

## Strategic Importance Of Rail Corridor Links

*Dr. Cooper is a consulting engineer (Cooper Consulting Co., Kirkland, Wash.), who has done extensive work on the proposed Bering Strait rail and tunnel project, the Alaska-Canada railroad connector, and related programs. This is his paper submitted to the Kiedrich Conference on Sept. 15. Its full title was "The Worldwide Strategic Importance of the Intercontinental Rail Corridor Connections Between the Eurasian and North American Land-Bridges." His speech was a summary of this paper, using his extensive map collection to show the audience where construction will occur. We use a small selection of maps and tables here.*

### Introduction

The present paper is based on the results of a detailed technical and economic analysis of the proposed Alaska-Canada railroad connector project, in a feasibility study prepared for the Canadian Arctic Railway Company of Vancouver, British Columbia in Canada by the Cooper Consulting Company of Kirkland, Washington in the United States. This feasibility study has been concentrated on the construction and operation of the proposed Alaska-Canada railroad project

from Fairbanks, Alaska to Prince George, British Columbia and Dawson Creek, British Columbia over a 2,190 mile (3,515 km) route distance. This feasibility study has evaluated the expected impacts upon the Alaska-Canada railroad project resulting from the construction of the proposed Alaska natural gas pipeline from Prudhoe Bay to Alberta and the Midwest. This feasibility study has also examined the impact of the proposed construction of the Bering Strait railroad tunnel between Alaska and Siberia upon the viability of the Alaska-Canada railroad connector project and of the entire region as a part of an overall 12,500 mile (20,000 km) railroad network to connect North America with Eurasia, as part of an overall worldwide direct rail network.

One of the issues of current consideration is that there is a considerable benefit in the combined construction of the natural gas pipeline and the railroad between Alaska, Canada, and the Lower 48 States, in terms of construction cost and maintenance access for equipment and materials. However, public sector efforts alone have been unable to bring these projects to fruition, in spite of their common benefits to both countries. The primary reason has been because of the inability to date to provide either public-sector or private-sector financing, or a combination thereof, in order to implement the project. A recent feasibility study completed by the Yukon Territorial Government and the State of Alaska has attempted to address some of these questions. However, the Alaska-Canada rail project as contemplated in this publicly funded feasibility study suggested service only to adjacent ports and did not address other traffic considerations, including a continued gas pipeline-railroad line corridor in the region to foster economic development between Alaska and Alberta.

It was felt that private sector participation would be necessary to bring these projects to reality, where significant efforts began to be made in the late 1990s. A feasibility study was commissioned in August of 2002 by the Canadian Arctic Railway Company of Surrey, British Columbia to the Cooper Consulting Company of Kirkland, Washington, which was completed in February of 2006. The purpose of conducting this feasibility study was to evaluate the technical and economic viability of constructing a new railroad line between Alaska and Canada, with connections to the Lower 48 States, as a private sector activity. This feasibility study was based on an extrapolation of previous studies in Alaska and Canada conducted in the years since World War II, as well as on additional data, and some projections of expected future trends. In addition, this feasibility study addresses the question of the construction of the Bering Strait railroad tunnel, in addition to the Alaska-Canada Railroad

This feasibility study was commissioned to



EIRNS/Julien Lemaître

*Engineer Hal Cooper presents Helga Zepp-LaRouche with a painting of the proposed Bering Strait Railway Tunnel, a project dear to both their hearts.*

determine the proposed routings and physical characteristics of the proposed railroad corridor, as well as the freight and passenger traffic-generation potential and associated revenues, plus the overall estimated capital costs of construction, plus operating and maintenance costs. It was then intended to make the necessary economic cash flow projections of available income and net income after debt service, as well as depreciation and taxes. The necessary financial performance of the proposed Alaska-Canada railroad connector project could then be evaluated in terms of its potential rate of return on investment, as well as project payout period plus other economic and financial criteria for being able to assess its viability, based on expected cash flow projections. The potential impact of the construction of the Bering Strait railroad tunnel upon the Alaska-Canada railroad system was also evaluated in terms of its traffic-generation potential.

The original geographic extent of the feasibility study was limited to the corridor between the end points of Fairbanks, Alaska, and Prince George and Dawson Creek, British Columbia. This study was later expanded to include a connection through Alberta and Saskatchewan to North Dakota, and then to Texas and Coahuila over the route commonly referred to as the Central North America Trade Corridor (CNATCA). It was later recognized that the possible future construction of the proposed Bering Strait tunnel between Alaska and Chukotka would have a dramatic impact on the proposed Alaska-Canada rail connector, in terms of both traffic volumes and track capacities. As a result, it was decided to incorporate the consideration of future freight and passenger traffic flows between Asia and North America by way of the railroad corridors in northeastern Russia. There were two routes considered in parallel to the Pacific Ocean as well as the Arctic Ocean via a proposed tunnel under the Bering Strait between Alaska and Russia. Two routes were also considered to the southwest, in Yakutsk in the Sakha Republic in Russia, plus to China, Korea, and Japan, as well as to the West along the Arctic Ocean to western Russia and Europe.

There is growing interest in the expansion of the North American rail network with the recently announced sale of the British Columbia Railway to the Canadian National Rail-

FIGURE 2  
**Proposed Bering Strait/Alaska-Canada Rail Connector to Lower 48 States, Plus Existing Lines**



..... Existing Tracks      — Proposed Alaska Canada Railway Corridor

way in parallel with the extension of the Alaska Railroad. These recent announcements revive the earlier plans to extend the British Columbia Railway to Fort Nelson, which were completed in the 1960s, and the effort to complete the rail line to Dease Lake in the 1970s which were not completed. There had been earlier studies of expanding the Canadian railroad network to the Yukon Territory in the 1960s and 1970s by the Canadian National and Canadian Pacific Railroads, as well as by the Province of British Columbia. However, these efforts never went beyond the study plan. A feasibility study of the Alaska-Canada railroad was recently completed by the Alaska and Yukon governments, to connect resource extraction activities with the available port facilities in Alaska and British Columbia in June of 2007.

Considerable interest and expense have gone into the efforts to study the feasibility of a new natural gas pipeline from Alaska to Alberta and the Lower 48 States. The interest in and possibility of constructing a new natural gas pipeline from Alaska to the Lower 48 States has proceeded in parallel to the possibility of connecting Alaska, Canada, and the Lower 48 States by a direct railroad network. The U.S. Congress has recently passed legislation offering incentives for the construction of the proposed natural gas pipeline between Alaska and the Lower 48 States through Canada, through a combination of tax credits and economic incentives. The State of Alaska has recently issued a Request for Proposals from private organizations to construct a 3,500 mile (5,600 km) natural gas pipeline from Prudhoe Bay to Chicago, but no provision is included for a railroad as part of this natural gas pipeline project.

This detailed technical and economic analysis of the proposed Alaska-Canada railroad connector project has been undertaken in the text of the present feasibility study. This feasibility study has been concentrated on the construction and operation of the proposed Alaska-Canada railroad project from Fairbanks, Alaska to Prince George, British Columbia and Dawson Creek, British Columbia over a 2,190 mile route distance over several route options. This feasibility study has evaluated the expected impacts upon the Alaska-Canada railroad project resulting from the construction of the proposed Alaska natural gas pipeline from Prudhoe Bay to Alberta and the Midwest. This feasibility study has also examined the impact of the proposed construction of the Bering Strait railroad tunnel between Alaska and Siberia upon the Alaska-Canada railroad project, over the broad route network through the Bering Strait tunnel, with two routes in Asia as well as in North America.

## Route Description

There are two major routes for the proposed railroad linkages to the Bering Strait from the Eurasian side and two routes on the North American side. The two main rail links on the Eurasian side are a northern route to Moscow and Europe, to the north and west along the south shore of the Arctic Ocean,

as well as a southern route to the south and west to the Sakha Republic and to China by way of Yakutsk. On the North American side, there are two main routes, with a northerly and easterly extension via the Tintina Trench and the Liard River, through Watson Lake and Fort Nelson, to northeastern British Columbia and Alberta, plus a southerly and westerly route via the Alaska Highway and northwestern British Columbia to Dease Lake and Prince George.

