The Northern Corridor of the Trans-Asian Railway

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Background

The 1980s and early 1990s witnessed some dramatic changes in the political and economic environment of countries in the UNESCAP region. Peace returned to Southeast Asia, countries in the Caucasus and Central Asia became independent and a number of countries adopted more market-oriented economic principles. These changes, which resulted in more outward-looking policies, led to unprecedented growth in trade to and from the UNESCAP region, at a rate that was twice the global figure. In addition, a salient feature of the region's trade growth was the increasing significance of trade within the region itself. Concomitantly, the number of journeys by people within the region to neighboring countries for both tourism and business purposes also soared. Each of these developments increased demands on the region's transport and communications systems and underscored the need to improve and expand existing infrastructure and upgrade the operational efficiency of linkages between the countries of the region as well as with other regions.

Recognizing that a process of profound change was underway, the 48th session of the Commission[1], held in Bangkok in April 1992, endorsed the Asian Land Transport Infrastructure Development (ALTID) project. The project was formulated around three components, namely: the Trans-Asian Railway (TAR), the Asian Highway (AH) and the facilitation of land transport, with the objective of improving intraregional and interregional transport links as part of the secretariat's efforts to assist member countries in addressing the challenges of globalization by providing them with a tool for accessing the world's markets.

Implementation of the ALTID project

In turning intentions into reality several considerations dictated a pragmatic approach. One consideration was the sheer scope of the project itself in terms of the geographical area that it encompassed, i.e. almost the entire Asian continent. Another was the disparities in the development of land transport networks in the countries and subregions concerned, and, finally, the availability of resources in individual member countries. As a result, a specific strategy was adopted for the implementation of ALTID. This strategy comprised (i) a major emphasis on project implementation at the subregional level to make the project more manageable for UNESCAP, while reinforcing the ownership of the member countries through the full involvement of existing subregional groupings as partners in the implementation process; (ii) a step-by-step approach through a series of corridor studies to assist in the formulation of rail and road networks with an emphasis on minimizing the number of routes to be included in the networks and making maximum use of existing infrastructure; (iii) a focus on the facilitation of land transport at border crossings through the promotion of relevant international conventions and agreements as an important basis for the development of trade and tourism; and (iv) the promotion of close international cooperation with other United Nations agencies, including UNECE and UNCTAD[2], as well as other governmental and non-governmental organizations such as the International Union of Railways (UIC), the Organization for Railway Cooperation (OSJD), the International Road Union (IRU) and the International Road Federation (IRF).

The Trans-Asian Railway component of ALTID.

The Trans-Asian Railway (TAR) project was initiated in the early 1960s with, at the time, the objective of providing a continuous 14,000km rail link between Singapore and Istanbul (Turkey), and possible onward connections to Europe and Africa. This link offered the potential to shorten distances and reduce transit times between countries and regions to a considerable degree, while being a catalyst for the notion of international transport as a tool for trade expansion, economic growth and cultural exchange.

Box 1. TAR-Related Corridor Studies Carried Out by UNESCAP

1. Feasibility study on connecting the rail networks of China, Kazakhstan, Mongolia, the Korean Peninsula and the Russian Federation (1996) - *Northern Corridor*
2. Development of the Trans-Asian Railway in the Indo-China and ASEAN subregion (1996); (countries concerned: Cambodia, China, Indonesia, Laos, Malaysia, Singapore, Thailand, Vietnam)
3. Development of the Trans-Asian Railway, Trans-Asian Railway in the Southern Corridor of Asia-Europe Routes (1999); (countries concerned: Bangladesh, China, India, Iran, Myanmar, Pakistan, Sri Lanka, Thailand, Turkey)
4. Development of the Trans-Asian Railway, Trans-Asian Railway in the North-South Corridor Northern Europe to the Persian Gulf (2001); (countries concerned: Armenia, Azerbaijan, Finland, Iran, Kazakhstan, Russia, Turkmenistan)

[1] The Commission is made up of high-level government officials from ESCAP member countries and is the main legislative organ of ESCAP. It meets once a year to consider economic and social issues of regional importance, review ESCAP activities and adopt its program of work.

[2] ECE - Economic Commission for Europe. UNCTAD - United Nations Conference on Trade and Development.

The international events that punctuated the 1960s, 1970s and early 1980s had a negative impact on the concept and its momentum during these three decades. However, with the political and economic changes that took place in the region in the 1980s and early 1990s, TAR-related activities were reactivated under the ALTID project. In 1996, the first of four major corridor studies (see Box 1) reflecting the regional approach adopted to implement the project was published. The studies followed similar methodology and principles, namely: (i) identifying the links according to the ALTID criteria (see Box 2); (ii) assessing their conformity with a set of technical requirements (e.g. loading gauges, axle-load, speed); and (iii) appraising the compatibility of operational practices on both sides of different national borders, in order to evaluate the possibility of cross-border movements (e.g. couplers, length of trains). In addition, the "soft" aspects of transport were reviewed with particular attention to tariff-related issues and the institutional framework pertaining to the passage of goods across borders. Finally, two crucial infrastructure-related elements were also considered, namely: (i) the existence of break-of-gauge points along specific linkages with an assessment of possible solutions to overcome this apparent technical incompatibility; and (ii) the existence of so-called 'missing links' making end-to-end movement impossible on some of the linkages.

The break-of-gauge issue: A break-of-gauge occurs when the railways of neighboring countries have different track gauges[3] as, for example, between China and Kazakhstan, or the DPRK and Russia. Various techniques exist to overcome these discontinuities. They include transshipment, bogie exchange and the use of variable gauge bogies[4]. Whatever solution is adopted, a break-of-gauge always constitutes an interruption to rail operations since it imposes additional stoppages in the movement of passengers and cargo.

