

EURASIAN LANDBRIDGES: OPPORTUNITIES, CONSTRAINTS AND CHALLENGES

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Introduction

In the 1990s progress was made towards realising a modern 'silk road', a link over the landmass of Eurasia between the markets of Western Europe and those of East Asia. The progress was uneven, however. The first operational link, the Trans-Siberian Railway (TSR), has experienced difficulties, yet there were important steps made at the national and multinational level to define other potential corridors which are now about to be brought into being. The Eurasian landbridge concept is an idea whose time has come, it would appear. In this paper I describe the concept and discuss the steps being put in place to achieve it. Some of the optimism of the proponents of the Eurasian landbridge is tempered by a review of the technical, logistical and competitive challenges.

The Landbridge Concept

Ever since the first organised overland trade route between Asia and Europe, the famous Silk Road from Xian, there have been many attempts to establish land connections across the land mass of the largest continent. Most were small scale and of short duration, their hopes dashed by the sheer extent

of the continent, the difficulties of the terrain, political conflicts and war, and competition from ocean-based connections.

By the end of the 1980s conditions became favourable for a reconsideration of this old dream. Most important was the remarkable economic development of East Asia, which saw the expansion of exports from a burgeoning industrial economy. Continued economic prosperity in Europe, fuelled by the growth, achieved through the integration achieved by the economic union of nations, presented complementarities with the Asian economic expansion. Trade between Western Europe and Asia had grown from \$94 billion in 1980 to \$310 billion in 1993. An increasing proportion of this trade was containerised, which meant that it could be transported and transferred between the modes more easily. Meanwhile, the collapse of the Soviet bloc, and the growing liberalisation trend made it possible to consider establishing international transport links between countries that hitherto forth had been isolated.

Attempts to provide land links across the continent took many forms. The Russians sought to exploit further the TSR, by expanding services from Europe to the Far Eastern port of Vostochny, in order to carry containers from Western Europe to Japan. In 1991 a service was offered in conjunction with the large U.S. container shipping company, Sea-Land. In 1992, a new privately owned Russian company, Trans Siberian Express Service (TSES), was established to offer intermodal service through and between CIS, Finland, the Baltic Republics, and Mongolia. While these practical steps were being undertaken, international bodies, including the UN's Economic and Social Commission for Asia and the Pacific (ESCAP), set in progress a number initiatives to develop transport corridors across Asia and between broad regions of the continent. Individual counties have played an important role in furthering these ideas. The PRC has made improved rail connections to its northern and western borders a priority, steps that are vital to completing interregional links. The Republic of Korea has financed a number of the feasibility studies of the Northern Route.

The term 'landbridge' is loosely applied in general, and in effect comprises several elements. In the strictest sense the term applies to traffic that is transiting across a continent en route to overseas destinations. It is exemplified

by Asian traffic that is destined for Europe that crosses the Pacific Ocean, and is transferred over North America by rail, and thence by ship across the Atlantic. In the context of Asia, this could involve a land transit over the continent and an ocean sailing at least at one end, such as traffic between Western Europe and Japan. Shipments from one side of the continent to the other is another category, since it follows an all-land routeing. Freight shipments by rail between Germany and China would fall into this category. A further group of shipments is the regional traffic that may use the overland corridor for a portion of its length, such as the traffic between Western Europe and Kazakstan. In North America, where landbridging is particularly well developed, specific designations are used: landbridge for the first type, mini-bridging for the second and micro-bridge for the third. Whether these terms will ever be applied in the context of the Eurasian land bridge remains to be seen, but clearly there are differences in the types of traffic and this requires that they be differentiated. Significantly, ESCAP does not use the term 'landbridge', rather it refers to 'Trans-Asian Rail Corridors'.

Corridor Routes

The TSR forms the spine of many of the actual and potential landbridge routes (see Figure 1). From the borders with Poland (present-day Belarus), the former Soviet Union established a rail network that extended across Siberia to the Pacific. This forms the basis of the TSES all-Russian bridge that offers services from Poland and Finland across to Vostochny.

Other potential northern routes identified by ESCAP include:

- Kazakhstan through China to the port of Lianyungang;
- through Mongolia to Northern China;
- through Manchuria to the Korean peninsula and Pusan and a branch to the Chinese port of Dalian.

ESCAP has also identified a southern corridor and several other possible

routes. The main southern corridor begins at the Turkish border with Iran, with a route across Afghanistan to Pakistan, India and Bangladesh, with extensions through southern India to Sri Lanka. The possible links identified in southeast Asia, including Vietnam, Malaysia and Indonesia, comprise a more regional network.