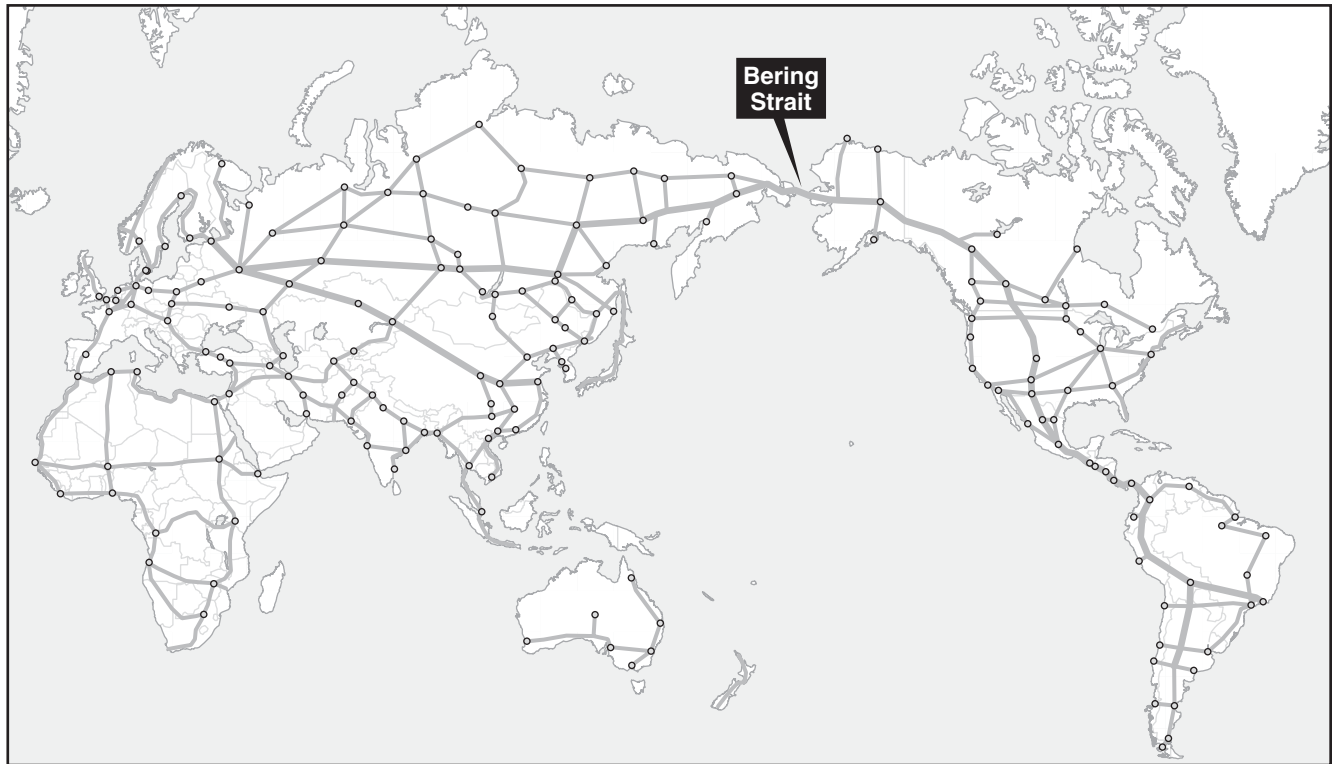
There are numerous connecting routes to the proposed Eurasian-North American Land Bridge connector corridor via the Bering Strait. On the Asian side, the railroad extension in an east-west direction through China to Beijing and Shanghai could be connected to the already underway South Asian development corridor from Urumchi to Istanbul via Kazakhstan, Uzbekistan, Turkmenistan, Iran, and Turkey. This railroad corridor is already under development as a single standard-gauge route for hauling intermodal containers and crude oil, plus other commodities, between Asia and Europe, with a major 8-mile-long rail tunnel to Istanbul at its western terminus. The development of this rail corridor will tie all of the South Asian and Middle Eastern countries together to foster peaceful relations and economic development as a far preferable alternative to endless wars over oil in the Middle East, as is now the United States policy, to the great detriment of the World as a whole.

There are the parallel east-west railroad corridors through Russia along the recently completed Baikal-Amur Mainline to the north, as well as the older Trans-Siberian Railway to the south. The Baikal-Amur Magistral needs to be connected to Sakhalin Island via a 5-mile-long bridge at the north end over the Tatar Strait. It also needs to be connected at the south end by a 32-mile-long tunnel under the La Perouse Strait to Hokkaido, to the existing Seikan rail tunnel to the main island of Honshu in Japan. Separate north-south rail corridors through North Korea need to be developed between China or Russia and South Korea to promote peaceful relations and economic development on the Korean Peninsula. The electrification of the Trans-Siberian Railway was recently completed over its entire distance, so that no oil is needed to provide the energy for transportation, and so that oil can be saved for export while preparing for nuclear power to be implemented.

In North America, there are two major north-south connecting rail corridors which can be developed to the Alaska-Canada railway and to the Bering Strait. One new rail corridor would upgrade the existing rail lines from Prince George, British Columbia in Canada to Tijuana, Baja California in Mexico, through Washington, Oregon, and California. This new electrified rail corridor would be intended for both freight and passenger transport, with several major infrastructure expansion projects with tunnels under the Fraser River near Vancouver and under the Columbia River near Portland. There would need to be a new 8-mile-long tunnel under the Siskiyou Mountains south of Ashland, Oregon, plus a rebuilding of the existing rail line through the Sacramento River Can-

FIGURE 2

**The Eurasian Land-Bridge: Proposed Links to a Worldwide Rail Network**



EIRNS

yon to the north of Redding, California. A new 32-mile- (50-kilometer-) long electrified rail tunnel under the Grapevine Grade north of Los Angeles is needed to haul both passengers and trucks in order to reduce traffic congestion and air pollution and road repairs.

The main rail corridor extension of the Alaska-Canada rail connector would be along the eastern end from Edmonton, Alberta to Portal, North Dakota along the existing routes, in parallel to a new natural gas pipeline. A new rail line along the proposed Central North America Trade Corridor would then need to be built from Portal, North Dakota to Del Rio, Texas for hauling coal, oil, gas, farm products, and other commodities. This new rail line could then be extended from Mexico to Columbia through Central America to South America. This rail-line corridor could then be extended through South America, in parallel to a proposed new natural gas pipeline from Venezuela to Argentina. This new Latin American railroad corridor could then serve as the focus for economic development and peaceful relations, so that the present need for immigration to the United States could be reduced if not eliminated.

The linchpin of this entire railroad network is the 65-mile-long (105 km) Bering Strait railroad tunnel. This rail tunnel would be built at 100 feet (30 meters) below the water depth, which is a maximum of 200 feet (65 meters) deep through the

Big Diomedes and Little Diomedes islands in the center of the Bering Strait. There is a relatively steep mountain range known as the Tenkanyi Mountains to the west in Chukotka, which would probably have to be circumvented by building to the north. This railroad tunnel would have three tubes of approximately 26 feet (8 meters) diameter, with three tracks and two parallel utility corridors between the three tubes. The entire railroad tunnel would be built with electrified operation throughout, as part of a 1,000 mile (1,600 km) central three-track connector between Egvekinot, Chukotka in Russia, through Fairbanks, Alaska to Jakes Corner in the Yukon Territory of Canada, and double-track elsewhere.

**Traffic Potential**

The proposed major traffic potential for the Bering Strait railroad tunnel project involves hauling construction materials and equipment, plus coal and crude oil, plus natural gas-derived liquid fuels, forest products, potash, metallic ores, and containers. The completion of the Bering Strait railroad tunnel would make it possible to haul containers between China and North America in 10 days or less, as compared to 20 days or more by the present rail-ship mode via West Coast port, at equivalent or lower cost. Coal of high quality and low sulfur could be hauled from Alaska to China to help reduce its serious air pollution problems. Crude oil and petroleum products could