The 'missing link' issue: A 'missing link' is an absence of physical linkages between the railway networks of neighboring countries or an absence of continuous railway infrastructure within one country, often due, in the latter case, to local geography. Missing links between the networks of neighboring countries are due either to the fact the link was never there in the first place, or because it ceased to exist due to political events. Bridging the former requires a joint approach by the railways concerned and by their respective governments. Such elements as the importance of the link in regional economic development or trade may influence the decision to consent to a particular project. However, the traffic-generating potential of each route compared to the cost of constructing the necessary infrastructure will no doubt be a crucial factor, especially if private sector investment is to be sought. Meanwhile, bridging and, more importantly, operating the politically-induced missing links requires a high-level of bilateral cooperation and understanding. However slow progress may be in this area, it is nonetheless tangible. Thus, progress is underway to reconnect the rail networks between the northern and southern parts of the Korean Peninsula, and work should commence soon on restoring the 48km missing link between Sisophon and Poipet which was closed to traffic in 1980, thereby making rail movement impossible between Cambodia and Thailand.

Twelve years into ALTID, the TAR network looks as shown in Map 1, with each corridor presenting different characteristics in terms of their configuration and operational readiness. In broad terms, in the Northern Corridor[5], with the exception of the missing link between the northern and southern parts of the Korean Peninsula (currently being constructed), there is a high level of operational readiness. In the Southern Corridor, a number of missing links hamper the development of international traffic and the priorities given to their development vary between countries. In the Indochina and ASEAN subregion, the need to develop subregional rail linkages is now fully accepted and related activities are being implemented by the ASEAN secretariat under the Singapore-Kunming Rail Link project, with the Asian Development Bank studying the potential for providing assistance in upgrading existing links and building some of the missing links. Finally, in the North-South Corridor linking northern Europe to the Persian Gulf, activities are being undertaken by the countries concerned with the aim of promoting traffic along the corridor in an effort to capitalize on shorter transit times by rail as compared with maritime shipping.

Box 2. Criteria for Including Specific Links Into the Trans-Asian Railway Network

- Capital-to-capital links
- Connections to major industrial and agricultural centers
- Connections to major sea and river ports
- Connections to major container terminals and depots

The Trans-Asian Railway Northern Corridor (TARNC)

The context of TARNC development: Under the ALTID project, the first corridor study to be carried out was the 1996 study on connecting the railway networks of China, Kazakhstan, Mongolia, the Korean Peninsula and Russia. This choice was dictated by the fact that, with the exception of the missing link across the Demilitarized Zone in the Korean Peninsula, the railway infrastructure was already in place in and between the countries concerned, and rail operation in all of these countries already followed high technical standards. Two additional elements also

[3] Track gauge is the distance between the inner surfaces of each rail and is conventionally measured in millimeters. Discontinuities in track gauge may also occur within individual domestic railway networks. This is the case, for example, in Bangladesh and India.

[4] Adopting measures to gradually standardize gauges or resorting to dual gauge operation are also possible options, albeit more readily applicable when the break-of-gauge occurs within individual domestic railway networks.

[5] Please refer to Box 1 for the list of countries involved in each corridor.

came into the equation. One was internal to the railways and related to the increasing pressure put on all railways around the world to act more as commercial enterprises, a trend that the railways along the Northern Corridor could not ignore. The other was external to the railways and took the form of the booming container trade between Asia and Europe.

In the 1980s and 1990s, beset by a host of other demands beyond the workings of market forces such as the need for, *inter alia*, better education, improved health services and efficient social safety nets, many governments both inside and outside the ESCAP region started to implement policies aiming to rationalize state spending. Under these policies, railways were encouraged to develop safe, efficient, reliable and competitive services that were likely to generate sufficient funds to maintain their assets and maximize company profits, thereby reducing the burden on national budgets. For the railways, achieving this broad objective meant the adoption of modern management and planning techniques, and the development of commercial skills within railway organizations. The booming container trade between Asia and Europe offered an ideal platform for railways to strengthen their capacity to define and market new services, and step into a new era.

A consequence of the more liberal economic policies adopted by a number of countries in the 1980s and 1990s was the transfer by western European producers of production facilities to the eastern and southern peripheries of the European continent and, more extensively, to Asia. In the other direction, manufacturers in Japan, the ROK and other manufacturing centers in Asia established production facilities for automobiles and electronic products in the UK or elsewhere in continental Europe. The international companies that created this trend had an obvious requirement for organizing the delivery of components to their manufacturing sites and for shipment of the finished products to distribution facilities. Progress in information technology only accelerated this trend. Concomitantly, rising disposable income in many countries in Asia and Europe resulted in ever-increasing demand for consumer products. All of those factors fed a surge in container trade around the world. Box 3 shows the evolution of container port traffic in three selected Asian and European countries over the period 1985 through 2000.

Box 3. Container Port Traffic in Three Selected Asian and European Countries (TEU)

	1985	1985	Increase over period
China	446,473	21,559,037	4,700%
(excluding Hong Kong)			
Japan	5,517,009	13,129,864	138%
ROK	1,245,538	9,030,174	625%
Germany	2,248,293	7,695,688	
(1985 figure includes East Germany)			
Netherlands	2,769,281	6,407,162	132%
UK	2,886,196	6,434,734	123%

Source: Containerisation International Yearbooks, 1988 and 2003.

ESCAP activities relating to TARNC: With the above elements in mind, and the possibility of the railways capturing some of the Asia-Europe market, a study of the international movement of containers by rail constituted a logical choice when reviewing the physical and non-physical bottlenecks impeding the development of international trade among the countries participating directly in the study and, as later became the case, among many developing countries of the ESCAP region. The initial study (i) defined a network of routes making up the TARNC (see Box 4); (ii) stipulated route requirements in terms of technical indicators (loading gauge and axle-load) and commercial indicators (minimum average speed); (iii) addressed a number of operational aspects including tariff issues; and (iv) stressed the importance of cross-border traffic facilitation measures.

