resource development would justify only relatively broad engineering estimates of construction and operating costs. These and budgetary considerations dictated a ceiling of $150,000 available for an economic study.

The Chairman and Vice Chairman, authorized by the Commission to negotiate a contract for the study, selected the Battelle Memorial Institute of Columbus, Ohio, one of the most outstanding research organizations in the United States. Battelle is eminently qualified, not only because it possesses on its staff specialists in almost every field in which the Commission has an interest, but, in addition, is recognized as a leader in the field of industrial technology, required for the proper analysis of potential industrial development. A negotiated contract for the economic study was executed by the Commission with Battelle on July 6, 1959.

The Executive Director of the Commission was named Contracting Officer. His function consisted primarily of supervising and maintaining liaison between the Battelle organization, the members of the Commission and other government agencies authorized by the Act to participate in the study. The contract required Battelle to submit monthly reports to Commission members, indicating progress being made and describing services which had been performed during the current period, with indications of tentative conclusions. Detailed provisions of the contract are highlighted in a fact sheet included as Exhibit XI, Section H.

4. BATTELLE REPORT TO THE COMMISSION

Officials of the Battelle Memorial Institute submitted copies of their preliminary report to the Commission and presented their findings, conclusions and recommendations at a meeting of the Commission in Seattle, Washington on November 11, 1960. Representatives of selected U. S. and Canadian government agencies, civic and transportation associations and news media were invited to participate. The report received wide and favorable coverage in the press and on radio and television. Copies of the preliminary report were made available to officials and agencies from whom comments were requested, and to a limited number of civic and transport organizations. Battelle made minor changes and furnished members of the Commission copies of their final report on March 15, 1961.

In order that the economic and engineering data collected by the Battelle Memorial Institute and its sub-contractor, Brown and Root, Inc., of Houston, Texas, will be available to Congress and the public, the Battelle Report, with Supplement 1, is submitted herewith as Attachments 1 and 2 to the Commission Report. Frequent reference to these reports is made herein, which precludes the necessity of repitition of volumes of data already recorded.

5. THE SMITH PLAN FOR AN ALASKA - CONTINENTAL RAIL NETWORK

Following the Battelle briefing on conclusions and recommendations to the Commission, it became apparent that insufficient attention had been devoted to determining the feasibility of rail connections between the Canadian-United States rail networks and the Alaska Railroad. Interest was intensified at that time by views expressed at the invitation of the Commission by Mr. D. J. Smith, General Manager of the Alaska Railroad. He indicated that an extension of the government-owned line to the Yukon border might join the planned Pacific Northern Railway, and thereby create a rail link that would connect the Alaska Railroad to the Canadian network and provide the Rail Belt with direct overland connections with sources of supply and markets elsewhere on the continent.

A Commission request to the Secretary of Interior that Mr. Smith present his views to the Commission was promptly approved. A preliminary plan was prepared for Commission consideration, copies of which were mailed directly to Commission members from Anchorage. The basis of the plan involved the economics of freight tarrifs on existing shipments of commodities originating in the trans-continental rate zone east of the Missouri River, to be shipped by an all-rail facility to Alaska. A preliminary review showed that the plan warranted further study.

Mr. Smith was invited to present his findings and recommendations to the Commission in Washington on March 29, 1961. To obtain an objective analysis of the Smith plan to extend the Alaska Railroad to join the proposed Pacific Northern Railway at the Alaska-Yukon border, the Commission employed W. B. Saunders and Company, transport consultants of Washington, D. C. The study would analyze the conclusions and recommendations made by Battelle and Smith relating to the need for rail service to Alaska. The Commission would have expert advice on possible operating costs by rail and estimated rail revenues.

The Smith submission, "Trans Canada - Alaska Railroad", and the Saunders report, "An Appraisal of Studies on Transportation Requirements for Northwest North America", are attached as Exhibits IX and X respectively, Section H.

SECTION D

RESOURCES OF THE AREA

1. GENERAL COMMENTS

Early in the life of the Commission, it was determined that the study authorized by Public Law 884, 84th Congress, as amended, would determine the location, availability and extent of resources, their competitive positions in world markets and the liklihood of their development within the next twenty years, prior to a study of the transport facilities for their exploitation. Too many of the previous study groups looked for the most likely route through the flattest valley or over the lowest divide to "open up the country", without giving a thought as to what the facility would transport once it was created.

Whether a resource is marketable may depend on factors other than its ease of extraction, whether or not it is in plentiful supply or whether it may be a "romantic enterprise". Some of these factors include availability of and cost of labor, availability of reasonably priced power, the distance from markets and possibly even weather. The production of iron ore from Alaska, for example, must compete with abundant and rich resources elsewhere in the world, many of which may be operated by ample cheap labor under equable climatic conditions.

In its study of resources in this vast region, Battelle was, of necessity, restricted to those resources which were known as to quality and quantity because limitations of time and money precluded detailed exploration. Whether or not the Northwest is a "vast storehouse of metals, minerals and other riches" is neither proven nor disproven in this report. Therefore, the conclusions and recommendations contained herein are limited either to known facts or on forecasts based upon history or trends.

The purpose of this section is not to provide detailed information on resources of the area, which is adequately covered in the Battelle report. The following is a brief resume of the resources picture as detailed by Battelle and supported by the Commission.

2. OIL AND GAS

Northeast British Columbia, northwest Alberta and the Kenai Peninsula of Alaska have each proven huge reserves of natural gas and petroleum during the past several years. The Canadian areas are sufficiently close to continental markets to be connected with Canadian and U. S. consumers by pipeline. This advantage does not exist for Alaskan fields.

Oil is now being transported by tanker from a short pipeline on Cook Inlet to Pacific Coast refineries. Large reserves of gas in the Kenai Peninsula will care for the needs of Anchorage and even the Fairbanks area for the foreseeable future, with excess available for natural gas liquefaction and shipment to areas both domestic and foreign, not being served by pipelines.

At the present rate of exploration of both areas, the next few years will see additional reserves developed. Exploration and production of these products

utilizes high priced labor, transportation and supplies, all of which add to the economy. in addition, government subdivisions are enriched by oil and gas lease revenues. Under a unique provision of law, Alaska is reimbursed 90 percent of revenues collected by the U. S. Federal Government.

Annual production by the year 1980 has been forecast at 25 million barrels of crude oil and 100 billion cubic feet of gas in Alaska, 62 million barrels of oil and 213 billion cubic feet of gas in northwestern Alberta and 50 million barrels of oil and 464 billion cubic feet of gas in northern British Columbia. Based on 1959 price levels, this adds up to a value of almost $500 million annually by 1980.

3. FOREST PRODUCTS

Due to wise conservation practices, most of the forests in Alaska and western Canada are now being harvested on an annual yield basis that will permit production at that rate for perpetuity. The world's rapidly expanding population and the demands of technology in the production of materials indicates a large increase in the consumption of all types of forest products, not only cut lumber but plywood, pressed wood, pulp and paper.

In 1959, for the first time, the production of the interior forests of British Columbia exceeded that of the coastal forests. Practically all the latter is now being harvested on a perpetual yield basis, while only a portion of the former is being harvested. This industry cannot help but increase in volume as additional transportation is provided. Currently, the Rain Belt forests of Southeastern Alaska could provide supplies for three additional pulp mills, the development of which are lagging because of market conditions. Again, market demands throughout the world could improve this situation in the foreseeable future.

Unquestionably, there will be a huge increase in the tonnages of pulp and lumber being shipped to market from these areas. However, the heaviest timbered areas are either adjacent to tidewater or in the relatively narrow strip on the southern edge of the area under study. Therefore, timber products will not be a major item in proposed inter-state, inter-provincial or international land transport facilities between Central Alaska and the forty-eight continental U. S. states, except as these benefits increase the number of workers and the population generally.

Much timber from the interior of British Columbia and Alberta now moves to eastern Canada and the United States by rail. As rail facilities are built further to the north, more of the interior forest reserves will be marketable. These tonnages will provide revenues for rail transport, as evidenced by the traffic experience of the Pacific Great Eastern extension north of Prince George.

Annual production of forest products in Alaska by 1980 is forecast to increase by over $96 million, requiring over 4,000 new workers, earning $30 million annually and will cause the state's population to increase by 24,000 persons. In Canada (British Columbia and Alberta) values would increase $186 million, requiring almost 10,000 new workers, earning $35 million and causing the population to increase by over 56,000.

4. METALS AND MINERALS

It is in this area that the greatest and most optimistic forecasts have been

made during the past 100 years. By the same token, concrete evidence pointing to future growth in this field is the most difficult to obtain. There is general agreement that parts of Northwest North America comprise good hunting ground for metals and minerals. Chances are reasonably good that further rich discoveries will be made. The fact remains, however, that most of the best known mineral deposits that have a chance for commercial development, requiring the handling of bulky materials on new transport facilities, are located relatively close to tidewater. The very nature of the product and the competition which controls its production and sale requires that it be transported to market as inexpensively as possible. It is therefore concluded that these minerals located on or near tidewater would be transported by water. The Commission feels that the same might apply to those deposits located further inland, until and unless rail facilities were available to transport these bulky commodities directly to the rail network of Canada or the United States.

Several iron deposits in Southeastern Alaska may be developed in the next few years. This would certainly assist the economy of the area and there would be side benefits. There would be little need, however, for a major artery, rail or highway, to be built across Southeastern Alaska and British Columbia to join the road and rail network to the south to exploit these deposits. The same general reasoning applies to known copper deposits rich enough for possible development within the twenty year period, except at Kobuk, where a road to tidewater would be required. Further developments of lead, zinc and silver properties in the Yukon might add to the need for internal transport.

Annual production of metals and minerals in Alaska is forecast to increase by $67 million annually by 1980, requiring 2,000 more workers earning $13 million and causing population increases of 12,000 persons. Canada, within the area, will do even better, increasing production by that year by $113 million, requiring 3,000 new workers earning $16 million and accounting for 18,000 more persons.

5. COAL

Huge reserves of coal exist in the area, most of which are in the northern part of Alaska. Generally, the distances are great and shipping costs would not allow competition with coal reserves elsewhere in the world. Furthermore, coal must compete with gas, oil and hydroelectric power throughout the area, as these competitive fuels are developed at relatively low cost.

A demand for coking coal for use in blast furnaces on the U. S. West Coast and in Japan has encouraged recent exploration in Alaska. The Bering River Field was sampled in 1959 to determine coking characteristics, but much drilling and development still must be done to determine if general features of coal occurence will permit profitable production to satisfy this demand. Shipment of coal would obviously be by water carrier. Battelle estimates Alaska coal output may increase by 1 million tons annually by 1980, having a value of $10 million, requiring 400 new workers earning $4 million and accounting for 2,400 more population. Increases in the Canadian area are considered minor in nature and quantity.

6. HYDROELECTRIC POWER

The water power resources of Northwest North America are so great that development of just a few of the larger sites would take care of future requirements for many years to come. For example, the Rampart Dam on the Yukon River, now

being studied by the U. S. Corps of Engineers is rated at 4.7 million kw installed capacity. The Peace River Power Project in British Columbia would have more than 3 million kw capacity. The Yukon-Taiya Project, near Skagway, Alaska, utilizing Yukon River water from Canada would have a potential of more than 1 million kw. The total undeveloped capacity is more than 27 million kw installed capacity, not including sites of 2000 kw and less.

This power must compete with other fuels in other parts of the world, as well as in the area. Water power, of course, has the big advantage of being renewable. On this basis, it is only a matter of time until the water resources of this vast country will be harnessed for the benefit of the area, although they must compete with abundant and cheap hydro and thermal power elsewhere in the world.

7. FISH AND FURS

The fishing industry, despite its difficulties, still constitutes one of the major assets of Northwest North America. With proper conservation practices, Battelle has forecast an increase of $20 million annually by 1980. This tonnage now moves by water from land based canneries and cold storage plants. In addition, a few floating canneries process the fish on board and return to their bases in the forty-eight States with the canned product. It is unlikely that any of this cargo would be transported by additional rail or highway facilities.

The fur industry has declined and will further deteriorate as the wilderness country is invaded by expanding populations. Its effect on transportation needs is negligible.

8. AGRICULTURE

As population increases in the North Country, more and more land will come under cultivation. While weather conditions are severe, long periods of daylight, even in a short season, produce quick results. As local markets increase, there will be a material growth in this industry. It is doubtful that few, if any, locally grown products can compete outside the area, with the exception of grain crops from the extreme southern portion. Transport requirements for shipping agricultural products out of the area will probably be negligible.

9. TOURISM, VISITORS TO THE AREA

The growing importance of visitors from outside the area, both now and in the future, cannot be overemphasized for a number of reasons: Northwest North America is the last remaining frontier of the North American Continent; its scenery is magnificent, its wildlife is a sportsman's dream; money spent by tourists is at the retail level; whether for goods or services, and filters down through the entire economy.

Because distances are great, visitors to the area are now limited because of inadequate and insufficient transport facilities and inadequate and insufficient accomodations. A third limiting factor might be the lack of proper organization to handle and promote this highly specialized trade. Tourism is a big business in many parts of the world, and it could become big in Northwest North America.

The Commission believes that tourism can be greatly expanded as these basic facility deficiencies are corrected. Battelle forecasts almost a five-fold increase in expenditures by travelers of $380 million annually by 1980, which would support an additional 20,000 workers and result in an increase in population of about 125,000.

10. RESOURCE BASED INDUSTRIES (less expenditures by travelers)

Battelle has forecast a population increase in Alaska of about 82,000 persons and increased payrolls in industries utilizing natural resources of more than $123 million annually by 1980, producing almost $373 million annual value of products in these industries. The Canadian portion of the area would account for increases of 126,000 persons, with added payrolls of almost $100 million annually by 1980, producing over $660 million worth of products annually by then.

It can be seen, therefore, that each of these resources and the industrial development that is forecast will produce certain benefits to the people of Canada and Alaska. It is these benefits that will provide a basis for additional transportation facilities planned to assist in this over-all development.

11. SUMMARY

Total increases in population, number of workers, payroll, value of products and services and the accumulated benefits to the area made by Battelle are considered to be on the conservative side. Discovery of new reserves of oil, gas, metals and minerals could increase these forecasts substantially. The Commission realizes that Battelle confined its recommendations to benefits derived from known resources, or those which could reasonably be expected to develop by 1980.

ESTIMATED INCREASES IN VALUES OF INDUSTRIES
AND EXPENDITURES BY ADDITIONAL TRAVELLERS ANNUALLY BY 1980

INCREASES	ALASKA	CANADA
Number of Travelers	650,000	425,000*
Annual Expenditures by 1980	$223 million	$155 million
New Workers Required	14,000	7,000
New Payrolls	$87.6 million	$35 million
Population Increase by 1980	87,000	42,000
Resources and Resource Based Industries (not including expenditures by travelers)		
Annual Increase in Value	$370 million	$660 million
New Workers Required	14,000	20,000
New Payrolls	$123 million	$100 million
Population Increase by 1980	82,000	126,000
* Plus 560,000 visitors en route to Alaska		
TOTALS		
Annual Increase in Value	$593 million	$815 million
New Workers Required	28,000	27,000
New Payrolls	$210 million	$135 million
Population Increase by 1980	169,000	168,000

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Of the total expenditures forecast by Battelle to be spent annually by additional travelers in the area by 1980, only those expenditures derived from visitors traveling by highway were calculated to contribute toward the benefits of the coordinated highway system recommended herein. Of the total mentioned above, highway travelers to Alaska are forecast to spend $146,2 million annually by 1980 in Alaska. Those visiting western Canada by highway, or passing through enroute to Alaska may spend an additional $131.6 million per year in Canada by that time.

From the preceeding analysis, it is readily apparent that the benefits -- taxes based on increased income, payrolls and population increases -- from development of resources and resource based industries exceeds those resulting from increased tourism.

A complete analysis of these forecasts, a computation of a cost/benefit ratio between initial investments required for improved or additional transport facilities and returns expressed in taxes resulting from increased values in the area, are contained in Section G.

SECTION E

MILITARY AND CIVILIAN DEFENSE

Military requirements for adequate transport facilities were a major factor in the construction and improvement of both railroads and highways within and to Alaska during the past several decades. The Act establishing the Alaska Railroad states in part: "... to provide transportation of coal for the Army and the Navy, ... of troops and arms, munitions of war, the mails, and for other governmental and public uses ..." At the specific request of the military departments, the Alaska Railroad rehabilitation program following World War II included the Portage-Seward portion to provide an alternate ice-free military port in addition to the installation at Whittier.

Simultaneously, the need for all-weather dust-free highways connecting defense bases near Anchorage and Fairbanks hastened their hardsurfacing, made possible with defense-supported annual appropriations for highway construction by the Alaska Road Commission. As a result, the primary highway system of Central Alaska and the Alaska Highway to the Yukon border is asphalt surfaced.

Public Law 884, 84th Congress, assigned specific responsibilities for making "a thorough and complete study of the economic and military advantages of additional highway and rail transportation facilities connecting continental United States with Central Alaska." (underscoring supplied) In performing these duties, the Commission provided a copy of the Battelle preliminary report to the Secretary of Defense and requested a current military evaluation of existing transportation facilities between Alaska and the forty-eight continental states. A similar request was made to the Director, Office of Civil and Defense Mobilization, relating to civil defense needs. 1/

The requests to military and civil defense agencies solicited views on adequacy of existing transport facilities to support mobilization and war plans; if not adequate, the extent to which they are deficient; whether military vulnerability due to lack of of additional routes constitutes a military risk; and whether the application of the Battelle recommendation for an integrated highway system for tourists would constitute a military advantage. Both agencies were informed that the Commission was studying the "Smith" plan 2/ to extend the Alaska Railroad to the Yukon border, to connect with a Canadian rail link to the continental rail network to the south.

1. MILITARY DEFENSE EVALUATION

In a response to the Chairman's request, 3/ the Department of Defense states that "Existing transportation facilities including rail, highway, sea and air, are adequate to support foreseeable military requirements... while additional rail and highway facilities between the forty-eight States and Alaska are desirable from an economic and military standpoint, they are not required for the support of present or projected plans."

The letter 3/ continues, "The Battelle study recommendations pertaining to

1/ See Exhibits VII and VIII, Section H
2/ See Exhibit IX, Section H
3/ See Exhibit VII, Section H

rail and highway improvements and extensions have a military significance even though existing facilities meet current and foreseeable military requirements. The recommended rail link between Fairbanks, Alaska and Dawson Creek, B. C. (sic) [4] would offer an additional land line of communications to tidewater Alaska supplementing the existing land, sea and air routes which meet military requirements."

In commenting on the need for additional transportation requirements for Alaska in a letter to the Secretary of Interior dated November 19, 1948, Lieutenant General N. F. Twining, USAF, then Commanding General of the Alaska Command, stated in part:

> "Since much of the present high cost of construction can be traced to high transportation costs and long delays in shipping, improvement of means of transportation and reduction in transportation costs is also vitally necessary. Improvement in the internal highway net in the Central Alaska area is desirable from both the civil and purely military standpoint. The provision of an alternate land line of communication to the United States is a vital matter. The blockade of Alaska, occasioned by the current shipping strike, merely hints at the disaster which would strike Alaska in the event the lines of communication were interrupted during the period of an emergency. Although improvement of the Alaska Highway would provide an emergency land line of communication, the only sure tonnage link with the states is the construction of the proposed Alaska-United States rail line down the intermountain trough. Such a railroad would open up for development new areas presently inaccessible because of the lack of transportation both in Alaska and in Canada."

The Commission believes that General Twining's views are applicable to present conditions. The fact that current Canadian plans for the development of the Peace River Power Project would require a partial re-routing of the railroad does not materially affect the over-all picture.

In 1958, the United States Army Transportation Corps estimated the military capabilities of the Alaska Highway to accomodate civilian and military shipments in case emergency conditions precluded use of sea lanes to Central Alaska. While present capacity of the highway through British Columbia and the Yukon is adequate to handle existing traffic averaging about 13,000 tons annually, this tonnage would increase substantially under mobilization or war conditions.

Civilian and military waterborne traffic to and from Central Alaska totals approximately 1,300,000 short tons annually. If emergency conditions precluded use of ocean shipping to supply Central Alaska, the Alaska Highway would be required to accomodate an increase of 3,600 tons of cargo daily. Transportation Corps estimates indicate that if average daily gross tonnage over the unpaved portion of the Alaska Highway would exceed 2,000 tons, maintenance costs would be excessive. Due to alternate freezing and thawing during Spring months, this capacity would be reduced to little over 300 tons daily [5] A review of engineering literature [6] indicates emergency requirements represent vehicle volumes considerably in excess of current practice on limited type roads in the United States.

[4] The proposed Pacific Northern Railway would terminate at Summit Lake, instead of at Dawson Creek, B. C.

[5] See map, Military Capabilities of Alaska Highways, Page E-4

[6] See Estimated Highway Freight Tonnages, 1957, and Reference List, Page E-5

2. CIVIL DEFENSE CONSIDERATIONS

Despite the view that existing transportation facilities can support mobilization plans, the letter from the Director, OCDM, dated March 6, 1961 7/, points out serious deficiencies which might result from:

a. Inability of existing highways to absorb traffic loads diverted from sea lanes made inoperative due to submarine attack;

b. High consumption of fuel and manpower for truck movement of freight;

c. Lack of suitable links with the industrial heart of Canada and the United States; and

d. Dependence upon a single mode of transportation under emergency conditions.

OCDM believes that "... additional highway connections, if otherwise economically justified, would provide marginal benefits for meeting mobilization deficiencies; Recommended highway improvements ... are desirable for the mobilization potential of increasing access to and mobility within the region." Even based on a 40 percent cutback of wartime cargo resulting from possible nuclear attack and further diversion of only 40 percent from oceanborne to overland transport due to submarine interdiction, OCDM estimates that land facilities would have to absorb at least 500,000 tons additional traffic annually. This averages about 1,400 tons daily, considerably in excess of estimated military capability of the Alaska Highway during the spring months.

OCDM supports the Commission view that a rail connection between the Alaska Railroad and the continental rail network would provide substantial military and civil defense benefits. Such a link would provide an alternate capacity which would conserve the nation's manpower and fuel resources, both of which may become severely taxed in case of limited war, mobilization or mass attack on North America. OCDM estimates that rail movement of 500,000 tons of freight would require approximately 3 million gallons of fuel and 10,000 man-days of effort, as compared to 10 million gallons of fuel and 150,000 man-days of effort if this traffic moved by motor truck.

3. SUMMARY OF COMMISSION VIEWS ON DEFENSE ASPECTS

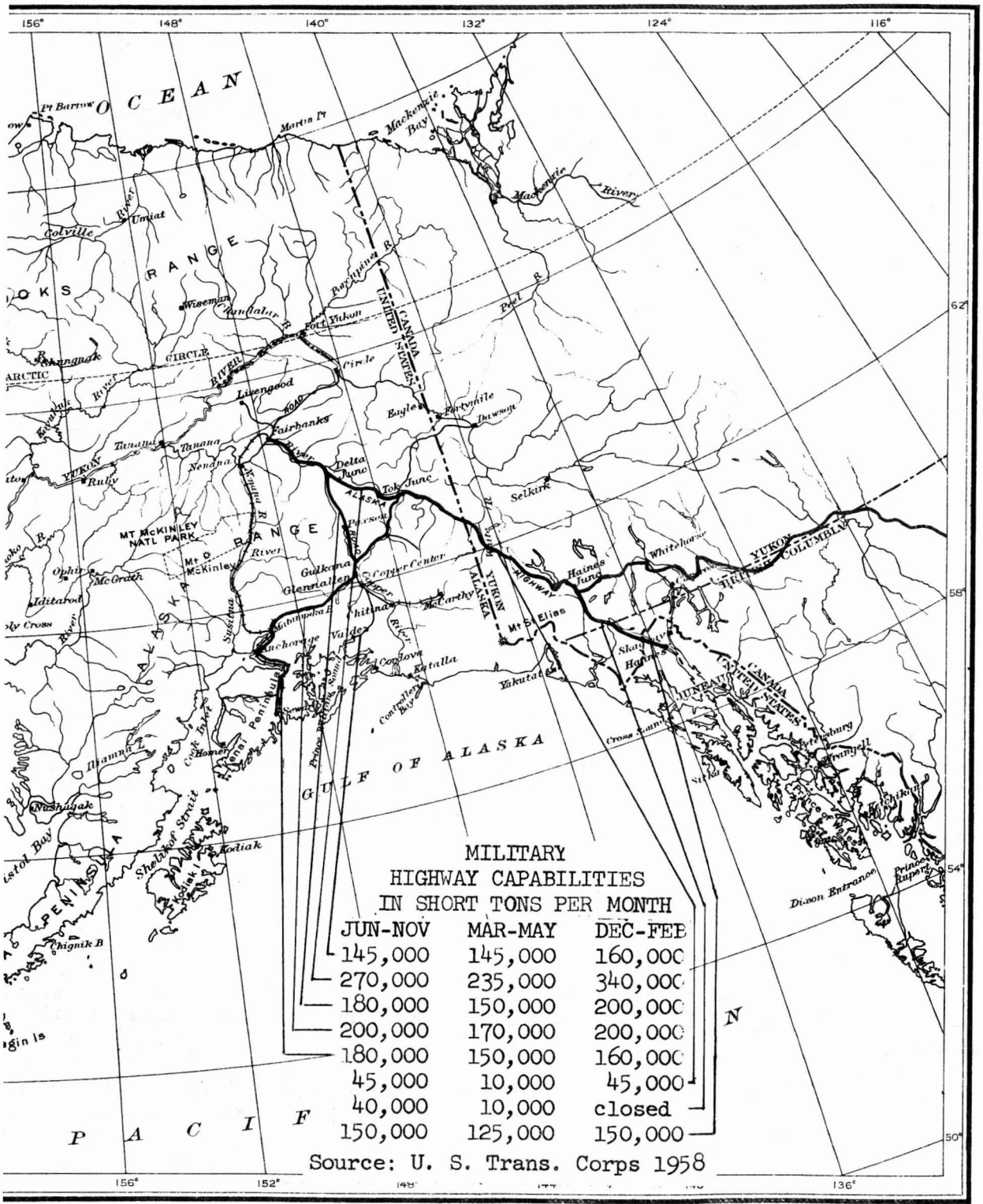
Despite the views of the Secretary of Defense that present transportation is adequate to support foreseeable military requirements, the Commission believes:

a. That substantial benefits would accrue to military and civil defense agencies and to the public from improved and additional rail and highway facilities to Alaska;

b. That it is unrealistic to depend upon the single link of the unimproved Alaska Highway to provide the only alternate to oceanborne commerce, subject to interruption during periods of emergency; and

c. That rail facilities connecting the Alaska Railroad with the continental rail network would effect economies which might lead to lower costs of military supplies and services in Alaska.