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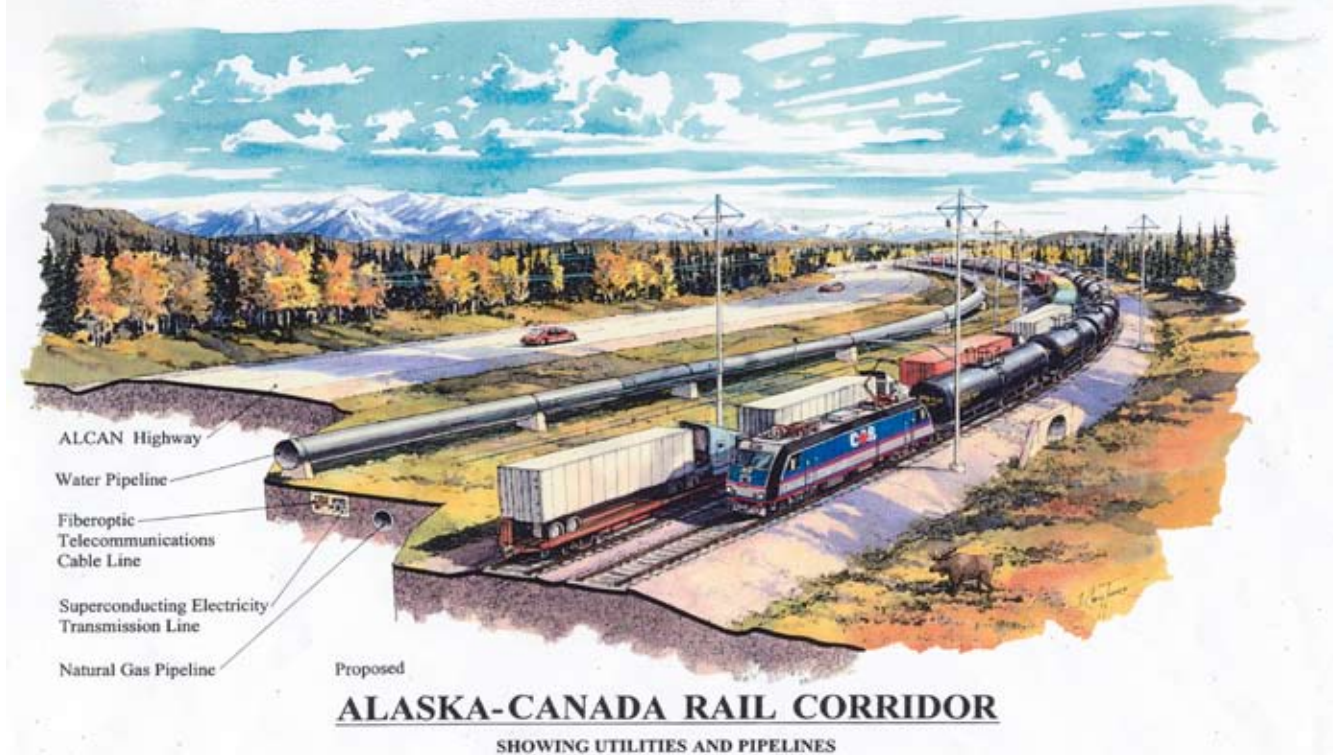
be hauled from Russia or Alaska or northern Canada to the Lower 48 States by this railroad. There could also be significant commodity movements from Russia to China, plus passenger transport over the entire system. The economic viability of the proposed Alaska-Canada railway connector could be substantially enhanced in the short term, because of the considerable freight traffic generated for equipment and material transport by the construction of the Alaska natural gas pipeline between 2010 and 2017. The construction of the Alaska natural gas pipeline, simultaneously with or immediately following the completion of the Alaska-Canada railroad connector, will substantially increase the freight traffic on the railroad by 10 to 30 million tons per year in the short term, following start-up after 2010. These increased freight traffic volumes will be especially great for the Fort Nelson route option, which substantially parallels the pipeline over most of its route distance in the early years, where freight traffic volumes of up to 120 million tons per year can result over the Alaska-Canada railway, without the Bering Strait tunnel being built. With the Bering Strait tunnel, freight traffic volumes of up to 300 million tons per year become possible over the entire route or greater. The cost savings to the natural gas pipeline project from reduced material transport costs with the prior construction of the Alaska-Canada railroad could nearly equal the cost of the railroad between Alaska and British Columbia.

The economic feasibility of the Alaska-Canada railroad connector is also examined for the reverse case of the potential impacts of the Alaska-Canada railroad construction upon the proposed Alaska natural gas pipeline. It has been determined that the technical feasibility of the Alaska-Canada railroad connector is basically independent of the proposed Alaska natural gas pipeline, because it can be built independently and in advance of or simultaneously in conjunction with the proposed Alaska natural gas pipeline. However, there is some commonality in the facilities which can act to mutually benefit both the railroad and pipeline projects along common rights-of-way. It may also be possible to haul natural gas as well as crude oil by rail, from producing fields to end use point, so as to avoid the need to build the pipelines altogether. If so, this crude oil and/or liquefied natural gas traffic alone would be sufficient to justify building the Alaska-Canada railroad. In addition, gas-to-liquids plants being constructed in the northern Yukon and Northwest Territory and in northern Alaska along the Arctic Ocean, could substantially increase railroad freight traffic on the Alaska-Canada rail connector route, by hauling natural gas-derived liquid fuel products to demand centers in the Lower 48 States.

The expected train traffic flows and freight volumes from the three route options with the Alaska-Canada railroad connector are as follows. The freight traffic is expected to gradu-

Figure 4

ARTIST'S CONCEPTUAL VIEW OF THE PROPOSED ALASKA-CANADA RAILROAD NEAR LAKE KLUANE, YUKON



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ally increase from 6 to 50 trains per day between 2010 and 2050, following completion of the Alaska Canada railway connector. The expected train traffic would increase to 35 to 37 trains per day and then decrease after the period between 2010 and 2020, depending on whenever the proposed Alaska-Canada natural gas pipeline is completed. In addition to the pipeline, the expected transport of liquefied natural gas and crude oil can add significantly to the freight traffic base of the proposed Alaska-Canada railway connector. If a new natural gas pipeline were to be built from Prudhoe Bay to Delta Junction to parallel the existing crude oil pipeline to Valdez, gas could then be liquefied and hauled by train from Delta Junction to Alberta or the Lower 48 States. A second natural gas pipeline would then be built from Prudhoe Bay to Delta Junction to Valdez, to facilitate constructing a gas liquefaction loading terminal. Otherwise a new rail line would need to be built from Fairbanks to Prudhoe Bay to haul the natural gas.

The expected freight train traffic on the Alaska-Canada railroad line via the Dease Lake route would be expected to increase from 6 trains per day in 2010 to 30 trains per day in 2030. The average total freight tonnage moved would then be expected to increase from 10 million tons per year in 2010 to 50 million tons per year in 2030 assuming food, lumber, coal, oil, machinery, and other commodities would be moved for the minimum traffic growth scenario. The construction of the

proposed natural gas pipeline would require as much as 110 million tons of all materials to be moved, including earthworks, which would largely be on the Fort Nelson line, but would also occur on the Dease Lake line to a lesser degree. The development of the proposed Bering Strait railroad tunnel would increase the traffic volumes over the rail network to as much as 300 million tons per year, with train traffic movements of as many as 250 to 300 trains per day or more between Chukotka and Alaska.

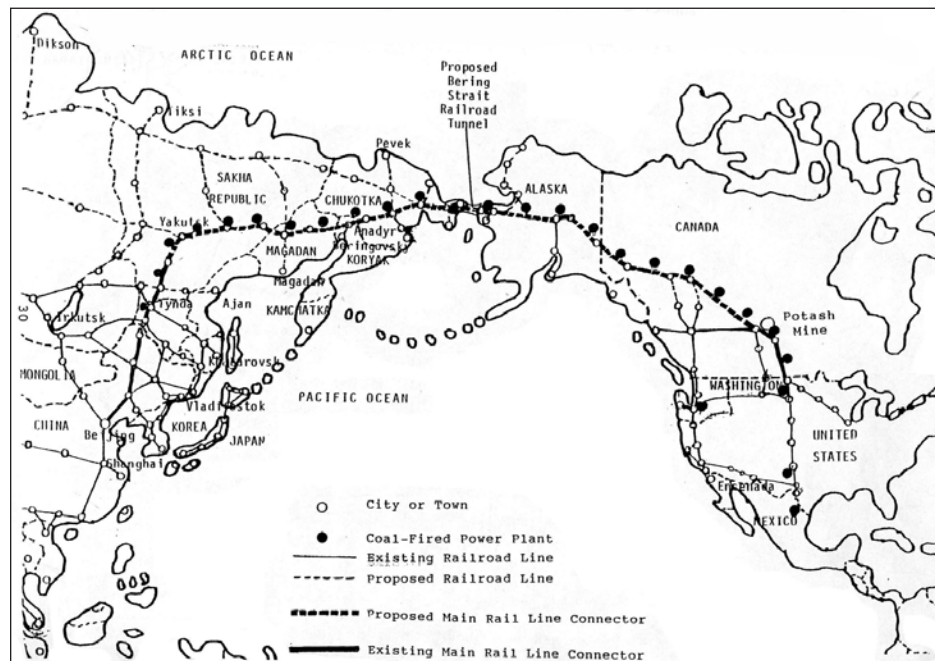
The hauling of intermodal containers by rail through the Bering Strait railroad tunnel between China and North America could act to reduce port traffic along the west coast of North America. It is possible that as many as 5 to 7 million containers per year could be hauled by way of the Bering Strait railroad tunnel, which could be as much as 10% of the total intermodal traffic flows between Asia and North America. In addition to the traffic benefits, the diversion of container traffic from west coast ports to the Bering Strait railroad tunnel could reduce the air pollution emissions from the Los Angeles-Long Beach port complex. Now it is reported that air pollution from the Los Angeles-Long Beach port complex may contribute as much as 25 to 30% of the total emissions in the Los Angeles Basin. The commodities most likely to add to the freight traffic base for the Alaska-Canada rail connector are crude oil and petroleum products as one category, intermodal trailers and containers as

a second category, and forest products as a third category, plus various other commodities which will be significant for the Alaska-Canada rail connector. The proposed Alaska-Canada railroad connector can then serve as the engine for the overall economic development of the entire northwestern North America, especially for the native reserves and communities along the route where new energy facilities, mines, forestry operations, and industrial facilities would be located. In addition, natural gas transport by rail from Alaska, the Yukon Territory, and the Northwest Territories would provide a separate justification for building the Alaska-Canada railway connector.