Routes i to iii are all in good operating condition as regards their infrastructure and the loading gauge allows the conveyance of all types of container currently used in maritime transportation. With the exception of Route i which is fully double-track and electrified, Routes ii and iii are a mixture of single-track and double-track sections as well as diesel and electric traction in China and Kazakhstan (Route ii) and in China, Mongolia and Russia (Route iii). Heading for western Europe there is a break-of-gauge on all three routes at the border between Belarus and Poland, which operate their railways on a 1,520mm and 1,435mm

Box 4. TAR Northern Corridor Routes
(distances to Berlin in brackets)

Route i: From Vostochny Port (Russia) to Europe via the railways of Russia, Belarus and Poland (11,600km);

Route ii: From Lianyungang Port (China) to Europe via the railways of China, Kazakhstan, Russia, Belarus and Poland (10,200km);

Route iii: From Tianjin Port (China) to Europe via the railways of China, Mongolia, Russia, Belarus and Poland (9,500km);

Route iv: From Busan Port (ROK) to Europe via:
- *Variant iv-1:* the railways of the ROK, the DPRK (from the border with the ROK to Sinuiju), China, Mongolia, Russia, Belarus and Poland (11,250km),
- *Variant iv-2:* the railways of the ROK, the DPRK (the from border with the ROK to Tumangang), Russia, Belarus and Poland (12,350km),
- *Variant iv-3:* the railways of the ROK, the DPRK, China, Russia, Belarus and Poland (10,950km).

Route v. From Rajin Port (DPRK) to Europe via:
- *Variant v-1:* the railways of the DPRK, Russia, Belarus and Poland (11,650km),
- *Variant v-2:* the railways of the DPRK, China, Russia, Belarus and Poland (10,100km).

track gauge, respectively. In addition, there is a break-of-gauge, on Route ii, between Chinese Railways (1,435mm track gauge) and Kazakhstan Railways (1,520mm track gauge), and, on Route iii, between Chinese Railways and Mongolian Railway (1,520mm track gauge).

Routes iv and v originate in the Korean Peninsula. As both routes connect with Routes i, ii and iii, the foregoing comments on infrastructure relating to these three routes and on the presence of breaks-of-gauge also apply to Routes iv and v. In addition, there is also a break-of-gauge between the railway systems of the DPRK (1,435mm track gauge) and Russia (1,520mm track gauge). In this respect, it must be noted that a 1,520mm Russian track extends about 50km across the border between the two countries to the port of Rajin. The condition of the infrastructure on this section of line is not known, although it is understood that it has seen little traffic, if any, in recent years. In general, the operational readiness of the rail infrastructure to carry containers in the northern part of the Korean Peninsula needs to be assessed in detail.

Finally, as regards Route iv, there is a missing link between the ROK and the DPRK. Following the historic meeting of June 2000 between the leaders of the two countries, the decision was taken to reconnect the railway systems on both sides of the Demilitarized Zone. With this objective in mind, both governments have started infrastructure work on the Gyungui line and the Donghae line. As regards the Gyungui line, work on the 12km section located in the ROK has been completed, while in the DPRK, 11.5km of a total of 15.3km requiring repair has been completed. All work is expected to be completed by the end of this year. As regards the Donghae line, preparatory work in the Demilitarized Zone has been completed and construction work is underway in both countries. When the railways in the Korean Peninsula are reconnected, through land transport from Busan to Europe will become possible.

At the Expert Group Meeting convened to review the recommendations of this initial study, the participants agreed to follow up on the work already accomplished with a detailed analysis of the tasks that needed to be implemented to make their railway services attractive to shippers. More specifically, this involved determining the required package of transit times, tariffs and level of services most likely to attract some of the Asia-Europe container volumes away from the shipping lines and onto the railways. At that time three more countries were added to the original group of six, namely Belarus, Germany and Poland. Germany was included into the project in view of its central location in the heartland of Europe and its integration into the European rail and road networks, making it an ideal hub for the pick-up and distribution of cargo. Meanwhile, with Germany in the project and Russia as the westernmost country in the TARNC, it was important to secure the participation of Belarus and Poland as transit countries from/to Germany. The findings and recommendations of the study were considered by representatives of all the countries concerned at two Expert Group Meetings held in Bangkok. One important outcome was the decision to organize demonstration runs of container block-trains along the routes in the corridor. This commitment was encapsulated in a Memorandum of Understanding (MOU) reflecting the desire of the countries concerned to work cooperatively to develop international rail freight corridors facilitating the movement of containers within Asia as well as between Asia and Europe. The MOU is based on a series of Steering Committee Meetings and a number of demonstration runs.

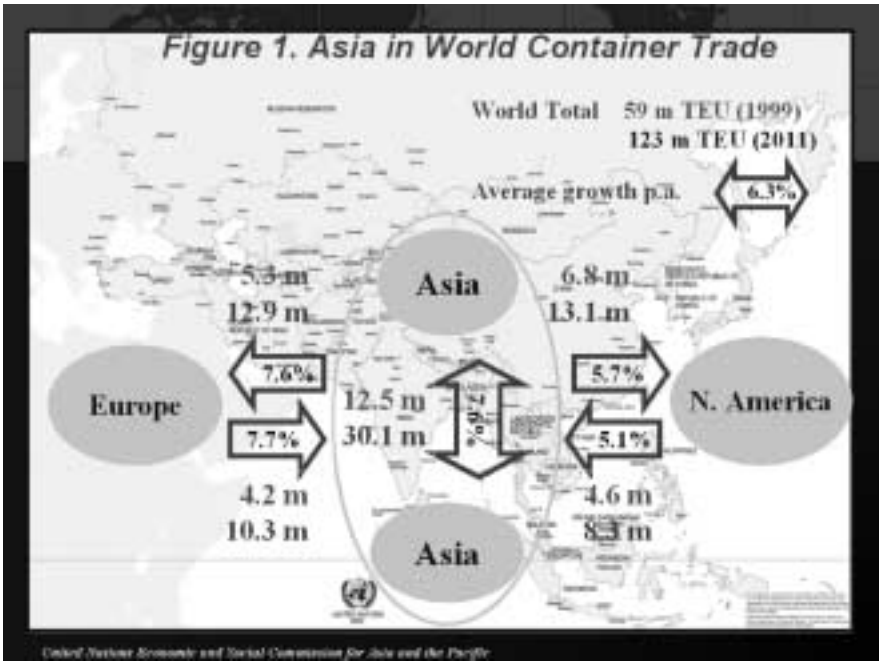
The Steering Committee Meetings (SCM) provide a forum to discuss issues of common interest in a cooperative manner. At the 1st SCM held in Vladivostok, Russia, in June 2002, the activities undertaken by each country to develop services and facilities for container operations were reviewed along with the possible synergies between these activities, with a view to integrating them into a wider framework for developing international freight corridors. At the 2nd SCM in Ulaanbaatar, Mongolia, in October 2003, the participants agreed on a schedule for four demonstration runs of container block-trains to take place along key sections of the TARNC between November 2003 and June 2004. The first such demonstration run was successfully organized between the Chinese port of Tianjin and Ulaanbaatar in November 2003.

