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THE PACIFIC DEVELOPMENT CORRIDOR:

Maglev Across the Bering Strait

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This article is from the 21st Century Science & Technology Special Report, "Nuclear NAWAPA XXI: Gateway to the Fusion Economy" .

The construction of the northern components of NAWAPA XXI in Alaska and Canada opens up development programs with massive international implications, linking the United States with East Asia in the creation of a high-technology, fusion- and fission-powered backbone for a new world economy.

A major geopolitical shift towards the Pacific is already underway, with a strong pro-growth orientation in Asia, centered on pro-development factions in China, Russia, South Korea, and Japan. This directionality stands in stark contrast with the stagnation and collapse of the trans-Atlantic sector. In line with this Pacific orientation, Arctic development is increasingly becoming an area of focus, with major untapped resource deposits lying in wait, while the melting of Arctic ice is opening up northern shipping routes.

The development of the nuclear-thermonuclear NAWAPA XXI system links the United States, Canada, and Mexico into this Pacific-Arctic perspective. However, the critical factor must be continually underscored: *The success of the effort fully depends upon the highest levels of technology and energy-flux density achievable*.

The present physical-economic collapse of the United States is the result of four decades of stagnation and attrition. Living standards have collapsed, industry has been shut down, power per capita has decreased, and aging infrastructure systems are breaking down. The only way to overcome the accumulated physical collapse in the United States (let alone the entire world) is to create greater leaps to higher levels of progress.

The United States will already need to partner with these Asian nations for the development and implementation of the fourth generation nuclear requirements of the NAWAPA XXI system itself,[1] but the implications of the construction and development of the project take the connection deeper, and connecting the North American and Eurasian landmasses across the Bering Strait with high-speed magnetic-levitation (maglev) rail is a keystone.

The gap between Alaska and Siberia—the Bering Strait, stretching a mere 50-60 miles—can be connected by a set of tunnels, linking the transportation systems of both continents for the first time.[2] To support the greatest leap in the productivity of the nations and people involved, the most advanced magnetic-levitation rail systems are required. Unlike trains with wheels, maglev trains float above the track, allowing for travel at well over 300 miles per hour, smoother rides, less wear on the track, and an improved ability to handle steep grades.

These maglev systems are a critical element of the new Pacific Development Corridor, connecting the United States with East Asia through a density of high-technology infrastructure, supporting the advanced development of the entire Pacific coastal basin, including resource development, new agricultural lands, new cities, and new nuclear agro-industrial complexes (nuplexes).[3]

Because of the density of high-technology development, centered on advanced infrastructure and a high density of power, this corridor can uniquely enable massive leaps in the productivity of the high-technology space, fission, fusion, machine-tool, and related industries and manufacturing centers needed to support a global fusion economy.

From this Pacific trunk line, development corridors can branch off to the rest of the world, completing the World Land-Bridge, as envisioned by Helga Zepp-LaRouche and Lyndon LaRouche. Thus the Pacific Corridor is now to be the start of a new global economy, both in geographical terms, and in physical-economic terms, because the growth factor provided to these Pacific Rim populations and territories is what will make the extensions physically possible.

FIGURE 1
Initial Approximation of the Pacific Rim Development Corridor.

The Pacific Trunk Line

The program starts with a focus on the development of the Pacific basin territory. This includes supporting and expanding the already extensive shipping routes, but the end goal of an initial generational investment cycle must guide the policy from day one.

On one end, the manufacturing centers of the Midwestern United States and the critical Pacific ports in California and Washington State, can be connected north, into the Canadian and Alaskan regions of NAWAPA XXI, and from there, on to the Alaska side of the Bering Strait, all with maglev rail.

This is premised on the role of the Pacific ports in existing trade relations (and their physical-economic implications), and the future role of the Midwest as a new high-technology industrial base in America.

