

BERING STRAIT TUNNEL, ALASKA-CANADA RAIL

Infrastructure Corridors Will Transform Economy

by Richard Freeman and Dr. Hal Cooper

The adoption and construction of the Bering Strait rail and tunnel project is the focus of a Schiller Institute conference in Kiedrich, Germany on Sept. 15-16, bringing together international experts and political activists to mobilize for this program, which will bring about a technological upshift in the economy globally. The infrastructure corridors built around the rail lines will help generate, through their bills of materials, a renaissance in manufacturing and infrastructure in the United States, as well as Canada.

The Bering Strait project would link, by hoops of steel, the entirety of the Americas to the entirety of Eurasia, with the potential to connect to Africa. It would replace the world's slow, outmoded, and vastly overburdened sea-rail routes with a geodesic high-speed-rail route. The system would use high-speed electric rail, and shift as quickly as possible to magnetic levitation rail. This would free the world forever from hundreds of billions of dollars spent on petroleum-driven transport, while doubling or tripling the speed of transport of people and freight. For example, goods produced in the American Midwest could be transported to China, or Russia, in 7-10 days, rather than the three weeks it presently takes by a combination of sea and rail.

As a leading vector for enabling a World Land-Bridge, the Bering Strait project would facilitate the proliferation of rail-spined development corridors of high economic growth, ending the Third World's enforced backwardness and death.

A critical feature of the overall Bering Strait project, would be the development of a 3,030-mile Alaska-Canada rail connector, which will contribute to moving the U.S. and Canadian physical economies from a deepening collapse process of several decades, onto an alternative path of growth. Building 3,030 miles of track—and double that amount if the system is double-tracked—demands a tremendous quantity of

goods, expressed as a *bill of materials*. This is an ordered array of goods—steel for tracks and for railroad bridges; wood for ties and railroad structures; cement for culverts and other structures; aggregates for cement manufacture, but also for roadbed, etc. The bill of materials for the Alaska-Canada rail connector will require the production of tens of millions of tons of goods. This will create 35,000 to 50,000 jobs in the building of the railroad, plus workers in the factories producing the steel, cement, copper and aluminum wire, power plants, locomotives, and other necessary components.

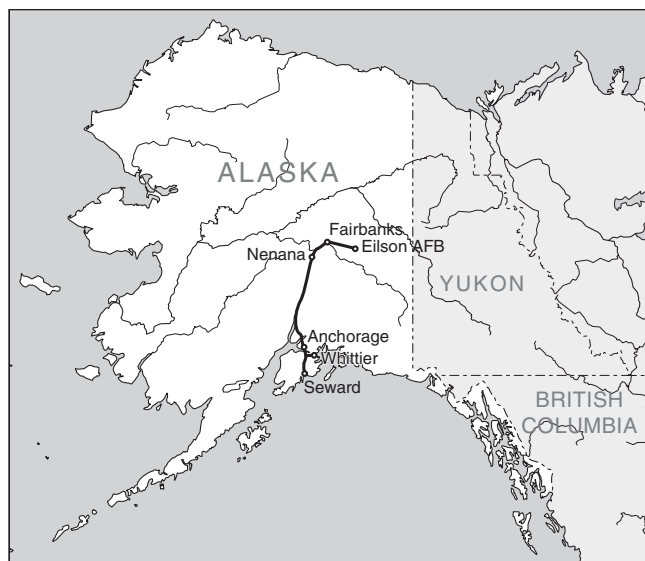
But that is just the first phase. In the second phase, potentially, hundreds of thousands of jobs will be generated.