7/ Letter from OCDM, Exhibit VIII, Section H



INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C. 1954

ESTIMATED HIGHWAY FREIGHT TONNAGE, C.Y. 1957, BY SECTORS
(Furnished by Consolidated Freightways, 1958)

	Common Carrier North	Taylor Oil Equip.	Oil Equip. Except Taylor	Equip. Except Oil	Cassiar Owned Trucks	POL 80% 20% North	POL 80% 20% South	Common Carrier South	TOTALS Annually	Average per Month	Average per Day
Dawson Creek & points south	25152	80000	30000	30000		9600	1300	176000	14500	500	
Ft. St. John	14286		30000	20000		8000	1300	73500	6000	200	
Mile 51-294	13586		30000	17500		6000	1350	68400	6000	200	
Fort Nelson	8986			15000		4000	1450	29500	2500	85	
Mile 301-634	15756			10000		2000	1625	29500	2500	85	
Watson Lake					(45000)		(150)				
Cassiar **	7000			7500	*45000	400	1725	61600	5000	165	
Mile 636-917	6600			5000	*45000	1400	2025	60000	5000	165	
White Horse	4600			3000			2025	9625	800	25	
Points within Alaska											

* 36000 tons northbound, 9000 tons southbound
** Cassiar tonnage included in figure for Watson Lake area
All figures are short tons

REFERENCE LIST

1. Baerwald, John E., "Improvement Priority Ratings for Local Rural Roads in Indiana", Proceedings Highway Research Board, Vol. 35, 1956
2. Panel Discussion, "Design, Construction and Maintenance of Secondary Roads", Technical Bulletin No. 190, 1952, The American Road Builders Association
3. Farley, Robert A.,"Pennsylvania's Calcium Chloride Road Program", pp. 9-13, Technical Bulletin No. 216, 1956, The American Road Builders Association.
4. Bruce, Arthur G., and Clarkeson, John, "Highway Design and Construction", pp. 164-166, International Textbook Company, 1950

SECTION F

PRESENT, PLANNED AND RECOMMENDED TRANSPORT FACILITIES

Northwest North America is currently served, in varying degrees, by all forms of transport. Its extent and adequacy, however, vary widely, partly because of geographical limitations, but more importantly because of lack of demand due to extremely limited population. This is most significant in attempting to determine the economic feasibility of additional or improved transport facilities.

Only in the case of air transportation is there a connected network of facilities available in Northwest North America and, even in this instance, service between Canada and Alaska in both directions is limited. Despite the geographical unity of Alaska and western Canada, their highway and rail transport systems are joined only by the tenuous link of the Alaska Highway, plus some limited rail-water facilities between Prince Rupert and Southeastern Alaska. Because of the respective coastal shipping laws of the two countries, even their water transportation systems are separate. For all practical transport considerations, the two areas are basically separate units.

The main consideration behind efforts to improve transportation to the forty-ninth State is to reduce its cost. During recent years, this effort has resulted in a number of changes, some of which have been experimental. One which has been highly successful in the Pacific Northwest trade, proportionately greater than elsewhere, is containerization. Carriers have developed facilities to handle up to twenty-four foot steel containers, which may be lifted from ship or barge to dock, flatcar or trailer truck. Even small containers, which may be handled by fork lift trucks, have proven economical for smaller shipments. Some of these are collapsible in order to occupy minimum space on the return trip.

Another alternative to high transport costs may be the establishment of through rail facilities connecting the Alaska Railroad with the Canadian-U. S. rail network. Closely allied with such a development is the establishment of ocean-going barge service with equipment for handling lift-on, lift-off containers, including loaded boxcars. This trend is duscussed fully in the following sub-section.

1. OCEANBORNE COMMERCE

Ocean transport has been of primary importance to Alaska from the earliest days of record. Alaska receives regular service from U. S. cargo carriers, at one, two and three week intervals to Pacific ports and, during the open season, to ports along the Bering Sea and north of the Arctic Circle. In 1958, incoming waterborne cargo, including U. S. military shipments, totalled a little more than 1,500,000 short tons, approximately half of which was tanker fuels. Outgoing cargoes, including 150,000 tons of pulp from Ketchikan, totalled little more than 500,000 tons.

Up to the present time, most waterborne commerce has been carried by regular cargo ships. During recent years, however, there has been a growth in barge service, which appears to provide certain economies, primarily due to lower labor cost and more flexibility in the use of smaller vessels. A crew of 48 men is required on Liberty ships, while a 2,000 horsepower tow boat with a crew

of 12, under favorable conditions, can tow two 4,000 ton barges in tandem.

Train-ship or rail-barge service from U. S. and Canadian ports to Alaska may be a means of reducing transportation costs. Several years ago, the Alaska Steamship Company made an exhaustive study of the feasibility of establishing sea-train or train-ship service, but found that high costs indicated that the service did not appear to be economically feasible. In addition to the high cost of constructing and operating such vessels, shore installations would be equally elaborate and expensive, especially in Cook Inlet, because of extremely high tides.

However, the two pulp mills in Alaska, at Ketchikan and Sitka, have successfully utilized contract carriers providing rail-barge service to and from the mills. It is rumored that plans for an extension of barge service connecting the forty-eight States and Canadian Pacific ports with Alaska ports will soon be announced. It is reported that this service may include facilities to handle not only containers of all sizes, but would include rail cars as well. It is not known whether this would be the roll-on, roll-off variety or whether the rail cars would be lifted on and off by crane.

Only four Alaska ports provide connections to existing rail systems, namely Seward, Whittier and Anchorage to the Alaska Railroad and Skagway to the White Pass and Yukon Route. The latter would be ineffective unless the narrow-gauge line were changed to standard-gauge track.

The City of Anchorage completed construction of a new dock on Cook Inlet in 1960. Cargoes destined for Anchorage and for trans-shipment on the Alaska Railroad and by truck to Central Alaska my soon go directly to the Anchorage Port. Methods of maintaining open water in Cook Inlet during sub-zero weather are being explored to keep this port operational the year around. If these methods are successful, the port may prove to be a major competitor to the Port of Seward, where cargoes are now being handled by rail and truck lines trans-shipping to the interior. Seward has an advantage of about fifty hours shorter sailing time, which may offset some of the disadvantage of rail shipment to Anchorage and points to the north.

The United States Army has closed the Military Port of Whittier as a peacetime military installation. The Department of Interior has expressed an interest in acquiring the port and operating it in connection with Alaska Railroad service from tidewater to interior points. The State of Alaska has indicated some interest in obtaining control of the port and its other facilities. Under either arrangement, it is understood that some military cargoes will continue to be received at Whittier for trans-shipment over the Alaska Railroad. At present, there is no plan to compete with the Port of Seward by routing commercial shipments through the Port of Whittier.

The only planned marine facilities which are forecast at this time include those relating to additional and enlarged barge service between Pacific Coast port cities. Neither Battelle nor the Commission has studied the relative merits of this development. As a result, no specific action is recommended.

2. THE HIGHWAY NETWORK

The Alaska primary system was relatively well established following World War II. It connects Fairbanks, Anchorage, Seward and Valdez, Alaska to the Alaska Highway and with many intermediate points. Almost all of this network is hard-surfaced, a major portion because of military requirements. Alaska has embarked on an extensive highway program under the Federal-Aid Highway Act and the construction of pioneer or access roads to encourage the development of resources in the interior. With the exception of Haines, Alaska, Southeastern Alaska cities are not connected by highway to the Alaska, Canadian or U. S. networks. 1/

The highway networks of British Columbia and Alberta are relatively well developed north to the Prince Rupert-Prince George-Edmonton line with the Hart Highway extending north from Prince George to Dawson Creek, the southern terminus of the Alaska Highway. The primary Alberta Highways feeding toward the Alaska Highway are practically all hardsurfaced to the Alberta-B. C. border. Approximately 150 miles of the Hart Highway remains to be realigned and hardsurfaced. The same applies to Highway 16, between Prince Prince George and Prince Rupert. These sections are scheduled to be hardsurfaced by the fall of 1962. 2/ 3/

The Alaska Highway, an overall distance of approximately 1,525 miles, is paved north from Dawson Creek to approximately Mile 82 and from the Yukon-Alaska border to Fairbanks. The remainder is an all-weather gravel surfaced road, approximately 1,140 miles, which is well maintained by the Northwest Highway Maintenance Establishment, a unit of the Royal Canadian Army Engineers, by agreement between the two governments made at the time the Alaska Highway was officially turned over to the Canadian Government in 1946. The Canadian portion is being paved at the rate of approximately 50 miles annually.

The Haines Cut-off, between Haines, Alaska and Haines Junction, Yukon Territory, is paved from Haines to the Canadian border. The Canadian portion is not kept open during the winter months, due to limited traffic and the location of the right-of-way in the troughs of mountain passes subject to excessive snowfall. The establishment of the Southeastern Alaska ferry system would result in sufficient traffic to require that this section be kept open the year around. The relocation of 40.5 miles along the Kelsall River would reduce the cost of winter maintenance and shorten the route by 15.7 miles.

The B. C. Government, under the Roads to Resources Program of the Ottawa Government, is constructing the Stewart-Cassiar Highway from Dease Lake, near the Cassiar asbestos mine, to Stewart, B. C., the northernmost Canadian port city located at the north end of Portland Canal. When completed, this highway will provide a connection from the Alaska Highway near Watson Lake to tidewater at Stewart. Approximately 190 miles of this route follow one of the recommended A routes of two previous commission studies.

Development roads in the Yukon and Northwest Territories include those connecting the Alaska Highway with Ross River, Mayo and Dawson and the Mackenzie Highway to Great Slave Lake from Grimshaw, Alberta. The Dominion Government is planning additional pioneer roads to develop the territories, the latest of which is one from Watson Lake, 65 miles towards Ross River, thence 80 miles northeast to a tungsten mine across the border into Northwest Territories. 4/

1/ See Exhibit III, Federal-Aid Highway System, Section H
2/ See Exhibit IV, British Columbia Highway System, Section H
3/ See Exhibit V, Alberta Highway System, Section H
4/ See Exhibit VI, Territories Road Construction Plans, Section H

The Southeastern Alaska Ferry System. In 1961, the Alaska State Legislature authorized a bond issue of $23 million for the establishment of a Southeastern Alaska-Prince Rupert Marine Highway System with approach roads, which was approved by the voters of Alaska. The 1961 State Legislature established procedures and regulations for the issuance of the bonds and assigned responsibility for the establishment of the system to the Alaska State Department of Public Works. Up to $15 million is expected to be made available for the Southeastern Alaska -B.C. Ferry System.

The ferry system is designed to provide daily ferry service for passengers, passenger cars and trucks loaded with merchandise between Prince Rupert, British Columbia on the south to Haines and Skagway, Alaska on the north, with service to intermediate points, including Sitka on the Pacific Coast side of Baranof Island. There may be provision for handling containers and vans under plans now being studied by the Alaska State Highway Department. The major emphasis, however, is being placed on carrying passengers and passenger automobiles. Neither the Commission not Battelle made a separate study of the economic feasibility of such a system, nor the type of service that would best satisfy the demand.

The original ferry proposal was studied by W. C. Gilman and Company of New York City,[5] who made a report in 1958 to the Bureau of Public Roads in Alaska, at that time responsible for the construction and maintenance of the intra-Alaska highway system. This report was reviewed and endorsed in principle by Mr. Felix J. Toner of Juneau, Alaska,[6] a consulting engineer for the then Territory of Alaska, and the Southeastern Alaska Conference, an organization of Chambers of Commerce interested in transportation facilities for that area.

The Alaska State Highway Department and Alaska State officials have been studying various types of vessels and kinds of service which might be adequate for this operation. Under recent federal legislation, assistance would be available under the provisions of the Federal-Aid Highway Act for the construction of approach roads to ferry sites, but not for the operating facilities. It has not yet been determined whether the ferry system will be operated by the State of Alaska or under contract by a private concern. Discussions by state officials indicate that state highway funds, regularly utilized for maintenance of highways, may be made available to the marine highway system to augment operating revenues, if necessary. The estimated cost of three ferry boats, eight terminals and financing charges, totalled $16.5 million in 1959. 1961 estimates are for about $15 million.

British Columbia officials have indicated that the province would provide ferry slip facilities at Prince Rupert, the southern terminus of the system. Discussions by Canadians have indicated an interest in providing ferry service between Prince Rupert or Kitimat, B. C. and Port Hardy on Vancouver Island, to be connected to Victoria by extension of the primary highway. Such a facility would further shorten the distance between Seattle-Vancouver and Prince Rupert, the Yukon and Alaska.

The Southeastern Alaska Ferry System is considered by the Commission and recognized by Battelle as a vital part of the coordinated highway system recommended elsewhere in this report, to encourage the development of tourism in Northwest North America. Based on economic data in the Gilman and Toner reports,

5/ Report on Routing, Terminals, Vessels, Schedules, Rates, Traffic, Revenues, Operating Costs and Financial Feasibility of a Proposed Passenger and Vehicle Ferry for Southeast Alaska, W. C. Gilman and Company, September 4, 1958

6/ Proposed Ferry Service for Southeastern Alaska, Felix J. Toner, February 1959

the Commission recognizes the establishment of a marine highway connecting the port cities of British Columbia and Alaska as the most efficient and least expensive way to provide transportation for people and things to and from the coastal cities, whether or not the coordinated highway system is constructed.

A Coordinated Highway and Ferry System. The development and promotion of visitors to the area and substantial increases in benefits from tourists appear to provide the most immediate opportunity to improve economic conditions in the area. Forecasts made by Battelle for increased expenditures by visitors, number of workers resulting from this activity, increased total population and increased tax collections by various subdivisions of government are all predicated on an extended and improved highway and ferry system in Southeastern Alaska and northern British Columbia and on the establishment of additional and improved lodging and entertainment facilities to handle this increased tourist business.

The coordinated highway-ferry system consists of the improvement and hardsurfacing of the Alaska Highway and the construction of a new north-south artery connecting Hazelton, B. C., on Highway 16, with the Alaska Highway at Jakes Corner via the present unimproved road to Atlin. This is the so called "A route" which had been recommended by previous commissions, which would afford connections to feeder roads through Southeastern Alaska to Petersburg and Juneau, respectively. The feeder highways, with Canadian Highway 16 to the south at Prince Rupert and the connection to the Alaska Highway via the Haines Cut-off to the north, would all be connected by the Southeastern Alaska ferry system and, in turn, to the principal cities of Southeastern Alaska.

Approximately 87 percent of the highway system, if and when constructed, would be on Canadian soil. Since the Commission is unilateral, it is recognized that bilateral agreements would be required, not only to establish the most desirable system, but also to determine the basis of financing.

The coordinated highway program, linked with the Southeastern Alaska ferry plan, may be divided into the following sectors, without reference to priority. It should be noted that the benefits forecast by Battelle are based on the construction and improvement of the entire system. No attempt has been made to delineate benefits to be derived from the respective sectors.

The Hazelton-Atlin Highway. New construction of 266 miles of this total distance would follow Route 5, designated by Brown and Root, Inc., which would connect with and utilize 194 miles of the Stewart-Cassiar Project. This highway, now under construction by British Columbia with the assistance of the Canadian Dominion Government, is part of the "Roads to Resources Program" recently instituted by the Ottawa Government for the benefit of the Canadian Provinces. This project would include, in addition to new construction, upgrading the existing road between Atlin and Jakes Corner on the Alaska Highway, bridge replacements and line improvements on the Alaska Highway to the Alaska-Yukon border and hardsurfacing the entire distance of 897 miles.

Hardsurfaced highways are now available across Canada from the south and east to Prince George. By the time the Hazelton-Atlin Project would approach completion, the British Columbia Government would have scheduled the hardsurfacing of approximately 150 miles of gravel highway on Highway 16, between Prince George and Hazelton, as well as a short stretch between Hazelton and Prince Rupert. It is possible that Highway 16 will soon be constructed and hardsurfaced east of

Prince George to connect with other paved routes to eastern Canada and central United States through the Province of Alberta.

The completion of the Hazelton-Atlin link would reduce the distance from West Coast United States and southern British Columbia cities to the Yukon and Alaska by approximately 300 miles. It would provide a route parallel to the Pacific Coast, far enough inland to avoid the variegated coastline, but sufficiently close to connect to coastal cities in Southeastern Alaska. This highway is the link which has been studied and recommended by commissions since 1933. The highway would bisect a mineralized area, and would encourage exploration and make possible the development of these resources in areas now only accessible by air.

Estimated cost of 266 miles of new construction between Hazelton and the Stewart-Cassiar Highway and between the highway near Dease Lake and Atlin; upgrading 88 miles of unimproved roads between Dease Lake and Jakes Corner; bridge replacements and line improvements on 349 miles of the Alaska Highway from Jakes Corner to the Yukon-Alaska border, and asphalt-surface-treatment of the entire distance, is $88,128,800. This highway would connect the Alaska primary highway system, most of which is hardsurfaced, to two or more connections to the hardsurfaced road network of southern Canada and the forty-eight continental States.

The Southeastern Alaska-British Columbia Marine Highway. This vital link in the coordinated highway-ferry system has been discussed earlier in this section. It should be emphasized that the Commission recognizes the benefits of the establishment of such a ferry service, along the lines recommended by the economic consultants and being considered by the Alaska State Highway Department.

It should further be noted that the estimated cost of the ferry system and the necessary approach roads up to the maximum authorization of the bond issue of $23 million has not been included in the estimated cost of the coordinated highway system. The benefits, insofar as increased tourism is concerned, have been included in the cost-benefit ratio discussed in Section G. The Commission feels that this attitude is justified since the basis on which the ferry system was recommended to the State of Alaska is on a self-supporting basis, made possible by revenues collected from passengers and shippers.

The Haines Cut-off Highway. Residents of Alaska have urged winter maintenance of the Canadian portion of the Haines Cut-off for some time. The establishment of a Southeastern Alaska ferry system connecting Prince Rupert and the principal Southeastern Alaska cities certainly will provide sufficient traffic to warrant the year around maintenance of this northern connection to the Alaska Highway.

One of the principal difficulties in providing winter maintenance is that much of this highway is located in the trough of the passes over the mountains. Because of heavy snowfall, it has proven extremely costly to attempt to keep the highway clear of snow. The most logical elimination of this difficulty is the relocation of a section of the highway between Milepost 23.3 and 79.5 with a saving of 15.7 miles in distance.

Estimated cost of 40.5 miles of new construction of that portion of the highway to be relocated, upgrading 79.5 miles of the existing highway and asphalt-surface-treatment of 120 miles of new and improved highway from Milepost 23.3 to

Haines Junction on the Alaska Highway is $16,500,000. This would, in turn, connect with the hardsurfaced highway into the Yukon and Alaska on the north and to Whitehorse and British Columbian cities to the south.

A Petersburg Feeder Highway. One of the most important features of a feeder highway connecting the ferry system to the Hazelton-Atlin Route is that it would provide alternate routes and distances for visitors from the south. In addition, it would provide an overland outlet for residents of Southeastern Alaska for highway travel to either the north or to the south.

A route following the Stikine and Iskut Rivers to the interior affords moderate grades in relatively difficult terrain. In addition to providing a means of access and egress from the Panhandle of Alaska, it would provide a route directly to tidewater for mineral and timber products that may be produced in that part of British Columbia. Estimated cost of 96 miles of new construction and asphalt-surface-treatment from Popof Creek, the terminus of Mitkof Highway out of Petersburg as planned by Alaska, would be $23,784,900, of which $3,687,000 would be construction within Alaska.

A Juneau Feeder Highway. A highway connecting the capital of Alaska with North America's highway network would contribute importantly to encouragement and development of the tourist business from outside the area. It would provide an additional alternate route and distance for visitors from either the south or the north. It would provide an overland route for not only the residents of the capital city, but also for the numerous visitors and officials traveling there to and from the central and western parts of the state. In addition, it would provide a deep water port for minerals and timber that may be produced in British Columbia adjacent to Atlin and the lake country of northwestern British Columbia.

Estimated cost of 71 miles of new construction, including asphalt-surface-treatment on the Canadian side of the border, is $17,600,000. Commissioner Downing had previously estimated the cost of the Alaska portion, totalling 52 miles, and the establishment of a ferry across Taku Inlet at $20 million, making a total of $37,600,000, all of which has been included in the total estimated cost of the coordinated highway and ferry system.

The Alaska Highway. Realization of the full potential of highway transportation in Northwest North America requires that the Alaska Highway be improved and hardsurfaced. This conclusion is shared by both Battelle and the Commission and is based on the economic study which Battelle made to determine the economic benefits which would be provided by additional transportation facilities.

The Alaska Highway was located as a result of a military decision during World War II. Nevertheless, Canadian authorities have never expressed a doubt as to the advisability of continuing its maintenance. Canada is presently hardsurfacing the highway at the rate of approximately 50 miles annually.

Opinions have been expressed that if a hardsurfaced highway were provided from Hazelton into the Yukon and Alaska, Canada would soon complete Highway 16, connecting southern Alberta and the network to the south with the British Columbia network at Prince George. In this instance, Highway 16 would lead directly to Hazelton and thence northward over a route which would be shorter, more scenic and afford connections to coastal cities in Canada and Alaska.

Nevertheless, the Commission believes that hardsurfacing the Alaska Highway between the end of the existing paving at Milepost 82 and the hardsurfacing which is proposed northward from Jakes Corner at Milepost 872 would be justified, not only because of benefits resulting from increased tourist travel, but also because of other substantial benefits from the numerous feeder roads adjacent to the Alaska Highway in northeastern British Columbia and southern Yukon Territory. Many of the latter are private development roads constructed by commercial organizations to assist in exploration for minerals, oil and gas.

The Commission concludes that there is a serious need for a hardsurfaced connection east of the Rocky Mountain Range between the heavily populated areas of Canada, the forty-eight continental States and the Yukon and Alaska. Furthermore, a dust-free, rock-free modern highway in this area will provide an additional, alternate route and distance for travelers from the central portion of the North American Continent, and even for travelers from the Pacific Coast Area. Points of origin of all travelers of record up to 1959, utilizing all methods of transportation, are approximately half and half on either side of the Rocky Mountains. Vacationers traveling by automobile prefer to select alternate routes to and from a vacationland.

It is estimated that bridge replacements, minor relocations and line improvements and the asphalt-surface-treatment of 790 miles of the Alaska Highway from Milepost 82 to Milepost 872, at Jakes Corner, will cost $70,500,000.

3. RAILROADS IN THE NORTHWEST

The area is served directly by four United States and Canadian Railroads. The Alaska Railroad and the White Pass and Yukon Route are not connected with the U. S.-Canadian rail network, except by water carriers along the Pacific Coast.

The Alaska Railroad, government owned and operated by the Interior Department, extends for a mainline distance of 470 miles from Seward to Fairbanks, Alaska, plus a 12 mile mainline connection through 4 miles of tunnels to the military port of Whittier. Branch lines to coal fields and military bases total 58 miles. The right-of-way and equipment have been modernized since World War II so that the Alaska Railroad now compares favorably with other Class I railroads in the forty-eight continental states.

One of the primary goals of the ARR, as directed in the enabling Act, is to "aid in the development of the agricultural and mineral or other resources of Alaska, and the settlement of the public lands therein." The law does not require the payment of interest on investment, nor for repayment of capital investment. Since 1957, accounting practices have provided for depreciation of property and equipment, in addition to operation and maintenance costs. The total investment of funds from appropriations and surplus since 1912 is approximately $186,000,000 7/

Defense requirements have had a marked influence not only on the type of service and facilities which have been provided through the years, but also on the need for rehabilitation following World War II. For example, in addition to complete docking and transit shed facilities at the military port of Whittier,

7/ Total Appropriations to the ARR through FY 1960 ..... $167,284,972
Appropriations to Other Federal Agencies, Transferred 1,723,811
Value of Property Transferred from Other Agencies 17,012,699
Source: Department of Interior TOTALS $186,121,482

defense considerations influenced the complete rehabilitation of the mainline between Portage and Seward and construction of dock and transit shed facilities at Seward, all of which required an investment in excess of $8 million. During 1960, the U. S. Army, Alaska, deactivated the military port of Whittier as a peacetime installation and made it available for transfer to other agencies.

There is no question that the Alaska Railroad has succeeded in its major role of assisting in the development of the Territory, now the State of Alaska. A lion's share of the population and industrial development and the center of increased property values are adjacent to or served by the rail facility. In addition, railroad service made possible the location of four major military bases at Anchorage and Fairbanks and provided economical transportation of coal, which, up to the present, is the major source of fuel for the production of power in Central Alaska.

There is ample reason why freight rates may be considered high as compared to rates in the heavily populated areas of the forty-eight States. By U. S. and Canadian standards, the Alaska Railroad is a shortline, which precludes long haul economies. In addition, more than three-fourths of inbound through tonnage from Seward terminates in Anchorage, which results in an average freight haul of less than 130 miles. Weather conditions are severe, to which may be added high costs of materials and supplies to be shipped long distances from sources outside of Alaska. Labor rates are high. Competition from other modes of transport, principally the military pipeline, has reduced large volume tonnages which might reduce costs. Other than shipments of coal from Matanuska to Anchorage, shipments are predominately northbound, which require backhaul of empty cars and containers.

The Alaska Railroad, in conjunction with water carriers, has been a leader in containerization and piggy-back operations, which have resulted in lower costs and savings to shippers. At present, there is no roll-on, roll-off operation available by sea between ports in Alaska and Northwest United States, except two contract carriers serving the pulp mills at Ketchikan and Sitka, Alaska.

The White Pass and Yukon Route operates 110 miles of narrow guage rail service between Skagway, Alaska and Whitehorse, Yukon Territory, of which approximately 20 miles is on Alaskan soil. The company has been in operation since the turn of the century. In addition to rail, it operates busses and trucks north of Whitehorse to the Alaska border and southeast into northern British Columbia, an oil products pipeline from Skagway to Whitehorse and a steamship line from Skagway to Prince Rupert and Vancouver. Canadian goods are handled in bond through the U. S. port at Skagway.

The White Pass and Yukon Route handles about 85,000 tons northbound, consisting of merchandise and general supplies, and approximately 85,000 tons of ore concentrates and asbestos southbound to Canadian ports. In this respect, the facility has the advantage of a semi-balanced traffic load, which is reflected in its operating costs.

The company has been privately owned throughout its life, originally owned by British investors, but now largely by Canadian owners. It is reported to have paid its first common stock dividend in 1959. The company has discussed the need and advisability of providing a standard gauge track and equipment if rail-barge or train-ship service is established from the south and if tonnages would warrant.

Battelle has made a complete analysis of present tonnages and limited prospects for substantial increases from known mineral deposits in the area north and west of Whitehorse.

The Commission knows of no immediate plans for expansion or extension of rail facilities. The company is known to be progressive and states it would provide rail services farther to the north and west when conditions would warrant. Management states that present facilities could be geared to handle up to three times present volume with only minor capital expenditure, which could lower present freight rates.

The Pacific Great Eastern Railway is owned by the Government of British Columbia. It operates a mainline distance of approximately 700 miles from North Vancouver through central British Columbia to Dawson Creek and Fort St. John on the Alaska Highway, crossing the Canadian National mainline at Prince George. The northern extension beyond Prince George has been in operation since 1958.

The PGE differs from the government-owned Alaska Railroad in that bonds covering some of its investment draw interest payable to private bondholders. Published financial data indicates that the line is solvent and growing in volume. The northern extension is reported to be unusually successful for a newly established facility. However, despite an increase in traffic revenues from $9,653,000 in 1958 to $13,171,000 in 1960, the operating loss in 1960 was reported in the press to be $2,904,786.

Extensive oil and gas exploration programs in northern British Columbia, the discovery of huge reserves there and the establishment of the Taylor Oil Refinery and gas scrubbing plant at Fort St. John contribute high tonnage to the extension north of Prince George. In addition, during the first full calendar year of operation, the new line north of Prince George transported more than 1 million tons of forest products, not including logs, besides agricultural products, fertilizers and general supplies. Plans have been mentioned in the press for a possible extension of approximately 50 miles north to the Beatton River Area, primarily agricultural, and from that point to a connection with the Alberta Northern Railway at the B. C.-Alberta border.