At the other end, the high-technology regions of China, South Korea, and Japan can be linked up on the Asian side, with maglev lines traveling from southern China, to create a loop connecting China, North Korea, South Korea, Japan (through Hokkaido), Russia's Sakhalin Island, the Russian mainland, and back down into China. From this, a connection runs north, through eastern Russia, meeting the maglev Bering Strait connection from Siberia.

This East Asia side links the relevant ports, along with the high-technology and industrial centers of South Korea, Japan, and China, including the Russian plans for an advanced space industry complex (along the Svobodny-Komsovolsk corridor) in the region, centered around the new Vostochny Cosmodrome.[4]

Taken together, this defines an initial functional system, in which high-speed maglev rail and a nuclear-thermonuclear driver can support the development of the Pacific Rim, connecting the high-technology and industrial centers of the United States and East Asia, through the NAWAPA and Siberian territories.

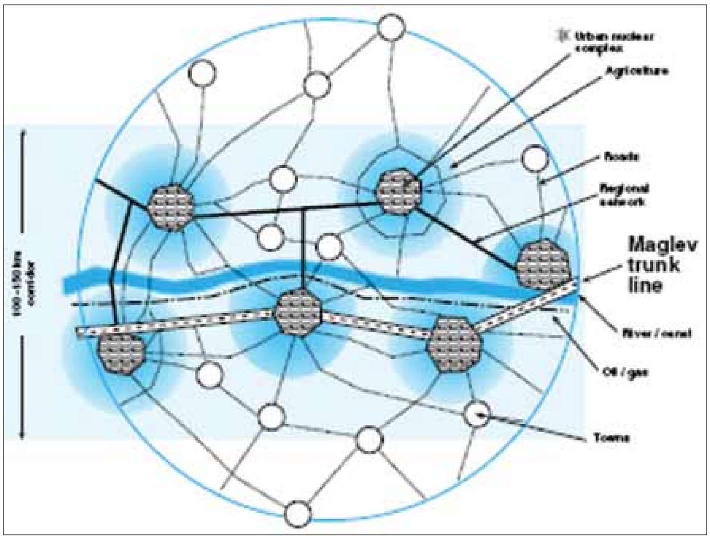

FIGURE 2
Development Corridor (schematic).

However, the key is that the connecting route will not just be an empty transport line. Fast transportation, water, high densities of nuclear power, and abundant untapped resources enable the creation of *the most advanced and productive strip of territory the Earth has ever seen.* New cities and industries can be constructed along the way, featuring upgraded nuplex systems designed to work with fourth-generation fission reactors and thermonuclear fusion technologies (see "Nuclear Agro-Industrial Complexes for NAWAPA XXI", printed in last week's *Almanac*). The extensive resources available in the Arctic can be developed with the most advanced nuclear and thermonuclear technologies, and raw, semi-processed, and processed goods can be rapidly delivered to the high-technology industrial centers at each end in Asia and North America, radiating the effects of a higher level of productivity throughout the global economy.

The key is achieving the highest level of energy-flux density accessible, integrated with the most advanced infrastructure systems, concentrated to create a revolutionary leap in the physical-economic productive powers of labor throughout the region (see "A Call for an International Crash Program: Creating the Fusion Economy", see *21st Century* Special Report).

As the world shifts to a Pacific orientation, the Pacific Development Corridor will be the ultra-high-productivity backbone of the new world economy, and NAWAPA XXI with the Bering Strait connection, can be the critical driver to initiate the entire program.

FIGURE 3
East Asia.

Maglev Systems

Germany and Japan have already developed magnetic-levitation train systems, while other designs have been proposed by U.S. engineers. While there are variations in the designs, the general principle is to use the power of magnetism to create a continuous gap between the entire train and the track, allowing the floating train to be smoothly propelled electromagnetically at very high speeds. This is powered by the electrical grid (eliminating the need for separate engines and fuel supplies for each train), and because there is no direct contact on the track,

The Shanghai maglev, shown here at the Long Yang Road Station, is the only operational maglev in the world. Its maximum speed is 311 mph.

there is no mechanical wear and tear, allowing for longer-lasting tracks with less maintenance. And difficult weather conditions (such as iced tracks) do not pose a problem to electromagnetic braking and acceleration.