The demonstration runs aim to (i) identify physical and non-physical bottlenecks to efficient cross-border movements by rail; (ii) develop interconnectivity between railway organizations, and between railway organizations and other modes of transport; (iii) give particular attention to the potential of the Trans-Asian Railway Northern Corridor to offer landlocked countries better access to the main ports of the region (there are two landlocked countries in the Northern Corridor, i.e. Mongolia and Kazakhstan, with the latter providing the only rail access to ports in East Asia for all the Central Asian Republics); and (iv) raise awareness among freight forwarders of the possibilities offered by rail for the transport of containers between Asia and Europe.

Traffic potential: The TEU volumes in Box 3 above indicate TEU throughput in selected ports in Asia and Europe. While they are illustrative of the continuous boom in container volumes worldwide, they do not accurately reflect the volumes of containerized trade between the two continents[6]. In a recent study, ESCAP estimated that global container trade will jump from 59 million TEU in 1999 to 123 million TEU in 2011, i.e. an average growth rate of 6.3% per annum (Figure 1). Of this overall figure, it is predicted that, during the same period, trade within Asia will rise sharply, from 12.5 million TEU to 30.1 million TEU. Meanwhile, trade between Asia and Europe is predicted to grow from 5.3 million to 12.9 million TEU in the westbound direction, and from 4.2 million to 10.3 million TEU in the eastbound direction. Finally, trade between Asia and North America will increase from 6.3 million to 13.1 million TEU in the eastbound direction and 4.6 million to 8.3 million TEU in the westbound direction.

If one takes a closer look at trade between Asia and

[6] In contrast to port container throughput, container trade only considers loaded containers between specific origins and destinations.



Europe (defined as member states of the European Union and Scandinavian countries), the following picture emerges. According to Containerisation International, in 2002, eastbound and westbound trade totaled 2.8 million TEU and nearly 5.5 million TEU respectively, with these volumes expected to increase to 3.15 million TEU and 6.6 million TEU in 2005 (Box 5). As these traffic figures include Northeast[7] as well as Southeast Asia, some refinement is required to identify the share of traffic between Northeast Asia and Europe, which is the catchment area of the TARNC so far as traffic between Asia and Europe is concerned. In 2002, containerized trade volumes to Europe totaled 1.25 million TEU from China, 0.58 million TEU from Japan and 0.3 million TEU from the ROK. Meanwhile, trade volumes from Europe totaled 0.36 million TEU to China, 0.44 million TEU to Japan and 0.33 million TEU to the ROK[8]. It therefore seems that, when considering the current market for containerized trade between Asia and Europe, the railways concerned could tap into a potential of around 2.16 million TEU and 1.13 million TEU in the westbound and eastbound directions, respectively. Although in macro-economic terms these figures should be further refined to match as closely as possible the pattern of containerized shipments between these three countries and Europe, the exercise would, however, yield little additional benefit for railway marketers. Indeed, in terms of cargo routing, all routes in the corridor (see Box 4 above) connect at some stage with the Trans-Siberian main line, whose capacity is estimated at around 300,000 TEU per annum. The railways of the Northern Corridor will therefore only ever dent the market share of shipping. More important is for them to capitalize on their most obvious intrinsic advantage, i.e. faster transit times, to capture time-sensitive cargo for which shippers are ready to accept high transport charges provided fast transit times are matched by a high level of reliability and cargo security. Together, these items form the basis on which shippers will decide whether or not to commit their cargo to rail.

Transit times: The rail distances from ports in the Far East to Germany (Berlin) along the TARNC routes are between 10,000km and 12,000km (Box 4). This is substantially shorter than the sea distance of around 20,000km to 22,000km from Asian ports in China, Japan and the ROK to European ports in Germany, the Netherlands and the UK. Consequently, the railways are in a position to realize an improvement of 5 to 10 days on the Northeast Asia - northern Europe sailing time of 25 to 28 days on all routes in the TARNC. A number of container services launched by the railways concerned have yielded

Box 5. Europe - East Asia Trade in TEU

	East Asia to Europe	Europe to East Asia
2002	2,822,000	5,447,000
2003	2,936,000	5,741,000
2004	3,040,000	6,185,000
2005	3,149,000	6,633,000

Source: Containerisation International, October 2003

[7] In these Containerisation International figures, Northeast Asia is defined as including China (including Hong Kong), Japan, the ROK and Taiwan; while Southeast Asia is defined as including Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam.