The expected freight traffic volumes on the other connecting railroad lines in North America will generally increase from the range of 5 to 10 million tons per year in the first 3 to 5 years, between 40 and 50 million tons per year over a 20 to 30 year period. In addition, it is expected that the proportion of the freight traffic hauled over the Alaska-Canada rail connector will be between Alaska and the Upper Midwest and Eastern States, with an expected 65 to 75% of the total. A relatively small proportion of 25 to 35% of the expected freight traffic will originate or terminate in the Pacific Northwest, as at present. In fact, it is likely that there may be substantial political opposition to the proposed Alaska-Canada rail connector project from the maritime interests in the Puget Sound area, whose businesses would be adversely affected as Alaska's trade center shifts to the east from Seattle to Minneapolis.

The completion of the Port MacKenzie port project and the resulting large container traffic volume would virtually guarantee an economically viable Alaska-Canada railway connector and ultimately lead to the Bering Strait tunnel. The completion of the proposed Bering Strait railroad tunnel between Alaska and Chukotka would dramatically increase the expected freight traffic levels all along the Alaska-Canada rail connector and on other rail lines as well. As a result, there would be a need to double-track all connecting main railroad lines on both continents once the Bering Strait tunnel is completed, plus to have a triple-track route between Whitehorse, Yukon Territory in Canada, and Egvekinot, Chukotka in Russia. Also, the proposed Bering Strait railroad tunnel will need to be built with three tubes instead of two, because of the very large freight (and passenger) traffic volumes to be expected in

**FIGURE 3**  
**Proposed Route for the Intercontinental Railroad Line Corridor**  
**Between Asia and North America Across the Bering Strait,**  
**Employing Power Plants and Transmission Lines**



Cooper Consulting Co.

the future between North America, Europe, and Asia, as economic growth and integration accelerate, including coal traffic to China and oil traffic to the United States from Russia, Canada, and Alaska.

The proposed Alaska-Canada railroad connector will make it possible to haul large quantities of crude oil at low transport rates from Alaska to northwestern Canada, to refineries located in southern Canada (if allowed) as well as existing or new refineries located in the Northern Tier of the United States. In addition, the proposed Bering Strait tunnel will make it possible to haul crude oil from fields in North Dakota, Montana, and elsewhere. It will be very desirable to expand crude oil production in Alaska, with oil transported by rail to refineries located in North Dakota and elsewhere in the Upper Midwest. It is also possible that petrochemical production could take place using natural gas, ethanol, or crude oil feed stocks in Saskatchewan, Alberta, Montana, and North Dakota. The major development of heavy oil deposits in Alaska could significantly increase the Alaska-Canada rail connector's freight traffic. This development should be greatly encouraged, as well as from the Athabasca tar sand deposits in northeastern Alberta, as a way to increase the railroad traffic base. The development of the Athabasca tar sand deposits near Fort McMurray, Alberta, and the associated heavy oil and tar sand deposits in Alberta and Saskatchewan, necessitate the immediate construction of the natural gas pipeline

from the MacKenzie River Delta to Fort McMurray, because Alberta's gas production is now beginning to decline, after peaking in 2001. The Alaska natural gas pipeline is a separate project to serve the United States. The pipe would be supplied from the planned steel mill near Eagle Plain in the Yukon Territory using iron ore from the Crest deposits. This proposed new steel mill could also supply rail plus reinforcing steel for the proposed Bering Strait railroad tunnel, as well as for other construction projects. This steel mill would justify the construction of a new railroad line from the mouth of the MacKenzie River through the northern Yukon Territory to the main Alaska-Canada railroad line, for the purpose of carrying both steel products and natural gas-derived liquid fuels.

The completion of the proposed Alaska-Canada railway connector will then greatly benefit the economies of Alaska and northwestern Canada. The development of mineral and energy resources will be greatly benefited, because previously inaccessible resources will become accessible because of their reduced transportation costs. A particular benefit will be to either encourage the construction of new natural gas pipelines or, alternatively, make it possible to transport natural gas by rail from the Arctic Slope to Alberta and the Lower 48 States, in liquid tank cars, by way of the Alaska-Canada railroad line, as well as for natural gas liquids processed along the Arctic Ocean.

It may also become possible to transport crude oil from northern Alaska or northwestern Canada, to refining centers in Alberta and the Lower 48 States in the interior. It is also possible to complete the upgrading of the rail link from Alberta to North Dakota and Texas. The completion of this rail line would make it possible to haul crude oil produced by thermal oil recovery from the tar sands and heavy oil deposits in Alberta and Saskatchewan and Alaska, to as far south as Houston on the Texas Gulf Coast. This crude oil traffic alone would justify the construction of the Central North America Trade Corridor through the Great Plains, between North Dakota and Texas. In addition, it is expected that passenger traffic will add 5 to 10% to the railroad revenue base for tourist and cruise trains, plus passenger service for business and pleasure. It is expected that this passenger traffic will increase train operation by 10 to 20% over the Alaska-Canada railroad connector. There will also be a great public relations benefit of the passenger traffic, which will greatly accentuate the political acceptability of the Alaska-Canada railway.

### Implementation Plan

The expected route characteristics and capital costs for construction of the

proposed Alaska-Canada railroad connector are as follows. The estimated capital costs of the Alaska-Canada railroad with diesel power are then expected to be \$3.715 billion for the Dease Lake route option, as compared to \$4.220 billion for the Fort Nelson route options, and \$6.185 billion for the combination route option. It is planned that the Dease Lake route connector will be built initially to connect Alaska and the Yukon Territory with British Columbia, to be followed by the Fort Nelson to Whitehorse connection, with the natural gas pipeline to create the combination route option to both Prince George and Dawson Creek.

The program of implementation for the Alaska-Canada railroad connector is based on single-track routes employing diesel power. An initial single-track line of 1,355 miles in length would be built between Prince George, British Columbia and Fairbanks, Alaska via the western Dease Lake route in four years, at an estimated total capital cost of \$3.715 billion. The construction of this railroad line would employ 3,000 to 5,000 workers during the planned four-year construction, with an operating staff of 1,000 to start, increasing to 1,500 within ten years after its starting operation. The comparable capital cost of the alternative eastern route via Fort Nelson between Fairbanks and Prince George, would be approximately \$4.220 billion for the 1,435 mile route, which would require five years to complete if built completely separately. The combination route would have an estimated capital cost of \$6.185 billion U.S. for the 2,190 mile route, and \$9.45 billion if the Tintina Trench route is also included, for a 3,075 mile total route distance in northwestern North America.

The recommendation is to build the Dease Lake line first as a single-track route, with siding spaced at 20 mile intervals, and centralized traffic contract signaling and diesel locomotive traction. It is expected that there would be a two-year

TABLE 1  
**Route Characteristics and Capital Costs of the Proposed Alaska-Canada Railroad Connector Project**

Specific Factor	Units Employed	Dease Lake Route Option	Fort Nelson Route Option	Combination Route Option	
Route Distance	Miles	1,355	1,435	2,490	
	Kilometers	2,175	2,305	3,995	
Ending Points	Start	Fairbanks	Fairbanks	Fairbanks	
	End	Prince George	Dawson Creek	Both Cities	
Capital Cost	Diesel	U.S.\$ (Million)	3,715	4,220	
		CN.\$ (Million)	4,645	5,275	
	Electric	U.S.\$ (Million)	5,320	5,785	9,470
Unit Capital Cost	Diesel Power	U.S.(\$/Mile)	2,741,695	2,940,765	2,483,935
		CN.(\$/km)	2,135,630	2,288,500	1,934,920
	Electric Power	U.S.(\$/Mile)	3,926,200	4,031,360	3,104,420
		CN.(\$/km)	3,057,470	3,137,200	2,963,705

Source: Cooper Consulting Co.



evaluation and design period followed by a four-year construction period, with operation to begin in 2013. The siding spacing would be reduced to 10 miles by 2015 and 5 miles by 2020 as traffic increases and the line is progressively converted to double-track operation by 2030 as the full line capacity is reached. The railroad line connection from Whitehorse to the east to Watson Lake in the Yukon Territory and to Coal River, British Columbia, would be built along the Liard River of the Fort Nelson route. The rail and gas pipeline routes would continue in the combined line to the Beatton River, north of Fort. St. John, where they would diverge from each other in the Peace River region.