Maglev can also travel up and down steeper grades than conventional rail, allowing for much easier travel through mountainous terrain—as encountered in the NAWAPA XXI regions and the Pacific Development Corridor.

The German system is called the Transrapid. Utilizing electromagnets to lift the train, Transrapid created a test facility in 1987, but after years of successful demonstrations, the only construction of an operational line has been in China, with the Shanghai Transrapid running since 2004, achieving a maximum speed of 311 miles per hour.

In Japan, maglev systems are being developed which utilize a different technology, superconducting magnets. Although they have to be cooled and are heavier systems, the superconductivity allows for a much stronger magnetic lift, creating a larger gap between the train and the track, and the ability to handle heavier loads. In June of 2013, officials at Central Japan Railway unveiled their latest prototype, the "Lo" model, which is planned to begin operations between Tokyo and Nagoya in 2027, operating at 360 miles per hour.[5]

While much of the discussion has focused on the applications for passenger transport, the systems can also revolutionize freight and cargo transport. Even the existing Transrapid systems could be quickly altered for freight, while additional investments could produce faster and more advanced second-generation systems.[6] The more powerful superconducting magnets involved in the Japanese design can carry heavier loads, further increasing the possibilities for maglev freight transport.[7] Again, the faster speeds and ability to handle steeper grades and cold climates make these systems far superior to existing wheel-based rail, especially for the terrain of NAWAPA XXI, accessing Arctic resource deposits, and traversing the length of the Pacific Development Corridor.

With maglev, the top speeds are limited not by the magnetic-levitation technologies, but by wind resistance as speed increases. While it will not be worthwhile for freight, ultra-fast passenger transport can take full advantage of the magnetic-levitation capabilities by utilizing enclosed-vacuum or semi-vacuum tubes, removing the air-resistance factor (and trouble with sonic booms), and allowing for speeds of thousands of miles per hour.[8] Special ultra-fast passenger transport could bring people from American urban-industrial centers to those in East Asia in a matter of hours.

The Nuclear-Thermonuclear Driver

The highest levels of energy-flux density are required to power this development corridor. While significant amounts of electricity will be needed to support the development of this entire territory, including the maglev lines and advanced industrial sectors on both ends, power sources with higher temperatures and greater heat densities have broad applications beyond electricity generation.

The decades-old concept of nuclear-powered agro-industrial complexes must be revived and upgraded. Fourth-generation nuclear-fission reactors provide higher levels of process heat, allowing for direct applications to chemical, industrial, and agricultural requirements, ranging from the production of metals, to fertilizers, to synthetic fuels. Centralizing these processes in a dense cluster maximizes the productivity and efficiency (see "Nuclear Agro-Industrial Complexes for NAWAPA XXI").

Additionally, nuclear desalination and water purification can provide abundant water where needed along the corridor as well (see "The Nuclear NAWAPA XXI and the New Economy", see *21st Century* Special Report).

Even more advanced options are available with fission-fusion-hybrid systems, controlled high-temperature plasma-based systems, and full-scale controlled thermonuclear fusion (see "A Call for an International Crash Program: Creating the Fusion Economy", see *21st Century* Special Report).

High energy-flux-density processing of raw materials closer to the extraction site enables the transportation of higher quality goods, translating to a greater value per ton transported. It also enables the more efficient processing of ores, cheapening the process and making lower-grade and lower-concentration deposits valuable and economically viable resources.

FIGURE 4
The Pan American Highway with the Darien Gap.

Maglev Across the Bering Strait

FIGURE 5
Full World Land-Bridge as proposed by Lyndon and Helga LaRouche.