The Alberta Northern Railway is owned jointly by the Canadian National and the Canadian Pacific Railways. It serves as a branch system throughout Alberta, supplementing the service of the two larger facilities. Two lines extend to the northwest, one connecting with the PGE at Dawson Creek, the other to Grimshaw and Hines Creek.

A Royal Commission considered two routes for a northern extension of the NAR to Pine Point, on the south shore of Great Slave Lake, to exploit sizable zinc and lead deposits. The western route, which was selected by the Royal Commission, would connect with the NAR at Grimshaw. It is assumed that these mineral shipments, estimated to be 240,000 tons annually, would provide the basic tonnage for making such a line economically feasible and allow the facility to assist in the development of timber, agricultural and other resources adjacent to the right-of-way.

The Pacific Northern Railway (PNR), incorporated by Canadian and British interests in 1960, would, when completed, extend 697 miles northwest through British Columbia from Summit Lake, approximately 32 miles north of Prince George, to the Yukon-B. C. border southeast of Whitehorse, Yukon Territory. A location survey and cost estimate was performed by Colonel Sidney Bingham (Retired), a New York engineer, for the Wenner-Gren British Columbia Development Company of Vancouver. The company has been under contract with the Government of British Columbia to develop the natural and industrial resources of the province and to begin construction of a railroad to the north. A token start on construction of marshalling yards at Summit Lake was made during June 1960, in accordance with provisions of the agreement. Specifications call for construction of a relatively high capacity railroad which, at $360,000 per mile, would cost $250,990,000.

The company has applied for a license from the British Columbia Government for the portion of the rail facility within the province. The route selected would cross sizeable forest reserves in the Takla Lake Area, would bisect the Groundhog coal fields in central British Columbia, would cross the Stikine River south of Dease Lake and generally traverse a mineralized area not now served by any mode of transportation.

The company has also applied for a license from the federal government in Ottawa to construct and operate the PNR through the Yukon Territory, a distance of 80 miles to Whitehorse, thence north through Carmacks and Fort Selkirk to the Alaska border, a distance of approximately 380 miles. The total distance within Canada from Summit Lake to the Alaska border would be approximately 1,159 miles.

The Commission assumes that the company considers the PNR rail project economically feasible, based on revenues from traffic originating in the area to be served, without benefit of revenues from through traffic to and from Alaska. However, as in the case of other intra-state and intra-provincial projects, neither Battelle nor the Commission made separate economic studies of the Pacific Northern Railway.

The Canadian National Railway, wholly owned by the Canadian Government, skirts the southern edge of the area under study from Prince Rupert through Prince George to the east and south. Since it does not traverse the area under study, its contribution to the area has not been determined. However, there is the possibility that the Canadian Government might consider an extension of its system from Hazelton, through British Columbia and the Yukon to connect with the Alaska Railroad at the Yukon border.

The Canadian Pacific Railway, further south, is entirely outside of the area under study.

An Alaska-Continental Rail Network, studied by the Commission, would be created by a 298 mile extension of the Alaska Railroad from Rex to the Yukon border, following the route surveyed by the U. S. Army Corps of Engineers in 1942. At that point, it would connect with the proposed Pacific Northern Railway or any other Canadian rail facility which may extend north from the Canadian rail network.

It is assumed that the extension would be a part of the Alaska Railroad, thus affording substantial economies in management, maintenance and accounting since these functions could be performed by existing departments. Although additional revenues would be required to defray operating costs of the extended rail line,

including depreciation on depreciable items, appropriated funds to cover construction costs would be recovered by the government through appreciation of public domain, through the creation of tax producing income and increases in values of lands and industrial properties served by the enlarged rail system.

The Commission has considered prospects for existing rather than future freight traffic to produce revenues required to offset additional operating costs. Anticipated revenues are limited to those produced by a portion of existing northbound traffic to Alaska on commodities which could originate in the eastern United States. Additional tonnages and revenues which would be generated by the railroad, including southbound traffic, have not been considered in computing the cost/benefit ratio of the proposed rail extension.

The plan to extend the Alaska Railroad to the Yukon to connect with the Canadian rail network was presented to the Commission by Mr. D. J. Smith, General Manager of the Alaska Railroad. 8/ The Commission also received a report from Mr. William B. Saunders, a transport consultant of Washington, D. C., employed by the Commission to make an appraisal of the transport assumptions, conclusions and recommendations contained in the Battelle and Smith plans. 9/ A discussion of the Alaska-Continental Network follows.

a. Analysis of Northbound Freight to Alaska. Freight tonnages entering the Alaska Rail Belt, including petroleum moving by military or privately-owned tanker ships, but not including petroleum off loaded at Haines for transmission in the military pipeline, are reported by the ARR for the year 1960 as follows:

Alaska Railroad Through Moves to Seward (Including 70,147 tons of commercial gasoline)	544,389 tons
At Valdez for Truck Movement	45,000 tons
At Anchorage	85,000 tons
By Highway and Other Means	50,000 tons
TOTAL ENTERING ALASKA RAIL BELT	724,389 tons

The total freight tonnages handled by the Railroad in FY 1960, including local hauls, was 1,248,000 tons, of which almost 45 percent was military freight moving under government bill of lading. A portion of the remainder was probably military-generated traffic, but was billed as civilain cargo by contractors and others for the account of the Government. This volume of freight produced a total revenue of $11,804,358. Because more than three-fourths of the northbound tonnage is destined for the Anchorage area, the average freight haul in 1960 was only 128 miles.

Until receipt of the plan to extend the Alaska Railroad, it was assumed that the Alaska Railroad would guard jealously existing tonnages inbound to the Rail Belt at Seward, Whittier and Anchorage for trans-shipment to the north. However, the Smith plan introduced the possibility that approximately one-fifth, or 150,000 tons of inbound cargo to the Rail Belt, might originate in the eastern continental United States and thence be entitled to the trans-continental freight rate to Pacific Coast ports. If an all-rail facility from eastern United States to the Alaska Railroad at Rex were established, such an operation would make possible certain economies resulting from southbound tonnages and the Alaska Railroad would be

8/ Trans Canada - Alaska Railroad, D. J. Smith, Statement to the Commission, April 14, 1961, Exhibit IX, Section H.

9/ An Appraisal of Studies on Transportation Requirements for Northwest North America, W. B. Saunders and Company, May 1961, Exhibit X, Section H.

entitled to a greater share of the transport dollar expended for shipments to Alaska.

The Canadian National Railway has been studying commodities destined for Alaska which could be considered as originating in the transcontinental rate zone. A portion of the study report was made available to the Alaska Railroad. It includes a list of commodities totalling approximately 150,000 tons annually, which have been received in Alaska and are of such a nature that they might well originate in this eastern zone. It has been estimated that water transportation on this 150,000 tons of commodities has produced total revenues, including Seattle terminal charges, of $6,750,000. For purposes of studying the economic feasibility of providing rail facilities to Alaska, it has been assumed that rail costs could not exceed the total trans-continental rail and water freight costs now being paid on this existing tonnage.

Mr. Smith presented the concept that trans-continental freight rates might be applicable to all-rail shipments to Alaska, thereby delivering commodities to a "rate point A" on the proposed PNR the same distance north of Prince George as the shipment would travel west if it were consigned to Prince Rupert. His reasoning is that a divisional agreement among the railroads involved would give the lines south and east of point "A" no more than their present trans-continental rate. In theory, this would allow allocation of the $6,750,000 now paid for water shipment to be utilized for payment of rail divisions from mythical rate point A to Rex, a distance of 988 miles.[10/] This revenue would average about 4.6 cents per ton-mile.

In his analysis of the Smith plan, Mr. Saunders agrees with the assumption that 150,000 tons of existing annual northbound freight could move economically over an all-rail route to Alaska. He believes that additional revenues from this volume of freight would offset most of the additional operating expense of the new line but might incur an operating deficit of about a half million dollars annually. He believes it unwise to assume that water transportation costs are less than those by rail.

He arrives at these conclusions by four separate analyses. First, he estimates the cost of operating a limited train service on the extended Alaska Railroad. Second, he analyzes present through transportation charges, reducing them to provide an incentive for shippers to divert to all-rail. Third, he calculates typical divisions of such all-rail rates by usual procedures and thus estimates possible revenues to the Alaska Railroad. Fourth, he compares various U. S. railroad costs and present water costs to show that water transport is not automatically low cost because of seasonal and other factors. Details are in Exhibit X.

b. Operating Costs of the Proposed Alaska Railroad. Based on the assumption that the extension of the Alaska Railroad would be operated by the existing organization, Mr. Smith gives a complete analysis of additional costs involved in operating 298 miles of mainline, to be offset by additional revenues available as a share of through rates. He points out that this method of operation would not require duplication of services such as management, maintenance and accounting because adequate capacity currently exists to absorb these functions into the present organization. The opposite would be true if this extension were operated as a separate entity.

10/ Saunders' report estimates this distance as 1,019 miles. See Exhibit X, Page 21, Section H.

The same reasoning would apply to the Canadian portion of a rail link to the north. On the assumption that the economic feasibility of the PNR is based on traffic originating within the area to be served, the addition of through traffic to and from Alaska would entail only slightly increased direct operating costs, but would not otherwise increase overhead expenses. It would, however, provide substantial additional freight revenues.

c. Benefits of All-Rail Facilities to Alaska. Transportation costs on merchandise delivered to Fairbanks, Alaska are proportionately higher than those to Anchorage because water-rail routings on substantial proportions of such shipments are through Seward and Anchorage. Similar rates are charged by truck lines utilizing the Alaska Highway, despite the shorter distance to Fairbanks. This condition precludes the establishment of warehousing and distribution facilities in Fairbanks for the Central Alaska Area.

On the assumption that rail facilities could deliver merchandise for the same transportation cost to Rex as is now charged to Seward, Fairbanks would only be 85 miles from the junction, while Anchorage would be approximately 275 miles. It is therefore assumed that rates to Fairbanks would be equalized with those to Anchorage, which would effect a substantial reduction to residents of the Fairbanks Area.

If the assumption is correct that revenues from a portion of existing northbound traffic to Alaska could support rail facilities across Canada, it must also be assumed that these revenues would be lost by existing carriers in the Alaska trade. However, circumstances under which rail facilities may be extended are such that losses in volume and revenue by existing carriers need not necessarily occur. All economic studies indicate substantial increases in population in the north and traffic to Northwest North America will continue to grow and expand. Furthermore, since the establishment of rail facilities probably requires a bilateral agreement with Canada, Congressional consideration, negotiation with the Government of Canada, passage of legislation and construction of necessary facilities, it may require as much as ten years. The Commission is convinced that facilities for all-rail freight shipment between the continental network and the Alaska Railroad would provide substantial benefits to the economy of Northwest North America.

The rail links under discussion would have obvious defense benefits, providing alternate overland routes to Alaska in case of national emergency and probable disruption of Pacific sea traffic by submarine attack; the Alaska Highway would be the only surface link connecting the forty-ninth state with sources of supply, both civilian and military. Rail facilities which have been proven to be the most reliable type of transportation under military conditions, would provide military as well as civilian support for the first non-contiguous state in the Union.

While the Secretary of Defense states that existing transportation facilities are adequate to support foreseeable military requirements, it is conceded that additional rail and highway facilities are desirable, not only from an economic but a military standpoint. The Secretary's letter states that the recommended rail link would offer an additional land line of communication to tidewater Alaska supplementing existing routes.

d. Use of Public Funds for Rail Construction. Major economic values created by good transportation accrue to the owners of the land along the right-of-way and to the owners of industrial properties which are located there because of the

existence of the facility. This is applicable equally to railroads and highways. The Commission believes that it is illogical to require payment of interest and amortization of the capital investment of a rail facility in a pioneer country unless the same requirement is made of an investment in public highways. Admitedly, it is difficult to estimate increases in values of lands and industrial properties which would create a tax base of direct benefit to local and national governments. This difficulty, however, should not preclude recognition of these values, which in the case of government-owned railroads accrue to all the people.

4. AIRWAYS

Air transportation is of unique importance to Alaska and Northwestern Canada. This is due to several factors. Among these are the great distances between traffic points, the lack of adequate surface facilities and weather conditions which hamper convenient surface transport access for long periods during the winter months.

The unique ability of aviation to contribute to the transport requirements of the area has resulted in a relatively high degree of activity for that form of transport. There are eight scheduled airlines operating within the State of Alaska. These are: Alaska Airlines, Alaska Coastal Airlines, Cordova Airlines, Ellis Airlines, Northern Consolidated Airlines, Pacific Northern Airlines, Reeve Aleutian Airways and Wien Alaska Airlines. In addition, international service to Alaska is provided by two U. S.-flag international airlines, Pan American World Airways and Northwest Orient Airlines, and by Canadian Pacific Airlines (temporarily suspended), Air France/Japan Air Lines and Scandinavian Airlines System. Northwestern Canada is served by Canadian Pacific Airlines and Pacific Western Airlines.

The eight airlines serving Alaska have a fleet of about 49 aircraft. The fleet consists primarily of small aircraft, relatively outdated by mainland standards. The 49 aircraft are distributed as follows by type: C46 - 8; DC6 - 3; DC4 - 4; DC3 - 8; F27 - 5; L749 and 049 - 6; G21A - 15. [11] The specialized nature of air transport service in Alaska is indicated by the fact that nearly one-third (15) of the domestic aircraft are the Grumman (Goose) 21A amphibian type.

Although air transport activity is widely spread throughout Alaska, a few cities account for the major share of such activity. For example, in the 12 months ending June 30, 1960, Anchorage, Fairbanks, Juneau and Ketchikan accounted for 68.9 percent of all passenger traffic, 62.8 percent of all air mail and 69.5 percent of all cargo moved by scheduled carriers in the state. [12]

U. S. certificated airlines based in and operating in Alaska accounted for 42.2 million ton-miles of traffic in 1959, a 28 percent gain over the previous year. Passengers carried totaled 347,000, a new record. Passenger-miles totaled 183 million, also a new record. Freight traffic by Alaskan based carriers totaled nearly 7.5 million ton-miles (7,486,000).

In the year ending June 30, 1960, certificated U. S. and foreign aircraft carried 367,785 passengers from Alaskan airports. These aircraft also accounted for 10,629 tons of air mail and 10,887 tons of air cargo. Passenger traffic on these aircraft exceeded the domestic flight traffic of some 20 of the south forty-eight states and their cargo carriage exceeded that of 37 of the south forty-eight States. [13]

[11] Data as of December 31, 1960, from FAA
[12] FAA data
[13] FAA data

The particular importance of air freight cargo in Alaskan air transport is shown by the fact that revenue from such operations account for much higher percentages of total income than do such revenues for carriers in the south forty-eight states. For example, in 1959, freight and express revenues accounted for 8.4 percent of all domestic Alaskan airlines revenue but only 4.7 percent of total revenue received by the domestic trunk airlines in the south forty-eight states. This sharp variation is a significant indicator of the role which air transport plays in meeting present surface transport deficiencies in Alaska.

Northwestern Canada and Alaska are dotted with airfields receiving scheduled service. Facilities range from such modern airports as Anchorage and Fairbanks which can accomodate the most modern jets, down to grass covered strips capable of taking only the smallest commercial type aircraft. Service at the smaller airfields is seasonal and infrequent but it often provides the only feasible connection with the remainder of the area or to the "outside".

Although there are numerous airports in northwestern Canada, Alaska is especially well supplied with airports. There are 256 public-owned airports and 156 airports receiving scheduled service, more than in any other state. 14/ Although most of these airports receive service from one airline (138 out of the total of 156) many receive service from several airlines. Anchorage is served by six scheduled airlines, Fairbanks by four, Juneau by four and Ketchikan (including Annette Island) by six scheduled airlines.

There is considerable planning for expansion of air transport in Alaska. This is clearly demonstrated by the attention which airport expansion and improvement programs have received in the state. At the end of 1960 there were 117 such airport projects planned. This exceeds by far the total for any other state. The 117 projects planned are estimated to cost about $27,594,000. Although the bulk of the funds to be expended will probably be devoted to expansion and improvements at major airports, a review of the program shows that air transportation throughout the state will benefit by the broad program envisioned. Several new airports are planned and minimum facilities at some minor airports are scheduled to be improved.

14/ As of June 30, 1960; FAA data.

SECTION G

COST/BENEFIT ASPECTS OF AREA TRANSPORT DEVELOPMENT

It is customary to compute the cost/benefit ratios of proposed federally-financed works such as irrigation and power generating projects by comparing estimated returns on such investments, from user fees and other revenues, with the cost of such works. Because of the difficulty of measuring indirect and intangible benefits to the public, however, this practice has not been followed in determining the economic feasibility of public highways. This problem of estimating cost/benefit ratios in the north is magnified by extremely small and scattered population, long distances from sources of supplies for both labor and materials and higher costs of facilities in remote areas. Furthermore, indirect benefits, such as taxes generated from increased values of lands and industrial properties in isolated areas are difficult to evaluate in a meaningful manner in determining economic feasibility.

Despite these problems, Battelle deemed it necessary to establish the most meaningful cost/benefit criteria possible on the basis of available data. Battelle concluded that it would be feasible to use national averages of tax collections by various government subdivisions, based on additional expenditures by travelers from outside the area, and payrolls and other wealth created by this increased traffic, as their basis for cost/benefit determinations. Battelle found that taxes levied by state and local governments in the United States averaged about 6.5 percent of Gross National Product and those levied by local and provincial governments in Canada averaged about 6 percent of GNP. The percent of federal tax on Gross National Product averaged 14 percent in Canada and 15½ percent in the United States. These averages were used to determine taxes which would be collected by local, state, provincial and federal governments from expenditures forecast to be spent annually by 1980 by increased numbers of travelers from outside the area. The Commission endorses this assumption.

1. BENEFITS FROM HIGHWAY TRAVELERS

When Battelle forecast the taxes to be generated by increased expenditures of travelers to the area, it was realized that these taxes must support not only those directly concerned with transport but also other functions of government at the local, state or provincial and national level. It would be illogical if all of these taxes were used to defray the cost of only the transport function, a small part of the total responsibility of government. Therefore, Battelle estimated these benefits from expenditures of expected travelers to the area, but only from those travelers utilizing highway facilities into and through the area under study. No tax benefits were computed from increased values of public lands or industrial properties, nor from increased production of resource based industries.

Table G-I, G-6, entitled "Cost/Benefit Comparison by Political Sub-Divisions" outlines the Battelle approach. It analyzes the costs and benefits of the coordinated highway system in both Canada and Alaska. The table shows the annual costs of the highway system within each subdivision, assuming that the investment would be amortized over twenty years and the unamortized balance would carry annual interest of 5 percent. The table also shows the number of miles of highway which

would require maintenance, in addition to those in being in 1960 and the Stewart-Cassiar Highway now under construction. The cost of this additional maintenance, based on $2,500 per mile per year, is suggested as a suitable average in the engineering study made for Battelle by Brown and Root. The Commission thinks it is especially significant that these additional maintenance costs are more than offset by additional gasoline taxes forecast to be collected from travelers using the highway facilities listed in Line 10. Line 6 of the table lists total annual costs of these new and improved highways during the next twenty years.

The lower portion of Table I illustrates the various benefits to the area based on taxes to be collected on travelers' expenditures. It lists the additional expenditures by all visitors to the area annually by 1980 as forecast in the Battelle report. It also shows total annual expenditures by all highway travelers by the year 1980, as the Battelle report does not include a forecast of expenditures by additional highway travelers.

Since annual expenditures by travelers would be a part of the area's increased Gross National Product, and assuming that national tax averages, as previously listed, are generally applicable to the area, Line 9 lists tax benefits to be derived by each political subdivision. In the case of British Columbia and the Yukon, 60 percent of expected tourist expenditures determines the tax which would be collected by municipal and provincial governments. In addition to local and provincial taxes, 14 percent of total expenditures, representing federal tax collections, are added, the total representing all taxes to be collected by all subdivisions from this new tax base annually by 1980. The same procedure is followed in the case of Alaska, except that a tax rate of 6.5 percent is used for local and state governments, with 15½ percent being used for the federal share. Line 10 lists estimated gasoline taxes, which are deducted from total annual taxes generated by highway travelers and provides funds for maintenance of additional highways recommended in this report.

In summary, net tax benefits, Line 11, compared with annual highway costs, Line 3, provides a practicable cost/benefit ratio. This compares the total annual cost of capital investment in the coordinated highway system with the annual tax benefits to governmental subdivisions from expenditures of highway travelers utilizing those facilities. In the Canadian area, the net annual tax revenue is almost 1½ times the annual highway costs by the end of the twenty year period, while, in the case of the United States, the annual tax is almost 14 times the cost. The widely divergent return on investment is primarily due to the physical location of the various highway projects concerned, since approximately 87 percent of route miles are on Canadian soil. The annual tax in both countries is $55.1 million 1/ compared to annual costs of $20.6 million, a ratio of more than 2½ to 1.

2. BENEFITS FROM INDUSTRIAL DEVELOPMENT

As previously noted, only that portion of expenditures by visitors using highway transportation has been utilized in this cost/benefit comparison. In addition, Battelle has forecast a sizeable increase in value of production of natural resources and from resource based industries during the next twenty years. This increased industrial activity would produce products valued at many millions of dollars and in the process would provide employment for a large number of new workers earning additional payrolls, resulting in extensive area development of facilities required to support a sizeable increase in population (see Page D-5).

1/ Additional annual expenditures by highway travelers not available. $55.1 million should be reduced by $7 million, estimated 1960 tax collections, to determine additional tax to be collected by 1980

Table G-II, Page G 7, illustrates the increase in value of resources and products resulting from industrial activity in the respective government subdivisions under study. It is especially significant that Table G-II demonstrates that tax benefits from industrial development exceeds by a considerable margin those which have been allocated specifically to the coordinated highway program. For example, British Columbia is forecast to collect additional tax revenues of some $38 million annually by 1980, as compared to less that $3 million revenue allocated to the highway project. The Canadian area as a whole is forecast to collect some $132 million annually in new taxes, both local and national, over and above the $24.6 million resulting from expenditures by travelers.

In the case of Alaska, the increase in new taxes from resource development is $24 million, compared to $8.4 million from highway travelers, a ratio of almost three to one. Total national and local tax revenues, due to increased industrial activity, are estimated at over $80 million, about three times the taxes collected from highway development benefits alone. If the two areas of Canada and Alaska are considered together, increased tax collections annually by 1980 would total over $214 million, in addition to the $55 million of taxes credited to benefits resulting from 720,000 new travelers to the area annually by 1980, utilizing the coordinated highway network.

The Commission has adopted a broad concept of benefits to be derived from rail facilities which would connect the Alaska Railroad with the Canadian-United States rail networks. Increased tangible and intangible values of real estate and industrial properties adjacent to or served by these facilities would be recognized. These values may justify investment of public funds despite the fact that the magnitude of these indirect benefits are difficult to forecast precisely during the twenty years considered in this report.

Battelle has been careful to point out that most of the best known deposits of minerals and metals and almost all the heavy stands of timber in Alaska re located relatively close to tidewater and, therefore, would not generate significant requirements for inter-regional or international highways or railroads. This situation on timber products is not equally applicable to Canada. Recent production from interior forests in British Columbia has outstripped those of the coastal forests for the first time in history.

The Commission assumes that the Pacific Northern Railway (PNR) has been determined by Canadian interests to be economically feasible. The PNR would traverse heavily timbered areas in northern British Columbia. These timber stands have not been harvested due to lack of adequate transportation. Timber products would probably provide the major tonnages and a large part of the freight revenues upon which the new line would be dependent until other industry develops. Battelle has forecast that pulp and lumber production in the northern half of British Columbia and the northwestern portion of Alberta will increase by $186 million annually by 1980. Provincial and national taxes generated by these products would reach $37 million annually by that year.

The Commission notes that a significant portion of existing freight traffic to Alaska could orignate in the eastern half of the forty-eight states and might ultimately be transported by an all-rail carrier to the Alaska market at a cost equal to or less than by water carriers. It is estimated that freight revenues from this northbound through tonnage would pay almost all additional operating costs on the Alaska Railroad extension to join the Canadian network. Estimated

additional operating costs of the ARR extension to the Yukon have not included interest charges on appropriated funds for construction, estimated at $89.4 million. If the government should require payment of interest at, say, 3½ percent annually, increased revenues of $3,129,000 would be required. The Commission is convinced that benefits to federal and state governments from increased taxes on higher values of public lands and industrial properties served by the extended rail system would more than offset this additional cost. Through revenues on freight to Alaska would also improve substantially the income of the Canadian rail link across British Columbia and, like the Alaska Railroad extension, would probably offset most, if not all, additional operating costs of a rail connection with the ARR across the Yukon Territory. All these benefits stem from existing tonnages that could be diverted to an all-rail route to Alaska, provided equable division of through rates is possible. From areas along the way, additional revenues would probably be available as soon as this line is operational. For example, Battelle foresees annual mineral production in the Yukon by 1980 as follows:

Keno Hill Mines -	Lead-Zinc and Silver	100,000 tons
Vangorda Creek -	" " "	100,000 tons
Tinta Mountain -	" " "	25,000 tons
Clinton Creek -	Asbestos	50,000 tons
Other Areas -	Miscellaneous Products	25,000 tons
	TOTAL	300,000 tons

Tonnages would average about 70 percent southbound, with about 30 percent being northbound supplies and equipment. No estimate of southbound tonnages from the Fairbanks area and the Alaska Rail Belt has been included, nor have local requirements for food, supplies and equipment been considered, except in the mine locations listed by Battelle.

3. SUMMARY

a. Substantial benefits would accrue to both countries from a thorough review of the conditions affecting coordinated water, rail and highway transportation in the North Pacific Area, by representatives of the Governments of the United States and Canada.

b. The cost of the coordinated highway system would be repaid to local, state, provincial and federal governments at the rate of about $48 million annually by 1980, a cost/benefit ratio of about 2½ to 1.[2/] Additional maintenance costs of 583 miles of new and improved highways would return $3.9 million in additional gasoline taxes, a cost/benefit ratio of 2.76 to 1.

c. Taxes totaling $208 million annually by 1980 from increased production of natural resources valued at $1.034 billion would be possible if the area were served by adequate transportation facilities.

d. The 298 mile extension of the public-owned Alaska Railroad to the Yukon border to connect with a Canadian rail link would earn sufficient revenues from commodities transported by all-rail carriers from eastern United States to pay substantially all operating costs and is considered economically feasible. Benefits to the federal and state governments from increased taxes on higher values of lands and industrial properties adjacent to the extended rail system would more than offset initial operating deficits.

[2/] Table G-I, Line 11, less $7 million estimated tax collected in 1960.

e. A Canadian financed rail link in British Columbia would gain additional freight revenues from through freight to Alaska which would more than offset additional construction and operating expenses.

f. An extension of the Canadian network to Alaska to connect with the Alaska Railroad extension in the Yukon would provide sufficient revenues to offset initial operating costs. In addition, the Canadian Government would benefit from taxes generated by increased values of lands and industrial properties adjacent to the new railway.

g. Benefits which may be derived from (1) more adequate rail facilities, (2) savings in freight costs, (3) reduced inventories due to faster deliveries, (4) elimination of warehousing and transfer costs, and (5) more economic means of transporting bulk commodities to market would accrue to residents of Canada and Alaska adjacent to the proposed rail connections through British Columbia and the Yukon, and equally to those areas served by the Alaska Railroad, the Pacific Great Eastern and Canadian National Railways. It seems reasonable to assume that a portion of the benefits of industrial development during the next twenty years could be attributed to proposed rail facilities between Alaska and the forty-eight continental United States.

