

The World Development Federation  
Virtual  
Global Super Projects Conference  
November 2001

**Unifying Four Continents:  
A modern railroad linking the world  
through the Bering Strait.**

*By*

George Koumal  
President  
Interhemispheric Bering Strait Tunnel & Railroad Group  
Tucson, Arizona

## **1. Introduction**

The land from Battle Harbour in Labrador, on the North American continent, to Land's End in Cornwall, England, is now nearly one continuous landmass, interrupted in only two places by narrow bodies of water. With one recently bridged by the Channel Tunnel between England and France, there is only one remaining linkage -- at the Bering Strait -- to be closed.

For more than 16 years, the Interhemispheric Bering Strait Tunnel and Railway Group (IBSTRG), a non profit organization incorporated in Washington D.C. in 1991, has been working on a proposal to close this remaining gap by tunneling under the 47-mile-wide body of water at the Bering Strait. As if giving Man an invitation to cross the Bering Strait, Mother Nature placed in the middle of the Strait two islands: Little Diomedede (U.S.) some 22 miles from the Alaska coastline; and Big Diomedede (Russia), 2.5 miles farther west and another 22 miles from the Asian mainland. Between the two islands runs the International Date Line.

A tunnel under the Bering Strait would truly be a "bridge" into the future. As former U.S. president Clinton was so fond to say, Monday in Alaska is Tuesday in Russia, each visible to the other with a bare eye across the water. Tunneling under the Bering Strait will make it possible to connect rail transport systems on four continents.

The Age of the Railroad is yet to come and therefore, it is not surprising that we have selected the modern electric traction railroad as the transport mode for the Project. Such a Transport and Commerce artery via the Bering Strait would span the Northern Hemisphere in latitudes where the East-West and West-East distances are the shortest. From this artery, branch lines to the industrial and commerce centers in the South will be established. Even more importantly, all-weather, all-seasons access to the tremendous natural resources of Northwest America and Eastern Siberia (more than 4 million square miles) will be established to benefit mankind. Oil/gas lines, fiber optics communication cables, electric power distribution lines (electric power use with the movement of the Sun), will be established along the railroad right-of-way.

A branch of this global transport artery will connect to Japan via a tunnel under Tatarski Strait to Sakhalin Island, using a tunnel connection between the southern tip of Sakhalin and Hokkaido islands.

The southern branch of this global artery will span Middle East and cross the Suez canal to the African continent. The Cape-to-Cairo railroad dream will become reality.

Over the Isthmus of Panama, mainline railroad can be built to connect the North American rail system with the systems on the South American continent. The magic is not in the possibility of rail transport between places and continents far apart, it is the magic of what the railroad will do economically for the people and places in between.

It is not just coincidence that by comparing the density of railroads one can make an accurate judgement on wealth and prosperity of a given area or region. The denser the rail transport network, the more prosperous and wealthy the region and its people.

This brings us to the most important aspect of the Bering Strait project: It is the Project's potential to trigger global creation of Primary and Real Wealth -- the kind of wealth most needed on our small Planet with its population of more than 6 billion. Realization of the Project will enlarge the Economic pie of the World, on which more and more people are making just claims. As it is impossible to expect a hungry man to use his last few dollars to buy a ticket to a symphony, it is equally unrealistic to expect a man without water and a roof over his head to buy a computer and access to E-mail. There are millions in Africa, Asia, South America and in other parts of the world who live not only without what one would consider the basic necessities of life in the 21<sup>st</sup> Century, but they are also without any hope that in their lifetimes the things in their corner of the Globe will get any better. This is especially important now, in the aftermath of September 11, 2001, the day terrorism, born to envy and despair, tried to stop progress and return the World to the misery of medieval time. Our Project would reestablish that hope on a global scale. The new industrial revolution would start, this time with global reach. Tools to establish prosperity will be made available to all nations willing to use them. They will come with an instruction manual on how to use them. While the civilized world can not afford to let acts of terrorism to go unpunished, it also can not afford not to deal with the root causes of such behavior, which clearly are poverty, ignorance and despair.

We have to come to the realization that the Economic Pie of the World, on which more than 6 billion people are making just claims, must be enlarged. Industrialized nations of the World will either help to enlarge this Pie or they will be forced to use the 19<sup>th</sup> Century remedy to defend the Wealth they have with a force of arms. In the World full of nuclear weapons and other arms of mass destruction, the 19<sup>th</sup> Century remedy is not appealing at all. To help to enlarge the Global Wealth seems a much better method to maintain peace and tranquility in the 21<sup>st</sup> Century. Our Project is the right tool to use to trigger the wealth-enlargement process. Millions, if not billions, of people will be transformed from poverty and despair to consumers and active participants in the Global Economy and marketplace. History gives ample testimony that such a process can not fail.