[8] Sources: Korea Maritime Institute - Shipping Outlook 2002 for figures on China and Japan. Ministry of Maritime Affairs and Fisheries for figures on the ROK.

promising results. Along the Trans-Siberian main line, container block-trains cover the 10,300 km distance from the Russian port of Vostochny to Brest, at the border between Belarus and Poland, in 12.5 days, and the 10,500km distance to Buslovskaya, at the border between Russia and Finland, in 11.5 days. Through transit to Berlin (11,500km) is in the order of 14.5 days. Meanwhile, in December 2001, a container block-train travelled from Druzhba, at the border between China and Kazakhstan, to Berlin (6,200km), in 8 days and 4 hours. To fully exploit this transit time advantage, however, coordination at border points between railways on one hand, and between railways and customs on the other will be crucial with regard to such issues as the opening hours of border stations, the processing of documentation and the acceptance of documents in electronic format optimizing the railways' recent investment in information technology.

Reliability/punctuality/frequency: The pressure for continuous cost-reduction in industries and the development of modern management methods favor limited stock and just-in-time deliveries. As a result, shippers turn to transport operators who can guarantee that a shipment will be delivered without fail at a stated delivery time. Reliability means that the services promised in the contractual agreement are actually delivered as stipulated, i.e. at the right place, at the time and date stipulated, and with the goods in the condition expected. Punctuality is that part of the reliability concept relating to time and means that the advertised schedule, i.e. day/hour of departure/arrival, is always implemented. Meanwhile, frequency means that the intervals between two consecutive services of a certain type are of a duration that meets a shipper's production pace and matches his need to distribute the items produced to consumption centers without having to create stock. The three concepts are linked and have an impact on the shippers' performances. In all three aspects, the railways along the TARNC have in recent years taken the necessary steps to put in place through scheduling and give container block-trains a similar operating priority as that normally granted to passenger services. Railways are now concentrating their efforts on closer cooperation with customs administrations to reduce the time required for clearance, especially with regard to goods in transit.

Security of cargo: A few years ago, the United States National Cargo Security Council indicated that US companies alone were losing more than US$10 billion annually from cargo theft and, according to Pinkerton Consulting and Investigations, total worldwide losses could be as high as US$30-50 billion each year[9]. Considering that a container-load of high-value cargo will often reach millions of dollars, the conditions in which cargo security is undertaken during the line operation are an essential aspect of the service. Erroneous security choices in the selection of a transport operator can result in missing or damaged goods and will have a direct impact on a shipper's company image. Even the best insurance that customers may subscribe to will only compensate for the direct financial consequences. Seldom will commercial prejudices and the loss of confidence in the shippers by their own clients be compensated and these will have unquantifiable negative effects on their businesses in the long term. Aware of the threat, shippers will naturally select freight operators who recognize the need to monitor all security requirements and have an unblemished record in this area, as well as being able to maintain this. As an example of this, it is acknowledged that the rising number of thefts and losses along the Trans-Siberian main line after the breakup of the Soviet Union is one of the reasons explaining the sharp decline of Japanese shipments by rail[10].

The 'security message' sent by shippers to transport operators has been received loud and clear by the railways along the TARNC and full attention is now given to the issue in the design of new services. The operation of block-trains with a reduced number of stops between origin and destination, together with the presence of armed security personnel onboard container trains should go a long way towards dispelling lingering apprehensions as to the ability of railways to protect goods traveling over long distances.

Tariffs: The rate that a shipper is offered will always be a key determinant in his selection of a transport mode. Understanding the principle of modern railway pricing is therefore essential if the railways involved in the definition and operation of TARNC services are to position themselves adequately in respect to competition while being able to cover costs and maximize the net revenue earned for each individual shipment. Until recently, the freight tariffs in use on the railways were those devised under a monopoly or in an era when the railways were not subjected to competitive forces; the related rate-making procedures applied very often to groups of commodities for which single freight rates were set in relation to the length of the haul. Such tariff structures may have had a *raison d'être* under a different economic environment, but they do not have the flexibility needed quickly to adjust to the competitive environment in the market segment of Asia-Europe container traffic in which the pace is set by sea transport. At this stage, juxtaposing existing TARNC rail tariffs with ocean rates is an awkward exercise as no through rail tariffs are currently available other than on the Trans-Siberian route from the Russian port of Vostochny to either Brest at the border between Belarus and Poland, or Buslovskaya, at the border between Russia and Finland.

In the context of TARNC, the railways are now well aware of and support the idea of an integrated approach to setting through tariffs for the international movements of containers. However, problems in the implementation of the idea arise from the different base tariff level promoted by each individual railway. The 1996 ESCAP feasibility study suggested that one possible step towards re-engineering tariff-setting practices in the railways concerned could be the creation of a jointly run entity with full authority to develop and negotiate price/service packages on behalf of all the railways involved in the

[9] Containerisation International, *Crimewave*, March 1999.
[10] H. Tsuji, *Growing International Use of the Trans-Siberian Railway: Japan is Being Left Out of the Loop*, ERINA Report Vol. 52, June 2003.

traffic. Whatever the form and mandate of the body (or bodies) that will eventually be responsible for tackling the issue, the through tariffs that will eventually be applied should take into account such elements as (i) the railways' revenue needs; (ii) an analysis of a shipment's point-to-point characteristics; (iii) an assessment of the value of the package put together by the railways, i.e. equipment, facilities, ancillary services, etc, within the shipper's total distribution system; (iv) the package on offer by competing modes; (v) the costs to the railways of providing the service; and (vi) the need to finance replacement of the equipment. The joint unit suggested above would ensure a consistency in the methodology used for pricing services.

This, however, does not mean that prices per TEU on all routes should be equivalent, as each shipment should be priced on a point-to-point basis reflecting the actual routing, terminals and facilities used. In practical terms, this also means that different shippers or forwarders may pay different prices for similar services; pricing policies should provide for premium services and reward large volumes and early booking, as well as reflecting the value of the service provided in the overall distribution cost for shippers. This last point is particularly important as it means that the entity (or entities) responsible for marketing TARNC services will have to be aware not only of the transport market but also of the market situation for the goods committed to their care.