TABLE G-I

Source: Battelle Report March 15, 1961

ALASKA INTERNATIONAL RAIL AND HIGHWAY COMMISSION

May 1961
$ in millions

COST-BENEFIT COMPARISON BY POLITICAL SUBDIVISIONS - COORDINATED HIGHWAY SYSTEM
BENEFITS FROM TAXES GENERATED BY INCREASED EXPENDITURES

Line	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
1	Items Costs Estimated by Battelle	British Columbia	Yukon Territory	Total Canada	Alaska	U. S. Federal	Total U. S.	Grand Total	Sources of Data
2	Costs of Coordinated Highway System	$152.9	$ 59.2	$212.1	$ 27.2	--	$ 27.2	$239.3	Brown and Root
3	Annual Costs - Amortization & Interest @ 5%	12.2	4.8	17.0	2.2	--	2.2	19.2	Battelle IX-2 and Computed
4	Additional Miles of New Highways to be Maintained	458m	60m	518m	65m	--	65m	583m	Battelle IX-9 & Brown & Root
5	Additional Annual Maintenance Cost @ $2,500 per Mile	1.15	.15	1.3	0.16	--	0.16	1.46	Miles x $2,500 per Mile
6	Total Annual Costs, New and Additional Highways	13.35	4.95	18.3	2.36	--	2.36	20.6	Line 3 plus Line 5
	Benefits Estimated by Battelle								
7	Additional Annual Expenditures by All Travelers - 1980	99.0	51.0 7/	155.0	223.0	--	223.0	379.0	Battelle I-13
8	Total 8/ Annual Expenditures by Highway Travelers	72.2	37.6 7/	131.6 1/	146.2	--	146.2	277.8	Battelle IX-3 & 4 & Computed
9	Total 8/ Tax on Highway Traveler's Expenditures	4.3 2/	3.6 2/	26.5 3/	9.5 4/	23.0 5/	32.5 6/	59.0	Battelle IX-8 & I-21
10	Less Increased Gas Tax Collections from Highway Travelers	1.5	0.4	1.9	1.1	0.9	2.0	3.9	Battelle IX-9
11	Net Tax Benefits 8/	2.8	3.2	24.6	8.4	22.1	30.5	55.1	Computed

G-6

Footnotes

1/ Includes Alberta

2/ National average tax collections at local and province levels in Canada is 6% of Gross National Product (Expenditures)

3/ Average tax collections by Federal Government is 14% of GNP, plus local collections in 2/ above.

4/ National average tax collections at local and state levels in the U. S. is 6.5% of GNP. (Alaska percentages not available)

5/ Average tax collection by U. S. Federal Government is 15½% of GNP.

6/ Local and Federal tax total

7/ Includes Northwest Territories

8/ Additional annual expenditures by highway travelers not available. 1960 tax revenues estimated by Battelle (P. IX-8) at $7 million, which has not been deducted from these figures.

TABLE G-II

ALASKA INTERNATIONAL RAIL AND HIGHWAY COMMISSION

May 1961
$ in millions

INCREASE IN VALUE, GROSS NATIONAL PRODUCT RESOURCES AND RESOURCE BASED INDUSTRIES

Source: Battelle Report March 15, 1961

Line	Items	B. C. & Alberta	Yukon & NW Terr.	Total Canada	Alaska	U. S. Federal	Total U. S.	Grand Total
1	**Increases in Production by 1980**							
2	Metals and Minerals	$ 91.0	$ 22.0	$113.0	$ 67.0	same	same	$180.0
3	Coal	--	--	--	10.0	"	"	10.0
4	Oil	252.0	--	252.0	60.0		"	312.0
5	Gas	83.0	--	83.0	15.0	"	"	98.0
6	Pulp	144.0	--	144.0	90.0	"	"	234.0
7	Lumber	42.6	--	42.6	6.6	"		49.2
8	Fish	8.0	--	8.0	14.0	"	"	22.0
9	Agriculture	20.0	--	20.0	35.0	"	"	55.0
10	Miscellaneous	--	--	--	75.0	"	"	75.0
11	TOTAL INCREASE IN GNP	$640.6	$ 22.0	$662.6	$372.6	$372.0	$372.0	$1035.2
12	Total Additional Tax Based on **Increased Values** by 1980	$ 38.4 1/	1.3 1/	132.4 2/	24.2 3/	57.6 4/	81.8 5/	214.6

Footnotes

1/
2/ National average tax collections at local and province levels in Canada is 6% of Gross National Product (GNP). Average tax collections by the Canadian Federal Government in Canada is 14% of GNP, to which has been added tax collections in 1/ above.
3/ National average tax collections at local and state levels in the U. S. is 6.5% of GNP.
4/ Average tax collection by the U. S. Federal Government is 15½% of GNP.
5/ Local, state and federal tax collections.

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

TERRITORIAL ROAD CONSTRUCTION

1961

Scale of Miles

50 0 100 200

LEGEND

Existing Roads

Roads under Construction

Roads Under Reconstruction

Possible Additional Roads

EXHIBIT VI

REPORT TO THE CONGRESS

Public Law 884-84th

May 15, 1961

ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION — WASHINGTON

ARCTIC OCEAN

BEAUFORT SEA

BANKS ISLAND

ALASKA

YUKON TERRITORY

NORTHWEST TERRITORIES

BRITISH COLUMBIA

ALBERTA

SASK

PACIFIC OCEAN

TUKTOYAKTUK

INUVIK

Anderson River

Richardson Mts.

Porcupine River

YUKON River

EAGLE PLAIN

FORT MACPHERSON

MACKENZIE River

Arctic Red River

Peel River

CANOL

FORT NORMAN

GREAT BEAR LAKE

PORT RADIUM

Bear River

MacKay L.

Snare R.

Yellowknife R.

FORT RELIANCE

Lac la Martre

RAE

YELLOWKNIFE

HWY

Clinton Cr.

DAWSON

Klondike R.

Flat Cr.

KENO HILL

MAYO

Stewart River

STEWART RIVER

YUKON

Macmillan River

Keele River

CARMACKS

AISHIHIK

Pelly R.

ROSS RIVER

South Nahanni River

Flat R.

FORT SIMPSON

FORT PROVIDENCE

FERRY

GREAT SLAVE LAKE

GREAT SLAVE HWY

HAY RIVER

PINE POINT

BELL ROCK

FORT SMITH

FORT FITZGERALD

ENTERPRISE

WOOD BUFFALO PARK

PEACE POINT

Lake Athabasca

ALASKA HIGHWAY

Teslin R.

WHITEHORSE

WATSON LAKE

FORT LIARD

Liard River

SKAGWAY

HIGHWAY

FORT NELSON

UPPER HAY RIVER

MACKENZIE

FORT VERMILION

Athabasca R.

McMURRAY

JUNEAU

Stikine River

U.S.A. CANADA

60°

65°

140° 130° 120° 110°

WATER RESOURCES BRANCH

2-2261E

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NORTHWEST TERRITORIES

BRITISH COLUMBIA

SASKATCHEWAN

U. S. A.

PROPOSED RAILWAY

PROPOSED RAILWAY

SLAVE RIVER

LAKE ATHABASCA

PEACE RIVER

PEACE RIVER

GRIMSHAW

PEACE RIVER

DAWSON CREEK

RYCROFT

DONNELLY

RIVER

TRIANGLE

LESSER SLAVE LAKE

GRANDE PRAIRIE

SMOKY

VALLEYVIEW

SMITH

SWAN HILLS

RIVER

ATHABASCA

LAC LA BICHE

COLD LAKE

MC MURRAY

RIVER

ATHABASCA

WHITECOURT

ATHABASCA

RIVER

SASKATCHEWAN

RIVER

NORTH

ST. PAUL

EDSON

ATHABASCA

HINTON

EDMONTON

VEGREVILLE

VERMILION

LLOYDMINSTER

JASPER NATIONAL PARK

DRAYTON VALLEY

SASKATCHEWAN

RIVER

NORTH

WETASKIWIN

CAMROSE

VIKING

KILLAM

WAINWRIGHT

PONOKA

HAYTER

STETTLER

CASTOR

NORTH SASKATCHEWAN RIVER

ROCKY MOUNTAIN HOUSE

RED DEER

RIVER

RED DEER

SUNDRE

DEER

RED

HANNA

DRUMHELLER

BANFF NATIONAL PARK

CALGARY

RIVER

HIGH RIVER

BOW RIVER

BROOKS

SASKATCHEWAN

RIVER

SOUTH

MEDICINE HAT

WALSH

OLDMAN

RIVER

TABER

FORT MACLEOD

LETHBRIDGE

COLEMAN

CARDSTON

WILDHORSE

CARWAY

COUTTS

REPORT TO THE CONGRESS

Public Law 884-84th

Exhibit V - May 15, 1961

ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION — WASHINGTON

PROVINCE OF ALBERTA DEPARTMENT OF HIGHWAYS

MAP

SHOWING

PROVINCIAL HIGHWAYS

AND

RAILWAYS NETWORK

LEGEND

EXISTING PAVEMENT .....

PROPOSED FUTURE PAVEMENT .....

RAILWAYS .....

1961 M. 238

EXHIBIT IV

REPORT TO THE CONGRESS

Public Law 884-84th

May 15, 1961

ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION — WASHINGTON

FEDERAL-AID HIGHWAY SYSTEM
ALL PRIMARY AND PRINCIPAL SECONDARY ROUTES
STATE OF ALASKA

ALASKA HIGHWAY DIVISION

50 0 50 100 150 MILES

LEGEND

F-11 EXISTING PRIMARY ROUTES

S-6443 EXISTING PRINCIPAL SECONDARY ROUTES

PROPOSED FOR CONSTRUCTION IN FIVE YEAR PROGRAM

REPORT TO THE CONGRESS
Public Law 884-84th
Exhibit III - May 1961

ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION — WASHINGTON

ARCTIC OCEAN
BEAUFORT SEA
CHUKCHI SEA
BROOKS RANGE
COLVILLE RIVER
KOTZEBUE SOUND
ARCTIC CIRCLE
KOYUKUK RIVER
YUKON RIVER
BERING STRAIT
SEWARD PENINSULA
Wiseman
Kivalina
Deering
Taylor
Teller
NOME
Council
ST LAWRENCE ISLAND
NORTON SOUND
Ruby
Poorman
Livengood
Eureka
Tofty
FAIRBANKS
Circle
Eagle
Nenana
Ferry
McKinley Park
Kantishna
MT McKINLEY NAT. PARK
Summit
Colorado
Ophir
Medfra
Iditarod
Petersville
Talkeetna
TALKEETNA MTS
Willow
PALMER
ANCHORAGE
VALDEZ
CORDOVA
Chitina
McCarthy
Nabesna
WRANGELL MTS
CHUGACH MOUNTAINS
PRINCE WILLIAM SOUND
Kenai
SEWARD
Homer
Seldovia
COOK INLET
KENAI PENINSULA
Yakutat
GULF OF ALASKA
Haines
Skagway
JUNEAU
Douglas
Chichagof Island
Admiralty Island
Sitka
Baranof Island
Kupreanof Island
Petersburg
Wrangell
Prince of Wales Island
Hyder
KETCHIKAN
Metlakatla
CANADA
UNITED STATES
YUKON ALASKA
ST MATTHEW ISLAND
NUNIVAK I
KUSKOKWIM BAY
KUSKOKWIM RIVER
Aniak
Bethel
Iliamna
Iliamna Lake
Old Iliamna
Dillingham
Naknek
PRIBILOF ISLANDS
BRISTOL BAY
ALASKA PENINSULA
SHELIKOF STRAIT
KODIAK ISLAND
KODIAK
TRINITY ISLANDS
ALEUTIAN ISLANDS
Unimak Island
Unalaska Island
Umnak I
FOX ISLANDS
SHUMAGIN ISLANDS
PACIFIC OCEAN

BERING SEA
ALEUTIAN ISLANDS
NEAR ISLANDS
Attu
Agattu I
Kiska
RAT ISLANDS
Amchitka I
Tanaga I
Kanaga I
Adak I
Atka I
Amlia I
Seguam I
Amutka I
ANDREANOF ISLANDS
PACIFIC OCEAN

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ROUTE CHART

Oblique Mercator Projection

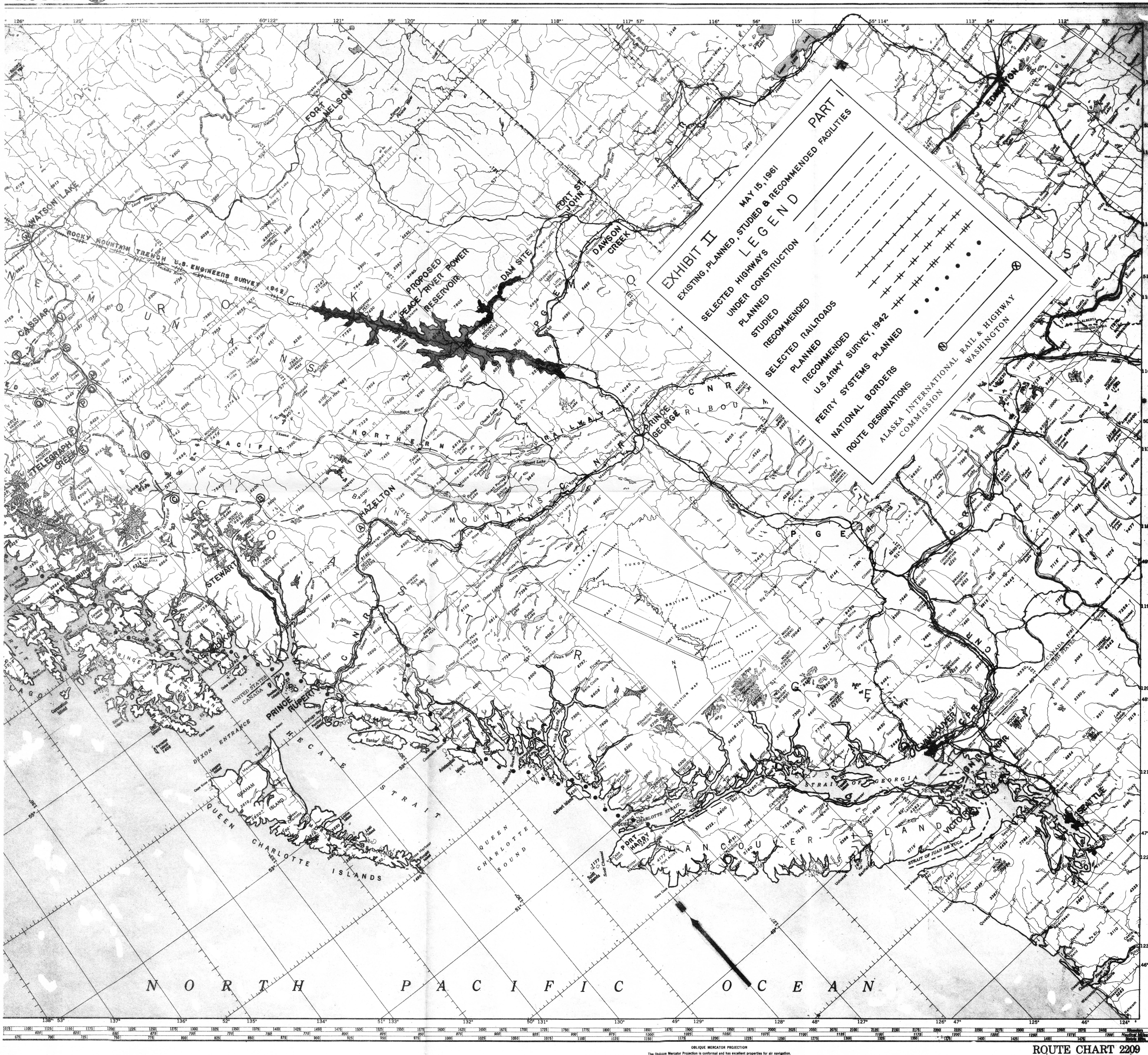

EXHIBIT II
PART I
MAY 15, 1961
EXISTING, PLANNED, STUDIED & RECOMMENDED FACILITIES
LEGEND
SELECTED HIGHWAYS
UNDER CONSTRUCTION
PLANNED
STUDIED
RECOMMENDED
SELECTED RAILROADS
PLANNED
RECOMMENDED
U.S. ARMY SURVEY, 1942
FERRY SYSTEMS PLANNED
NATIONAL BORDERS
ROUTE DESIGNATIONS
ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION — WASHINGTON
WATSON LAKE
FORT NELSON
FORT ST. JOHN
DAWSON CREEK
EDMONTON
PRINCE GEORGE
PROPOSED PEACE RIVER POWER RESERVOIR
DAM SITE
ROCKY MOUNTAIN TRENCH U.S. ENGINEERS SURVEY
CASSIAR
TELEGRAPH CREEK
HAZELTON
STEWART
PRINCE RUPERT
PETERSBURG
VANCOUVER
VICTORIA
SEATTLE
PORT HARDY
HECATE STRAIT
DIXON ENTRANCE
QUEEN CHARLOTTE ISLANDS
QUEEN CHARLOTTE SOUND
QUEEN CHARLOTTE STRAIT
STRAIT OF GEORGIA
STRAIT OF JUAN DE FUCA
GRAHAM ISLAND
VANCOUVER ISLAND
NORTH PACIFIC OCEAN

OBLIQUE MERCATOR PROJECTION

The Oblique Mercator Projection is conformal and has excellent properties for air navigation. It is mathematically derived from a cylinder tangent to and along a great circle, approximately through the center of the chart lengthwise. The scale is exact along this great circle and increases with the distance from it. For all practical purposes no correction need be made for radio bearings as all straight lines closely approximate great circles. Measurements of bearings and distances may be performed similarly as on a chart constructed on a Lambert Conformal Conic Projection.

ROUTE CHART 2209

SEATTLE — ANCHORAGE

(Edmonton-Fairbanks-Kodiak-Juneau)

ELEVATIONS IN FEET

ROUTE CHART

EXHIBIT II

MAY 15, 1961

PART 2

EXISTING, PLANNED, STUDIED & RECOMMENDED FACILITIES

LEGEND

SELECTED HIGHWAYS
UNDER CONSTRUCTION
PLANNED
STUDIED
RECOMMENDED

SELECTED RAILROADS
PLANNED
RECOMMENDED

U.S. ARMY SURVEY, 1942

FERRY SYSTEMS PLANNED

NATIONAL BORDERS

ROUTE DESIGNATIONS

ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION — WASHINGTON

LOCATION MAP

CAUTION
RELIEF DATA INCOMPLETE
ELEVATIONS IN FEET
20320
15000
12000
9000
7000
5000
3000
2000
1000
Sea Level

ALTITUDE CONVERSION SCALE

Meters 3 5 10 15 20 25 30
Feet 10 20 30 40 50 60 70 80 90 100

For conversions above 100 feet, add like number of ciphers to the figures on both sides of scale.

Compiled and printed at Washington, D. C. by
U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
BASE: Edition of October 1950 Revised SEPTEMBER 1959

ALASKA INTERNATIONAL
RAIL AND HIGHWAY COMMISSION
1809 G STREET NW.
WASHINGTON 25, D.C.

November 23, 1960

Dear Mr. Secretary

The Alaska International Rail and Highway Commission was assigned certain responsibilities under the provisions of Public Lw 884, 84th Congress, among which is that of making "a thorough and complete study of the economic and military advantages of additional highway and rail transportation facilities connecting Continental United States with Central Alaska". (Underscoring supplied)

In May 1958, your office provided a then current military evaluation which materially assisted the Commission in its deliberations. Since that time, several important steps have been taken by the Commission. The tenure of the Commission has been extended and an economic study of transportation needs of Northwest North America has been made, utilizing funds made available by Congress for this purpose. This study, which specifically excludes military considerations, was made by the Battelle Memorial Institute of Columbus, Ohio. A draft copy of the report with a summary of its recommendations is attached.

It is requested that the appropriate agency of the Department of Defense again provide this Commission with a current evaluation in light of changed conditions, if any, which may have developed in the intervening time period. It is suggested that the evaluation consider the enclosed Battelle report and include answers to the following specific questions:

1. Can existing transportation facilities meet the movement requirements of mobilization and war plans?

2. If not, in what way and to what extent are they deficient?

3. Would additional highway or rail connections meet known deficiencies?

4. To what extent would the application of the recommendations of the Battelle Memorial Institute study constitute a military advantage over existing transportation facilities?

5. If the proposed Pacific Northern Railroad is completed by private interests, would its extension to connect with the existing Alaska Railroad at Fairbanks offer any military advantage?

6. Is the military vulnerability of existing transportation links between Continental United States and Alaska such that the lack of additional routes constitutes an undesirable or unacceptable military risk?

Exhibit VII

It should be noted that Battelle has recommended that the implementation of the recommendations for an integrated highway system be initiated through diplomatic channels with the Canadian Government. If you might obtain, informally, the views of the Canadian Minister of Defense on needs for additional transport facilities, it would be helpful if your comments on these views could be included in your reply.

In order to provide time for analysis, printing and distribution of the final report, it would be most helpful if the military evaluation could be made available to the Commission by 1 March 1961.

Sincerely,

Warren G. Magnuson, USS
Chairman (Acting)

attachments

The Honorable Thomas S. Gates, Jr.
Secretary of Defense
Washington 25, D. C.

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON 25, D. C.

March 22, 1961

INSTALLATIONS AND LOGISTICS

Dear Senator Magnuson:

This is in furtherance of our reply dated December 16, 1960 to your letter of November 23, 1960 transmitting a copy of the Battelle Memorial Institute study. Your letter requested the appropriate agency within the Department of Defense to evaluate existing transportation facilities between Alaska and the 48 States to meet military requirements, taking into account the Battelle study and other pertinent aspects of the over-all problem. This current evaluation is similar to the one provided to the Commission in May 1958.

Existing transportation facilities including rail, highway, sea and air, are adequate to support foreseeable military requirements.

While additional rail and highway facilities between the 48 States and Alaska are desirable, from an economic and military viewpoint, they are not required for the support of present or projected plans.

The Battelle study recommendations pertaining to rail and highway improvements and extensions have a military significance even though existing facilities meet current and foreseeable military requirements. The recommended rail link between Fairbanks, Alaska and Dawson Creek, B.C., would offer an additional land line of communications to tidewater Alaska, supplementing the existing land, sea and air routes which meet military requirements.

The opportunity to review the Battelle study and to comment on it is very much appreciated.

Sincerely yours,

V. F. CAPUTO
Director for Transportation
and Warehousing Policy

Senator Warren G. Magnuson
Chairman, Alaska International Rail
and Highway Commission
1809 G Street, N.W.
Washington 25, D. C.

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Exhibit VII-2

ALASKA INTERNATIONAL
RAIL AND HIGHWAY COMMISSION
1809 G STREET NW.
WASHINGTON 25, D.C.

November 23, 1960

Dear Mr. Director:

The Alaska International Rail and Highway Commission was assigned certain responsibilities under the provisions of Public Law 884, 84th Congress, among which is that of making "a thorough an complete study of the economic and military advantages of additional highway and rail transportation facilities connecting continental United States with Central Alaska." (Underscoring supplied)

The Commission employed the Battelle Memorial Institute of Columbus, Ohio, one of the country's outstanding research organizations, to conduct an economic study of Northwest North America. Any consideration of military or civil defense requirements was specifically excluded from the Battelle report by the terms of reference. A copy of a preliminary report by Battelle to the Commission was delivered to Mr. Owen Jones on November 8, 1960.

The Secretary of Defense is being queried for his current military evaluation of surface transportation facilities between Central Alaska and the forty-eight States, to include the following:

1. Can existing transportation facilities meet the movement requirements of mobilization and war plans?

2. If not, in what way and to what extent are they deficient?

3. Would additional highway and rail connections meet known deficiencies?

4. To what extent would the application of the recommendations of the Battelle Memorial Institute study constitute a military advantage over existing transportation facilities?

5. If the proposed Pacific Northern Railroad is completed by private interests, would its extension to connect with the existing Alaska Railroad at Fairbanks offer any military advantage?

6. Is the military vulnerability of existing transportation links between Continental United States and Alaska such that the lack of additional routes constitutes an undesirable or unacceptable military risk?

Exhibit VIII

It is requested that, in view of the recommendations made to the Commission by Battelle relating to an integrated highway transport system, you express your views on civil defense needs for additional transport facilities between Central Alaska and the forty-eight States. These views may then be considered by the Commission, in conjunction with the military and economic aspects, and incorporated in the Commission report to the Congress, due not later than June 1, 1961.

In order to provide time for analysis, printing and distribution of this report, it would be helpful if your evaluation could be made available to the Commission by February 15, 1961.

Sincerely,

Warren G. Magnuson, USS
Chairman (Acting)

attachments

The Honorable Leo A. Hoegh, Director
Office of Civil and Defense Mobilization
Washington 25, D. C.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF CIVIL AND DEFENSE
MOBILIZATION
WASHINGTON 25, D. C.

OFFICE OF DIRECTOR

March 6, 1961

Honorable Warren G. Magnuson
Chairman
Alaska International Rail and Highway
Commission
1809 G Street, N. W.
Washington 25, D. C.

Dear Mr. Chairman:

Reference is made to your letter to the Director, Office of Civil and Defense Mobilization, dated November 23, 1960, requesting that we give you our views on mobilization needs for additional transport facilities between Central Alaska and the other continental States.

We have coordinated this report with the Department of Commerce, the Interstate Commerce Commission, and with our Region 8 office which covers the Northwestern United States including Alaska. Following are our considered views in response to your specific questions.

1. Existing physical transportation facilities between Central Alaska and the other continental States, when considered only with regard to their intrinsic capabilities to support movement, can meet the requirements of mobilization plans. However, mobilization plans project a variety of circumstances and the effects of those circumstances upon different parts of our wartime economy. Some of these effects could seriously limit the ability of transportation to meet requirements in the area under consideration. (See Enclosure 1.)

2. The most serious deficiencies would probably result from:
   a. An inability of water transportation to maintain substantial traffic loads under circumstances of enemy threat to or attack upon sea lanes and waterways;

   b. An inability of land transportation, as presently existing in the area, to absorb traffic loads diverted from water routes, if the expenditure of manpower and fuel (usually critical in wartime) necessary to sustain land systems, were to become prohibitive.

3. Additional highway connections, if otherwise economically justified, would provide marginal benefits for meeting mobilization deficiencies; additional rail connections would provide substantial benefits for meeting such deficiencies.

(Questions 4, 5 and 6 relate to military advantages of proposed and existing transportation links with Alaska. The comments which follow relate to over-all mobilization implications--military, civil defense, maintenance of the economy--rather than just to military advantage.)

4. Highway improvements recommended by the Battelle Memorial Institute study are considered desirable for the mobilization potential of increasing access to and mobility within the region.

5. Completion of the proposed Pacific Northern Railroad and its extension to connect with the Alaska Railroad at Fairbanks would offer a major mobilization advantage in that it would provide:

   a. An alternative through mode of transportation, capable of heavy military and industrial movements, not now available;

   b. A transportation land link with the industrial heart of Canada and the United States;

   c. A potential for emergency land transportation with low manpower and fuel operating expenditures.

6. We believe, from the standpoint of full mobilization, the vulnerability of the present transportation links between continental United States and Alaska does constitute a degree of risk.