It would then be planned to add a single-track line to connect near Jake's Corner in the Yukon Territory to the east to Watson Lake by 2012, and to Fort Nelson, British Columbia and then to the east to High Level, Alberta by 2015. Construction on this line would begin at the same time as for the Dease Lake line and be completed in one year, with an additional connection between Dawson Creek and Fort St. John to completed by 2020. At the same time, the eastern extension of the Dease Lake line to the east via Tumbler Ridge to Grand Prairie, Alberta would begin construction in 2010 and be completed by 2015, from the east side of the existing tunnel to the west of Tumbler Ridge on the existing rail line.

The completion of the Tintina Trench Railway between Dease Lake and Faro in advance, will begin with an investment of \$1.2 billion (U.S. [all dollars are U.S.—ed.]) but will allow for startup freight traffic to be built up in advance of completing the rail connection between Dease Lake and Fairbanks at an estimated capital cost of \$3.7 billion. The estimated capital cost for completing these two rail links will be \$4.9 billion, with the total capital cost for the complete rail links of \$9.4 billion for a 3,075 mile (4,935 km) system. This capital cost will be \$3.2 billion greater than from the initial proposal of \$6.2 billion for a 2,190 mile (3,515 km) system, with an overall increased distance of 885 miles (1,420 km). The completion of the railroad line through the Tintina Trench between Watson Lake and Carmacks in the Yukon Territory then makes it possible to exploit the large copper, lead, zinc, gold, silver, platinum, and other metal and mineral resources in the area along the rail line. In addition, it would probably be desirable to build one or more metal smelters to

TABLE 2a  
**Estimated Construction Material Requirements for the Alaska-Canada Railroad Connector**

Construction Materials	Application Utilized	Unit Factor Tons/Mile	Single Track Tons	Double Track Tons
Wood	Construction Wood	31	62,390	112,700
	Railroad Ties	56	112,700	232,050
	Subtotal	87	175,090	344,750
Steel	Railroad Rails	923	1,857,535	3,824,680
	Reinforcing Bars	354	712,425	1,466,885
	Plates and Girders	150	301,875	621,565
	Major Bridges	10,000	90,000	140,000
	Subtotal	1,471	2,961,385	6,053,130
Metals	Aluminum, Copper	106	213,325	439,235
Concrete	Cement	557	1,120,965	2,308,070
	Aggregate	442	889,525	1,831,535
	Sand	327	658,085	1,355,005
	Gravel + Rock	442	889,525	1,831,540
	Subtotal	1,768	3,558,100	7,326,150
<b>Total</b>	<b>Dry Basis</b>	<b>3,363</b>	<b>6,908,350</b>	<b>14,163,265</b>
	<b>Wet Basis</b>	<b>3,808</b>	<b>7,840,975</b>	<b>16,075,305</b>

TABLE 2b  
**Estimated Construction Material Requirements for the Alaska-Canada Railroad Connector**

Material Required	Diesel Single Track Tons	Diesel Double Track Tons	Electrification Tons	Total System Tons
Wood	175,000	345,000	65,000	410,000
Steel	2,960,000	6,050,000	450,000	6,500,000
Copper + Aluminum	215,000	440,000	375,000	815,000
Concrete	3,560,000	7,325,000	605,000	7,930,000
<b>Total</b>	<b>6,910,000</b>	<b>14,160,000</b>	<b>1,495,000</b>	<b>15,655,000</b>

Source: Cooper Consulting Co.

process these ores in the Tintina Trench region, to generate added traffic for the railroad, but additional electric power would be needed.

The entire eastern line from Dawson Creek to Tumbler Ridge to Grand Prairie east to Edmonton, Alberta would then begin and be completed by 2020. In parallel, the existing Canadian National Railways branch line from Edmonton, Alberta to Lloydminster and Saskatoon in Saskatchewan would be upgraded for full-scale freight traffic by 2015. This line would then extend to Regina, Saskatchewan, and ultimately to Lampman, Saskatchewan to Minot and Max, North Dakota, as a new railroad line by 2020, to connect with the Central North America Trade Corridor being built between Minot and Del Rio, Texas between 2010 and 2020. In parallel, the new railroad line from Melville to Lampman, Saskatchewan would

TABLE 3

### Expected Employment Creation Potential and Payroll Generation for the Alaska-Canada Railroad Connector

Employment Type	Employment Activity	Employment No. of Jobs	Payrolls Million \$/Year
Direct	Construction	3,000-7,500	200-500
	Operation	1,000-1,500	75-125
Indirect	Construction	7,500-18,750	400-1,000
	Operation	2,500-3,750	125-190
<b>Total</b>	<b>Construction</b>	<b>10,500-26,250</b>	<b>600-1,500</b>
	<b>Operation</b>	<b>3,500-5,250</b>	<b>200-315</b>

Source: Cooper Consulting Co.

be built to allow a direct connection to the Hudson Bay Railroad line at Churchill, Manitoba, to connect with the Central North America Trade Corridor, to facilitate oil development in the Bakken Formation of the Williston Basin in North Dakota, South Dakota, Montana, Manitoba, and Saskatchewan.

The entire combination route for the Alaska-Canada railroad connector would then be completed for both the Dease Lake and Fort Nelson routes as a single-track route by 2015. A second track would be added for the common route segment between Fairbanks and Whitehorse to Jake's Corner by 2020. In addition, it would be planned to electrify the entire railroad route of the Alaska-Canada railroad connector between 2015 and 2020, as both diesel fuel prices and freight traffic volumes progressively increased into the future. It would also be planned to build a series of power plants burning coal and/or other fuels to serve the electrification needs of the railroad estimated as increasing from 500 megawatts in 2020 to 3,000 megawatts in 2050. Additional electric growth would serve the needs of the railroad, as well as facilitate regional economic development for the native reserves, mines, factories, and local communities along the route of the Alaska-Canada railroad connector, through ancillary power demands.

The expected implementation schedule for the Alaska-Canada railroad connector will occur between 2010 and 2020. The project cash flow projections are based on a rail connector startup between Fairbanks and Prince George via Dease Lake in 2008, but an expected startup in 2013 might be more realistic. It is expected that the Fort Nelson connector to Jake's

TABLE 4

### Expected Economic and Employment Benefits of the Proposed Alaska Canada Railway Connector Project

#### A. Economic Benefits:

Expected Benefit	Units Employed	With Railroad	Without Railroad	Net Difference
Transport Time	Days	5-10	3-5	2-5
Transport Cost Savings	Million \$/Year	—	500-1,000	500-1,000
Increased Payrolls	Million \$/Year	—	800-1,800	800-1,800
Increased Activity	Million \$/Year	—	5,000-10,000	5,000-10,000

#### B. Employment Creation:

Political Jurisdiction	Employment Creation Number of Jobs	Population Increase Number of People
Alaska	100,000-150,000	250,000-350,000
Yukon Territory	25,000-75,000	75,000-150,000
British Columbia	50,000-100,000	125,000-250,000
<b>Total</b>	<b>175,000-300,000</b>	<b>450,000-750,000</b>

Source: Cooper Consulting Co.