Distribution of traffic and catchment area at the European end: As indicated above, there are five main routes constituting the Trans-Asian Railway Northern Corridor. The following observations can be made regarding the possible distribution of traffic along those routes in the future:

(a) Route i, the Trans-Siberian route, is already being used for container block-train operations between Asia and Europe and has proved its operational viability from a technical and commercial point of view. The reduced number of border crossing and break-of-gauge points up to the border between Belarus and Poland makes the route highly competitive with shipping services;

(b) Route ii, through China and Kazakhstan, has to date only been used for the movement of containers in block-trains as far as Central Asian countries, i.e. Kazakhstan and Uzbekistan, from the ROK and China and only for small volumes of traffic. Route ii has clear commercial viability in this market segment given that the alternative shipping route through ports in Iran or Pakistan and subsequent land-movements by rail or road are not easy. As far as movements from Asia to Europe are concerned, Route ii has a higher number of border-crossing points and two break-of-gauge points (between the railways of China and Kazakhstan, and those of Belarus and Poland). Therefore, setting up the proper systems at these particular points will be crucial if the route is to divert traffic from shipping;

(c) Route iii through China and Mongolia has to date not been used for block-train container movements between Asia and Europe;

(d) So far as Routes iv and v are concerned, the above remarks are valid as they make use of Routes i, ii and iii over most of their distance;

(e) Given the importance of delivering high quality performance if rail is to compete with shipping, it is essential to reduce to the bare minimum imposed by technical requirements the time spent by containers at border points as well as at terminals where transhipment is necessary for break-of-gauge reasons. This means that such terminals will have to be well equipped and to a certain extent already accustomed to this kind of operation.

In general, it can be assumed that, eventually, each of the TARNC routes will have its share of Asia-Europe traffic, either generated by the route itself or diverted from shipping, provided the proper technical standards and operational capabilities are put in place. A certain amount of competition between the various TARNC routes may even be expected. However, it is important that the TARNC be developed as an efficient and integrated rail network for container traffic, especially if one considers the fact that all routes connect at some point with Route i, i.e. the Trans-Siberian route. Thus, all routes could easily carry loads originating on one route and having a scheduled connection with another load originating on another route at a dedicated yard along Route i. Accordingly, Karimskaya, Ulan Ude and Ekaterinburg would seem to be the natural meeting points for traffic traveling along Route i from places located east of these cities and traffic coming from across the northeastern part of China, Mongolia and Kazakhstan.

It is important to develop such synergies between routes as one route could then serve as a diversion for traffic in case of temporary operational problems on another route (e.g. natural disasters, derailments, speed restrictions, heavy track maintenance operation, etc.) thus leaving the commercial quality of TARNC services intact. They would also guarantee the optimal utilization of assets (e.g. locomotives, track use, etc.) and may help railways give greater consideration to 'light trains' - i.e. trains without a full load - knowing that space left unfilled at the terminal of origin would be occupied during the journey. Thus, along with the development of an information system, the development of an integrated jointly-defined space-booking system for the entire TARNC should be made a priority.

From a commercial point of view, the main traffic-generating areas in Northeast Asia are found in the eastern part of the region, in China, Japan and the ROK. Leaving technical standards and operational capabilities aside, traffic to and from these areas is likely to be distributed as follows:

Cargo to/from Europe:

(a) Out of Japan and the ROK: containers could converge on either Vostochny or Rajin. Of the two ports, Vostochny is likely to be the preferred option for the foreseeable future in view of its now well-proven ability to handle cargo, and its improved interface between shipping and rail. So far as Rajin is concerned, despite current efforts by the government of the DPRK, the port still lacks adequate infrastructure and handling capabilities, and the institutional environment necessary to attract traffic has yet to be put in place. >From either

port, the natural rail connection is through the Trans-Siberian line.

(b) Out of China: depending on where in the eastern part of China, or from which port, containers originate, containers can be routed either through Kazakhstan, or Mongolia, or through northeastern China to connect to the railways of Russia at Manzhouli/Zabaikalsk. Ultimately, the operational capabilities of each route will tip the choice towards one option or the other.

Cargo to/from Central Asia:

Out of Japan and the ROK: containers could converge on either the Russian port of Vostochny or ports in China. From Vostochny, containers would then be carried along the Trans-Siberian line to Novosibirsk, where there is a junction with the line to Kazakhstan. From Lianyungang, they would be carried through Urumqi and the Alataw Pass and on to Kazakhstan, or through Kazakhstan to other countries in Central Asia.

Although the route through China and Kazakhstan has a distinct distance advantage of around 3,500km over the route through Novosibirsk, it seems that Korean freight forwarders currently prefer routing their cargo through Vostochny and the Trans-Siberian line (see below). One possible reason for this is the fact that the route through China and Kazakhstan involves two railway organizations with different standards that may, at this stage at least, assign different priorities to Asia-Europe traffic. The route has one break-of-gauge point, at the border between China and Kazakhstan, and has a number of single-tracked and/or diesel-power sections. The attractiveness of this route will therefore depend on the efficiency of container transshipment, the operating priority given to container block-trains - especially on Chinese Railways where east-west movements may be affected by the high traffic density along the north-south corridors - and the flexibility of Kazakhstan's customs authorities regarding the clearance of containers in transit.

Notwithstanding future economic developments, the above elements point to the Trans-Siberian line, either in its entirety or over a fairly long section, becoming the backbone of TARNC for the movement of containers between North / Northeast Asia and Europe, while the route through China and Kazakhstan is better suited for traffic between North / Northeast Asia and Central Asian countries with possible future connections to Iran and Turkey.