Advances are also evident through bi-lateral cooperation. For example India and Russia have recently signed an agreement to establish a north-south corridor through Iran for intermodal traffic between the two nations.

Most progress has been made by ESCAP in defining and planning the Northern Corridor routes. Characteristics and technical problems have been identified. The only physical gap is the cross-border section between the two Koreas. China has recently connected its western rail system with neighbouring Kazakhstan. Issues relating to border clearance, tariffs have been identified, and a demonstration run was agreed upon at the latest meeting in Bangkok in February 2000.

Planning the southern route is less well advanced. Routes are still being considered by working groups, and the operational problems are still being identified. Commercial assessment has still to be undertaken.

Opportunities and Difficulties

One of the main reasons for this interest in landbridges is the size of trade between Europe and Asia. Despite the downturn in economic activity in Asia in the late 1990s, commercial exchanges between the two markets continue to grow at a significant rate. It is surprisingly difficult to provide exact trade volumes, but it is estimated that the traffic is in excess of 30 million containers per year and growing at an annual rate of 8%. The largest modal share is captured by shipping, with air freight dominating the high-value end of the market. Direct overland shipments remain insignificant. Even if a rail landbridge could capture only a small share of the market, that would represent an important economic opportunity for the railways involved.

All studies and reports dealing with the landbridge cite the advantage of

distance savings of the rail link over maritime transport. A large number of comparisons are drawn:

- 11,400km from Kobe to Frankfurt by rail corridor, 22,000km by the Suez canal
- 9,600km from Chittagong to Bulgaria by rail,

It is suggested that time advantages are possessed by the land route:

- 28 days Rotterdam to Hong Kong by rail, against 33 days by ship

However the southern route possesses no advantage, even when the optimal time by rail is considered:

- 34 days Dhaka-Frankfurt by rail, against 34 days by ship

It is for this reason that the northern corridors have received more attention because of the presumed time/ distance advantages. The landbridge is seen as a facilitator of trade, speeding up cargo movements between the two trade blocks. It is also seen as a means of offering competition to the shipping lines that dominate the trade today, thereby helping to keep rates low, to the advantage of European and Asian shippers and consumers.

As attractive as the landbridge appears to be, even the most ardent supporters recognise that there are many obstacles to be overcome. There have been a number of feasibility studies undertaken, which have examined and assessed the difficulties. The obstacles can be grouped into three categories:

Technical: As extensive as the rail network appears on the map, there are a number of missing links. Most notable are the gaps between the two Koreas, a section in Iran, and another in Bangladesh. Several earlier gaps, such as the link between China and Kazakhstan, have now been overcome. Because the northern corridors are the most complete, and because of their time

advantages, they are receiving most attention. There are other technical difficulties with single tracking and electrification, but these are being addressed as a result of agreements between countries and development agencies such as the World Bank.

The major technical problem is the basic difference in track gauge between Russia, Belarus and Mongolia, and the other national rail systems. Since the TSR is used by all the new potential northern corridors, a transfer between the broad gauge of the TSR and the standard gauge elsewhere is necessary. Thus a container shipped from western Europe would have to be transferred at the Polish border to a broad gauge freight car, and unless being shipped to a Russian Pacific coast port, would have to be transferred back to a standard gauge wagon at the Chinese border. A number of technical reports by ESCAP suggest that there are ways of effecting the transfers effectively, most economically using traditional container lift gear, but future systems could use wagons capable of switching bogies of different gauge.

Commercial: As much as time and distance advantages of the landbridge are evident, a critical factor is cost. Unless the rail corridors can compete with all-sea routes by offering competitive rates, it is unlikely that the landbridge will capture traffic. While ESCAP studies suggest that the rail corridor could offer advantages up to 30% for shipments between Poland and Korea, for most of the major markets in Western Europe the advantages are much smaller. The southern route is shown not to be cost competitive with ocean transport.

Operational: There are a large number of operational difficulties in realising the corridors when no links presently exist. Customs clearance and border controls are seen as a potential bottleneck. The lack of data control and information exchange between the operating systems is seen as another problem. Solutions to these problems are being urged on the national rail systems. For example, ESCAP is pursuing adoption of the international agreements on the clearance of containers, and has recommended adoption of common an EDI system for use by the railroad industry.

Challenges

Proponents of the northern corridor landbridge concept clearly recognise the formidable problems that confront the project, but the impediments are considered to be surmountable. Trial runs of block trains are being undertaken presently. Is this optimism justified? Certainly, the sheer size of the potential market makes the landbridge a very attractive possibility. The success of the North American rail landbridge is seen as confirmation of the potentialities of rail intermodal traffic. In this section I suggest that the proponents are overly optimistic, tending to gloss over some fundamental difficulties and dismissing minor problems.