It is our opinion that the Battelle study findings are predicated too heavily upon the "tourism" aspect of Alaska development. More weight should have been given to the potential for industrial growth of the area and its mobilization needs and services, as related to the total U.S. economy. Although we agree with their findings relative to the development of an integrated highway system, we feel that the study should have included a recommendation for the development of an integrated transportation system for the area. Our specific comments on the study, including remarks as to areas we feel have not been adequately evaluated, are attached (Enclosure 2).

We trust these comments will be of value to your Committee.

Sincerely,

Lewis E. Berry

Acting
Director

Enclosures

ENCLOSURE 1

MOBILIZATION FACTORS IN

PLANNING TRANSPORTATION IMPROVEMENTS FOR ALASKA

Our experience in civil defense and mobilization planning has taught us that the physical facilities of transport (roadways, waterways, railways, etc.) will probably be less severely affected by conditions of emergency than will other aspects of our civil economy and industrial effort, and would, as a consequence, be sufficient to support continuing wartime activity unless they themselves were limited by other factors in the economy. Therefore, we have found it unproductive to consider only one aspect of transport without regard to transportation as a whole, and to consider only transportation without regard to the emergency economy as a whole.

The projections we have made with regard to effects upon the economy by limited wars, stepped-up mobilization without general war, and general war with mass nuclear attack upon the United States, have taught us that the possibilities are sufficiently varied that our greatest overall danger is in reliance upon one or a few transportation alternatives as against a balance of transport modes and means. This conclusion comes very close to being identical with peacetime aims of a balanced competitive transportation economy.

Our reasoning with regard to transportation services between Alaska and the northwestern contiguous states is therefore conditioned on the long-term concern that reliance of the region in either peacetime or wartime should be placed entirely upon the continuation or upgrading of existing limited systems. Briefly, our reasoning runs like this:

Freight movement into and out of Alaska from the contiguous Northwestern United States is almost entirely waterborne, amounting to something over 2,000,000 tons annually. Considering that a high portion of this movement is currently military, we might realistically assume a substantial increase in shipments during any mobilization period. However, in consideration of possible effects of nuclear attack upon the United States resulting in a general cut-back in all activity, let us assume a 40 percent net reduction of wartime freight movement in this area, for a total of some 1,200,000 tons. Now let us further assume that, as a result of enemy attacks on ports and the interdiction of shipping by submarine, there is a necessary diversion of at least forty percent of the waterborne commerce to land transportation. This 500,000 tons is easily within the physical capacity of

the existing land routes. But more than this capacity is involved.

The transportation of 500,000 tons the 2,000-mile distance amounts to some one billion ton-miles of transportation effort a year, and requires an expenditure of resources commensurate with the task. The two most critical resources involved, in any war period, would probably be manpower and fuel.

To accomplish this by motor transportation would require an expenditure, roughly, of ten million gallons of fuel and 150,000 man-days of effort. By way of comparison, the same task could be accomplished by rail with an expenditure of, roughly, three million gallons of fuel and 10,000 man-days of effort.

This is not to suggest that, all factors being considered, rail linkage to Alaska would be preferred over highway. On the other hand, the entire absence of rail suggests a failure to take advantage of what might prove to be a highly desirable alternative, should the Nation's manpower and fuel resources become sorely taxed in the future.

ENCLOSURE 2

COMMENTS ON THE BATTELLE REPORT AND RECOMMENDATIONS FOR POSSIBLE FURTHER STUDY

Our purpose here is not to be critical of the Battelle Research Report within the area of its facts and specific findings, with which we find ourselves substantially in agreement. We would, however, like to point up some of the deficiencies in scope and framework within which the study was undertaken and which we believe show the need for further critical analysis and possibly additional findings.

The Report places an unbalanced emphasis on "tourism" as opposed to "industrial development" of the area. For example, compare on Page I-2, the statement that (line 2) "appraisals of the Area's resources have been based mainly on what is now known to be present" with the statement that (par. 3) "tourist expenditures in Northwest North America could soar from the present level of about $93 million to $472 million by 1980." This inability to project resource expansion and industrial development, coupled with (par. 4) a confidence in "intuitive judgments" as to the growth of tourism as the major factor in Alaska's future, somewhat colors the entire study, and in our opinion, underestimates the natural wealth and potential of the area.

The Battelle Report further uses this theme as the basis for arguing precedence for the projects it recommends. Reading it, one is led to the conclusion that only by first inducing travelers to view (page I-3) "awesome splendor of great snow-capped mountains" "without retracing his steps over long stretches of highway" can the business man be induced to promote (page I-5) "local use forest products," (page I-6) "low grade mineral deposits," (page I-9) "unpromising coal exports", (page I-10) "small demand hydro-electric power," (page I-11) "low productive agriculture", etc. This significance of tourism as the forerunner of resource-based manufacturing and related industries is stressed and summarized on pages I-12 through I-14.

We do not know of any historical precedent which would indicate that "tourism" can be expected to become a major inducement to economic exploitation and growth of a region. On the contrary, we feel that tourists inclined to take extended trips to underdeveloped regions are more apt to leave those regions with the hope and expectation that they remain in their primitive, underdeveloped, natural splendor.

It is our view that industrial development of an area more nearly advances in leap-frog fashion with the expansion of heavy power and transportation facilities going hand-in-hand with the finding and exploitation of new national resources. This being the case, we do not see a situation arising quite so austere as presented on page I-16, involving "volumes of business barely large enough now to support just one facility".

The comparative rail and highway costs, as summarized on pages I-16 through I-21, relate to two different propositions --the new construction and operating costs of rail versus upgrading and maintenance of existing highways. Neither of these in themselves should be determining criteria as to benefits or needs of the region. A better framework of comparative costs in transportation for public service would be in the costs of providing service to ultimate users. For example, heavy industrial movements to Alaska from North Central U.S. now travel to the West Coast by rail and thence by ship or barge to Alaska. It would be interesting to see what the comparative cost to shippers would be of similar movements from, say, Chicago, directly to Alaska across Canada by rail. A number of comparative studies of this sort, involving various routes and routings, would be a better criterion, in our judgment, for estimating transportation needs of the area than anything developed in the Battelle Report.

Battelle presents findings which imply that there is a substantial difference in public money applied to "Federal aid" type highway improvements and "outright Government subsidy" to rail construction. We hold that when either of these are undertaken in the public interest and with justified expenditure of public funds, their difference as "aid" or "subsidy" is purely semantical.

Although the Battelle report calls for imaginative planning for Alaska's transport needs, we further find that it overlooks certain major areas of forward thinking being discussed in other areas of transportation. Among these are possibilities for further study and consideration by the Commission, including:

a. Technological developments of overland transport vehicles both of the land train type (already in use in Alaska) and the newer ground effects vehicles.

b. Use of combined auto-rail piggy-back transportation systems for both tourism (4000 miles is a very long auto trip) and commercial (TOFC) shipments.

c. Shot-in-the-arm impact of direct transport linkage to a new raw materials area upon economy in the industrial centers of the North Central and North Eastern United States.

d. Economic, political, and defense implications of projects undertaken with regard to our relations with Canada.

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

APR 22 1961

Dear Mr. Chairman:

Pursuant to your request of January 26, the General Manager of the Alaska Railroad prepared an analysis of the factors involved in a proposed rail link across Canada to Alaska, using the Battelle Report as a point of departure. Mr. Smith submitted a statement direct to the Commission by letter of March 8, 1961 and discussed his findings with the Commission members at its meeting of March 29, 1961.

Based on the discussion at that meeting, Mr. Smith has revised and supplemented his statement and has forwarded it to the Department for transmittal to the Commission. Fifteen copies are submitted herewith and I am pleased to advise that the Department of the Interior concurs in the General Manager's observations and conclusions, and recommends their acceptance by the Commission as a basis for further action on the proposed rail link.

Sincerely yours,

Secretary of the Interior

Hon. Warren G. Magnuson
Chairman
Alaska International Rail and Highway
Commission
United States Senate
Washington 25, D. C.

EHHIBIT IX

It was a privilege to examine the Battelle Report on transportation problems in Alaska. No derogation is intended in raising the question as to whether the report supplies an adequate basis for decision as to the building of a rail link between The Alaska Railroad and one or more of the southern railroads. Just as certainly this report does not pretend to provide a final answer to this question, but rather to bring to the reader's attention the fact that justification for such a rail link rests only in part on tonnages and developments which may develop in the future. If an extension of the Canadian National Railways or an extension of the Pacific Great Eastern is treated as a planned facility and consideration is given only to the justification of a rail link between The Alaska Railroad and the Canadian border, there are tonnages and revenues presently available which should be studied in detail by experts thoroughly familiar with the traffic and tariffs involved before any sound decision regarding the feasibility of such a rail link can be reached.

For the purposes of this report three basic assumptions will be made, as follows:

1. The rail line between the Pacific Great Eastern, or the Canadian National, and the Alaskan border will be considered as a planned facility to be built by the Wenner-Gren group or some other group, or government agency.

2. The construction of a link between The Alaska Railroad and the Canadian border will be constructed as an extension of The Alaska Railroad, and revenues will be required to defray operating costs (including depreciation on depreciable items), but amortization of the investment would be recovered as appreciation of public domain, creation of tax-producing income and benefits which would accrue through advantages to the national defense. More detail will be devoted to these items later in this report.

3. The proposed link connecting The Alaska Railroad to the border will be built from Rex (Kobe), Alaska to the Canadian border, a distance of 298 miles, at a cost of $300,000 per mile to standards equal to the present main line standards of The Alaska Railroad. While this route is somewhat longer than the route indicated in the Battelle Report, maintenance problems would be substantially lessened. Further, consideration must be given to the fact that substantial tonnage will flow southward from the junction point.

With the making of the above assumptions, this report will devote itself to consideration of the following five aspects of existing, rather than future, conditions which must be considered in detail before any final decision is reached.

1. The impact of the transcontinental rate structure on such a proposed link, and the revenues (and tonnages) that are potentially available to such a proposed link now.

2. The actual added costs which would accrue to The Alaska Railroad if such a link were built, as opposed to the hypothetical projected operating costs computed as though the proposed link were a new, separate entity.

3. Benefits which could accrue to Alaskan consignees, both civilian and military, if such an all-rail link were available.

4. Factors supporting the assumption that amortization costs need not be met from operating revenues.

5. Suggested location of the proposed link between Rex (Kobe), Alaska and the Canadian border.

Each of the above items will be the subject of a section of this report in the order as expressed above.

Section 1.

The Battelle Report failed to indicate that much, if any, significance had been given to the impact the transcontinental rate structure would have on any feasibility study. Transcontinental rates on commodities originating from points east of the Missouri River are equal to Seattle and to Prince Rupert, even though Prince Rupert is some 600 miles closer to Seward, Alaska on the water route than is Seattle, Washington. Examination of the attached map (Exhibit "A") will indicate the alternate route from Chicago, Illinois to Seattle, Washington, and Chicago to Prince Rupert.

The routing to Prince Rupert passes through Prince George and advances 469 miles westward to reach Prince Rupert. Assuming completion of the proposed railroad, for the purpose of this report it is assumed that this same mileage of 469 miles would produce a rate equalization point on the proposed railroad 469 miles north of Prince George, or only 988 miles from junction with The Alaska Railroad at Rex (Kobe). For the sake of ready reference, this point 469 miles north of Prince George shall henceforth be referred to as "Rate Point A".

Admittedly, this mythical rate point does not now exist, but with the completion of the through route to Alaska, the application of the through rate from the East to Prince Rupert could be logically applied to a point northward on the route equidistant to the Prince George-Prince Rupert mileage. The same justification as now exists for the Prince Rupert rate would apply, namely, the movement of tonnage beyond the last named point to which a transcontinental rate would apply.

The present Alaska Railroad is operating within its revenues by virtue of its local tariffs and its division of existing through tariffs. It is contemplated that these revenues would not decrease substantially if the present tonnages were received at a point north of Anchorage rather than at Seward. For the purposes of this report the revenues available for the transportation of tonnage from "Rate Point A" to junction with the present Alaska Railroad facility are therefore equal to the water rates Seattle to Seward including Seattle terminal charges. A weighted average of this rate on the tonnage involved is approximately $45.00 per ton of 2,000 pounds.

For more than a year and a half the Canadian National Railways has been conducting investigations on the volume of traffic destined for Alaska which could properly be considered as originating in the Midwest or East and which might, with advantage, utilize the transcontinental rate structure. Their findings to date indicate that an average annual tonnage in the order of 150,000 tons of freight is presently in this category. Present water charges (including Seattle terminal charges) Seattle to Seward would total some $6,750,000, or a ton mile rate on the tonnages outlined for the 988 miles from "Rate Point A" to Rex (Kobe) of better than 4.5¢ per ton mile. These figures do not reflect the costs of breaking bulk shipments at Seattle, warehousing and subsequent drayage to the dock. Such charges are not generally reflected as freight charges in the Alaska trade, but rather are reflected in the invoice prices of the commodities involved. They represent substantial charges, however, and avoiding them would be an added inducement to shippers to use the all-rail route.

Therefore, detailed consideration must be given to tonnages <u>presently available</u> to the proposed rail link by virtue of the long haul tariff picture presently existing on the transcontinental railroads. Such tonnages would virtually balance off the added operating costs involved, with the <u>future</u> tonnages to be generated from the developed country, as per the Battelle Report, constituting a plus factor to produce a net reserve after costs are met.

It is acknowledged that the 150,000 tons indicated is a minor portion of the tonnage presently moving through the Puget Sound gateway and other West Coast ports to Alaska. The total of this dry cargo tonnage is indicated by the Battelle Report to be in the neighborhood of 450,000 tons per year (Table VII-2 of the Report). There is no intent to suggest that the indicated tonnage of 150,000 tons would grow at the expense of the substantial tonnage that would remain to be moved from the West. The present north-south structure in the West does not at present contain through rates from the south to points much farther north than Seattle. However, south to north rate structures have indicated an awareness that such rates must be competitive with the transcontinental rates to Seattle. With the establishment of a through rate from Prince George to the Alaska Railbelt there is every reason to believe that similar through rates would develop to enable the West Coast to compete vigorously with the East for the traffic involved.

Section 2.

The Battelle Report assumes operating costs of approximately $15,000 per mile for the proposed link from Rex to Whitehorse, based on the present operating costs of the existing Alaska Railroad. It is also noted that the Battelle Report utilizes The Alaska Railroad F. Y. 1959 annual report as a basis for the estimates. For purposes of comparison, this same annual report will be utilized in this reference.

It is felt that the estimates in the Battelle Report substantially overstate the operating expenses of the added rail link between Rex and Whitehorse. These estimates overstate, to a lesser degree, the per mile operating expense of the total facility of The Alaska Railroad if the proposed link of 680 miles were added to The Alaska Railroad, as follows:

It is presumed that the Battelle Report considered a proposed rail link from Rex to Whitehorse because the planned facility from Prince George extended no farther than Whitehorse. This report will deal with the added costs of a rail link from Rex to the Alaska border only, although Exhibits "B", "B-1", and "B-2" will show costs from Rex to the Alaska border as compared with Rex to Whitehorse. It is interesting to note that the added costs per mile decrease with the extension of the proposed link into Whitehorse.

The total operating expense of The Alaska Railroad as indicated in the F. Y. 1959 report includes large expense items which would not be duplicated in the operation of the proposed 298 mile link. It is well recognized that The Alaska Railroad has both plant and equipment

installed in response to military rather than economic necessity at time of installation. Depreciation charges in this plant and equipment run high and would be duplicated only in small part on the proposed link. Additionally, the present cost statement includes substantial longshoring costs in connection with the Seward dock operation and depreciation charges on the dock facility at Seward, combined with depreciation charges on river equipment used out of Nenana. These charges would not be applicable to the proposed link or to true rail line operating costs. The proposed link would not provide any significant increase in Traffic Department costs or General and Administrative overhead. Further, the Alaska Railroad general repair shops, stores department, and engineering department costs, together with depreciation costs on plant and equipment, would continue, but not be duplicated with the addition of the proposed link. Such physical facilities as now exist would, with little or no expansion, handle the service requirements of the proposed link as well as the existing railroad. The following recapitulation will indicate how the added cost and added mileage will combine to produce a per mile operating cost for the total of the existing railroad and the proposed 298 mile link that is less than the per mile cost estimate for the proposed link alone.

Total expense (F. Y. 1959) for existing Alaska Railroad	$ 12,890,480.00
Less Seward longshore & dock costs	1,061,975.00
Less river equipment depreciation	73,897.00
Total applicable costs	11,654,616.00
Operating cost per mile	21,703.00

This figure must now be combined with the line maintenance and train operating costs of the proposed link. Our engineering department estimates the line maintenance costs would approximate $1,185,426 (See Exhibit "B"). You will note that Exhibit "B" also shows the line maintenance costs of the 680 miles Rex to Whitehorse as $2,705,000, or approximately equal to such costs for the present Alaska Railroad. It is true that in this last instance a greater mileage is involved, but present engineering department costs are loaded heavily with depreciation costs and superintendence that would not be duplicated on the proposed link.

Train operation cost estimates are based on available tonnages as outlined in Section 1 above which require three round trips per week over the proposed link, or one train per day traveling one way. Wayside

facilities were limited at the outset to three agency stations and one complete and one joint small engine house in which emergency running repairs could be made. Estimate for such train operations is $933,483.80. This estimate is comprised of actual train crew and mechanical payroll costs based on present pay rates and fringe benefits such as sick and annual leave, etc. Locomotive costs were continued at the present unit mile cost of $1.05. This latter figure would undoubtedly decrease as now idle units contributing depreciation costs to the present unit mile cost were better utilized. To these payroll and locomotive unit mile costs were added a contingency item of $137,500 and a freight car repair and per diem cost of $202,671 (one-half the freight car repair and per diem charges for F. Y. 1959 on The Alaska Railroad) to reach the total of $933,483 as the cost of train operations over the proposed link (See Exhibit "B-1"). The sum of the line maintenance and operating costs is therefore $2,118,909.

Total applicable operating costs of the present facility have been shown as $11,654,616. To this figure must be added the estimated operating costs of the proposed rail link as shown in Exhibit "B-2". You will note that the added operating cost of the proposed link Rex to the Alaska border is $2,118,909 for a distance of 298 miles, or an operating cost of $7,110.43 per mile. (See Exhibits "B-1" and "B-2".)

As indicated in Section 1 of this report, a survey by the Canadian National Railways indicates there is presently available in the order of 150,000 tons of freight destined for Alaska from points in the Midwest or East which would be influenced by the transcontinental rate structure. This tonnage, moved over the 988 miles from "Rate Point A" to junction with the present Alaska Railroad, at an amount equal to the alternative ocean haul costs, produces a ton mile revenue of slightly better than 4.56¢ per ton mile, without including Seattle warehouse cost. The above indicated added operating cost of the proposed Alaska Railroad-Alaska border proposed link is $7,110.43 per mile or, based on the movement of this same 150,000 tons, 4.7402¢ per ton mile.

Admittedly, the train operating costs as shown above represent an austerity type operation. However, the operation was tailored to fit only the 150,000 tons used in this report. The tonnage involved represents only about 1,000 tons per train and a tonnage three times as great could be absorbed with the same service at only a slight increase in cost. No effort has been made to apply revenues which would accrue from the movement of southbound freight or from freight which may be generated from any point in the area to be served by the proposed rail

link, or from military freight which would move over the proposed route for reasons other than rate considerations. Obviously, as such tonnages develop, attendant revenues would support required additional service. While much of the timber and mineral resources outlined in the Battelle Report is located in Canada, the proposed rail link, in conjunction with the new Port of Anchorage, could well provide a direct export route.

Further, for the purpose of this study, the tonnage utilized comprises only about a third of the dry cargo coming into this area. This tonnage was selected because of existing rate structures from the East. With the establishment of a through route to Alaska it is safe to assume that south to north through rates will develop from points San Francisco and south, and that these through rates will equalize with the transcontinental rates at some point along the proposed route with resulting added tonnage and revenue for the proposed route.

Section 3.

Present avenues of transportation present an obstacle to the maintenance of true distribution centers in Alaska. Unless a producer is located in the Puget Sound area or in the San Francisco Bay area, he is faced with the likelihood of the cost of breaking bulk shipments at one of these points, warehousing his product and then bearing the cost of drayage from warehouse to dock. There is little incentive for the producer to assume the costs of warehousing stocks in Alaska if he must continue to pay the costs of like handling of the same freight at the trans-shipping point in the Puget Sound area or the San Francisco Bay area. Because of this, producers' stocks are rarely maintained in Alaska with the result that businessmen in Alaska must operate with the cost burden of financing three inventories of stock, one inventory on order and in the process of drayage to the docks or on the docks awaiting transport, one inventory on the high seas, and one inventory on the shelves.

As Alaska develops, the need for producers' outlets in Alaska grows. Already scattered efforts are being made to meet this need through the use of "prepay allowances", but the cost of the extra warehousing and handling continues because of the inability to ship a sealed carload from, say Chicago, through to ultimate destination.

Much of the military's supplies is produced in the industrial centers of the Midwest and East, and these same supplies must undergo not less

than two extra handling operations, and in most cases three handling operations before the load is set out at destination for final unloading by the military personnel at the bases involved.

Section 4.

Several intangible factors support the assumption that the proposed government built rail link need not be amortized from rail line freight revenues. Consideration of amortization and interest as operating costs of the proposed railroad depends entirely upon the point of view. If a private investor should consider building such a railroad, interest would obviously be a part of the cost of doing business. Whether amortization should also be considered a part of the operating cost would depend upon the fiscal policies and programs of the railroad builder and operator and upon applicable law.

It cannot be emphasized too strongly that the major economic values which good railroad transportation creates accrue, not to the owners and operators of the railroad, but to the owners of the land along the right of way. For example, millions of dollars in private values and private profits of economic and business enterprise have been created by The Alaska Railroad but do not figure in the Railroad's balance sheets. It follows that interest and amortization of invested capital are not meaningful costs of the proposed railroad if the owner of the land along the right of way is also the builder and operator of the railroad. This is the same as saying that loss of interest must be more than balanced by (1) increases in land values along the new railroad, (2) the establishment of natural resource values which could not exist in the absence of transportation access, and (3) the related tax potentials which such increased values would provide as the land was withdrawn into private ownership. In view of the burgeoning oil and gas industry in Alaska, and the vast untapped power potential, the creation of a virtually ready-made pipeline and power transmission line right of way, complete with servicing transportation, is a factor which falls in this group.

To base a judgment as to whether this type pioneering railroad should be built on the question of ability to earn interest is fallacious from an economic standpoint because it ignores this potential of values which creates income for the owners of the property along the new railroad in addition to the income values to the railroad itself because of goods which it transports.

There is still another reason why the proposed railroad, if government-built, should not be required to pay interest on capital. Without this requirement, interest, when earned, can be plowed back into railroad improvements and betterments. Many millions of dollars of Alaska Railroad earnings have thus been used for capital improvements because interest did not have to be returned to the Federal Treasury.

On the basis of this kind of reasoning it follows that interest should not be charged as an operating cost of the proposed railroad and that an economic appraisal of its earnings potential should cover, not only the estimated net income of the railroad itself, but also an estimate of the amount of property and tax values which would be created along the railroad right of way.

The available copy of the preliminary Battelle Report indicates that such treatment must be considered as outright subsidy. Yet this same logic is not pursued with reference to the rather extensive highway network as recommended in their report.

In the preliminary Battelle Report the Military considerations are specifically excluded. This writer shares with the Battelle Institute a reluctance to pose as any sort of expert in this highly specialized field. However, the Alaska International Rail and Highway Commission contains members who are qualified to evaluate the significance the proposed rail link would have on military defense planning. It is for this purpose that the following thoughts are set forth.

Modern weapons have become so sophisticated that tremendous investments are contained in relatively small packages. It is entirely possible for the Government to have an investment of several millions of dollars in a weapon or piece of apparatus that occupies one, or at the most, two rail cars. The complexities and delicacy of such equipment are such that handling or loading and unloading operations rapidly assume risks of very substantial sums of money through damage. Even worse, the equipment may be rendered inoperative pending availability of suitable repair parts and the expert knowledge needed to effect repairs. Some of this equipment is not susceptible to movement by highway carrier over pioneer type roads, or must be dismantled to effect such transportation and cannot arrive at the using point in a ready-to-use state of assembly.

The movement of explosives and ammunition is presently beset by many obstacles if moved by the present water and overland method. While there are few restrictions to trainloads of such freight, regulations severely restrict the amounts that can be discharged from a vessel at docks engaged in commercial operations.

The proposed rail link route from Rex (Kobe) to the Alaska border follows the route indicated in the Army Engineers' report dated October 12, 1942. This route is somewhat longer than would be the case if the highway routing and highway mileage were followed. However, it is anticipated that additional rail mileage along the highway route to avoid excessive grade would more than equalize the apparent difference in mileage. In addition, the route laid out by the Army Engineers east from the border to Carmacks skirts a mineralized region capable of ultimately developing tonnages for rail haul south or for export.

The Battelle Report makes reference to a possible extension of the Fairbanks-Eielson branch as permitting the shortest potential route. However, indications are that construction and maintenance problems from this point would far outweigh any mileage savings involved. Additionally, population density would assure a substantial amount of freight being routed south from the junction with the existing Alaska Railroad and the Rex junction would eliminate the penalty to this tonnage.

At present approximately 51,500 tons of the dry freight coming across the docks at Seward and/or Whittier for rail movement beyond goes to points Nenana and north, with the balance going principally to Anchorage and Palmer area. This 51,500 tons does not include the interline piggy-back tonnage to points Nenana and north, presently moving at an annual rate of approximately 17,000 tons.

Conclusion: As stated before, this report or statement is an attempt to support an opinion that the Battelle Report, as read, does not present a conclusive case against such construction. Further, it is an attempt to present the fact that feasibility of the proposed link does not depend on the development of as yet unproved resources or the generation of tonnages therefrom. Also, it is an attempt to direct the attention of the Commission to the tonnages that are presently available because of the transcontinental rate structure, and other through rates as they develop and become effective.