Current traffic along TARNC: Movements along TARNC have increased dramatically in recent years. This increase, however, has been mostly driven by traffic growth along the Trans-Siberian main line out of the port of Vostochny. 48,800 containers were carried along the route in 2001, 70,000 in 2002 and 119,000 in 2003[11]. A look at traffic to and from Europe shows that 31,000 TEU and 21,000 TEU were carried in the westbound and eastbound directions respectively[12]. An origin/destination breakdown of these volumes shows that, in the westbound direction, 84%, 14% and 1.5% originated in the ROK, China and Japan respectively, with nearly all cargo going to Finland. Containerisation International recently estimated that a third of the cargo routed to Finland is actually destined for Russia[13]. The reason is that Russia has yet to develop customs-bonded warehouses, so that import duties have to be paid immediately upon arrival, which can be expensive as electronic goods are mostly involved. To get around the problem, a number of Asian manufacturers, mainly from the ROK, have established distribution centers in Finland across the border from Russia, from where cargo trickles back as and when required. Meanwhile, in the eastbound direction, nearly all cargo originated in Finland; 73% of this was bound for the Korean Peninsula, 18% for China and 9% for Japan. An interesting feature of that trade was that 35% of the Korea-bound cargo was destined for the DPRK[14]. Unfortunately, no information was forthcoming as to the nature of the cargo being transported.

Other routes have also seen initiatives being taken to promote container transport by rail. These include container block-trains running between Brest and Ulaanbaatar, and between Beijing and Moscow. One of the most successful initiatives in recent years is the regular container block-train operating twice a week between Ulaanbaatar and the port of Tianjin, carrying around 100 TEU per trip in each direction.

Another sign of greater awareness by the railways of the requirements of shippers is to be found in investment in information technology. All railways in the corridor have installed, or are in the process of installing, optical fiber cables, demonstrating their understanding of shippers' requirements for information that is freely accessible at the push of a button. This will showcase the readiness of railways along TARNC to become part of the global supply chain.

Catchment area of TARNC at the European end: The foregoing has consistently referred to Europe as being one of the extremities of the corridor. However, the concept has to be geographically refined when it comes to identifying the terminal point of the rail journey.

Interviewed by Containerisation International, the director of APL said that the dream of connecting Asia with western Europe for large-scale commercial traffic still largely remains unfulfilled, citing the high cost of western European rail services as the main factor in this[15]. Additionally, a number of shippers have looked beyond the cost issue and have denounced the decline in the overall quality of freight services by western European networks, especially as regards punctuality and reliability. In the first half of 2003, this resulted in a 3.4% drop in volumes despite sustained overall demand for freight transport across the continent[16]. In short, past action plans aimed at increasing the rail share of freight traffic have not produced the expected results and the prevailing mood among shippers is not that of a forthcoming rail revival. This

[11] Railway Gazette International, March 2004.
[12] Source: Organization for Railway Cooperation (OSJD).
[13] Source: Containerisation International, January 2004.
[14] Source: Organization for Railway Cooperation (OSJD).

would, therefore, indicate that containers traveling along TARNC and destined for western Europe could travel on TARNC up to Brest and from there travel to their final destination by road. This is a somewhat ironic prospect in view of past political declarations in favor of moving freight away from Europe's congested road networks onto rail. It is highly probable that this will occur, as containers have in any case to be transshipped from broad gauge (1,520mm) to standard gauge (1,435mm) at Brest. Loading the containers onto trucks might then offer greater reliability and flexibility. This would most likely be the case for containers with final destinations in Belgium, France or the Netherlands. For cargo with final destinations in Germany, the mode for onward connection from Brest is more difficult to determine with certainty. Exchanges between Russia and Germany have boosted freight transport on Byelorussian Railway and the freight arms of the German and Russian railways have tried to develop container traffic on the Ostwind services. Active marketing could direct traffic onto rail, although the short distances from Brest to places in Germany could speak in favor of roads, especially in view of the transshipment constraint mentioned previously.

For containers destined for eastern and central Europe, continuation by rail may be a greater possibility. For a start, recent traffic trends have contradicted the pessimistic outlooks based on the drop that followed the breakup of the Soviet Union and rail freight traffic in the countries concerned increased by 4% in 2003. In addition, offering rates that are more moderate than in western Europe, traffic to and via these countries could be facilitated by their forthcoming entry into the European Union, which will result in the disappearance of time-consuming customs clearance procedures. The countries concerned will be the Baltic States, the Czech Republic, Hungary, Poland and Slovenia. Future through traffic to the Baltic States will be facilitated by the absence of a break-of-gauge between their respective national railways and the rail networks of Belarus and Russia. For traffic to the Czech Republic, Poland and Slovenia, a similar observation as the one formulated above for traffic to Germany applies. For traffic to Hungary, continuation from Russia could be via the railways of Ukraine (with no break-of-gauge between the two countries) to the border and break-of-gauge station of Chop/Zahony.

For container traffic with Scandinavian countries as its final destination, it seems that Finland-bound traffic will be a regular feature of TARNC for the foreseeable future, given that the absence of direct sea services between Asian and Finnish ports requires the relay of cargo via German ports, thereby increasing shipping times to around 28 days when services through the Trans-Siberian line can guarantee transit times of 18 days from the Korean port of Busan. For the same reason, cargo bound for other Scandinavian countries, i.e. Norway and Sweden, will in all likelihood follow the same route to ports in Finland, Russia or the Baltic States, whence feeder movements by sea to Oslo or Stockholm are more efficient than the circuitous land route by rail or road via the north of Finland.

Conclusion

Trade between Asia and Europe continues to develop and the resultant growing volume of containers being exchanged between the two regions represents an attractive market for the railways. In this respect the activities undertaken by ESCAP in relation to TARNC are proving popular among the railways participating in the project, as they provide a forum for coordinating efforts aimed at developing efficient services to shippers, for whom fast transit times and reliable schedules are important factors in their choice of a transport mode.