On June 2, Fred Stakelbeck, of the Center for Security Studies, published a blistering attack on the project: "What do Russian President Vladimir Putin, spiritual leader the Dalai Lama, political activist Lyndon LaRouche, and former ... Governor of Alaska Walter Hickel have in common? They are all supporters of the Bering Strait Tunnel Project." The *Wall Street Journal* said the project would "soak the American taxpayer." But economist LaRouche has shown just the opposite: Hamiltonian long-term, low-interest financing will bring the project into realization. The confluence of the project's generation of technology and productivity worldwide, the development corridors, and the bill of materials will produce a several-fold increase of physical-economic activity, and an increase in tax revenue. It will pay for itself several times over. The adoption of LaRouche's New Bretton Woods monetary system is the context in which the project would come into existence.

A Critical Rail Network

To appreciate what must be done, we can first look at the state of rail, and transportation in general, in the Great North

FIGURE 1
The Alaska Railroad



region comprised of Alaska; the Yukon Territory of Canada; and the northern tier of British Columbia, Canada. To say that this area is underdeveloped, is like saying that the Sahara Desert is dry. **Figure 1** shows the Alaska Railroad, which was built in 1914-23, by the U.S. government, and has been, since 1985, owned by the Alaska state government. The Alaska Railroad, which extends from Fairbanks to Anchorage, covers 544 miles (876 kilometers), counting spur lines. It is a small, isolated system in the vastness of Alaska's 663,267 square miles (1,717,855 square kilometers). The map shows that, by rail, there is currently neither a passage to reach Fairbanks from the Lower 48 U.S. states, nor a way to get from that city to the Bering Strait.

The Alaska-Canada (Alcan) Highway, which was built under President Franklin Roosevelt's direction in 1942, extends from the Lower 48 states to Fairbanks, but goes no further west. To reach the Bering Strait by overland passage, short of using a snowmobile fortified with extra cans of gasoline, one must resort to huskies pulling a dog sled!

The Yukon Territory has only a tiny rail line. The North American rail grid that joins Mexico, the United States, and Canada, comes to a dead-end stop at the northern tier of British Columbia.

The Arctic North region is underpopulated, and its development frozen in time.

The Alaska-Canada rail connector, with the construction of a development corridor extending 50 miles (80 km) on each side of the railroad, can transform the region in its entirety. Power lines, fiber-optic lines, and where necessary, freshwater pipes would be encased within the corridor. Cities, population, manufacturing, and scientific agriculture would be fertilized and harvested in this corridor as well. The Arctic

North's nearby abundant, but largely untapped, mineral and raw material resources would be made accessible, by rail link, out of the frigid ground for rational use in the Arctic North and the world.

Overcoming a Transportation Dark Age

Figure 2 shows the plan for an Alaska-Canada rail connector system, as developed by co-author Dr. Hal Cooper, a consulting engineer.* This proposed system starts off with two route-branches, each of which heads in a north-south direction. The first branch, called the *westerly* one, starts at Prince George, British Columbia, and proceeds to Chipmunk, B.C., to Dease Lake, B.C., to Jake's Corner, Yukon Territory, and then to Whitehorse, Yukon Territory. The second branch, called the *easterly* one, starts at Prince George, also. It then heads to Dawson Creek, B.C., to Fort St. John, B.C., to Fort Nelson, B.C., to Watson Lake, Yukon Territory, to Jake's Corner, and then to Whitehorse. Both branches should be built.

The two branches join at Jake's Corner, which is in proximity to the larger Whitehorse. The rail connector line would then extend, as a single route, northward to Beaver Creek in the Yukon Territory, at the Alaska-Canada border, and then to Fairbanks. From there it would proceed to Cape Prince of Wales, Alaska, which lies across the Bering Strait from Uelen, Russia. The Bering Strait tunnel would link Cape Prince of Wales to Uelen.

Spanning off from this main line, two spur lines would be constructed—the first heading toward Nome, the second toward Red Dog, and then to Point Lay. This second spur would be a critical route, linking existing and projected mines in Alaska to the main line. Red Dog is the site of a massive Alaskan mine, currently the world's largest producer of zinc; it also produces sizeable amounts of lead and gold.