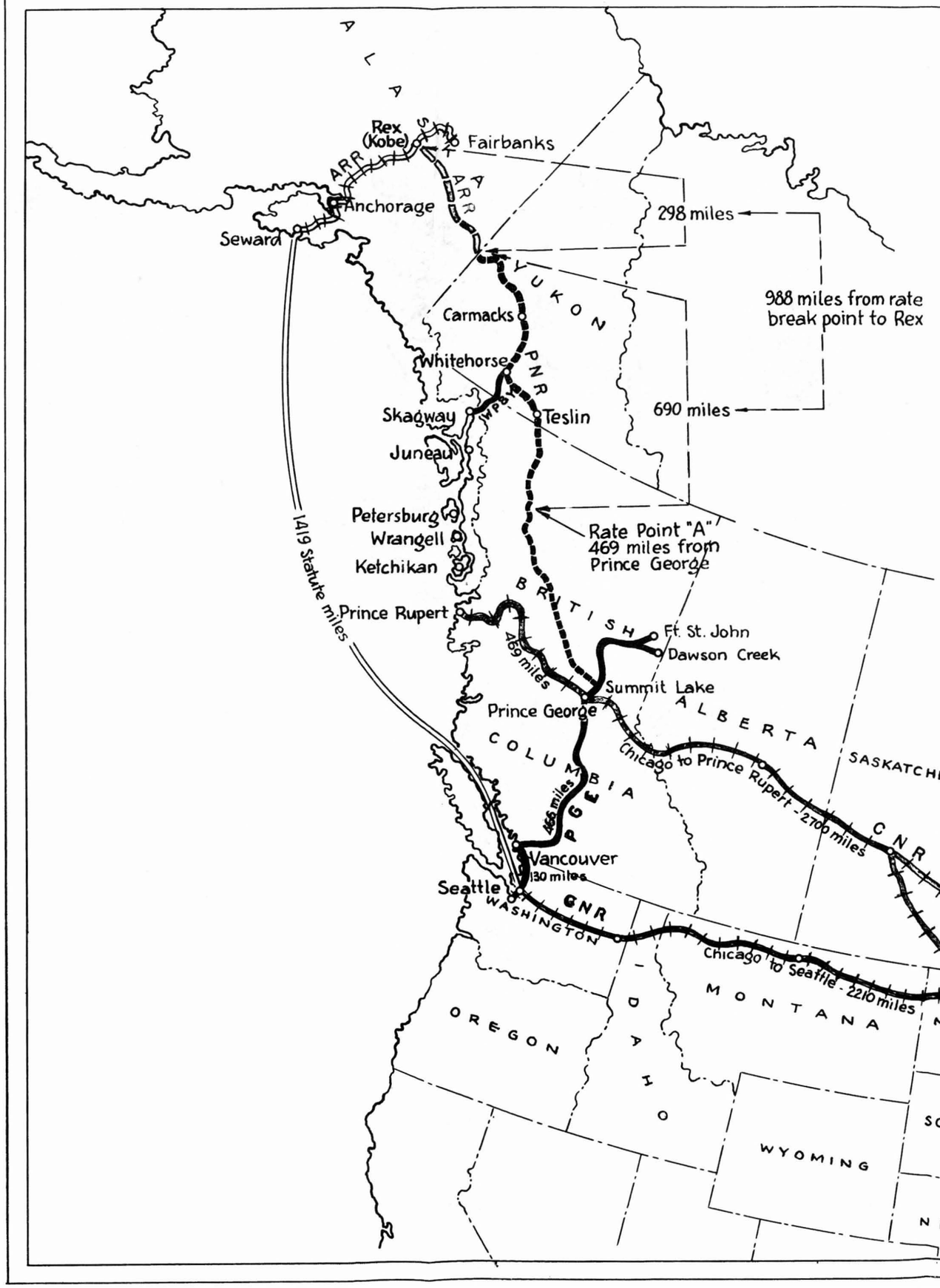
This report can offer three specific recommendations:

1. That the Commission should take into consideration the tonnages and rate advantages presently available to such a proposed rail link. Such a study has already been conducted to a degree by the Canadian National Railways. Further study would require detailed research both as to

EXHIBIT "A"

LEGEND

- Great Northern Route
- Canadian National Route
- Proposed Canadian Section
- Proposed Alaska Railroad Extension
- The Alaska Railroad



Map A to accompany Exhibit IX

REPORT TO THE CONGRESS

Public Law 884-84th

May 15, 1961

ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION — WASHINGTON

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long haul, heavy minimum carload rates, and the ability of the Alaska Railbelt to utilize properly factory distribution facilities. In addition, the possible benefits to military defense should be explored with the thought in mind that logistical support capabilities are not the sole criteria. The results of such a study may well indicate that present benefits would cause the construction to be viewed in a favorable light, with the tonnage to be generated through development of the country in the future assuming the proportions of a reward, or profit, to the far-sighted.

2. Operating cost considerations should be based on the added operating costs of the proposed link as an addition to an already operating entity so that the proposed link does not have to shoulder the cost burden of a headquarters plant with its attendant fixed costs.

3. Should the Alaska International Rail and Highway Commission pursue this matter further with Canadian authorities, it is suggested that the Commission should strongly urge that the rail link from the Alaska border south to connection with existing rail systems south be contemplated in the same light. A rail link southward from The Alaska border to connection with the Canadian National Railways at Hazelton appears to offer economies in construction of such a link that would enable the new rail link to avoid the costs of separate general repair facilities, purchasing facilities, and accounting and administrative headquarters with attendant heavy fixed costs. A similar link southward from the Alaska border to connection with the Pacific Great Eastern at Prince George could rely on the already existing plant of that railroad. Such a procedure would produce an operating cost picture substantially below that contemplated in the Battelle Report.

EXHIBIT "B"

DIVISION OF OPERATIONS ENGINEERING	Rex to Border (298 miles)	Rex to Whitehorse (680 miles)
Superintendence	$ 39,441.00	$ 90,000.00
Maintenance of Way and Track	635,441.00	1,450,000.00
Maintaining Track Structures	39,441.00	90,000.00
Maintaining Auxiliary Structures	43,823.00	100,000.00
Dismantling Retired Non-Depreciable Property	2,203.00	5,000.00
Other Road and Structure Expense	4,382.00	10,000.00
Removing Ice and Snow	175,290.00	400,000.00
Depreciation - Buildings	43,823.00	100,000.00
Depreciation - Other Structures	175,290.00	400,000.00
Section Mess Operation	26,294.00	60,000.00
	$ 1,185,426.00	$2,705,000.00

EXHIBIT "B-1"

TRAIN OPERATION COST

	Rex to Border (298 miles)	Rex to Whitehorse (680 miles)
Train crew cost (298 miles per trip plus 25 miles initial and terminal work, 3 round trips per week - annual mileage 100,776 miles at $1.93 per mile, including benefits)	Based on 227,760 miles	
	$ 194,497.60	$ 439,576.00
Car repairs and per diem	202,671.00	405,342.00
Locomotive Cost (Based on $1.05 per unit mile, 3 units per train)	317,444.40	717,444.00
Engine House Crews	45,894.60	91,789.00
Agents Cost (Based on 3 one-man agency stations)	35,475.40	59,124.00
Contingencies & Miscellaneous	137,500.00	275,000.00
	$ 933,483.00	$1,988,275.00
Plus Track Maintenance	1,185,426.00	2,705,000.00
	$2,118,909.00	$4,693,275.00*

*In original report the figure of $4,701,000.00 was given because of an error in work papers.

EXHIBIT "B-2"

REX TO ALASKA BORDER (298 miles)

Total applicable costs (Present ARR)	$ 11, 654, 616. 00
Operating cost per mile	21, 703. 00
Total applicable costs present ARR plus operating costs of 298 mile extension = $11, 654, 616 plus $2, 118, 909	13, 773, 525. 00
Mileage of present facility plus proposed link to border	835 miles
Operating cost per mile combined facilities	16, 495. 00
Operating cost of added facility only	7, 110. 43

REX TO WHITEHORSE (680 miles)

Total applicable costs (Present ARR)	$ 11, 654, 616. 00
Operating cost per mile	21, 703. 00
Total applicable cost present ARR plus operating costs of 680 mile extension = $11, 654, 616 plus $4, 693, 275	16, 347, 891. 00
Mileage of present facility plus link to Whitehorse	1217 miles
Operating cost per mile combined facilities	13, 432. 00
Operating cost per mile of added facility only	6, 901. 87

EXHIBIT "C"

Map C to accompany Exhibit IX
REPORT TO THE CONGRESS
Public Law 884-84th

May 15, 1961

ALASKA INTERNATIONAL RAIL & HIGHWAY
COMMISSION — WASHINGTON

RAILROAD
FAIRBANKS
EIELSON A.F.B.
REX (KOBE)
ALASKA
Wood R.
Delta R.
TOK JUNCTION
Ladue River
DAWSON
Yukon River
298 mile section, Rex to Alaska Border
SNAG
River
White River
CARMACKS
ALASKA
CANADA
Donjek
Kluane Lake
WHITEHORSE

LEGEND

- The Alaska Railroad
- 1942 Trans Canadian Alaska Survey
- Suggested Carmaks to Whitehorse Route
- Possible Tok Junction to Whitehorse Route
- Alaska Highway

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ADDENDUM

The initial report by the writer based cost figures on the construction of the rail link from Rex to Whitehorse in order to parallel the comments in the Battelle Report. For obvious reasons this revised report deals with the extension of the link Rex to the Alaska border. After discussing the foregoing report on the proposed railroad across Canada to Alaska with some of the members of the Alaska International Rail and Highway Commission, it appears that implications regarding tonnage figures are not entirely clear. Actually, other tonnage over and above the 150,000 tons indicated in the report would be available to this proposed railroad and such increased tonnage handled would improve the economic feasibility.

It should be emphasized that this 150,000 ton estimate as developed by the Canadian National report was made after a rather thorough study on the part of traffic experts of that railroad in the interest of developing a freight car barge system from Prince Rupert to Seward or Whittier. Subsequent investigation by The Alaska Railroad indicates that this is a fairly reliable figure. Assuming that only 150,000 tons annually were handled over the trans-Canadian railroad, we estimated train service at three times a week.

In addition to the 150,000 tons available by virtue of origin from points east of the Missouri River, there is also considerable additional tonnage that would be available. As an illustration, in 1960 The Alaska Railroad handled 51,500 tons under its own billing into Fairbanks plus 17,000 tons via piggyback. In addition, current reports indicate that the Port of Valdez handled approximately 30,000 tons annually into the Fairbanks area and that there are approximately 15,000 tons annually being moved over the Alaska Highway to the Fairbanks area. This constitutes a total of 113,500 tons. Admittedly, some of this tonnage is already considered as a portion of the 150,000 tons of transcontinental freight. However, as indicated earlier in the report, the establishment of south to north through rate structures from points on the West Coast will make substantial portions of this same West Coast freight available to the proposed link for transport to the Fairbanks area.

Under established rate-setting patterns, that freight originating from points east of the Missouri River would move into the Fairbanks area with transportation costs at more nearly parity with such costs to Anchorage then now may be done. This could well enable Fairbanks

to assume its rightful role as the distribution center for the northern part of Alaska with a resultant reduction in the cost of living for Interior Alaskans.

Since completion of the Canadian National study, the rapid growth of oil exploration on the Kenai Peninsula has created new tonnage potentials. The 1961 agenda alone calls for the drilling of 36 new wells. This means increased tonnage movements to Alaska, not only for oil well supplies, but for subsistence items for the workers and their families and for building materials with which to create whole new communities.

Recent news articles indicate the transfer of the Army's winter test station from Ft. Churchill in Canada to Ft. Greely, Alaska with a resultant increase in tonnage to the new test site. Much of the equipment to be tested would benefit from availability of a method of through movement from the East. At present a good deal of the military tonnage moving to Alaska is moved from storage at Ogden, Utah to San Francisco and/or Seattle for trans-shipping to Alaska. A substantial portion of this tonnage could be moved direct to Anchorage or Fairbanks over the proposed link at a saving when the cost of multiple handlings is combined with present transportation charges.

The figures compiled by the Canadian National could normally be considered current. Yet in the brief span of time since they were compiled, the events just outlined tend to cause them to seem ultraconservative. The following is quoted from a recent publication of the Association of American Railroads: "Projections indicate that in the next 15 years America will need to build 15 new Chicagos to take care of 60 million additional people. The Army Corps of Engineers recently estimated that present inter-city freight traffic would double by 1980, and double again by the year 2000".

The charge could be made that the proposed rail link could hurt the Pacific Northwest because traffic may by-pass this route. Indeed, the opposite could well apply. Railroad in-transit rates, which permit the movement of raw materials to a processing point and then the resumed movement of the finished product on a through rate basis could improve the position of the Pacific Northwest as Alaska's population grows.

The writer feels that the proposed trans-Canadian railroad would form the backbone of a transportation system to Alaska. Lateral highways could make its advantages felt over a wide area. In the twenty years that the Alaska Highway has been in operation its lack of extensive use

bears mute testimony to the fact that long haul motor trucking is not the answer to the transportation needs of the area involved. Trucking over the Alaska Highway has not to date provided a widely competitive form of freight transportation.

The report on the proposed rail link was intended to show that the 150,000 tons of freight presently available from the eastern portion of the lower 48 states would support added operation costs as an extension of The Alaska Railroad. It was done deliberately to dramatize the importance of this tonnage. If feasible on this basis, how much more so when one considers the additional tonnage referred to in this addendum plus the locally generated tonnage! Imagine the increased feasibility with the tremendous impact of the population explosion in the decade of construction! The time required for treaty negotiations, seeking and receiving approval from Congress, detailed engineering studies and the time required for actual construction preclude the proposed link from becoming a reality in much less than ten years. With the projected population growth as projected and the resultant impact on Alaska, substantial increases in the tonnages used in this report can be expected with attendant benefits available to the proposed link before the first spike is driven!

It must be emphasized again that the projected minimum of 150,000 tons annually requires only 1,000 tons per train for three trains per week. This same train service could easily handle three times this tonnage with a very nominal increase in operating costs. Railroad transportation is characterized by sharply diminishing cost ratios as traffic increases up to the capacity of a given railroad.

United States
DEPARTMENT OF THE INTERICR
The Alaska Railroad
P. O. Box 7-2111
Anchorage, Alaska

March 8, 1961

Mr. Carl L. Junge
Executive Director
Alaska International Rail & Highway Commission
Suite 705, 1809 G Street, N. W.
Washington 25, D. C.

Dear Mr. Junge:

In accordance with the attached letter dated February 9, 1961 from Secretary of the Interior Stewart L. Udall, I am enclosing a statement as to the proposed rail link across Canada to Alaska.

This statement has not been cleared with the Secretary of the Interior and it is understood that the views expressed are not necessarily those of the Department of the Interior.

For simplicity's sake, I have utilized only tonnages considered to originate east of the Missouri River and which would be likely to move over the proposed route because of the advantages of the transcontinental rate structure now in effect. West Coast tonnages, which could be available, and tonnages to be developed in the future have not been considered, and increased revenue to the existing Alaska Railroad has not been used as a justification. It is unfortunate that none of the presently published tonnage statistics reflect in any way the tonnages that are now and will be generated because of the fast-growing oil industry on the Kenai Peninsula.

The routing to Whitehorse from The Alaska Railroad departs The Alaska Railroad at Rex. From Rex to approximately Big Delta the route follows the northern slope of the Alaska Range. Construction costs and maintenance costs are indicated to be much lower than the suggested extension of the present Fairbanks-Eielson branch.

I shall be happy to attempt to answer further questions during my appearance in Washington the latter part of March.

Yours very truly,

D. J. Smith
General Manager

UNITED STATES
DEPARTMENT OF THE INTERIOR
Office of the Secretary
Washington 25, D. C.

FEB - 9 1961

Dear Mr. Smith:

There is enclosed a copy of a letter of January 26 from Senator Magnuson requesting your assistance in the work of the Alaska International Rail and Highway Commission, and a copy of our reply.

This will authorize you to prepare and submit to the Commission a statement as to the proposed rail link across Canada to Alaska, and to discuss the problem with members of the Commission and its staff.

Since there will not be time to clear your statement here, it is understood that the views expressed will be your own and not necessarily those of the Department. It is suggested that you send your statement directly to the Commission with copy to this office.

Sincerely yours,

s/ Stewart L. Udall
Secretary of the Interior

Mr. D. J. Smith
General Manager
The Alaska Railroad
P. O. Box 7-2111
Anchorage, Alaska

Enclosures 2

ALASKA INTERNATIONAL
RAIL AND HIGHWAY COMMISSION
1809 G Street NW.
Washington 25, D. C.

January 26, 1961

Dear Mr. Secretary:

During its study of the economic feasibility of rail and highway transportation facilities connecting the forty-eight continental states with central Alaska, the Commission has received conflicting data on capabilities, construction and operating costs and other information relating to rail transportation.

As you know, Public Law 884, 84th Congress, which established the Commission, authorizes me to utilize the facilities, information and personnel of the establishments of the executive branch of the government and authorizes you to furnish such information.

It is requested that the General Manager of the Alaska Railroad, as an expert in his field of railroading, without committing the Department, be authorized to furnish the Commission a statement of his views relating to the establishment of a rail link between the United States-Canadian rail network and the Alaska Railroad. It might be desirable to have Mr. Smith meet with some of our members to discuss with them the details of such a project.

Since the time for submission of our report to the Congress is rapidly expiring, I will be grateful for your prompt response to this request.

Sincerely,

Warren G. Magnuson, USS
Chairman

The Honorable Stewart L. Udall
Secretary of the Interior
Washington, D. C.

A REPORT

for

THE ALASKA INTERNATIONAL RAIL & HIGHWAY COMMISSION

An Appraisal of Studies on Transportation Requirements for Northwest North America

by

W. B. Saunders & Company
Transportation Consultants
Washington, D. C.

May 1961

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Exhibit X

REPORT TO THE ALASKA INTERNATIONAL RAIL AND HIGHWAY COMMISSION

An Appraisal of Studies on Transportation Requirements for Northwest North America

by

W. B. Saunders & Company
844 Pennsylvania Building
Washington 4, D. C.

I. Purpose of the Report

This report is an evaluation of certain transportation aspects of the research report prepared by Battelle Memorial Institute on "An Integrated Transport System to Encourage Economic Development of Northwest North America," dated March 15, 1961 and submitted to the Alaska International Rail and Highway Commission. Subsequently this report was the subject of comment and analysis by D. J. Smith, the General Manager of the Alaska Railroad. The analysis here will deal with basic transportation issues raised both by the Battelle study and by the Smith Report.

In this report we shall evaluate the assumptions, conclusions and recommendations on transportation requirements dealt with in both studies. However, we shall not attempt to evaluate the underlying economic estimates as to known resources of Alaska and the Yukon. Rather, we shall adopt Battelle's estimate that about 300,000 tons of new mineral traffic (including mine supplies) may be developed in Northwest North America in the next twenty years.

II. Analysis of the Battelle Report

At the outset it should be emphasized that the Battelle study concludes that principal developments of known resources will occur over the next twenty years in areas along or close to the coast (page I-16). For this reason Battelle assumes that little of the increased tonnage will be susceptible to movement overland. Further, Battelle suggests that "if major freight movements result from future discoveries of mineral resources in regions back from the coast in Alaska, Yukon Territory, and in Northwestern British Columbia, these could be handled most economically by shipping to the coast over the shortest possible route available at that time and thence to markets by water transport." Thus, demand for land transport is found to be limited essentially to tourism.

This is a critical assumption. A general review of the terrain will show that resource developments at certain points in the interior would call for the construction of relatively expensive land transport to cross the various mountain ranges between such interior points and the coast for subsequent movement by water. Furthermore, if the ultimate markets for such developments were located at points in the interior of Canada or the 48 Continental States, it would not necessarily be more economical to move such traffic to an Alaskan port for water movement south to a Canadian or American port, thence for movement east to the interior. There could be some situations in which an inland direct connection by rail or highway would be more economical than the three-way handling assumed in the Battelle study. Furthermore, in addition to the handling question, there is the element of circuity. While

it is commonly held that water transportation is cheaper than land transportation, there certainly is a point at which, even if other things were equal, excessive circuity would eventually operate against even the cheapest form of water transportation relative to direct land transportation.

It is important to emphasize that the Battelle study was confined to known deposits of raw materials and most of these are close to the coast. It is thus not surprising that as little as 300,000 tons of new freight were projected. As a consequence of this limitation the Battelle report fell back on the concept of tourism as "the only major economic-development potential in the Area that would benefit substantially from major new or improved land-transport linkages between Alaska and the southern forty-eight states."

Next, turning to tourism, Battelle makes a forecast of future tourist traffic which can be achieved if certain assumptions are made. "In order to assure a real growth in tourism, it will be necessary to exert strenuous and constant efforts to this end from all angles, including the following:

(1) Schedule more tourist or coach rates on airlines serving the Area

(2) Continue to improve air schedules from the central and eastern parts of the southern 48 states

(3) Give greater attention and service to visitors' needs in respect to lodging, eating, and other travel services

(4) Develop a greater variety of tourist attractions and activities

(5) Build more and better accommodations at low rates both in the Area and on roads leading to it

(6) Reduce the distance and cost, and improve the comfort of auto travel to and in the Area

(7) Provide a variety of ways of traveling to the Area

(8) Extend the length of the tourist season, striving for nearly year-round activity

(9) Create and maintain effective promotional efforts."

With tourism as the only basis for future development and with some very important assumptions which must be satisfied before tourism can grow, Battelle concludes that the only way to permit the growth and development indicated is to build or improve the highway system. In short, without any freight operation and with dependence solely on tourism, it would be quite true that a highway system would be the only means of stimulating economic growth in the Area. Yet this view is unduly narrow.

In determining the costs vs. benefits of the highway program to satisfy the tourist needs, Battelle looks to the total expenditures of tourists in the Area and the resulting stimulation to the gross national product of the territory visited. Battelle estimates that "assuming that needed transportation facilities and tourist accommodations are provided and that vigorous, effective promotional efforts are launched and maintained, tourist expenditures in Northwest North America could soar from the present level of about $93 million to $472 million by 1980. In addition, a significant share of the additional expenditures, $123 million, would swell the Area's payrolls and lead to increased employment and population, 21,600 and 130,000 respectively."

In discussing the possibility of a railroad linking Alaska with present Canadian rail lines, Battelle makes several basic assumptions. The details will be discussed hereinafter but the theory is to be noted at this point. Battelle concludes that a new railroad linking the planned Pacific Northern Railway with a terminus at Whitehorse to Eilson (near Fairbanks) would cost $147.5 million and require 820,000 tons of freight with an average haul of 400 miles at revenues of 5 cents per ton-mile in order to break even. It concludes that foreseeable freight movement is but a fraction of that figure.

We can test the logic of this approach by considering how it would compare with the approach built into the analysis of tourism. First, in evaluating tourist potential, the Battelle study suggests that the availability of an improved highway system would greatly enhance the possibility of traffic development. It is not clear why this same point would not be true with respect to freight development. Unquestionably, throughout history the availability of transportation has made easier and more rapid the development of freight traffic, the tapping of otherwise uneconomic natural resources, and the growth of industrial development. Thus, provision of transportation facilities which would generate increased tourist traffic may be expected to help generate increased freight traffic as well over the long run.

III. Battelle Treatment of Rail Facilities

The foregoing section has discussed generally the analytical method used by the Battelle study. It now remains to evaluate this approach in somewhat more detail.

An important element is the estimated investment cost for a new railway.

It should be understood that there is now a proposal to build a new Pacific Northern Railway from Summit Lake in British Columbia to the Yukon Territory. This line has been planned by British Columbia interests. Details now available show a proposed line of 697 miles would cost about $250 million. This includes rolling stock, an extensive microwave communications system, and large marshalling yards. The overall cost, including equipment and facilities, amounts to $360,000 per mile.

The Battelle study accepts the proposed Pacific Northern as given, including its eventual extension to Whitehorse. It then projects a possible railroad which would run 590 miles from Whitehorse to Eilson, where it would connect with the present Alaska Railroad. For calculating purposes, Battelle allows $250,000 per mile for construction. The combined investment in a new railroad through both the Canadian and the United States portions of the route would therefore be about $147,500,000.

From the foregoing, Battelle calculates amortization over a 50-year period with interest at 5 per cent to be $8 million.

The significance of this $8 million figure should be understood. This capital recovery charge is, in a broad sense, a true economic cost. Certainly it would have to be borne by a private enterprise seeking a recovery of its capital. But it takes on a somewhat different complexion when a comparison is made for a public facility intended to develop a new territory. From this standpoint such an investment is no

different from an investment in an airport or in air traffic control systems or development of inland waterways, or the improvement of harbors. These expenditures by government represent public investment which we justify strictly as a matter of public policy, in the absence of full user charges.

The private investor must recover all of his costs, including interest, from his customers. Government has an opportunity to look at the issue more broadly. It can seek to recover its costs from the general improvement of the economy.

In evaluating the highway prospects, Battelle did not try to recover investment costs specifically from user charges to be paid by tourists. Instead, Battelle's approach was to estimate the improvement in total gross national product as a result of tourism and to show that such improvement was far above any cost chargeable directly to the highway. The logic as applied to rail facilities is, of course, exactly the same. A rail facility would have substantial impact on the "value added" to the Area and would also increase employment and other economic indicators.

In this connection, it should be noted that there is an important difference in the method of evaluating highway and rail facilities. When Battelle makes an estimate of the cost of rail transport, it includes an allowance for the total cost of providing the service, including the handling of the traffic from origin to destination. When Battelle discusses highway transport, it does not include the total cost of transportation from origin to destination but merely cites, at most,

additional fuel taxes. The rail costs seem high compared with highway costs only because the rail figures include all of the cost whereas the highway figures include only the investment and maintenance of the highway itself, with nothing shown to the cost of operating the equipment which uses the highway.

This conceptual difficulty is intensified in the Battelle study when attention is directed to the actual figures built into the operating expense estimate. Battelle assumed that operating expenses could be calculated at $15,000 per mile. It defended the use of this figure by showing that the reports of the Alaska Railroad for fiscal 1960 reflected an average expense of $20,000 per mile of main line and that the average expense for the Pacific Great Eastern in 1959 was $11,400 per mile. However, Battelle conceded that, "through strict economies, including operation as a part of the Alaska Railroad, the annual operating costs might be lowered by 50% or more, estimated by the Alaska Railroad as low as $7,000 per mile."

As a result of this assumption, Battelle estimated that total cost for the 590 miles would be $8,850,000 annually, and this figure, together with amortization and interest of $8,000,000, produced an overall cost per year of $16,850,000. This cost figure is reduced somewhat by a passenger revenue estimated at $400,000.

Actually, one using such an average must do so at his own peril. The average expense per mile for any railroad necessarily reflects the density, length of haul, train characteristics, yard distribution and other physical and traffic aspects of the railroad.

Two railroads of equal length may have vastly different expenses per mile if one road operates one train per day and the other operates 20 trains per day. The total expense for 20 trains is obviously much greater than that for one train and a failure to take into account these differences would produce a serious distortion in any subsequent estimates of the future cost. Furthermore, a line that has 20 trains may or may not have 20 times as much expense - this depends on the kinds of trains operated. A railroad with one train per day averaging 5,000 tons will have less expense but not as little as 1/10th the cost of a railroad having 10 trains per day each averaging 1,000 tons.

Similarly, expressing all expenses per mile gives no weight to the fact that terminal costs exist regardless of distance. A short railroad with a great deal of terminal work will have a high total expense per mile merely because the fixed terminal cost must be spread over a short haul. Without considering the location of terminals and the kinds of traffic handled, it would be impossible to draw any overall conclusions about the applicability of average costs for one railroad to the operations of another.

In any event, having made certain assumptions about the expense per mile, Battelle developed an estimated annual operating expense. This, plus the fixed charges, led to some calculations of necessary revenue. Break-even operations were shown to require at least 820,000 tons of freight traffic at an average haul of 400 miles and revenue of 5 cents per ton mile.

The critical question in determining the possible market for any new product is to evaluate competition. If one is contemplating entry

into the steel business in Colorado, one must ask what the possibilities are of a new steel plant in that area competing with existing plants located at various points and serving the markets which the new Colorado plant would propose to serve. If the cost of providing this service from Colorado to the markets sought would be less than the present cost of supplying these markets from eastern steel mills, then the project is worth considering.

The Battelle study does not seem to have followed this basic approach. As applied to the issue of whether there is a need for a new freight facility between Alaska and the rest of the United States, the appropriate question would be:

> "What is the present cost of hauling freight from Chicago (or some other producing point) to Seattle and thence by water to Alaska plus rail beyond?"

If we looked at such figures and then considered the economics of the proposed railroad operation, we would have a much clearer idea of the possible range of competition. It is entirely inadequate to say that the average revenue per ton-mile in trucking service is about 5 cents and that therefore this represents the yardstick against which the compensativeness of the proposed railroad should be measured.