One reason why international corridors may have failed to capitalize on their intrinsic advantage in the past was that they may have been perceived by shippers not so much as a uniform transport mode but as a juxtaposition of various systems with little unity. The development of services along TARNC offers a unique opportunity for the railways concerned to dispel that misconception by promoting the image of a unified, efficient and, above all, quality-conscious transport operator.

The increasing pressure on industries to be ISO-certified in order to be anywhere near the top of their business sphere has led to renewed quality awareness and to a redefinition of quality management in industry. The result is that shippers who have gone through the process of improving performance–and for whom benchmarking is a question of survival–expect the same from transport operators whom they trust with their cargo. In this respect, one important benefit of the project is to promote closer relationships between railways and the private sector. Through joint meetings under the project implementation framework, railways develop a greater awareness of the growing demand for efficient international container block-train services within Asia and between Asia and Europe, and espouse shippers' logic in the way they develop, market and operate services. At the same time, freight forwarders are increasingly aware of the activities undertaken by the railways to offer fast landbridge services and, since the profession is always in an evolutionary mood to cut costs, careful planning, intelligent marketing and professional monitoring of services by railways along the Trans-Asian Railway Northern Corridor may give them the chance to carve their own niche in the Asia-Europe container market.

The railways concerned have already made significant progress in recent years towards a better understanding of

Box 6. Useful UNESCAP Websites

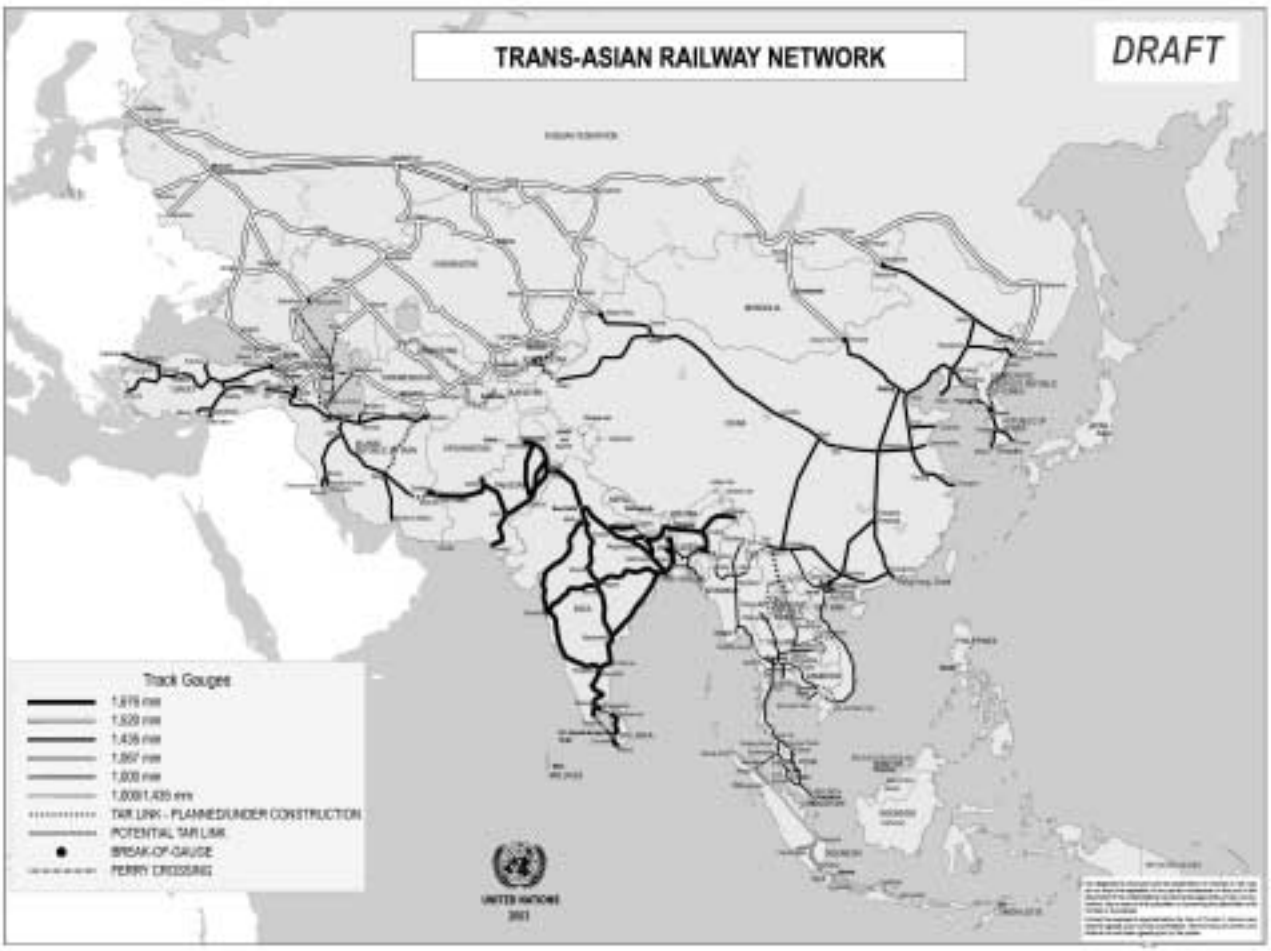
Greater in-depth knowledge of related UNESCAP activities can be obtained through the following websites.

- http://unescap.org/ttd/index.asp

- www.unescap.org/tctd/tar/index.htm

[15] Source: Containerisation International, January 2004.
[16] Source: François Batisse, *Le Rail*, October 2003.

their potential customers. The challenge for the future challenges lies in “brand-building” the TARNC concept. Corridor-based organizations with the authority to act on behalf of their constitutive railway administrations in areas such as service definition, tariff-setting and marketing, as well as the possibility of bulk-selling trainload-based capacity to the private sector, constitute an interesting area of work for future managers of the railways concerned.



http://www.unescap.org/ttdw/common/images/latesttarmap-2003.gif