These considerations must be placed up front when considering the development of the vast Arctic resource deposits, including the role of strategic Arctic fusion-fission nuplex power and processing systems along the Pacific Corridor.

For these reasons, it will be critical to locate demonstration and experimental fusion systems specifically along this corridor, with the goal of developing a broad range of fusion technologies. This includes high-temperature controlled-plasma technologies such as the plasma torch, capable of separating any substance (from nuclear "waste," to chemical waste, to dirt, to basic city trash) into its constituent elements, turning virtually any input into useful material. The resulting resources can even be tuned to the isotopic level—providing higher-quality materials than were possible before.

To maximize the benefits received from the surrounding infrastructure, and contributions delivered back to the integrated productive processes, the initial experimental investigation and development of high-temperature plasma and fusion-related systems should be strategically constructed as part of the Pacific Development Corridor, and within proximity to the advanced industry on both ends, and the resource development along the corridor when appropriate.

Bering Strait and the World Land-Bridge

Integrating the NAWAPA XXI, Bering Strait, Arctic Development, and Pacific Corridor projects will provide the needed economic leaps for the nations involved, creating a density of productive potential that will drive the growth of the entire world.

Done properly, this can be the physical-economic foundation for a new global economy.

Branching off the East Asian side, the northern, central, and southern corridors of the Eurasian Land-Bridge can be upgraded to maglev and high energy-flux-density development corridors, reaching back into Europe, where the Paris-Berlin-Vienna Productive Triangle (see *EIR*, Feb. 2, 1990) can become the high-technology center of western Eurasia. Through Spain and the Middle East, two branches reach down into Africa, bringing the same density of development and advanced infrastructure throughout the continent.

On the North American side, branches from the main Pacific Development Corridor can expand across the rest of the continent, integrating national and international high-speed maglev rail grids throughout the United States, Canada, and Mexico. From Mexico, the lines continue into South America across the Darien Gap, connecting the tip of Argentina with the tip of South Africa in a single high-speed maglev network.

The first stage is the development of the Pacific Development Corridor, with NAWAPA XXI and the Bering Strait connection being the critical driver. Done with a fusion-fission driver applied to the most advanced infrastructure, industry, and resource development, this high density of high-technology development is the only way to provide the needed physical-economic leaps, overcoming the past four and a half decades of attritional collapse by reaching farther and faster into the future.

These are requirements, not options.

Footnotes:

[1] The basic pumping requirements of the NAWAPA XXI system will require over 50 gigawatts of power. Additional requirements for desalination systems (up to 42 systems) and power for industry increase the requirement, all in addition to the need to replace existing aging systems. When the requirements of the world population are considered, it becomes clear very quickly that mankind needs a lot of nuclear power, and fast. See "The Nuclear NAWAPA XXI and the New Economy," by Michael Kirsch.

[2] This project has been discussed as far a back as the 19th-Century railroad revolution. See "Origins of the Bering Strait Project," by Richard Freeman, *EIR*, May 4, 2007.

[3] See "Nuclear Agro-Industrial Complexes for NAWAPA XXI" by Liona Fan-Chiang.

[4] See "Space Industry Cluster in Russia's Amur Region," submitted by Yuri V. Krupnov (then-director of the Institute for Demography, Migration and Regional Development), presented by his associate, Ilnur Batyrshin, at the Sept. 15-16, 2007 conference held in Kiedrich, Germany, "Reconstruction After the Financial Crash," *EIR*, Sept. 28, 2007.

[5] "Commercial Superconducting Maglev Train on Tracks in Japan," June 10, 2013, LaRouche PAC.

[6] "Maglev Trains—Even More Powerful as Freight Carriers," Oct. 1, 2007, LaRouche PAC.

[7] "Maglev: Transport Mode for the 21st Century," by Drs. James Powell and Gordon Danby; *EIR*, Sept. 21, 2007.

[8] Ibid.