TABLE 5

### Estimated Capital Cost of the Overall Russian and North American Railroad Connector Network

Railroad System	Name of Corridor	Route Distance		Capital Cost—Million Dollars <sup>1</sup>	
		Miles	Km	Single Track <sup>2</sup>	Double Track <sup>3, 6</sup>
North America	Central Trade Corridor	2,055	3,298	4,896	11,370
	Hudson Bay Connector	1,097	1,760	1,662	5,675
	British Columbia Connector	503	807	200	985
	Canadian Prairie Connector	1,360	1,605	3,794	7,320
	Alaska-Canada Connector	2,490	3,995	5,489	14,745
	Western Alaska Connector	710	1,140	4,189	8,680
<b>Total North American Network</b>		<b>8,215</b>	<b>12,605</b>	<b>20,320</b>	<b>48,775</b>
Bering Strait	Bering Strait Tunnel	65	105	15,400 <sup>4</sup>	25,000 <sup>5</sup>
Russian Asia	Uelen-Egvekinot Connector	275	441	1,075	2,825
	Yakutsk-Chukotka Magistral	1,690	2,715	4,163	10,665
	Yakutsk-Amur Magistral	1,320	2,120	2,600	4,910
	Yakutsk-Irkutsk Magistral	1,140	1,830	2,860	6,280
	Near Polar Magistral	3,125	5,019	10,805	16,265
<b>Total Russian Network</b>		<b>7,550</b>	<b>12,125</b>	<b>21,505</b>	<b>40,945</b>
<b>Total Route</b>	<b>Entire Network</b>	<b>15,830</b>	<b>24,835</b>	<b>56,735</b>	<b>114,720</b>

1. All capital costs are reported in 2003 constant U.S. dollars.

2. The single track configuration is based on diesel traction with 20-mile siding spacings.

3. The double track route configuration is based on electrified operation with 5-mile crossings.

4. This cost factor for the Bering Strait tunnel is based on a two-tube tunnel.

5. This cost factor for the Bering Strait tunnel is based on a three-tube tunnel.

6. The double track configuration includes 1,240 miles of triple track on the North American side (Wales-Whitehorse) and 275 miles of triple track on the Russia side in Chukotka/Uelen-Egvekinot.

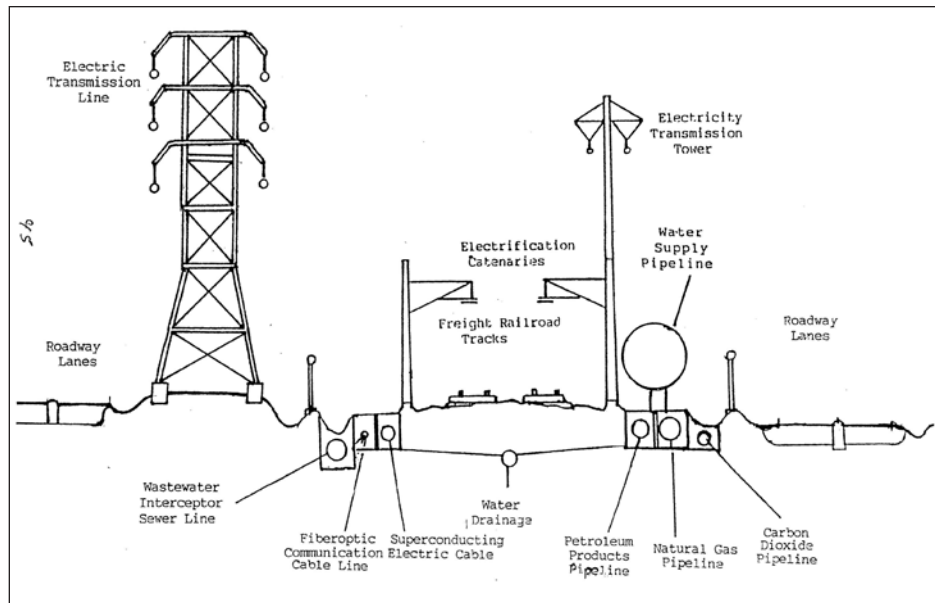
Source: Cooper Consulting Co.

Corner would be completed between 2010 and 2012, with double-tracking to begin in 2015 and electrification after 2015. The proposed development of the Bering Strait railroad tunnel would be expected to have a major impact upon the Alaska-Canada railroad connector after 2020, with the planned infrastructure expansions to be completed between 2015 and 2025 over the entire route. The potential electrification of the Alaska-Canada railroad connector would mandate the construction of a series of regional power plants to supply the railroad operation itself, plus for regional economic and industrial development. The overall generating capacity requirements for these power plants would be expected to increase from 500 megawatts in 2020 to 1,000 megawatts in 2050 without the Bering Strait railroad tunnel as compared to 3,000 megawatts with the Bering Strait tunnel, being completed. There would be an initial requirement of two parallel 250 megawatt units to be built near Whitehorse plus two additional units in British Columbia by 2050, without the Bering Strait tunnel being built.

A total of 12 generating units would be required by 2050 if the Bering Strait railroad tunnel were to be constructed for the railroad operation. The use of coal at these power plants would require initially 1.5 to 1.0 million tons per year in 2020, to increase to between 3.0 and 4.0 Million tons per year by 2050 without the Bering Strait railroad tunnel being built. There would be a total of 9 to 12 million tons of coal required by 2050 for these power plants if the Bering Strait railroad tunnel were to be built for the rail operation alone, because of the then greatly increased freight traffic volumes. The coal traffic being hauled over the rail line would increase with the freight traffic volume being transported.

The electricity from the power plants would then be sold to the railroad for its electrified operations. The possible use of the CEFCO Process at these coal-fired power plants for air pollution emission control, plus chemical and fertilizer production, would result in added byproduct sales revenues of initially \$300 million per year, to increase to \$600 million per year without the Bering Strait tunnel, and to \$1.8 billion per year with the Bering Strait tunnel being built. The electrification option with the power plants will act to foster the economic development of mines and industries in northwestern North America over the long term in these mineral-rich regions, so as to serve industries and residences and commercial activities, as well as the railroad

**FIGURE 4**  
**Proposed Conceptual Arrangement of the Railroad-Utility-Roadway Transportation Corridor as the Basis for Economic Development Between Cities Incorporating the Land-Bridge Idea**



Source: Cooper Consulting Co.

propulsion throughout the entire region.

The proposed implementation for the Alaska-Canada railroad connector is as follows. The initial effort will be to complete the 805 mile connector between Dease Lake and Eielson Air Force Base, so that Alaska and British Columbia are joined through the Yukon Territory. The second phase of the project will be to complete the 500 mile link between Jake's Corner in the Yukon Territory with Fort Nelson, British Columbia. The third phase of the project will be to upgrade this entire 1,300 miles (2,085 km) of new railroad and to prepare for double-tracking and electrification over the route network in Alaska, the Yukon Territory, and British Columbia. The final phase would then be to extend the Alaska-Canada railroad to the west from Fairbanks to Wales at the Bering Strait. It is ultimately planned to have the entire route network as double track between Jake's Corner and both Prince George and Dawson Creek, British Columbia, with a triple-track section from Fairbanks to Jake's Corner. There will be a major maintenance facility in Whitehorse, plus smaller maintenance facilities in Fairbanks and Prince George. There will be planned to be intermodal terminals for the railroad in Fairbanks, Whitehorse, Dawson Creek, and Prince George. The operational center for the railroad is expected to be in Whitehorse, at the approximate central junction point for the overall network.

**Economic Benefits**

The initial financial analysis of the proposed Alaska-Canada railroad line is based upon an initial capital investment of

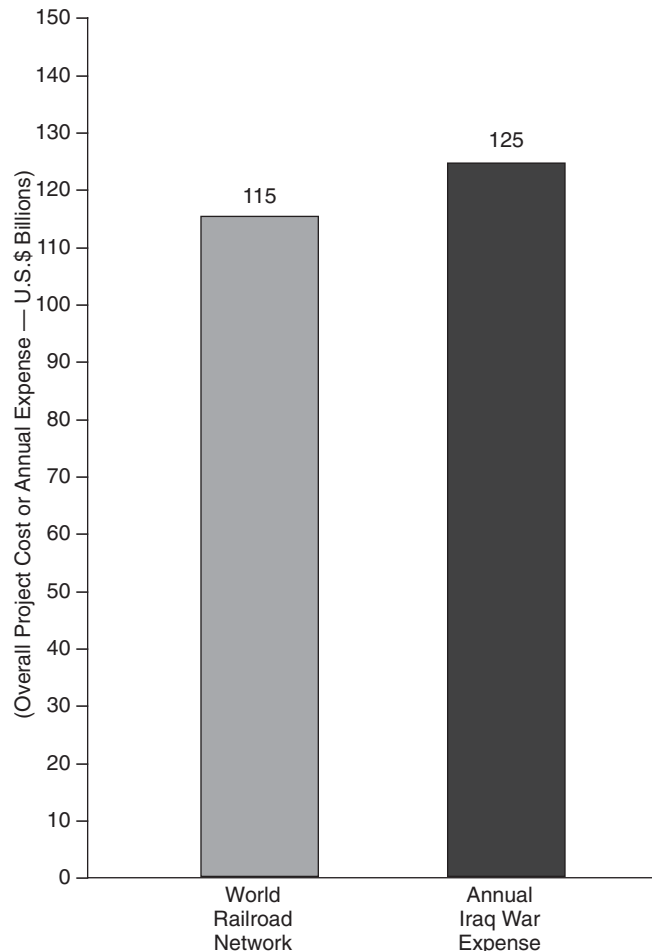
\$3.7 billion. This project will have an estimated rate of return on investment of over 15% per year, with a project payout period of 5 to 8 years from the end of construction, for the minimum freight traffic growth scenario, with the Fort Nelson route. For the higher traffic growth scenarios, the expected rates of return on investment will be greater, and the project payout periods will be shorter. The advantage of the proposed Alaska-Canada rail connector from a financial standpoint, is that the freight traffic hauled will go over a long distance of 1,100 to 1,300 miles, as a high unit revenue generation source with a consummately high income level, as compared to conventional rail operations.