## **2. The Railroad**

As noted in the Introduction, we have a vision of a modern railroad to unify the transport systems on four continents. *Please refer to Fig. 1.* We would start with establishing a spine of the system by connecting East with the West (or West with the East) in the Northern hemisphere. In the second phase of the Project, the Railway building to the South will be done, to connect the African continent via Central Asia and the Middle East.

Transport systems of China and other countries along the Far Eastern Pacific Rim will be connected through the existing rail system as soon as the railroad from the Bering Strait joins the branch of the Baykal-Amur mainline now constructed toward the Siberian city of Yakutsk on the Lena River.

In this paper the America-Asia railroad is described. To connect North America with Asia and Europe via a tunnel under the Bering Strait was first mentioned in 1844. Quite serious steps were taken toward the Project's realization in the 1905/06 period. Buoyed by the prior successful completion of long railway tunnels under the Alps in Europe, the engineers in 1905 considered the Project to be a cinch. Being more humble than our predecessors, we will just say that the Project can be constructed much easier now than in the beginning of the 20<sup>th</sup> Century. However, it will not be a cinch, and we will not be able to do it as cheaply as the people in 1905 estimated: US \$ 300,000,000.

Nearly 1,200 miles of railroad will have to be built to connect the existing railroad terminal at Fort Nelson or Dease Lake in British Columbia with the Alaska Railroad in Fairbanks area. If Fort Nelson is considered, the section of railroad between Dawson Creek and Fort Nelson will have to be completed, and the existing railroad to Prince George will have to be upgraded.

Dease Lake- Prince George will also need rebuilding as mainline railroad. The railroad will be built to the northwest through the Canadian Rockies, following the Teslin River and then the Yukon, before reaching Fairbanks.

From Fairbanks the railroad will go along the Nenana River to the town of Tenana on the Yukon. After crossing the Yukon, the railroad would follow the river along its right bank to the town of Nulato. There it will go west along the Koyukuk river and its tributary to the Wales area on Seward Peninsula, some 1,050 miles from Fairbanks.

Via tunnel under the Bering Strait, at its narrowest point, (some 47 miles wide as the crow flies), the railroad would reach the Asian continent on Cape Dezhnev, part of the Chikchi Peninsula. In that part of the Russian Far East, the transport and communication system is built south of 55 degree Northern Latitude, and the new railroad will be the first all-weather, all-seasons transport to open that part of Russia for industrial development.

From the Chikchi peninsula the railroad would go south to the coastal town of Evensk and then turn west and follow several river valleys (Balygican, Kolyma, Indigirka) to cross the Cerskogo and Suntar-Hajata mountain ranges, before reaching the city of Yakutsk, an industrial center and river harbor on the Lena river.

Our Russian friends are currently building a mainline railroad to Yakutsk from the Baykal-Amur mainline (BAM) in Tynda. Yakutsk is some 2,100 miles from the Bering Strait. Once connection to BAM is made, the railroad system of Asia, Europe and North America will become one.

With this construction completed, the first phase of our Project would be a reality. The railroad system of China and the Far East will become an integral part of the new intercontinental system. As we write this paper, our Russian colleagues are considering construction of a railroad tunnel under the Tatarski Strait to connect the Sakhalin Island

railroad to their national network. Japan will be just one more tunnel away. (Under La Perouse Strait to Hokkaido.)

In the second phase of the Project, the city of Yakutsk will be connected to the European part of Russia by the new railroad, which will be constructed across Siberia along the 60<sup>th</sup> Latitude North all the way to the Ural Mountains -- connecting along the way several existing mineral and industrial areas of Siberia.

With full use of the existing rail system in Iran and Syria, the railroad will be built to cross the Suez Canal to Africa. The railroad will continue close to the center of the Continent all the way south, to make the Cairo–Cape railroad dream a reality. Connections to this African transport and commerce artery will be made to connect national railroads on many African nations to the Intercontinental system.

Lots of railroads must be built to complete the Project. To justify the expenditure, one has only to remember what the railroads have done for the European countries. For America, the railroad is the key to development of industry and commerce, and it is a key to prosperity. No other transport system can come even close to what a railroad can accomplish for a region and its people. We believe that the Age of Railroads is yet to come. With it will come a truly Global Industrial Revolution and development of resources needed by this Planet to satisfy the increasing needs of its population.