Problems of the TSR and the consequences

As the one rail corridor actually in operation, and the one that would form the spine of all the other potential northern corridors, the experience of TSR is a useful indicator of the landbridge concept. The evidence is not good. Traffic flow has declined from a peak of 4.5 million tons of transit cargo in 1988, to 0.3 million tons in 1996. SeaLand, the US ocean carrier that had invested heavily in establishing a container service over the TSR in 1991 is presently handling less than 4,000 TEUs per month, and its new owner, the A.P. Moller Group, is presently evaluating its continued involvement. While many of the problems can be ascribed to the economic difficulties of Russia, including the devaluation of the rouble, other difficulties have prevented the system from achieving success. Transcontinental traffic that crosses many national jurisdictions requires a different tariff structure from purely national traffic. These transit rates are frequently set high to maximise revenues within the national territory, a frequent problem in Europe, with many national railroads. In Russia transit rates are either FAK (freight all kinds) or TVC (time volume contracts), which are not attractive to customers shipping lower value goods. Companies such as SeaLand have found it not easy to develop competitive

door to door rates, because they are bound by a rate structure which is inflexible. While the feasibility studies for the northern corridor have highlighted the problems of tariff structures, the example of the TSR, demonstrates that solutions are not readily come by. Furthermore, if China is brought into a landbridge partnership, as would occur with all the proposed new northern corridors, it is by no means clear that the Ministry of Railways or Sinotrans would be capable of offering the flexibilities that international container shippers require.

For a service to have credibility, it has to be safe and reliable. Unfortunately, the TSR has a very poor reputation. Pilferage and theft in Russia have become endemic. In 1994, 40,000 containers simply disappeared. Inevitably customers have become reluctant to send containers by this route when other, all-sea, options are available. Presumably, security can be upgraded, but perceptions take longer to change. A poor reputation is very difficult to overcome, and as in any system, the whole is only as strong as the weakest link.

Although the TSR offers an unbroken link from the borders of Poland in the west to the Pacific Ocean in the east, the gauge change at the border with Poland has been something of a bottleneck. Representing a delay in time, an additional cost, and necessitating a transfer of the containers, this has caused many shippers to re-route their boxes by ship to Finland, where they are loaded directly on a Russian-gauge wagon for uninterrupted haulage to the Far East. As recognised by the northern corridor feasibility studies, an exchange between gauges will occur at the borders with China for all the routes. The assumption that lift equipment can provide a technical solution overlooks several factors. Extra lifts are disliked by the transport providers and are avoided as much as possible, partly because of the cost factor, but also by the issue of damage and delay, as evidenced by the TSR. The potential for delay is considerable. Equipment breakdown, non-scheduled arrival of trains can play havoc with operations, and the larger the traffic flow, the greater the potential for bottlenecks and costly delays. The experience of Australia, trying to provide inter-State rail services where gauges differ is well worth considering.

Lessons from North America

It is all too easy to look to the North American landbridge and extrapolate its success to the Eurasian continent. An essential, though frequently overlooked, difference between North America and the situation elsewhere, is that the private railway companies are all-freight operators. Freight is their only pre-occupation, and passenger trains, managed by publically-funded bodies, have to take second priority on the tracks. This focus on freight is unique. One of the great difficulties in Europe is slotting freight services on tracks that are prioritised for passengers. Similar problems are faced in China, where continued growth in freight and passenger traffic is precipitating capacity constraints on a large number of corridors. It is not clear what the problems of passengers and freight sharing tracks will have on the operations of blocks of container trains that would be part of the landbridge.

A further basic difference is that the success of rail intermodal in North America is based to a considerable degree on the ability to double stack containers, and the opportunity to operate very long blocks of trains. In Eurasia, both characteristics would not be possible technically. For example, low clearances, due to overhead electric cables, makes double stacking impossible. This greatly affects the economies, and, presumably, the success of landbridging.

Competition from the ocean carriers

The proponents of the landbridge certainly recognise that in order for it to be a success it must be able to compete effectively with the ocean carriers. Rate comparisons reveal the marginal advantages of the all-land route, except in inland markets of Eastern Europe. Unfortunately, the ability of the ocean carriers to match and undercut the landbridge rates is quite large. The container shipping industry is experiencing a dramatic increase in vessel size. Most of the new vessels on order are post-Panamax size, and the debate in the industry is just how large vessels will get. The opportunities to realise very

large economies of scale from the 8,000 TEU ships being deployed and on order gives the ocean carriers very significant rate-cutting opportunities. It is significant that these large ships are deployed on only two world routes: Asia to the West Coast of North America, and unfortunately for the landbridge, from Asia to Europe. This competition has not been factored into the feasibility studies.