This rail system has two features to be noted. First, Prince George is a location where the North American rail grid nearly comes to an end. Starting in Prince George, the rail routes have been built out to Chipmunk and to Fort Nelson on the westerly and easterly branches, respectively. Both rail sections are owned by the Canadian National Railroad. But some of the rail line to Chipmunk has already been torn up, and both lines would require substantial repair and upgrade as part of the Alaska-Canada rail connector plan.

Second, by building the Alaska-Canada rail connector, we create the ability to move goods from Russia and China, as well as from Central Asia, Southwest Asia, and Europe, directly to the North American rail grid, and thus to the United States. The westerly branch would extend the system's

*Dr. Cooper has presented the essential plan for the Alaska-Canada rail corridor from British Columbia's northern tier to Fairbanks, in many comprehensive studies over the past 15 years. He has also worked on the rail extension from Fairbanks to Cape Prince of Wales. This particular configuration was developed in his discussion with *EIR*.

FIGURE 2

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



⋯ Existing Tracks — Proposed Alaska Canada Railway Corridor

reach due south to Vancouver, British Columbia; Seattle, Washington; and then to major cities in California. The easterly branch would enable goods to travel either from Fort Nelson to Chicago, or from Dawson Creek to North Dakota, and then to a projected rail corridor to Texas.

An Immense Bill of Materials

Keeping the physical topology, and size of the railroad in mind, we can work up an approximate bill of materials.

There are two prerequisite steps in all rail construction, prior to laying a single mile of track. First, a comprehensive engineering survey must be conducted on the path and terrain on which the rail would be built, a process that Cooper and a few others have carried out. Second, the area must be graded, across mountains and low-lying areas. This would require bulldozers and earth-moving equipment, etc. Then building can begin.

In assessing a bill of materials, what the industry calls “unit factors,” that is, how many tons of specific goods are needed, per mile of track to be constructed, must be considered. These factors are approximate: In any particular several-mile-stretch of track, one may need more special materials to build on permafrost; one may need more of certain materials for extra strengthening of the track or to build more culverts; or one may need more wood or concrete to build protective walls and sheds, to protect the line from Winter weather.

Table 1 gives the unit factors for building a single mile of railroad track that is double-tracked, and where electric locomotives will be used. “Double-tracking” means that trains can run in each direction at the same time. An electric locomotive uses no diesel fuel, and is powered 100% by electricity supplied by overhead wires. This requires construction of power plants, transmission lines, overhead wires, poles, etc. All of this must be accounted for in the bill of materials.

The total length of the Alaska-Canada rail corridor, including spur lines, as displayed in Figure 2, is approximately 3,030 miles.

Using four different unit factors, it was possible to determine an approximate bill of materials for four different types of rail line that would be constructed: a single-track diesel-electric-hybrid locomotive; a single-track

TABLE 1

**Alaska-Canada Railroad
Route to Bering Strait
Unit Factor: Tons of Material
Required Per Mile**

Double-Track Electric

Wood

Construction Lumber	60
Railroad Ties	116
Subtotal	176

Steel

Railroad Rails	1,900
Reinforcing Bar	775
Plates and Girders	310
Major Bridges	15,500*
Steel Poles	100
Subtotal	3,085

Metals

Copper Wire	245
Aluminum Cable	125
Steel Wire	40
Subtotal	410

Concrete

Cement	1,218
Aggregate	966
Sand	715
Gravel	966
Subtotal, Dry Basis	3,865
Subtotal, Wet Basis	4,854

* There are 15,500 tons of steel in one mile of railroad bridge. There are projected to be 9 miles of bridges necessary for this project (though this could increase).

electric locomotive; a double-track diesel-electric-hybrid locomotive; and a double-track electric locomotive. (On average, the “factor” for a double-track electric locomotive system is roughly double that for a single-track electric locomotive system, although there is some economy of scale. The same holds for the comparable types of diesel-electric-locomotive systems). **Table 2** presents, for construction of each of the four types of system, the approximate tonnage required, by type of commodity. Notice that construction of a double-track electric locomotive system would require a huge bill of materials: more than 10 million tons of iron and steel; nearly 10 million tons of cement, aggregates, etc.; more than 1 million tons of copper, aluminum, and steel wire.