IV. Relative Economy of Rail Transport

In addition to its specific cost calculations, Battelle makes the general observation that an all-rail route would be unable to compete with present rail-water-rail service because water competition is notoriously low cost. In support of its general thesis, Battelle cites as

an illustration the domestic movement of iron ore between the Mesabi Range in Minnesota and the steel mills in the Pittsburgh area.

The study cites the fact that typically only a very small tonnage moves via all rail routes from the mines to the mills. By far the vast bulk of the tonnage moves by rail from the mines to the Upper Lake docks, such as those of the Duluth, Mesabi and Iron Range at Duluth, thence by water to Lake Erie ports, such as Conneaut or Cleveland, and thence by rail to Pittsburgh. Further, the report mentions that the present all-rail rate is $10.12 per ton and that this is well above the estimated $6.75 cost per ton under the rail-water-rail combination, including dock handling charges.

There are several important defects in this analogy. In the first place, the handling of iron ore is much less expensive than the handling of general cargo. An ore vessel may be loaded and unloaded in only a few hours. Records of the Alaska Steamship Co. show that in 1959 the average round-trip voyage required 19.6 days and that of that total time 8.6 days were spent in port. The economy of bulk handling is graphically illustrated by this comparison.

Furthermore, it should be emphasized that the handling of bulk iron ore from Duluth to Lake Erie is accomplished in vessels which can haul perhaps 20,000 tons or more on each voyage. Many of these vessels move coal in the opposite direction, thus further reducing the costs.

At the loading and unloading docks, specialized and highly efficient equipment is available for the cargo handling operation. This is not only performed at very low cost but, in addition, the process

is an integral part of the consumption pattern for ore. Cars of ore move down from the various mines to the docks for temporary storage, each with its own particular mix. When a vessel is to be loaded at the head of the Lakes, the cars can be selected for dumping in such a way as to produce the exact mix needed for the particular furnace. Thus, the rail-water-rail method of handling is vital to the ore-blending process used by the mills.

From the dock at the lower lake ports, ore moves largely in solid trains, frequently weighing as much as 11,000 to 16,000 tons. This produces rail costs well below average.

While, the present all-rail rates are indeed higher than the present rail-water-rail rates on iron ore, this is not necessarily a fair indication of the economic situation facing shippers and carriers who must move freight from interior points in the United States to ultimate destination in Alaska. Table I shows some important facts about the Alaska Steamship Company. At the present time, Alaska Steamship Company handles approximately 500,000 tons annually to and from Alaska. In 1959, of 461,000 tons, some 365,000 tons were handled north to Alaska and only 92,000 tons were moved south for distribution elsewhere in the United States, while an additional 4,000 tons were handled between intermediate ports. Thus, 79 per cent of the traffic moved in one direction.

Alaska Steamship operated 177 voyages in 1959, with an average of 19.6 days for the round trip. The average voyage handled a total of only 2,605 tons. Northbound, the average load was only 2,061 tons,

while the southbound lo ad was only 521 tons, with an additional 22 tons being handled for intermediate points. This is a far cry from the 20,000 ton loads hauled on the Great Lakes.

Another point to note is that the average revenue per voyage was approximately $92,000 and the average operating expense was $91,000. The operating expenses are but little affected by the amount of traffic handled, because most voyage costs are fixed per voyage, irrespective of tonnage. Only certain of the terminal expenses vary with the traffic hauled. As a result, whether traffic is heavy or light, costs will approximate some $90,000 per voyage. When traffic is heavy, revenues will go up and profits will rise. When traffic falls, revenues decline, costs remain substantially the same, and profits decline sharply. Thus, between 1958 and 1959, traffic fell from 482,000 tons to 461,000 tons. With voyage costs remaining the same and revenues declining, the average gross profit fell from $5,046.00 per voyage in 1958 to $906.00 per voyage in 1959.

It remains to be considered just how profitable this much profit is. How much "fat" is there in the average rate level under present conditions? In 1959, the average revenue per ton was $35.28 and the average gross profit per ton was only 35 cents - 1 per cent.

It thus becomes clear that any showing based on bulk handling of iron ore at a rate of $2.00 per ton produces inappropriate results when applied to the operations of the general cargo carrier whose present average revenues are $35.00 per ton. There would be some possible significance to this comparison if the rail costs of non-bulk

traffic were also likely to be 17 or 18 times as high as the rail cost of the bulk ore traffic. In fact, as will be shown subsequently, this is not at all the case.

What is the relativity of rail and water cost in this area? We can see that present water costs average about $35 per ton. This is about $1,000 per carload equivalent for a typical move between Seattle and Seward, a water haul of over 1,400 miles. For a shipment with ultimate destination in the Alaska Railbelt, there would be additional costs of port handling at each end plus rail haul to destination.

How would this compare with land transport? We have no land route now available, but a few general yardsticks will be helpful.

The ICC publishes average cost data for railroads serving the Western District of the United States. The figures include the large roads serving the West Coast. Assuming that their cost characteristics could be applied to a move overland (and they cannot be literally applied, of course), how would the results compare.

Data are readily available for the year 1959. On the basis of fully distributed costs, including a 4 per cent return on investment, and allowance for Federal Income taxes, the cost of a 35-ton box carload would be only about $800 for a 2,110-mile rail haul from Seattle to Rex (Kobe), Alaska. (See Table 2.)

A similar movement in a gondola car would cost about $878 on a fully distributed basis from Seattle to Rex.

Of course, these Western District costs would not be directly applicable to a movement over a rail link between Seattle and Rex.

However, the figures do show that even allowing for a substantial disability as a result of weather and other problems, full rail costs might not be much different from water costs between Seattle and Seward. The water costs do not include full terminal handling plus line-haul to destination. As Table 2 shows, the fully distributed line-haul cost for a haul of about 300 miles on a Western District average basis is about $100. Allowing at least 11 cents per hundredweight for handling in and out of the car at each end, there is an added cost of over $4 per ton for this terminal service, or $140 per car, assuming a 35-ton load. If consideration is also given to additional storage and handling in the port areas, including truck pickup and delivery, it can be seen that a rail route should not be dismissed lightly.

V. Conclusions on Battelle Study

1. The Battelle report does not give adequate recognition to the importance of added transport in making possible new economic development in under-developed areas.

2. When it is considered that possibly 40 per cent of the total foreign aid program and foreign loan program of the United States government is devoted to improved transport facilities as a means of encouraging accelerated growth of under-developed countries, it would appear that the importance of adequate transport is well recognized in other branches of the United States government.

3. By over-emphasizing tourism, Battelle has put undue emphasis on highway potential without considering that long haul freight transportation by highway will not be economical and thus will not expedite the development of Alaska's agricultural, mining and manufacturing potential.

4. Whether a rail or highway investment is considered, it should be emphasized that interest and amortization must be considered as economic costs. However, it is an issue of public policy to determine how this cost shall be recovered. A private investor must recover these costs from his customers. Government may look more broadly to recovery of its costs from the general improvement of the economy.

5. The Battelle report recommends a highway program by including improvement of the general area welfare as a "benefit" and thus does not contemplate recovery of all highway costs from the users of the highway alone. But in evaluating the rail potential, Battelle sets up a standard under which the user (the freight shipper) must pay all costs including interest and amortization in order for the rail line to qualify as "economically feasible."

6. Battelle assumes that water transport is automatically cheaper than land transport in the area being considered. This is partly because it overestimates the cost of rail transport in light density areas and fails to give adequate weight to the present relatively high cost of water service to and from Alaska.

VI. The Smith Proposal

Subsequent to the publication of the Battelle study, Mr. D. J. Smith, General Manager of the Alaska Railroad, prepared a statement suggesting that alternative possibilities exist which were not fully dealt with by the Battelle report. Mr. Smith's proposal was that a link could be built and operated economically from the present Alaska Railroad at a point near Rex (Kobe) Alaska for a distance of 298 miles to the Alaska border,

where it could connect with a line built north from Whitehorse through the Yukon. The total new rail mileage in Alaska and the Yukon would be approximately 680 miles.

The proposal contemplates a somewhat different route than that embraced in the Battelle study. One result is that the total mileage to be added from Whitehorse would be about 90 miles more than are reflected in the Battelle study. This is described as the more desirable route because maintenance problems would be less on this line even though the mileage would be greater. We take no position on this point since we have not had an opportunity to compare the routes in any detail. It should be pointed out, however, that the extra construction costs for the extra distance should be weighed against the saving in annual maintenance expenses per mile over a longer mileage. In any event, this is a detail which can be resolved at a later stage after detailed engineering studies have been made.

The essential point of the Smith report is first that the Battelle study greatly overstates the operating costs of any supplementary rail facility to be built in this area and, second, that the Battelle study completely ignores the nature of existing rates and rate structures in determining the feasibility of a rail route. In addition, the Smith report suggests that consideration should be given to general benefits which would arise from the development of a rail facility which would assist both the civilian and military population of Alaska and the rest of the United States. Finally, the Smith report suggests that the cost of amortizing the investment in the property need not be absorbed out of operating revenues.

The first point evaluated in the Smith report deals with the nature of the transcontinental rate structure. Mr. Smith suggests that the transcontinental rate system results in equal rates from points in the mid-west, such as Chicago, whether a shipment is routed to Seattle and thence by water beyond, or whether routed through Prince Rupert for water movement beyond. Since Prince Rupert is some 600 miles closer to Seward, Alaska than is Seattle, Mr. Smith suggests that the existing transcontinental rates would permit the movement of traffic considerably farther north under the existing rates.

Stated differently, Mr. Smith points out that a shipper in Chicago may pay a given rate to haul his Alaska traffic via Seattle or via Prince Rupert. If it goes via Seattle, the rail haul is 2,210 miles to the port. The same rate, however, will enable him to move it 2,700 miles to Prince Rupert. In effect, Mr. Smith then suggests that the rate to Prince Rupert might also be applied by "bending" the mileage up the line of the proposed Pacific Northern Railway to a point 469 miles from Prince George, B. C. If this were done, the haul from Chicago to such a point would be 2,700 miles - the same as it now is to Prince Rupert.

Thus, Mr. Smith's key point is that the present transcontinental rate structure will enable a shipment to move approximately 900 miles closer to Alaska than Seattle is now, and that, therefore, the only additional freight rate issue would be the measure of the rate which would be added for an all-rail movement from this rate point (469 miles from Prince George) to the destination in Alaska. Using Rex

as the destination point in Alaska, this would mean that the competitive rate structure need be confined only to such an amount as would cover a movement of 1019 miles from rate point "A" to Rex.

Another way of looking at this proposition is that at the present time a given rate will haul a shipment 2,210 miles from Chicago to Seattle. It will then move by water some 1,419 miles to Seward, a total of 3,629 miles and still not be at its final destination. If the rate structure could in fact be "bent up" to the key point north of Prince George, the receiver in Alaska could move his traffic some 800 to 1,000 miles closer to Rex without paying anything extra for the saving in water haul.

This is a key theory in the Smith proposal. It assumes that if there were a through route to Alaska, it would be possible to apply the through rate from the East to Prince Rupert directly to a point northward on the through route. The assumption is that it would be possible to justify this rate in the same way as the railways justify the present rate to Prince Rupert.

This is not an entirely valid assumption. The inherent basis for the transcontinental rate equalization program and indeed for the general level of the rates involved to the ports, is a special economic factor. Railroads historically have made rates for export traffic lower than rates for domestic traffic going to the same points. The reason is that export traffic has been considered to be entirely <u>additional</u> traffic. Shipments to a foreign country are considered entirely additive, whereas shipments which are made for domestic consumption are considered to be partly substitutes for one another. That is to say, a railroad may be willing to put in a low rate on an export shipment of steel to Japan

because in the absence of the low rate there will be no movement of this steel at all. If the shipper can market his steel in Japan, this will not at all interfere with the shipper's ability to market other tonnage domestically. The railroad sees it a matter of adding to its total revenue rather than merely substituting one movement for another. The attitude of the railroad would be quite different if it were a matter of changing the rate on a commodity merely to shift it from one location to another internally. There might then not be any increase in total revenue but merely a redistribution of existing revenue among the carriers.

In short, rates to the ports have always been treated as encouraging added traffic. A different view is held on domestic rates because a low rate to a distant point will automatically put pressure on all rates to intermediate points. It would be extremely difficult for a railroad to defend a rate of $1.00 to Seattle while maintaining rates to Montana points at higher than $1.00 unless the $1.00 rate were confined to off-shore movement.

Thus, what we come down to is an appraisal not merely of the "bendability" of the rates but also of the ability of the participating lines both to derive net revenue from the traffic moving under the rates and, second, the extent to which any reduction in rates for the long hauls here involved would tend to depress rates to and from intermediate points. The Smith report does not go into this critical question.

We believe that a better way of looking at the question is to consider the present through cost from origin to final destination via rail-water-rail and then to consider what the possibilities are for the same

rate or a lesser rate being applied via all-rail for the entire distance. While the Smith study does not approach this rate question from an entirely practical point of view, it may be observed here parenthetically that the general conclusion as to possible rate level may not be significantly out of line.

VII. Potential Traffic

The Smith study referred to a report made by the Canadian National Railways on traffic prospects in connection with the Alaska freight movement. The full details underlying this study have not been made available. The conclusion on which Mr. Smith relies is that something "in the order of 150,000 tons of freight is presently in (this) category....which could properly be considered as originating in the Mid-West or Mid-East and which might, with advantage, utilize the transcontinental rate structure." Mr. Smith then applies to this a present average water rate from Seattle to Seward, including terminal charges at Seattle, amounting to $45 per ton. This gives him an estimated potential revenue of some $6,750,000 which might be produced for the handling of this traffic by rail 1,019 miles from "rate point 'A'" to Rex. This includes handling through British Columbia and the Yukon as well as over the Alaska Railroad.

It is important to recognize that the Battelle study, as mentioned previously, gives no consideration to the possibility that an overland route might be able to compete with a rail-water-rail route and therefore gave no consideration to the possibility that existing traffic might move more economically via an overland facility all the way rather than being rehandled at Seattle and Seward. Thus, Mr. Smith makes a

major contribution to the clarification of the issue by first making an estimate of the tonnage now moving which might conceivably be diverted to an overland route.

Our analysis of the available data does not support the 150,000 ton figure as having a firm foundation. The study on which it is based appears to have been made largely from an analysis of the nature of the commodities handled rather than an analysis of actual origins and destinations of the traffic. In short, the study appears to have assumed that an item which is produced in the Mid-West might be able to compete with items of the same character produced on the West Coast. This further assumes that tonnage of a given commodity produced in the Mid-West may be divertible to the Canadian National for movement to Prince Rupert rather than to Seattle.

This assumption is, of course, only a rough way of making an overall estimate. On the other hand, consideration must be given to the fact that Alaska Steamship alone handles approximately one-half million tons of general cargo. Additional substantial sums are handled by Puget Sound Alaska Van Lines, Alaska Freight Lines, Pacific Western Lines, Foss Tug & Barge Company, Permanente Cement Corporation, and other public and private carriers.

Again, it is important to recognize that the midwestern area of the United States is an important center of manufacturing production, with much of the output moving to the West Coast. It should also be recognized that traffic now moving through Seattle to Alaska may have moved in the first instance from a factory in the Midwest to a warehouse on the West

Coast and thence by truck to a steamer for movement eventually to an Alaska destination. A traffic study would certainly establish the facts on this point. It is clear, to the extent that such handlings do occur, that the ultimate origin must be considered in evaluating the potential flow of traffic over a through land route if it were available. This is particularly so in view of the fact that the handling of freight into a warehouse, storing it, rehandling it, moving it to dockside, loading a vessel, shipping it by water, unloading it in Alaska, and further handling it to ultimate destination, represents a substantial additional cost to the shipper as compared with one handling at the origin plant and one handling at the destination plant.

In this connection it should be considered that a shipment from Chicago might average about 6 days via rail to Seattle. If there were no delay or rehandling, it would take an additional 6 days via Alaska Steamship from Seattle to Seward. From the port, including handling as well as rail movement, an additional 2 days would be required. Thus, if there were no delays awaiting vessels, the typical rail-water-rail shipment would take at least 14 days on the average. In contrast, the availability of a through overland route might enable traffic to move from Chicago to a point in the Alaska rail belt in perhaps 10 to 12 days. Thus, storage in transit could well be cheaper to the shipper than storage and rehandling at a West Coast warehouse.

Weighing all of the foregoing considerations, we believe that it is not unreasonable to consider the possibility of diverting as much as 150,000 tons of existing traffic to an all-rail route. Under other circumstances, we might suggest that existing rates are not the

principal criterion for determining the extent to which traffic may be diverted from one form of transport to another. This is because in the final analysis the ability to divert depends not on present rates but on relative costs to the competing forms of transport. If present rates are substantially above cost and a new through route publishes lower rates, it will not be sure of handling the traffic unless the older form of transport cannot afford to cut its rates to meet competition. Existing water rates do not seem to offer much prospect for reduction in view of present water carrier earnings. However, consideration should be given in any careful appraisal to the fact that technological changes may occur which would lower the cost by water and thus lower the cost of a rail-water-rail handling as compared with an all-rail movement. Presently barge-container operations are being tried out. Other developments may be anticipated.

It is of course difficult to put a magnitude on these possibilities. The development of containerization in general has already begun to have an effect on through costs. This is because containers are more economical to handle than general cargo being loaded and unloaded in small quantities. Furthermore, new types of barges and tugs can reduce water line operating costs themselves. On the other hand, it should also be pointed out that the possibilities exist for improved technology on land. Long haul railroads can make improvements in operation which could substantially reduce operating costs overland. In sparsely settled country such as would be involved in the proposals here being considered, the size of crew used on the trains might be substantially reduced as compared with the average

operation in the continental United States. At the present time the typical through train uses a 5-man crew. In many countries, similar trains operate with as few as 2 men in the crew, and experiments are now being conducted which contemplate completely automatic train operation. It probably would not be economical on a light density line to consider the capital investment in electronic equipment which would be required for a fully automatic operation. Nonetheless, if significant traffic developed, the opportunities for operating economies by rail would be substantial.

Domestic railroad costs are relatively high today in part because there are too many light density lines being operated competitively and partly because there are a number of operations conducted with more men than are physically required to perform the necessary duties. This, in turn, is an outgrowth of certain historical bargaining factors in the railway industry. They need not apply in a new operation with a new railroad where questions of job displacement are not involved.

We may conclude, therefore, that while there are opportunities for reduced costs of water transport, there are also opportunities for reducing the cost of land transport in the future. In the absence of any specific factors, we can make the reasonable assumption that the relationship of costs in the future will be substantially the same as it is at present for both the water and land facilities.

Thus the relative cost problem which must be given most consideration in assessing possible tonnage is the extent to which traffic originating in Chicago can compete with traffic originating in the West Coast

area such as at Los Angeles or San Francisco. If two plants have equal production costs, their ability to compete in the Alaska market will depend on the freight rates from the plant to final destination. The distance from San Francisco to Seattle is 900 miles, plus 1,419 miles by water to Seward, plus an additional 200 miles to some average center of consumption in Alaska, between Anchorage and Fairbanks. Thus, the total distance for a producer of a given commodity in San Francisco to an average consumer in Alaska would be 2,519 miles via rail-water-rail. The producer of the same commodity in Chicago would have to move his product 2,210 miles to Seattle and thence 1,419 miles by water, plus 200 miles to the weighted average destination in Alaska, or a total of 3,829 miles under present circumstances. Thus the Chicago producer has 52 per cent more mileage to traverse in order to compete with a San Francisco producer of the same commodity.

On the other hand, if an all-rail route were available, the Chicago producer would have a haul of approximately 2,200 miles to Prince George, plus 31 miles over the Pacific Great Eastern, plus 777 miles over the Pacific Northern Railway to Whitehorse, plus approximately 680 miles over a connecting link through the Yukon to Rex, plus perhaps 185 miles over the Alaska Railroad to the weighted average center of consumption, making a total of 3,873 miles from origin to destination all rail. Thus, the all-rail route actually would involve about the same total miles as the rail-water-rail route from Chicago.

The San Francisco shipper competing with the Chicago manufacturer would have a haul all-rail of 900 miles to Seattle, 620 miles from

Seattle to Prince George, plus 31 miles over Pacific Great Eastern and 777 miles over the Pacific Northern to Whitehorse, 680 miles through the Yukon to the Alaska Railroad and 185 miles to the average center of consumption. This is a total of 3,193 miles.

It seems clear that a shipper on the West Coast will have a mileage advantage as compared with a shipper of the same item in the Mid-West. What it comes down to, therefore, is whether the costs via the North-South lines like the Southern Pacific and its connections on the West Coast to Seattle and beyond to Prince George would be any less than the costs of East-West roads like the Great Northern and the Canadian National to Prince George and beyond. On the whole, it is highly unlikely that the longer haul could operate more economically than the shorter haul. Thus, in any industry where production costs are the same on the West Coast and in the Mid-West, we may expect the West Coast producer to have some relative marketing advantage as against the Mid-West producer in serving the needs of the Alaskan economy.

It may be observed here that in the event of a competitive struggle among the carriers serving the Mid-West and the West Coast, so long as rates remain compensatory for both groups, the public will stand to benefit in the long run as reduced transportation charges make delivered prices cheaper and thus tend to stimulate demand for additional goods and services in the territory served.

We conclude that 150,000 tons is a reasonable working figure for the measure of present traffic which might move all rail if such a facility were now available. For the long run, we accept the Battelle

estimate that only 300,000 tons of new traffic would be available to a rail link, making a total of 450,000 revenue tons for working purposes.

VIII. Operating Costs

The Smith study makes a detailed analysis of a possible extension of the Alaska Railroad from Rex to the Alaska-Yukon border. The estimate assumes that the new facility would not require additional overhead expenses or additional investment in equipment because there is ample excess capacity at the present time to haul considerably more traffic. We are unable to evaluate this particular assumption. However, it is well to recognize in the long run some allowance should be made for return on investment in and depreciation of locomotives, because such equipment will wear out and eventually must be replaced. Even though it is a government facility, the Alaska Railroad will have to consider ultimate capital costs.

The basic assumption in the operating cost estimate is that trains will operate three round-trips per week over the new line, or one train per day traveling one way. With a limited tonnage to be handled, this is an entirely reasonable assumption. Indeed, an initial operation might well operate with even less service in order to reduce costs. Since the railroad would operate through unsettled areas, there would be no need for extensive classification yards at intermediate points. Further, with limited traffic it would not be necessary to have frequent passing sidings or expensive signalling such as would be found on a more heavily traveled railroad. The maintenance and operating costs

of the additional 298 miles proposed is thus some $2,100,000, which represents an average cost of about $7,000 per mile.

Thus, if the 150,000 revenue tons were hauled over this new facility, the traffic would have to yield an average of approximately $14 per ton in order to cover the estimated direct operating costs of the new line. Obviously, to deliver the traffic to some point on the present Alaska Railroad beyond Rex would require added costs and additional revenues would be needed. Another 185 miles to destination would require line haul costs of one-third the foregoing, or close to $5.00 per ton plus terminal costs. Thus, on the basis of the Smith report, the delivery of a shipment to an average consuming point in Alaska would require total revenues of approximately $20 per ton in order to meet the operating expenses incurred, assuming a volume of 150,000 tons per year.

We shall test these figures by an independent method in another section of this report. It may be observed here, however, that if the Alaska Railroad obtains some $20 per ton for a haul of some 500 miles (298 miles over the new line plus perhaps 185 miles to some average consuming point in Alaska), it would absorb more than half of the present water cost for some 1,419 miles, approximately $35 per ton. Of course, the water costs must be plussed to allow for rail costs plus rehandling. It will be noted here, too, that the estimates of railroad costs do not include any allowance for interest and amortization at this point. If such items are included, the revenue necessary to cover costs, of course, would increase.

IX. Interest and Amortization Cost

A political and social issue is involved in determining whether to include interest and amortization in the cost of the proposed facility.

It seems clear that if a private investor were building such a railroad, interest would be a definite part of the cost of doing business. A private investor would have to borrow the money and pay interest each year on the sum borrowed. Furthermore, a private investor who borrows money expects eventually to pay it back and, in the normal course of business, sums are set aside each year for this purpose. This is the customary amortization process. Thus, if funds were borrowed on the basis of long term bond issues, at the end of the term a certain amount of interest has been paid and the sum borrowed has been repaid to the lender. This would be the natural situation if a private investor were considering this proposal.

When the issue is put in terms of government investment, the theoretical choices are the same but there are some important practical differences. When a private investor builds a railroad, he does so with the idea that he will develop benefits from the traffic and specific revenues derived therefrom. This is the only way in which a private investor can recover his investment. In the case of a government facility, however, there is a much broader choice open. The government can derive benefits not only from the revenues accruing to the rail facility, but also from the total development of the area.

However, whether such items are included is not strictly a technical question. It is a broad policy question which the Congress can determine. In effect, the Congress can decide whether it wants to forego interest and amortization on the money it lends to the Alaska Railroad in order to make possible more rapid development of the territory. It

can do this on the theory that this development is an important part of national policy. This would take the issue out of the pure economic arena where there is clearly no choice. Stated differently, Congress can forego what is definitely an economic cost if it wishes to give more weight to a national policy issue. In a sense, this can be viewed as a subsidy just as any other Federal expenditure is a subsidy when no user charges are made which will recover the full cost including interest and amortization. Needless to say, the number of illustrations of this type of expenditure are legion.

In appraising this concept of economic value, it should be noted that a highway which stimulates tourist travel at the rate of $356 per tourist per year, in terms of contribution to gross national product should be compared with a railroad which, while not normally an important factor in developing tourism, may have a much greater impact on the development of industry. If a railroad enables one mine to be opened which would not otherwise be economic, and if that mine produces 100,000 tons of concentrated ore worth $16 million, the economy of the area benefits automatically by this amount. And if the new tonnage adds freight revenue to the railway over and above the value of the output at the mine site, the economy is further advantaged. Certainly there is no difference between the railway and the highway investment in this regard. Whatever new expenditure is generated by the availability of the new transportation produces equally valuable dollars.

X. Cost of Possible Rail Facilities

In the light of the Battelle study and the Smith proposal thereon, we can draw a number of basic conclusions about the economy of rail facilities.

It appears reasonable to consider that if a rail facility were available connecting with the Pacific Northern at Alaska-Yukon border, some tonnage now moving between Alaska and the rest of the United States could be diverted to such a facility. For working purposes, a figure in the neighborhood of 150,000 tons is not unreasonable. As shown in Table 3, we estimate that normal operation of such an extension to the Alaska Railroad would require total operating expenses of $1.8 million. This includes allowance for train service on the basis of 3 trains per week southbound and 3 trains per week northbound. It assumes 100 per cent empty return of cars in the southbound direction. It allows for trains averaging 1,650 tons northbound and 700 tons southbound. These operating expenses include an allowance of $950,000 for track maintenance, the largest single category of costs for the new line - most of which would be the same even with a greatly increased traffic load.

To recover these costs the extended Alaska Railroad would require added revenues of $12 per ton of freight. We shall consider hereinafter the prospects for such revenues.