The ocean carriers have an additional advantage over rail for the re-positioning of empty containers. Trade imbalances produce an endemic problem for the container industry. Making sure sufficient containers are available for customers in export regions is matched by the problem of surpluses in the main markets. Re-positioning empties is a logistical and cost problem everywhere. Because of their considerable carrying capacities, ships can manage the problem more easily than railways. Presumably, the westbound trade surplus expected on the landbridge will create specific problems that will have cost and operation consequences for the system. These have not been fully addressed in the feasibility studies.

If the landbridge is unlikely to be able to match price competition, except in lesser markets, it is presumed that it will have a time advantage over ships. This is certainly true of the contemporary shipping services between Europe and Asia, but it is worth noting that a significant development in ship speed is about to take place on the North Atlantic, where FastShip, a US-based company, is about to begin a service involving high-speed ships offering four-day door-to-door service between the US and Western Europe. If the service proves itself, it might be possible to extend it to Asia, and this could erode the presumed time advantages of the railway.

Other factors

A striking feature of the feasibility studies is the limited consideration of capacity of the corridors. The solution to the problems of gauges that is proposed is a technical response, but as suggested above, there are significant throughput implications, in which congestion and delays need to be factored in. Scheduling blocks of container trains on tracks that are already highly used

is a challenge. If there is any lesson to be learned from North America, it is that congestion and delays can produce significant structural changes in the system. Congestion in the main inland hub of Chicago and in the ports Los Angeles of Long Beach has resulted in public authorities having to invest billions of dollars in infrastructure upgrades, and has led to the shipping lines in the last 12 months to expand or re-establish their services through the Panama Canal to the East Coast ports to avoid these bottlenecks. Significantly, the shipping lines can adjust their sailing schedules and ports of call much more easily than can the land-based providers.

It is recognised by most proponents of the landbridge that the actual services will have to involve intermediaries who will negotiate with the rail providers for intermodal service and then market these to customers. It is a fact that the most powerful of these intermediaries, or intermodal operators, are the shipping lines themselves who are inserting themselves into logistical chains and providing door-to-door services. How ready will the shipping lines be to promote a service that is intended to compete with their core business? This is a fundamental question that has to be addressed.

Prospects

If it the landbridge is successful, it could have a major impact on international trade between two of the main trading blocs of the world, and provide a significant boost to the economies of the countries and regions through which it passes. This is a potential is worth striving for. However, to this outsider, the Eurasian landbridge is a project with lots of unanswered questions.

As a grand project to link Asia with Europe it is probably premature. It is my opinion a more modest approach is called for. A step-by-step development, rather than a grand system-wide opening would appear to offer the best chance for success. Developing and improving intermodal links between the coastal regions and inland markets in both Europe and Asia should be the first step. This would expand trade and open up new markets.

The transport system would have opportunities to establish connections and refine services. Technical and logistical difficulties could be worked out, sheltered from the harsh competitive environment of other modal systems. Thus ports in Europe would extend their intermodal connections eastward, while Asian ports would establish efficient intermodal links in adjacent markets.

To a certain degree this is happening at the European end of the network. Polzug, a joint operation between Polish railways and the major terminal operator in the German port of Hamburg, is offering rail intermodal service to Polish interior markets, and has extended its operations into the Ukraine. Similar developments are taking place by German and Belgium freight operators between Hamburg and the Czech Republic, and Antwerp and the Belarus border.

The recent groundbreaking by South Korean president, Kin Dae-jung, at Imjingak starting construction of the rail link between the South and North Korea is a key step in permitting South Korean ports to gain access to regional markets in the North and Northern China. Similarly, there has to be an improvement and refinement between Chinese coastal ports and inland markets, made possible by the extension of the Railway to the borders of Kazakhstan.

When these links at either end of the continent are refined and working effectively they could be progressively extended to meet in Siberia, when a true landbridge would be created, and only then would the system be exposed to the competitive pressures of ocean shipping. This more gradualist approach would be less dramatic, but would be more likely to achieve success than the instant adoption of a transcontinental network. If the North American experience is any guide, microbridge traffic, flows from a port on one of the coasts to inland points, greatly exceeds transcontinental landbridge flows.

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