The total capital cost of the 2,400 mile (4,000 km) railroad network will be \$6 to \$10 billion for a diesel powered system, as compared to between \$10 and \$15 billion for an electrified railroad operation. The total estimated capital cost for the overall direct 8,000 mile connector (13,000 km) between North America and Eurasia via the proposed Bering Strait railroad tunnel, is \$65 to \$75 billion. The expected overall capital cost for the entire 12,000 mile (20,000 km) railroad route network between North America and Eurasia, with double-track electrified operation throughout, will be \$125 to 150 billion for the rail system alone. This overall worldwide railroad network will require between 10,000 and 12,000 megawatts of new electric generating capacity, to be supplied through a series of regional power plants, plus electric transmission lines to support the electrification. There will also be additional electric power generation required to support the ancillary local industries, mines, farms, and other businesses, plus for residential and commercial activities. The railroad transportation corridors will necessitate parallel pipelines, plus electric transmission line and utility cables, to be built as the core of an economic development program, as the core of the LaRouche precept in northwest North America.

The proposed plan for the construction of the railroad line connected with or in advance of the natural gas pipeline proposed to be built, would be reduced by between \$2.4 and \$2.7 billion, from a \$20.0 billion estimated total capital cost for transport cost alone, plus another \$1.2 to \$1.5 billion for reduced welding needs. This capital cost savings in the proposed pipeline construction cost, is equivalent to the direct construction cost of \$1.25 billion for the Dease Lake option of the Alaska-Canada rail connector. The capital cost savings for the natural gas pipeline, primarily based on building the Fort Nelson railroad line, would be greater, at \$2.65 billion, as there is a greater haul distance for construction materials and equipment than by the Dease Lake route.

The proposed Alaska-Canada rail project is expected to have a rate of return in investment of 10 to 15% per year, with a repayment time of 15 to 20 years or less, along with an average debt service coverage ratio of 2.0 to 3.5. As a result, it would then be possible to justify some type of long-term loan or bond financing over a 30-year period from 201 to 2040, as traffic increases. The total maximum capital investment for all

FIGURE 5  
**Comparative Capital Costs for the Proposed Worldwide Connector Railroad Network and the Iraq War Annual Cost**



Source: Cooper Consulting Co.

of the connecting railroad lines in North America and Asia is expected to be \$120 to \$175 billion over a 30 year period. This amount is less than that of the present Iraq War, estimated as \$800 billion to date, which is also the estimated total recovery cost from Hurricane Katrina.

The Fort Nelson railroad line route option will have a higher capital cost than the Dease Lake line, as it is longer, with a greater distance of new line to be constructed. There is more difficult terrain to encounter, especially through the Lizard River Canyon to the east of Watson Lake. However, it is expected that the freight traffic volumes on the Fort Nelson line, will be greater in the early years than on the Dease Lake line because the hauling of materials for the natural gas pipeline will occur over its entire route, as compared to only a part of the route with the Dease Lake option, to provide for a short-

er payout period and a higher unit debt-service-coverage ratio. The total capital cost of the Alaska-Canada railroad connector, with both the Dease Lake and Fort Nelson routes included, is expected to be \$6 billion for the diesel power and \$10 billion with electric power for the combination route option, and as much as \$12 billion with the Tintina Trench included.

As a result, the rate of return on investment for the Fort Nelson line is expected to be equivalent to or slightly greater than for the Dease Lake line, if only one route is built to start. The capital cost will be greater for the Fort Nelson line, but its traffic base during the early years of operation will be greater because of the pipeline. However, over the longer period, there is expected to be more freight traffic flowing over the Dease Lake line, because of its shorter distance and more gentle terrain. In conclusion, both lines need to be built at the start, in spite of the greater expense. The payoff will result when the railroad tunnel at the Bering Strait is completed and in operation. Major freight traffic increases are then expected to occur to a level two to three times greater than without the tunnel, so that very large freight traffic revenues will result after its completion. The initiation of passenger service along the Alaska-Canada railroad and the Bering Strait railroad tunnel route to Asia will add an estimated 10 to 20% to the train traffic flows and 5 to 10% to the overall traffic revenues.

The proposed Alaska-Canada railway connector is expected to bring major benefits to the economies of Alaska, the Yukon Territory, and British Columbia. There is expected to be a reduction in the transport times of goods of 2 to 5 days, as compared to the present ship or truck transport, with a potential cost savings of \$500 to \$1,000 million per year in the shipments of these goods. There are also expected to be new direct and indirect payrolls of \$0.8 to \$1.8 billion per year throughout the region. There would also be increased business activity of \$5 to \$10 billion per year over the long term, as a major economic benefit to Alaska, British Columbia, and the Yukon Territory.

The proposed Alaska-Canada railroad connector will have a considerable direct and indirect employment creation potential, along with increased payroll generation from its construction and operation. The construction of the railroad itself will create between 3,000 and 7,500 jobs over a 4 to 5 year period, with annual payrolls of \$200 to \$500 million. The operation of the railroad will create long-term benefits of 1,000 to 1,500 direct permanent jobs over a 30 to 50 year period, with annual payrolls of \$75 to \$125 million per year to the employees, over the life of the project, on a direct basis.

It is estimated that the total employment creation potential of the Alaska-Canada railroad connector will be 10,500 to 26,250 jobs during the construction phase, plus 3,500 to 5,250 jobs during operation. It is expected that there will in actuality be a long-term construction work force for the Alaska-Canada railroad connector, as it is gradually expanded in both distance and capacity over time of 3,000 to 5,000 workers, plus between 1,000 and 1,500 operating employees. As a result,

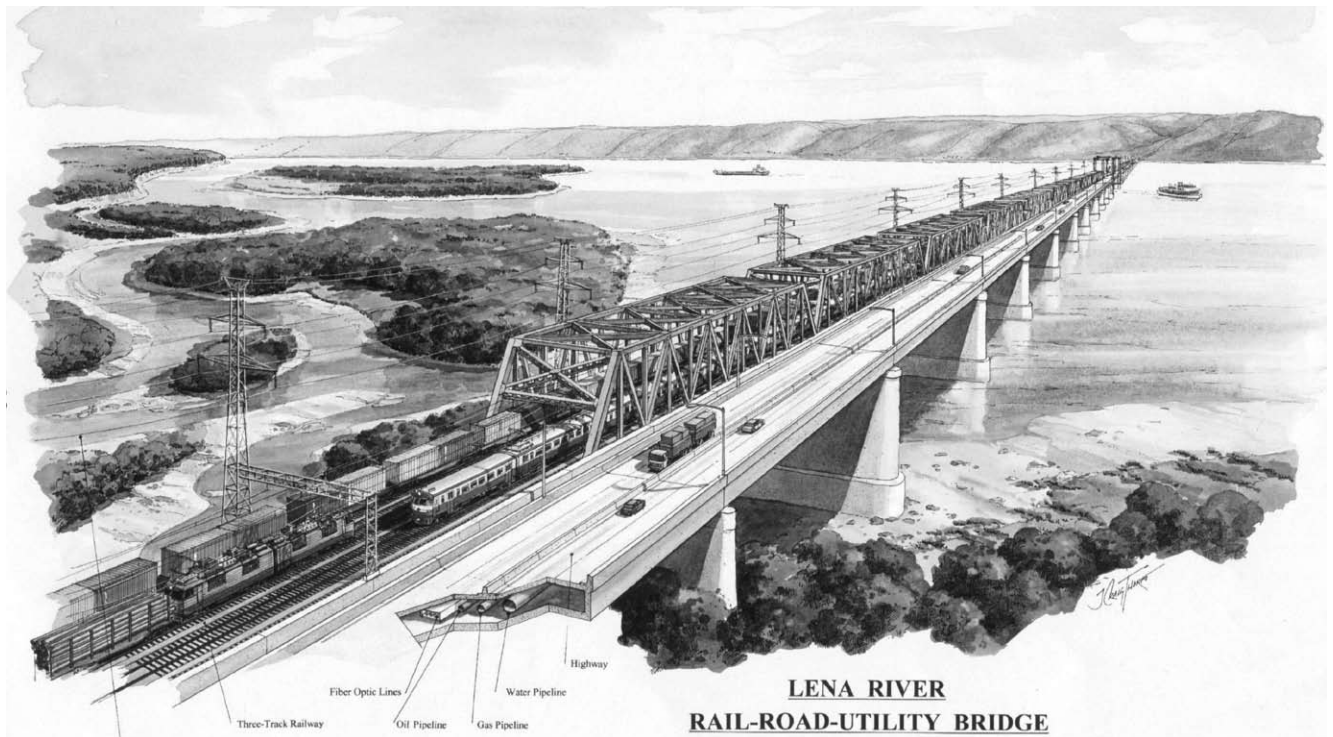
the total employment potential for the Alaska-Canada railroad connector would be 4,000 to 5,500 direct jobs and between 15,000 and 31,500 total jobs created over the long term throughout the region, including both direct and indirect jobs created by the project.