TABLE 2

**Alaska-Canada Railroad Route to Bering Strait
Bill of Materials: Tons of Material Required**

	Single-Track Diesel Electric	Single-Track Electric	Double-Track Diesel Electric	Double-Track Electric
Wood				
Construction Lumber	93,855	102,952	169,540	181,680
Railroad Ties	169,540	168,840	349,790	349,740
Subtotal	263,395	279,810	519,330	547,184
Steel				
Railroad Rails	2,794,380	2,794,844	5,753,180	5,753,200
Reinforcing Bar	1,071,735	1,134,000	2,207,835	2,343,600
Plates and Girders	454,125	453,000	936,155	936,200
Major Bridges	90,000	90,000	139,500	139,500
Steel Poles	0	151,000	0	302,000
Subtotal	4,455,915	4,670,661	9,106,190	9,550,185
Metals				
Copper Wire	190,730	378,500	378,440	741,860
Aluminum Cable	101,910	213,395	213,395	410,375
Steel Wire	30,275	60,560	60,550	121,120
Subtotal	322,915	652,470	652,385	1,273,870
Concrete				
Cement	1,686,320	1,785,930	3,472,275	3,686,886
Aggregate	1,338,155	1,417,104	2,755,185	2,925,048
Sand	989,990	1,047,688	2,038,100	2,165,020
Gravel	1,338,155	1,417,104	2,755,190	2,925,048
Subtotal, Dry Basis	5,352,620	5,668,416	11,020,750	11,703,220
Subtotal, Wet Basis	6,700,964	7,124,884	13,783,456	14,697,912

Source: ‘Unit Factor ton/miles’ as developed in “The Worldwide Strategic Importance of the Intercontinental Rail Corridor Connections between the Eurasian and North American Land-Bridges,” by Hal Cooper, Sept. 15-16, 2007; EIR.

Cooper estimates that, at the beginning, because the total tonnage of freight to be carried by each train would be relatively smaller, the the Alaska-Canada rail corridor system may start out as a single-track diesel-electric hybrid locomotive system; but, as the Bering Strait tunnel is built, sending through a greater volume of freight traffic, a double-tracked electric locomotive system would be built. Engineers estimate that it would require 10 to 12 years to build the Bering Strait tunnel.

However, *with foresight and strong support by the United States government, the Alaska-Canada rail connector could start out as a double-tracked electric locomotive system.* It would move as quickly as possible to a maglev system.

TABLE 1

Large-Volume Components for a New Advanced Nuclear Plant

(1200-1500 MW range)

Equipment	Number (Range)	Comments
Pumps, large	71-100	
Pumps, small	80-484	
Tanks	49-150	600-150,000 pounds
Heat exchangers	47-104	All sizes, types, material 2,100-250,000 pounds
Compressors, vacuum pumps	12-26	
Fans	61-123	600-45,000 pounds
Damper/louvers	730-1,170	
Cranes and hoists	25-50	
Diesel generators	2	10 MWe
Prefabricated equipment modules	64-133	Preassembled packages including mechanical equipment, piping, valves, instruments, wiring, etc.
Instruments of all kinds	1,852-3,440	
Valves of all kinds	9,633-17,891	

Source: *U.S. Job Creation Due to Nuclear Power Resurgence in the United States*, Volume 2, page A-125, November 2004, Idaho National Engineering and Environmental Laboratory.