Before discussing this, it is well to consider future tonnage prospects. The Battelle study suggests the possibility that 300,000 tons of new traffic may be made available in the next 20 years, originating and terminating at mines in the Yukon. If such traffic materializes, it

would generate southbound movement and fill what would otherwise be a train of empty cars in that area. On the other hand, some of the southbound traffic might require open-top equipment while the northbound traffic would consist largely of manufactured items requiring box cars. Assuming the worst, we may calculate that 300,000 tons of new traffic would result in average train weights in Yukon Territory of 2,700 tons northbound and 3,660 tons southbound if the same frequency of service were provided there as was contemplated with the 150,000 tons of traffic moving to and from Alaska itself. This would require additional power because of the heavier tonnage. It might even require some additional train service. But overall, the additional annual costs for 300,000 tons of new revenue freight in the Yukon added to 150,000 tons moving in and out of Alaska would be relatively slight. Assuming the same cost characteristics in the Yukon as in Alaska, the cost of 298 miles in the Yukon would also be $1.8 million with 150,000 tons; further, such a line would incur costs of $2.6 million with 450,000 tons. Cost per ton for this haul would drop from $12.00 at 150,000 tons to $5.78 at 450,000 tons.

XI. Through Transportation Charges

How do these estimated revenue requirements compare with the through charges now applicable on traffic to and from Alaska? A shipment of canned goods can be used as illustrative. A shipper located in Chicago now pays $1.68 per 100 pounds or $1,008 per car (with a minimum of 60,000 pounds) to haul his traffic to Seattle. There he incurs some storage and warehousing charges before arranging to load his traffic aboard ship. From Seattle to Anchorage, the present charge is 224¢ per

100 or $2,418 per car of 60,000 pounds, including handling at Seward and rail movement to Anchorage.

A shipper now spends over $3,400 per car or $110 per ton to move his canned goods traffic rail-water-rail to Anchorage, in addition to storage, warehousing or trucking charges at Seattle. To this must be added the indirect cost of tieing up of inventory which, in itself, means additional working capital and interest charges.

Considering traffic generally, it becomes apparent that we are discussing aggregate charges of at least $3,200 per carload shipment. We can now assume that a through rate on such a car from Chicago to Anchorage, or some other point in the heart of the rail belt, could move at a competitive charge of about $3,000 for the entire haul. Assuming a shipment over a United States line plus Canadian National to Prince George, thence Pacific Great Eastern and Pacific Northern to Whitehorse and the Alaska border, and Alaska Railroad to destination, the issue becomes one of division of through revenue for participating carriers. What are the prospects for the Alaska Railroad to derive a share of the revenue on through business sufficient to cover operating costs?

Divisions are made on various bases which take into account mileage, operating cost, revenue needs, whether the carrier is an originating, terminating or intermediate line, and so on.

One important test is relative mileage. A carrier who hauls the shipment 1/3 of the distance will seek to obtain 1/3 of the revenue since distance is a rough measure of the relative work done. In the

present case, the test is the proportion of the haul on a shipment from such a point as Chicago. The Alaska Railroad would have a haul of 298 miles to Rex plus 185 miles to destination, or 483 miles in all. The through haul would be 3,873 miles from Chicago. Thus, on a straight mileage pro rate the Alaska Railroad might expect to start negotiations to derive at least 12.5 per cent of the revenue. This is approximately $375 per car or $10 - $11 per ton. If the railroad is hauling only 150,000 tons of revenue freight, the operating costs of the extension alone average about $12 per ton. The cost to destination would still have to be added. It is clear that, on a straight mileage pro rate, the Alaska Railroad would have a substantial deficit.

Another consideration which is of great importance is the extent to which terminal service is provided. Customarily the origin line may expect a somewhat larger share than a straight mileage pro rate because this line has the burden of originating the traffic and supplying the car. Likewise, the terminating carrier has switching costs which are greater than those of the intermediate carrier. Therefore, in the case of a shipment of canned goods from Chicago to Alaska by an all-rail route, the Alaska Railroad would normally be expected to derive slightly more than a mileage pro rate, while the Pacific Northern would expect to receive slightly less than a mileage pro rate. Another general basis has to do with local rates. It sometimes is a useful guide to consider how the revenue would be divided if it were made up of a series of present rates. In this instance, there being no local rates, this method would not be meaningful.

A very important method for negotiating and determining divisions is relative cost. Actually, mileage and equated mileage are merely rough substitutes for costs. In the normal course of business, with a railroad in being, we would anticipate that relative costs would be evaluated. If a carrier incurs 1/3 of the total cost, this is a powerful argument in support of a division amounting to 1/3 of the revenue.

Naturally, we do not have the specific figures to work with here. However, we can make some rough approximations which take into account the fact that relative traffic density has an important bearing on costs and that there are important differences in the traffic density in the various lines involved. Thus, the Alaska Railroad will have the lightest traffic density on its portion of the haul from Rex to the Yukon border. The Pacific Northern would have considerably more traffic density, in view of the local developments outlined by the organizers of the railroad plus the fact that projected new minerals tonnage would occur in the Yukon. Finally, the Canadian National and connecting U. S. lines would have traffic densities certainly well above the Alaska Railroad. Other things being equal, a line with heavier density will have lower total costs per ton for a given haul. One major reason for this is that the fixed costs are spread over more tonnage. On a full cost basis, clearly the cost per ton would be highest on the Alaska railroads. The next highest unit cost would be on the intermediate Canadian lines, such as the Pacific Northern. The remaining U. S. and Canadian lines would have the lowest total costs per unit of freight.

Based on a volume of only 150,000 tons, the Alaska Railroad would incur about 16.5 per cent of the out-of-pocket cost. On a through

revenue of $3,000 from Chicago, its share would be $495 per car or $14 per ton (based on a 35-ton load in the car). With full costs of some $18 to $20 per ton from the border to final destination, again the Alaska Railroad would incur a deficit.

Including an estimate of fully distributed costs for all roads would increase the proportion accruing to the Alaska Railroad. Further, while the empty return ratio on box cars in the Alaska area would be virtually 100 per cent, the proportion would drop to 50 per cent or less as equipment moves closer to the industrial centers of Canada and the United States. Allowing for these considerations, we believe that the Alaska Railroad might incur 20-25 per cent of the total fully distributed costs of all carriers on a haul from Chicago to final destination. This would support a division of $600 - $750 per car, or $17 - $21 per ton.

We conclude that, while there might be small operating deficits, an extended Alaska Railroad would be economically sound. With prospective traffic of 150,000 tons, it is unlikely to incur operating deficits of as much as $1,000,000 annually on such traffic. A greater volume would sharply reduce the size of the potential deficit.

XII. Conclusions and Recommendations

1. The Battelle report overemphasizes tourism and does not give adequate recognition to the importance of added transport in making possible new economic development in under-developed areas.

2. While precise estimates cannot be made, it seems reasonable to assume that some existing freight tonnage - possibly 150,000 tons

annually - could move economically over a through rail route between the Middle West and Alaska.

3. An extension of the Alaska Railroad to the Yukon Territory border as part of a through rail route would produce about 2.5 million dollars in gross freight revenues even without the generation of new tonnage in the undeveloped areas of Alaska. Since the Alaska Railroad now hauls some of this traffic, the net addition to gross freight revenue would be less than this sum.

4. The added operating expense to the Alaska Railroad for a new line to the border would be about 1.8 million dollars annually with a traffic volume of 150,000 revenue tons. The cost of hauling the traffic to final destinations on the existing Alaska Railroad would make the total cost $2.7 million.

5. A new line extending the Alaska Railroad to the Yukon Territory border might incur an operating deficit of not more than one million dollars annually, with the possibility that it might be self-supporting, based on present information.

6. Looking to the future, the Battelle study indicates the possibility of adding some 300,000 tons of new mineral traffic in the Yukon. Because this tonnage would help to fill out otherwise empty trains, it would enable a new rail line in that area to haul three times as much volume (450,000 tons) with only moderate increases in expense over what would be incurred for the lighter tonnage moving to and from Alaska. This would improve the prospects for success of any Canadian segment of a through route.

7. Whether a rail or highway investment is considered, it should be emphasized that interest and amortization must be considered as economic costs. However, it is an issue of public policy to determine how this cost shall be recovered. A private investor must recover these costs from his customers. Government may look more broadly to recovery of its costs from the general improvement of the economy.

8. While tourism is important, there is also great need for facilities which will accelerate the opening of economically inaccessible areas, especially for bulk traffic. Such traffic can move relatively short distances by truck for subsequent movement by rail or water to final destinations. Thus highways can be developed in part as feeders to a rail main line and eliminate costly branch line service by rail.

9. Gradual programming is necessary now because of the international character of the systems and because of the time required. An integrated rail and highway program should be evolved jointly with the Canadians so as to ensure maximum total benefit at minimum total cost.

10. Today transport is moving increasingly in the direction of integrated handling in order to improve efficiency and cut costs. Outstanding is the growth of containerization and the resulting "piggyback" and "fishyback" services by rail and water. Since much of Alaska's known potential is located within relatively short distances from the water, some opportunities exist for speeding up development by improving water transport with a minimum investment in right-of-way, unlike either rail or highway programs. This should be the concern of both

Canada and the United States because present water costs inhibit the development of some otherwise inaccessible areas in Northwest North America.

11. The Congress should authorize negotiations and programs to develop the improved land and water transportation system in more detail.

12. A more intensive study is needed of present traffic between Alaska and the 48-state area. The nature of origins and destinations for Alaskan traffic is a vital element in the determination of when new land transport facilities could be successful. This is because through costs to and from Alaska via rail-water-rail or truck-water-truck set the upper limit on rates which could be charged by any new overland route.

13. The military significance of a through rail link should be noted. The sizeable investment and relatively small annual deficit may be worthwhile from the standpoint of national defense policy, although recognition should be given to the fact that a "disbenefit" of a new rail line would be some losses in net revenue to be faced by existing water and motor carriers.

14. If there is support for a new facility, it is recommended that first priority go to the construction of a rail line - assuming the construction of a Canadian link. This is because there is now a highway connection with Alaska but no rail connection. Considering current developments in containerization, sound economic development can be achieved by building a simple railroad line to connect the present Alaska Railroad with the proposed Pacific Northern, with feeder

highways being built as offshoots rather than railroad branch lines. Overland Service to Juneau and Petersburg might become economic in this way. The cost of building and serving branch lines by rail is extremely high, while the cost of moving freight over long distances by a main line is rather low. Conversely, the cost of truck movement over short hauls is relatively low, particularly with highways of limited capacity. Until the feeder area develops adequate tonnage, a combination of truck plus rail movement may offer the best combination of facilities.

Table 1

Alaska Steamship Company
Selected Averages, 1957-1959

		1957	1958	1959
	Days Per Round-Trip Voyage			
1.	Total	21.7	20.4	19.6
2.	At Sea	12.8	10.9	11.0
3.	In Port	8.9	9.5	8.6
4.	Miles (Nautical) Per Day at Sea	245.4	255.7	253.0
	Tons Per Voyage			
5.	Total (Round-trip)	2,882.7	2,958.3	2,604.5
6.	Outward	2,217.3	2,113.0	2,061.4
7.	Intermediate	25.7	42.6	22.0
8.	Inward	639.7	802.7	521.1
9.	Revenue Per Voyage	$ 86,436	$ 96,073	$ 91,893
10.	Revenue Per Ton	$ 29.98	$ 32.48	$ 35.28
	Water-Line Operating Expense			
11.	Per Voyage	$ 85,283	$ 91,026	$ 90,987
12.	Per Ton	$ 29.58	$ 30.77	$ 34.93
	Gross Profit from Shipping Operations			
13.	Per Voyage	$ 1,153	$ 5,046	$ 906
14.	Per Ton	$ .40	$ 1.71	$ .35

Table 2

Application of U. S. Western District Costs to Hypothetical Rail Movements
in
Box and Gondola Cars
(1959 Cost Levels)

		Box		Gondola	
		Out-of-Pocket	Fully Distributed	Out-of-Pocket	Fully Distributed
	Seattle-Rex, 2110 miles				
1.	Cost per hundredweight	73.7¢	114.5¢	84.6¢	125.4¢
2.	Cost per ton	$ 14.74	$ 22.90	$ 16.92	$ 25.08
3.	Cost per car	515.90	801.50	592.20	877.80
	San Francisco-Rex, 3010 miles				
4.	Cost per hundredweight	100.8¢	157.6¢	116.3¢	173.1¢
5.	Cost per ton	$ 20.16	$ 31.52	$ 23.26	$ 34.62
6.	Cost per car	705.60	1,103.20	814.10	1,211.70
	Add Line-Haul Rex to Anchorage 273 miles				
7.	Cost per hundredweight	8.6¢	13.4¢	10.0¢	14.8¢
8.	Cost per ton	$ 1.72	$ 2.68	$ 2.00	$ 2.96
9.	Cost per car	60.20	93.80	70.00	103.60
	Add Line-Haul Rex to Fairbanks 83 miles				
10.	Cost per hundredweight	2.6¢	4.1¢	3.0¢	4.5¢
11.	Cost per ton	$ .52	$ .82	$ .60	$ .90
12.	Cost per car	18.20	28.70	21.00	31.50
	Cost per Car				
13.	Seattle - Anchorage	$576.10	$895.30	$662.20	$981.40
14.	- Fairbanks	534.10	830.20	613.20	909.30
15.	San Francisco - Anchorage	765.80	1,197.00	884.10	1,315.30
16.	- Fairbanks	723.80	1,131.90	835.10	1,243.20

Source: I.C.C. Statement 5-60

Table 3

Estimated Characteristics of a Rex Extension
to the
Existing Alaska Railroad

1.	Revenue tons carried (all northbound)	150,000
2.	Number of cars originated and terminated (based on 35 revenue tons per car)	4,300
3.	Loaded car-miles	1,281,400
4.	Empty car-miles	1,281,400
5.	Total car-miles	2,562,800
6.	Tare ton-miles (based on 25 tons tare per car)	64,070,000
7.	Total trailing gross ton-miles	108,770,000
8.	Train miles	92,976
9.	Locomotive unit miles	92,976
10.	Trains per year	312
11.	Trains per week	6

Typical Costs of Foregoing Operation
(excluding return on investment)

12.	Car-mile costs	$ 57,662
13.	Locomotive and ton-mile costs	156,492
14.	Train-mile costs	209,196
15.	Constant track maintenance	1,117,500
16.	Indirect costs	187,500
17.	Switching	67,188
18.	Clerical	26,875
19.	Total	$ 1,822,413
20.	Average cost per car	$ 424

Public Law 884 - 84th Congress

as amended

Chapter 840 - 2d Session
S. 985

AN ACT

To establish an Alaska International Rail and Highway Commission.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) there is hereby established an Alaska International Rail and Highway Commission (hereinafter referred to as the "Commission") which shall be composed of thirteen members, to be appointed by the President, as follows:

(1) six of the members of the Commission shall be Members of the Congress of the United States, at least one of whom shall be a Member from the State of Alaska, and not more than four of whom shall be members of the same political party; and

(2) four of the members shall be selected from the executive branch of the Government, of whom, if practicable, one shall be from the Department of the Army, to be designated by the Secretary of the Army, one from the Department of the Interior, one from the Department of State, and one from the Department of Commerce; and

(3) three of the members shall be selected from the general public, one of whom shall be a resident of Alaska and one of whom shall be a resident of the Pacific Northwest region of the United States.

(b) The Commission shall select a chairman and a vice chairman from among its members.

(c) A quorum of the Commission shall consist of seven members. Any vacancy in the Commission shall not affect its powers and shall be filled in the same manner in which the original appointment was made.

(d) The appointment of an officer of the Army on the active list as a member of the Commission is authorized as an exception to section 1222, Revised Statutes (10 U.S.C. 576), and does not vacate his appointment as a commissioned officer of the Army.

SEC. 2. It shall be the duty of the Commission---

(a) to make a thorough and complete study of the economic and military advantages of additional highway and rail transportation facilities connecting continental United States with central Alaska;

EXHIBIT XI-1

(b) to make a thorough and complete study of the most feasible and direct routes of rail and highway transportation between the United States and Alaska, in relation to the economic benefits to be derived therefrom by the United States, Canada, and Alaska; and

(c) to make a thorough and complete study of the most feasible feeder rail and highway routes connecting coastal ports and cities with the rail and highway facilities between the United States and Alaska, determined most feasible and beneficial by the Commission.

In making such studies, the Commission shall give particular attention to the feasibility of rail and highway facilities between the Pacific Northwest region and Alaska. In determining the most feasible and beneficial routes for rail and highway facilities, the Commission shall take into consideration the proximity to such routes of suitable sites for airfields.

SEC. 3. The Commission is authorized to cooperate with the officials of the Dominion of Canada and of the Provinces of British Columbia and Alberta and with any commission or similar body appointed for such purpose by the Dominion of Canada or the Provinces of British Columbia and Alberta. The Secretary of State shall, at the request of the Commission, arrange for meetings with such officials and with such commissions or similar bodies of the Dominion of Canada or of the Provinces of British Columbia and Alberta.

SEC. 4. (a) The Commission may, in carrying out its duties under this Act, hold such hearings, take such testimony, sit and act at such places and times, and incur such expenditures as the Commission deems necessary. Any member of the Commission may administer oaths or affirmations to witnesses appearing before the Commission.

The Commission may, without regard to the civil-service laws and the Classification Act of 1949, employ and fix the compensation of such experts, consultants, and other employees, as it deems necessary to assist it in carrying out its duties under this Act.

(b) The Commission is authorized to utilize the facilities, information and personnel of the departments, agencies, and establishments of the executive branch of the Government which it deems necessary to carry out its duties under this Act; and each such department, agency, and instrumentality is authorized to furnish such facilities, information, and personnel to the Commission upon request made by the chairman or vice chairman. The Commission shall reimburse each such department, agency, and instrumentality for the services of any personnel utilized. The furnishing of information by any such department, agency, or instrumentality shall be subject to such restrictions as the head of the department, agency, or instrumentality deems necessary for the security of the United States.

(c) In performing its duties under this Act the Commission shall utilize all information available by reason of any surveys and plans made under authority of the Act entitled "An Act providing for a location survey for a railroad connecting the existing railroad system serving the United States and Canada and terminating at Prince George, British Columbia, Canada, with the railroad system serving Alaska and terminating at Fairbanks, Alaska", approved October 26, 1949.

SEC. 5. The Commission may delegate to any member of the Commission or to any committee composed of members of the Commission any of the duties and powers conferred upon it by this Act, other than the duty of submitting reports and recommendations to the Congress pursuant to section 7.

SEC. 6. Members of the Commission shall serve without compensation but shall be reimbursed for travel, subsistence, and other necessary expenses incurred by them in the performance of their duties.

SEC. 7. The Commission shall report the results of its studies and submit its recommendations to the Congress from time to time, and shall make a final report and submit its final recommendations to the Congress at the earliest practicable time, but in no event later than June 1, 1961. The final report shall include estimates of the cost of construction of rail and highway facilities along the routes determined most feasible and beneficial by the Commission, together with estimates of the economic benefits to the United States, Canada and Alaska. The Commission shall cease to exist for all intents and purposes, and all authority conferred by this Act shall and does terminate thirty days after the date of submission of the final report or on June 30, 1961, whichever date occurs first.

SEC. 8. There are hereby authorized to be appropriated such sums, not in excess of $300,000, as may be necessary to enable the Commission to perform its duties under this Act. Until such time as funds may be appropriated pursuant to this authorization, the President is authorized to make available to the Commission, from any emergency funds available to him, such sums as may be necessary.

PL 84-884 - approved August 1, 1956
PL 85-16 - approved April 20, 1957
PL 85-601 - approved August 8, 1958
PL 86-78 - approved July 6, 1959

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ALASKA INTERNATIONAL RAIL AND HIGHWAY COMMISSION

FACT SHEET July 1, 1959

BATTELLE MEMORIAL INSTITUTE

Contract for study and report on natural resources of northwest North American in relation to transportation needs.

Objectives and Scope

The study will be conducted along broad economic lines toward providing basis economic data for long range programs of economic development for Alaska, British Columbia, the Yukon Territory and the Pacific Northwest, with particular reference to evaluation of existing and potentially feasible main and feeder line transportation routes to serve the area.

Basic economic data would be sought concerning mineral resources, forest resources including pulp and paper products, fishing, furs, agriculture, manufacturing, wholesale trade and services, the tourist industry and population trends. Each of these resources will be analyzed in relation to their present status of utilization or contribution to the area's economy, potential exploitation of undeveloped areas or products, local, regional and world markets for potential products and the competitive position of each in world markets during the next twenty years, the role of transportation in the exploitation of undeveloped resources, existing and proposed transportation facilities and their routes and estimated costs of any facilities recommended.

Methods of Study

The essential ingredients of a study are availability of masses of data, ability to gather them, effectiveness of sorting methods and intelligence in analysis. Data will be gathered from U. S. and Canadian Government sources and from commercial sources throughout North America. Assembled data will be screened to coincide with the objectives set forth in the proposal. Screened data on resources, markets, transportation patterns, population, etc. will be submitted to groups of specialists and consultants for critical technical and economic examination. Each resource will be examined in light of technological developments for product substitution in order to preclude pinning development hopes on a dying industry. Costs involved in accomplishing various promising phases of development would be estimated and related as closely as possible to economic benefits or returns to be derived. Transportation facilities needed to serve potentially desirable developments would be tabulated as to possible cost and mapped as to appropriate location. Other requirements, such as the development of water sources, the installation of power utilities, improvement of harbor facilities and the development of fuel supplies would be described and evaluated.

Contract Provisions

The contract is a negotiated type executed under the authority of the Federal Property and Administrative Services Act of 1949 (63 Stat. 377) as amended, delegated to the Chairman and redelegated to the Contracting Officer by the Administrator, General Services Administration. The delegation authorizes negotiation of certain types of contracts without advertising for the procurement of services, in this instance economic and engineering services.

The contract provides for the payment of not to exceed $120,623, including

a fixed fee of $6,828 for professional services, travel and subsistence, supplies, secretarial and clerical services and other allowable expenses based on services actually performed. Provisions of the contract relating to costs are subject to changes authorized by the Contracting Officer in an amount not to exceed a total cost of $125,000, changes totaling in excess of this amount are subject to the specific approval of the Chairman of the Commission.

Battelle will submit monthly progress reports to the Commission and will be available constantly for consultation with the Contracting Officer.. A summary report will be submitted on or before September 30, 1960 and a final report not later than December 31, 1960.

Allowable costs will include materials and equipment required in the conduct of the study; personal services, including salaries, wages, consulting fees, including pensions and old-age benefits, social security and unemployment taxes, workmen's compensation, over-time premiums, shift premiums, holiday and vacation allowances and sick leave allowances; and miscellaneous expenses, including travel, freight charges and other out of pocket expenses as determined by Battelle's standard procedures in other government research generally.

Indirect costs, in the form of overhead expense, tentatively 60% of salaries and wages, subject to retroactive adjustment to contractor's actual indirect cost rate as applied on contract by the Department of Defense and other U. S. government agencies.

Payments on Contract

Payments of the total amount will be made upon the presentation of vouchers submitted monthly for personal services rendered and monies expended and other allowable expenses up to a total of 90% of the estimated maximum cost. The balance is payable upon the submission of the final report and its acceptance by the Commission.

Battelle agrees to schedule its time, efforts and resources as related to the several phases of the study in proportion to their respective degrees of importance to the whole study so as to enable Battelle to arrive at definite conclusions and recommendations in its final report to the Commission.

Interpretation

In case of discrepancy between the terms of the typed contract and the proposal, the typed contract shall govern.

Miscellaneous

The contract contains the usual provisions relating to termination in the best interests of the government, sub-contracts, assignment of claims, examination of Battelle's records, default, convict labor, eight-hour law, nondiscrimination in employment, officials not to benefit, covenant against contingency fees and utilization of small business concerns. In case of disputes or disagreements between the Contracting Officer and Battelle, the contractor may appeal to the Chairman of the Commission.

Qualifications of Contractor

Battelle is the oldest and largest research organization in the United States and possibly in the world. It employs regularly in excess of 2000 professional, technical and administrative personnel qualified in almost all fields of science and technology. Over a period of 29 years, Battelle has conducted research investigations for hundreds of American industrial concerns. Battelle will seek the advice and accumulated know-how from those industrial friends who can be of material assistance in the successful prosecution of this economic study.

Members of the Battelle staff possess experience in many areas of transportation and transportation economics. In a study such as that being conducted for the Commission, transportation facilities and economics are handled as intergradient factors in the development of their conclusions and recommendations. This will be handled principally by the staff in the Department of Economics who have demonstrated adequate knowledge of transportation economics in a wide variety of assignments. Detailed information regarding these individuals is included in the Battelle proposal which is made a part of the contract by reference.

Estimated Breakdown of Total Effort

Battelle has estimated that total effort and expenses will be divided approximately as follows:

Review of existing data from U. S. and Canadian Government and industrial sources - 20%.

Identification of market potentials - 30%.

Compilation of natural resource potential - 30%

Selection of transportation media and routes with estimated costs - 20%

Evaluation of Proposals

A total of 18 organizations submitted proposals to conduct the proposed economic study. In order to assist in the evaluation, the Commission requested that a cost estimate accompany each proposal. This cost estimate was not considered a bid for these services since it was difficult, if not impossible, to define in advance the scope of the proposed study.

The Commission published a list of ten items which the proposed report on the economic study should contain, titled "Economic Need and Justification for Additional Rail and Highway Facilities Between the United States and Alaska". To illustrate how difficult it was to properly define the scope and extent of the study, cost estimates ranged from a low of $66,609 to a high of $500,000.

Proposals were rated at the staff level by the use of a scoring sheet for the evaluation of 20 items pertinent to the conduct of the study and carrying out the provisions of the Act which established the Commission. The Chairman of the Commission selected the five organizations which appeared to possess the greatest qualifications. Representatives of these five firms were invited to Washington for a conference with the staff and the Chairman.

The Commission met on July 29, 1958 and approved the Chairman's selection of the Battelle Memorial Institute. This action was reconfirmed at a meeting of the Commission on July 1, 1959.

ALASKA INTERNATIONAL
RAIL AND HIGHWAY COMMISSION
1809 G STREET NW.
WASHINGTON 25, D.C.

/Terms of Reference, Economic Study of Northwest North America/

Economic Need and Justification for Additional Rail
and Highway Facilities Between United States and Alaska

The proposed research project, relating to Public Law 884, 84th Congress, will comprise study based on factual data and realistic projections, and recommend whether there is sound economic need and justification for additional highway and rail facilities between the United States and Alaska.

The report should adequately develop and objectively evaluate the following:

1. Capabilities and economics of existing and planned transport facilities between Alaska and the United States and anticiapted improvements thereon between now and 1980.

2. Location, availability and volume of resources whose economic exploitation is dependent upon improved or additional transportation facilities between the United States and Alaska, and the intervening areas.

3. Present and prospective location of local, national and/or world markets for such resources and present and long-range (1980) competitive position of each.

4. Delivered cost of marketable resources utilizing existing transportation facilities and subsequent comparison with estimated costs, utilizing proposed additional or improved transportation facilities.

5. Increase in national income and population resulting from production, processing and shipment of additional raw and/or finished products to national or world markets.

6. Traffic and transportation revenues and taxes generated from the foregoing.

7. Most feasible and direct major and feeder routes for rail and/or additional highway facilities in relation to economic benefits to be derived therefrom by the United States, Canada and Alaska, taking into consideration the proximity of suitable airfields to such routes.

8. Estimated construction costs of additional major and feeder routes based on aerial photos now available from United States and Canadian sources, supplemented by such route surveys as may be available.

9. Economic feasibility of improved or additional transportation facilities from correlated cost and revenue estimates, considering the economic effect on present carriers. If not economically feasible, form and extent of subsidy or assistance required.

10. Prospects for private capital investment in the transport facilities being considered.

11. Final report to be submitted to the Commission by April 30, 1959.

Dec. 4, 1957