Probably more important than the direct and indirect jobs which are created by the construction and operation of the Alaska-Canada railroad, are the economic expansion opportunities it can create in the affected regions with improved transportation infrastructure. While further studies will be necessary to define its exact magnitude, it is estimated that between 175,000 and 300,000 new jobs would be created in northwestern North America, with the increased business activity resulting from completion of the Alaska-Canada railroad connector. It is expected that between 100,000 and 155,000 new jobs could be created in Alaska, plus between 25,000 and 50,000 jobs in the Yukon Territory, plus between 50,000 and 100,000 new jobs in British Columbia, with new industrial, mining, and trade and transportation-related businesses which result following completion of the Alaska-Canada railroad between Fairbanks and Prince George.

## Conclusion

A technical and economic feasibility study was commissioned of the proposal to build a new railroad line 2,400 miles in length in northwestern North America by the Canadian Arctic Railway to close an 800 mile gap between Alaska and British Columbia. This new railway will be designed to carry goods and machinery to Alaska, the Yukon Territory and northern British Columbia, to foster economic and social development as well as to take natural resources from these northern regions to the rest of Canada and the Lower 48 States of the United States. The proposed Alaska-Canada railway connector is planned as the first critical link in a future worldwide railroad network to connect Asia and Europe and Africa with North America and South America, through a new 65-mile-long railroad tunnel at the Bering Strait between Russia and Alaska.

The major conclusion of the feasibility study is that the proposed Alaska-Canada railroad connector is both technically and economically feasible. There are no serious or overwhelming technical issues which would prevent the Alaska-Canada railroad connector from being built, as existing rail technologies would be able to be used. In addition, there are no overwhelming physical barriers, such as rivers or oceans or mountains, which could prevent its construction or make it cost-prohibitive for the Alaska-Canada railroad connector. There is a technical issue in going through the Bering Strait railroad tunnel to Russia, because of the difference in gauges between standard (4 ft., 8.5 in.) and Russian (5.0 ft.) railways. It is suggested that there be temporarily two parallel tracks built in Russia, with one in each gauge, until a longer-term conversion to a single gauge occurs by the Russian rail system, to standard gauges.



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*The proposed land-bridge would cross the Lena River near the city of Yakutsk, in Russia's Sakha Republic, creating a rail link that would sweep east to Alaska, and south to China.*

The proposed Alaska-Canada railroad connector project is a technically and economically feasible project with no immediately apparent prohibitive impediments. The project will require \$4.0 to \$6.0 billion to complete the 800 to 1,300 miles (1,285 to 2,085 km) of new rail line to be constructed, plus up to 900 miles (1,445 km) of line to be upgraded. The construction of the Dease Lake line is to be followed by the Fort Nelson line, to form an integrated 2,190 mile (3,515 km) railroad network, plus the Tintina Trench line. This project can then serve as the basis for the construction of an 8,000 mile (13,000 km) initial direct rail linkage between North America and Eurasia, at an estimated capital cost of \$65 to \$75 billion over a ten-year period with electric power. This network will then be expanded to a more extensive 12,500 mile (20,000 km) overall electrified route network, which will require up to 10,000 megawatts of added electric generating capacity.

The present feasibility study of the proposed Alaska Canada railway connector concludes that the project is both technically and economically feasible. The estimated capital cost of the new railway project is \$4.0 to \$6.0 billion initially, and ultimately between \$9.0 and \$15.0 billion. Initial project is \$4.0 to \$6.0 billion initially and ultimately between \$9.0 and \$15.0 billion. Initial construction of the Alaska-Canada railway connector is expected to take between four and five years, to be followed by an ongoing construction program of system expansion over the following 10 to 20 years. The proposed Alaska-Canada railway connector is expected to haul freight

in volumes which will progressively increase from 10 to 120 million tons per year over the life of the project, with passenger traffic of 1,000 to 5,000 passengers per day. Major commodities hauled will include coal, oil, natural gas, metal ores, steel, forest products, chemicals, containers, and consumer goods to and from Alaska, the Yukon Territory, and British Columbia. The amount of cargo to be hauled could increase to as much as 300 million tons per year with the completion of the proposed Bering Strait railroad tunnel project. The proposed Alaska-Canada railway connector is expected to generate revenues of \$2.0 to \$6.0 million per year, with net income expected to range from \$1.0 to \$3.0 billion per year over the life of the project. The debt-service-coverage ratio for the project is expected to range from 0.5 to 4.6 in the extreme, with intermediate values of 1.5 to 3.5. The expected rate of return on investment for the project is expected to range between 10 and 20% per year with a project payout period of 5 to 20 years in the extreme case with expected intermediate values of 15% per year and 15 years, respectively. The freight traffic revenues are expected to increase to between \$50 and \$75 billion per year with the onset of full-scale operation. This income, as compared to operating and maintenance expenses of \$35 to \$40 billion per year, with debt payments of \$10 billion per year and fixed expenses of \$5 billion per year, plus transit fees of \$5 billion per year.

The completion of the Alaska-Canada railway connector project is expected to result in 3,000 to 5,000 direct jobs dur-

ing construction plus 1,000 to 1,500 permanent operating jobs upon its completion. The completion of the Alaska-Canada railway connector will make it possible for substantial new economic development to occur throughout all of northwestern North America, with substantial employment, business, and tourism increases. Similar economic benefits will occur throughout all of Eurasia. The total number of direct jobs during the construction of the overall worldwide railroad network as proposed would be as much as 25,000 to 50,000 jobs for as much as 20 years with 5,000 to 10,000 operating jobs for 50 years or more for the railroad itself. The completion of the Alaska-Canada railway connector will set the stage for the joining of the entire worldwide railway system into a unified network to benefit peace and prosperity. Employment creation potential resulting from the completion of the Alaska-Canada railway connector the rest of North America could result in the creation of as many as 175,000 to 300,000 new jobs from expanded business opportunities plus as many as 450,000 to 750,000 new residents throughout northwestern North America. The overall capital cost of joining the worldwide railroad network is expected to be \$125 to \$150 billion, or less than half of the cost of the Iraq war to date.

It is recommended that a combination of public-sector as well as private-sector financing be used with long-term, low-interest-rate loans or bonds. The total capital investment of \$125 to \$150 billion could be collateralized by the pledging of gold reserved in the amount of 200 to 250 million ounces (6,000 to 6,500 tons), based on a present gold price of \$650 per ounce. The interim system revenue need could be supplied by the sale of crude oil on an interim basis of \$10 billion per year to cover initial debt service payments with 150 million barrels per year, until system revenues become sufficient to generate profitable operation for the railroad.

The support of regional government leaders is essential for the Alaska-Canada rail project, from Alaska Governor Sarah Palin, Yukon Premier Dennis Fentie, and British Columbia Premier Gordon Campbell. In addition, U.S. President George Bush, Canadian Prime Minister Stephen Harper, Russian President Vladimir Putin, and Chinese President Hu Jintao all need to provide the support basis for implementing these projects to the mutual benefit of all in terms of worldwide job creation by means of the Northern Strategy for energy and economic development. (It is suggested that this summit meeting would take place in Nome, Alaska, because there is no place like Nome for the meeting to occur!) It will be especially important to involve the aboriginal communities along the route of the proposed Alaska-Canada railway connector, because of its potential impact on their lands and benefits to their peoples. These native aboriginal groups include the Native Corporations in Alaska, the First Nations in Canada, and the Indian Tribes in the Lower 48 States. The respective importance of these native aboriginal groups along the Alaska-Canada railway connector cannot be overestimated, in obtaining the support base for these projects to come to fruition.