An Expansion of Employment

The process of constructing and operating a double-tracked electric locomotive system would generate a significant number of new jobs. It would require 7,500 to 12,800 full-time equivalent jobs to construct the railroad itself, and 1,800 to 2,300 workers to operate and provide maintenance to the railroad, once it is constructed. There is also indirect employment: An additional 15,000 to 25,600 jobs would be created, to produce the steel, cement, copper and aluminum wire, specified in the bill of materials in Table 2. The project would also require engineering and other services. Adding together the direct and indirect jobs, the corridor project would create between 24,300 and 40,700 new jobs, a goodly percentage of them productive.

There is more to this process. The Alaska-Canada Railway connector corridor will ultimately employ electrified rail: first high-speed (electric locomotive) rail and then magnetic levitation. This will require huge amounts of electricity, and mandate construction of a series of regional power plants to supply electricity to the railroad operation itself, plus for regional economic and industrial development. The requirement would be, conservatively, 3,000-6,000 megawatts of new installed electricity-generating capacity by 2050. Nuclear power would be the optimal means to supply the power. The bill of materials presented in Table 2 was re-

stricted primarily to the building phase of the railroad, and did not include that power requirement. **Table 3** documents the bill of materials to produce a 1,200MW power plant (construction of four paired 300MW plants, such as four pebble bed modular reactors, would require roughly the same bill of materials). Now, think of all the workers who would be needed to build the hundreds of pumps, heat exchangers, compressors, reactor vessels, etc., and the intermediate goods and raw materials, such as steel (see Marsha Freeman, "The Auto Industry Can Help Build New Nuclear Plants," *EIR*, Dec. 20, 2005).

This Alaska-Canada rail corridor would require the manufacture of a new fleet of thousands of electric locomotives, flat cars, hopper cars, and fuel transport cars. This engenders its own bill of materials, and the creation of new jobs. Given the collapsed condition of U.S. rail manufacture, we must immediately reopen and convert a number of closed auto factories, to produce rail capital goods. Laid-off skilled auto workers would be rehired.

In sum, adding up all the jobs cited above, the Alaska-Canada rail corridor would generate a new workforce of 35,000-50,000 workers, in largely productive jobs. But this is just the first phase.

Global Development

The Alaska-Canada railroad corridor, contemporaneous with the construction of a rail corridor from the Baikal Amur Mainline to Uelen, Russia—both leading vectors of the Bering Strait project—would bring about a profound and enduring change in the world economy. This would generate a second, much larger phase of jobs.

The Bering Strait rail and tunnel project's path is fast, both because it utilizes revolutionary high-speed/maglev technology, and because it operates along a least-action, geodesic Arctic Circle route. The shortest distance and fastest passage for goods from Beijing to Chicago is along this proposed route. Were the current mode of transport to be used to ship a product from Beijing to Chicago, it would go by train from Beijing to a Chinese port, broken down, and placed on a ship travelling at a much slower speed across the Pacific Ocean; be offloaded at the Port of Los Angeles/Long Beach, and placed upon a train for shipment to Chicago. That process takes up to three weeks. By the Bering Strait route, it would stay on high-speed train the whole way, travel along a much shorter route, and take 7 to 10 days.

A primary function of the Bering Strait rail system is to unlock of the vast treasure-house of varied elements of the Periodic Table trapped underneath the tundra and permafrost of the Arctic North, which consists of Russia's Far East, Alaska, the Yukon Territory, and the northern two-thirds of British Columbia. These mineral resources can be used for world economic development. The rail project, as part of what will become the World Land-Bridge, would also build development corridors in underdeveloped regions of the world, including

the Arctic North.

The case of Russia in this setting is developed by Rachel Douglas in “Russia: Contours of an Economic Policy to Save the Nation,” *EIR*, Sept. 7, 2007), so we will focus on the other regions of the Arctic North. The case of Alaska illustrates how the development of resources can contribute to igniting overall development. Alaska has almost no manufacturing: not a single steel plant, and only a few small machine-tool shops; it imports most of its industrial goods from the Lower 48 states or Asia. Sitting on a submerged mountain of raw materials, it has but seven mines of any significance in operation.