As noted in the Introduction, the railroad right-of-way is the most suitable strip of land to install fiber optics communication cables, electric power lines, and -- at a safe distance -- oil and gas pipe lines.

### **3. The Tunnel**

While the railroad construction described above is a much more complex and potentially difficult undertaking, most people are fascinated by the intercontinental connection created by tunneling under the Bering Strait. While almost double the distance of the English Channel tunnel, the Bering Strait tunnel excavation will be much easier due to better geology of the sea bed (granite and solid lime formations) and relatively shallow sea.(maximum sea depth between Big Diomedes island and Asian mainland is some 150'). The Tunnel concept will involve driving the pilot tunnel 16' in diameter. The main transport tunnel, nearly 30' in diameter, will follow.

Only the south branch of the main tunnel will be excavated in the first phase of the construction. The north branch of the main tunnel will be excavated while the southern tunnel is in full use. Excavation of the Pilot tunnel will be ahead of the main transport tunnel advance. Undersea excavation of the main tunnel will not start until the Pilot tunnel is connected to the vertical service and ventilation shaft located on the islands. Pilot tunnel excavation will start simultaneously on both continents and from both islands. We expect that TBM (Tunnel Boring Machines) technology will be used in excavation of the Pilot tunnel as well as the Main transport tunnel. Permanent rail installation will follow the advance in Main tunnel. The Pilot and service tunnel will also serve ventilation and de-watering functions. The belt conveyor system in the Service tunnel will be used to remove excavated material from the main tunnel, to which it will be connected through short raises, excavated in certain intervals. *(See Figures 4 and 5.)*

The Main tunnel will accommodate a single rail of standard gage 4'8 ½" (1435+10-3 mm). Transition to Russian gage 5' (1524+11-3mm) will be done on an appropriate site on the Russian side of the Strait. *Please see the tunnel cross sections on Fig. 6. (Pilot tunnel) and Fig. 7 (main transport tunnel.)* The same transition for the northern branch of the railroad will be done on the U.S. side of the Strait in the second phase of the excavation.

It is assumed that construction on the tunnel will start simultaneously with railroad construction. While the rail construction will be done from several starting points at the same time, it will take some time before the railroad would be able to supply the Tunnel excavation on the Seward Peninsula. The tunnel construction logistic support would come via sea transport. Excavation rock will be used as concrete aggregate and as fill material to build sea walls and piers to enable ships with deeper draft to unload construction supplies.

At the present time, a landing craft is needed to supply the village of Wales. Due to adverse weather during winter months, complete closure of the Tunnel portals will be constructed, allowing complete climate control of the underground excavation spaces.

#### **4. Other Project-Related Factors**

**Capital requirements and Ownership:** While initial support from Governments directly involved will be needed, it is expected that the bulk of necessary capital for the whole Project will come from private capital resources. The proven checkerboard pattern of land and mineral rights ownership along the railroad right-of-way can be used. Joint ownership of new mining, industrial, agricultural and forestry production capacities by government, native organizations and private interests is foreseen. A system can be established where every man, woman and child in Russia will become a shareholder in numerous development projects triggered by transport availability. Development of new oil and gas production areas will go a long way to balance the world's supplies of these important commodities.

**Rail transport:** It is important to emphasize again the important role of rail transport in the development of commerce, industry and agriculture. Air transport is ill-suited to the task to support such large-scale development. It is impossible to use one or even two 747's to satisfy the transport needs of 150,000 tons a day Coal or iron ore mine. River and sea transport is restricted in these parts of the world by the climate to some 4-5 months per year. Furthermore, water transport must be used in conjunction with land transport in order to operate efficiently. Vehicular transport for long-distance movement of large quantities of bulk cargo (ore concentrates, petroleum products, agricultural products, forestry products, waste and scrap materials etc.) can not economically compete with railroad transport.

**Travel and Tourism:** Realizing the ever-growing vacation and leisure time available in most industrialized countries of the world, along with longer life expectancies, the tourism potential the Project would create can not be underestimated. American and Canadian Grandmas and Grandpas, with their mobile homes, will have the entire world open to explore, carried by the railroad at least part of the way. Instead of spending the winter months in southern Arizona, which makes the roads very hazardous for natives like me, they would be able to spend the winter in Crimea, Spain or Egypt. European Grandmas and Grandpas will have America open to explore in their cars and

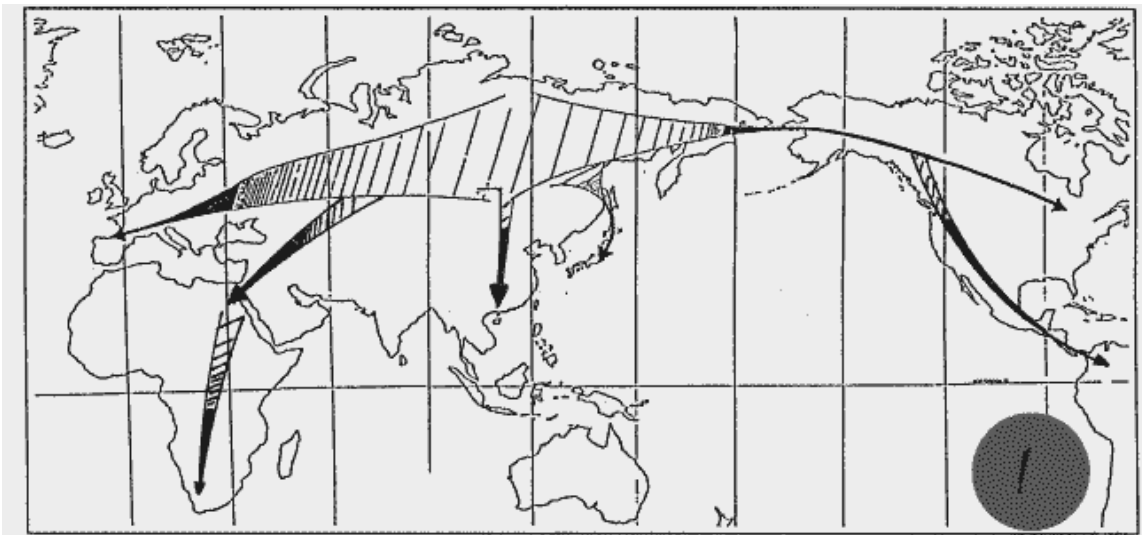
caravans. It is my sincere hope that new prosperity will make the Grandmas and Grandpas of Asia and Africa able to come to America for a visit.

Modern trains, equipped with the latest in electronics (phones, fax, television and e-mail) may attract the business traveler as well. After all, everyone must know by now that the modern airliner "cleverly compresses the minor irritations of several days or weeks of travel into a few hours of astonishing misery" (J. Skow, *Time*, November 13, 1989). Such travelers would arrive at their destinations without jet lag and, thanks to modern electronics, also without time off from work.

It was the Industrial Revolution of the 19<sup>th</sup> Century that made possible the tremendous improvements in quality of life and in living standards in what we now consider the developed countries. Our Project's realization will trigger a New Industrial Revolution, which will improve the quality of life and living standards on a global scale.