Yet, according to independent geologists and the U.S. Geological Survey, Alaska has a teeming resource base of iron ore, zinc, lead, copper, molybdenum, uranium, titanium, chromite, nickel, gold, platinum, and coal. (Russia’s Far East province has an equal or even greater supply of these and other raw materials.) A mining engineer told *EIR*, “Some financial people tell you that transportation has nothing to do with developing a mine, but they are totally wrong. If you don’t have transportation, you can’t ship the goods anywhere.” According to a study by University of Alaska at Fairbanks mining and geological engineer Dr. Paul Metz, Alaska has more than 500 “mineral occurrences”—sites where deposits of specific minerals have been identified—which fall within 60 miles on either side of the center line of the proposed Alaska-Canada rail connector. With rail, he indicated, several of these occurrences, perhaps dozens if they are rich enough, would become operating mines.

The development of mines calls for capital equipment and other supplies, but that is just the first step. Many in Alaska want to develop a manufacturing base. There are already plans to construct a petroleum refining facility outside the city of Fairbanks, Alaska’s largest, not only for producing refined product, but also for feedstock. There is also discussion of building metal-ore-processing and -refining plants, such as for zinc and copper, and of building initially one steel plant that would utilize iron ore from Alaska and neighboring Yukon Territory. These plans require railroads to transport the goods.

The Alaska-Canada rail connector, with 50 miles on either side, would be a development corridor within which new cities would be built and existing small cities would grow, following the general trajectory of the 19th-Century Transcontinental Railroad in the United States. Right now, three-quarters of Alaska’s small population (670,000 people) is concentrated in just two areas: the metropolitan areas around Fairbanks and Anchorage, in the southern part of the state. The rest of the state is virtually empty. As cities spring up or enlarge, they will build manufacturing establishments, and require construction of school systems, electricity grids, water systems, health and hospital systems; this will of course require an expansion of the workforce. For the short-term future, Alaska would import a host of advanced goods, in particular machine

TABLE 4

Population Density*: The Backward Effect of Underdevelopment

	Population per Square Mile	Population per Square Kilometer
Arctic North		
Alaska	1.00	0.38
Yukon Territory	0.16	0.06
Northern Two-Thirds of British Columbia	1.23	0.48
Other Regions		
Ohio, U.S.A.	277.0	108.0
Belgium	892.0	344.0
Netherlands	1,034.0	395.0

* Most of the data is for 2005 or 2006.

Sources: U.S. Department of Commerce, Census Bureau; several governments’ statistical bureaus; *EIR*.

tools, principally from the Lower 48 states.

Thus, as a second phase, over the next 20 to 25 years, this self-feeding process would create hundreds of thousands of jobs, most of them in Alaska and the continental United States, many of them productive.

Alaska’s population density of a mere 1.0 person per square mile (0.4 persons per square kilometer) is a measure of pitiful underdevelopment. **Table 4** shows the population densities for some regions, illustrating the underdevelopment of the Arctic North. The construction of the Alaska-Canada rail connector corridor will foster an increase in potential relative population density: that areas once thought to be barren—such as vast areas of snow and permafrost—will become fecund, through scientific agriculture (including the hot-house production of food), the technological- and capital-intensiveness of manufacturing, and the productive powers of labor. Through creativity, man will increase his productive power over the universe, per capita, and per square kilometer.

At a higher level, the movement of goods between Eurasia and the Americas, at previously unheard-of speeds, will transform world productive relations. It will cohere with an emerging isotope economy, and generate tens of millions of productive jobs in the United States, and hundreds of millions worldwide.

The regeneration of the world economy, which would be achieved through U.S.-Russian collaboration, would shift the relations between the two nations to a positive, war-avoidance footing.

The forceful implementation of Lyndon LaRouche’s New Bretton Woods monetary system, as the present financial system blows to pieces, creates the unique historical moment to bring the Bering Strait project into existence.