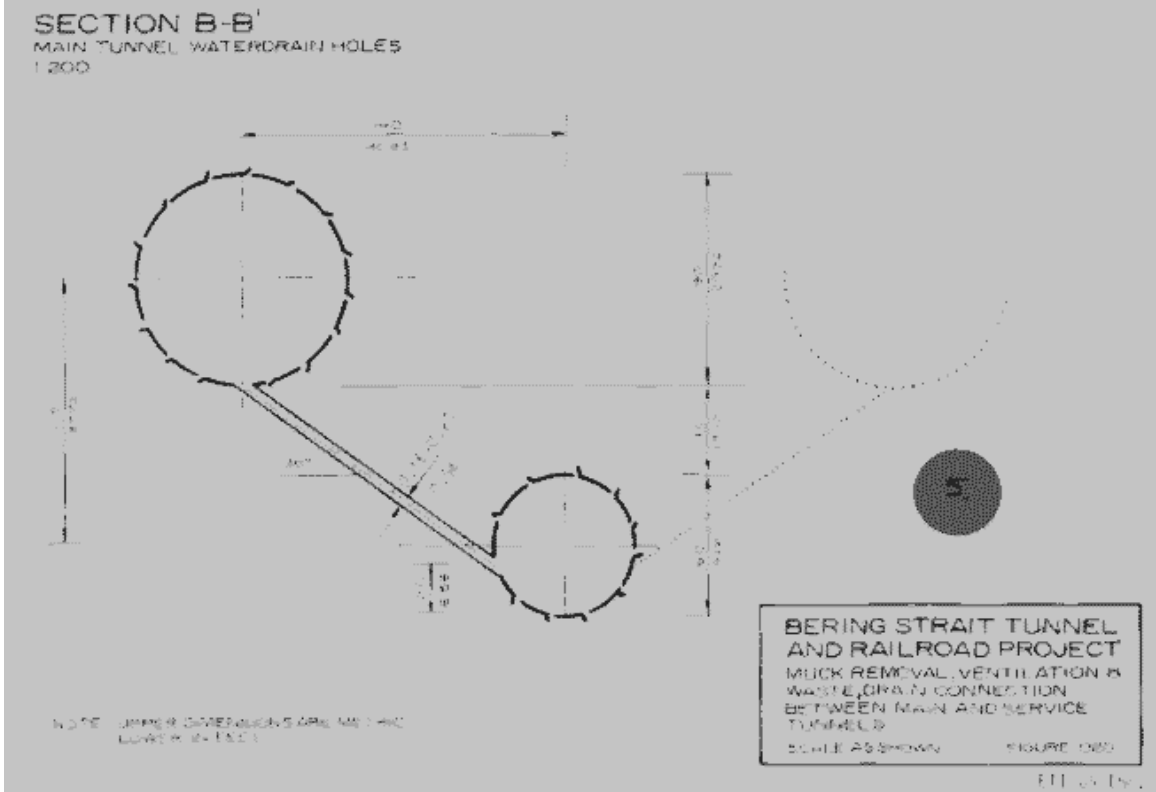
George Koumal  
IBSTRG

Tucson, October 2001



**Figure 1**





**Figure 5**



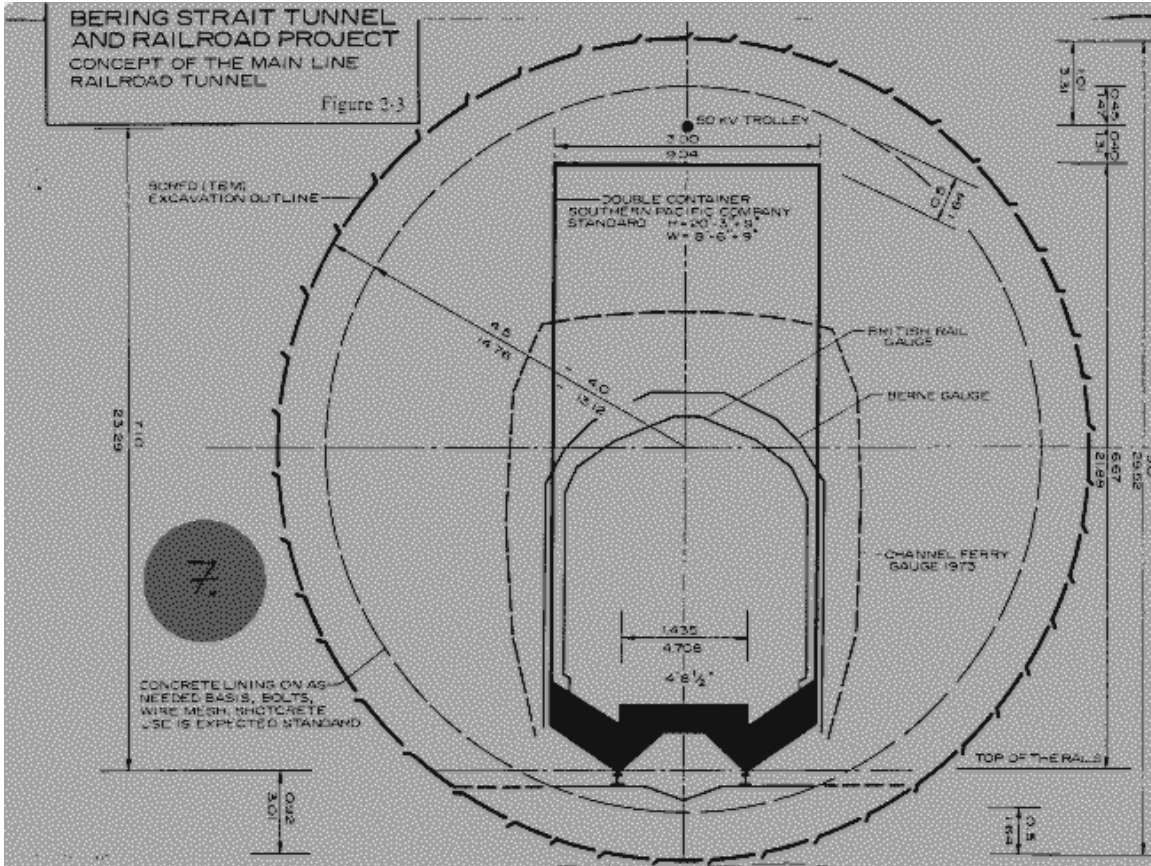


Figure 7