THE TRANS-ASIAN RAILWAY

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ABSTRACT

For a number of years Asian economies have been attracting attention for their dynamic growth with most countries enjoying GDP growth rates and employment levels that surpass those of their main trading partners in Europe and North America.

The result is an impressive increase in international trade among Asian countries as well as between Asia and the rest of the world as evidenced by the increase in TEU throughputs in all of Asia's main international maritime ports.

The need to carry these trade volumes between ports and production or consuming centres keeps the development of efficient land infrastructure high on the agenda of transport policymakers. It also gives rail transport an opportunity to play a critical role in the emergence of modern logistics in Asian countries.

The activities of ESCAP in relation to the development of the Trans-Asian Railway network have for many years serve as a catalyst for policymakers to benchmark trends, define a common vision, adopt joint programme of actions and create a new partnership for regional economic integration.

BACKGROUND

At its 48th session[1] in April 1992 the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) launched the Asian Land Transport Infrastructure Development (ALTID) project. The long-term objective of the project was to assist member countries in planning and developing

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[1] The Commission holds an annual session at which high-level government officials of ESCAP member countries review and adopt its programme of work. It is the main legislative organ of ESCAP.

a transport infrastructure able to serve the unprecedented surge in international trade between Asian countries and their main trading partners – primarily in the European Union and North America – and amongst Asian countries themselves. Although not limited to containerized traffic, the surge in international trade materialised most visibly in the ever growing number of containers passing through Asia's ports. But while these volumes showed the dynamism of Asian economies, they also highlighted a need for most countries to upgrade their transport infrastructure. Indeed, the existing road and rail networks were often ill-prepared to accommodate the sudden influx of goods and transport planners were put to the task of urgently revising their countries' transport master plans to enhance national capacity while, at the same time, giving greater attention to international connections.

As the new trade patterns arising from globalization were making requirement for cross-border linkages more pressing, countries of the Asia-Pacific region turned to ESCAP as a natural forum to harmonize and coordinate a number of policies and actions. The present paper reviews the distance travelled since the inception of the ALTID project and assesses the challenges and opportunities for a greater utilization of rail across the region.

I. THE LEGISLATIVE MANDATE OF ALTID

From its very start the ALTID project was articulated around three components, namely: the Trans-Asian Railway (TAR), Asian Highway (AH) and facilitation of land transport, with the objective of improving intraregional and interregional transport links as part of the ESCAP secretariat's efforts to assist member countries in addressing the challenges of globalization by providing countries with a tool to access the world's markets. This commitment had – and to this day still keep – a particular resonance for landlocked countries. The specific activities being undertaken under the ALTID project are defined, monitored and – if need be – reoriented by the ESCAP regional member countries at the annual Commission. They are then incorporated in specific work programmes which are implemented in close collaboration with the member countries as well as a number of other international and/or subregional organizations.

In addition to the Commission, senior officials of member countries assess and define the activities of ESCAP at specific sector-oriented events. In this regard, the work in the area of transport has received enhanced scrutiny and high-level endorsement at a series of ministerial conferences organized at five-year intervals.

The Ministerial Conference on Infrastructure held in New Delhi in October 1996 launched the New Delhi Action Plan that defined a set of activities to be implemented at the regional level and seeking to focus policy attention on promoting more efficient infrastructure and services taking into account economic, social and environmental considerations. Phase I activities (1997-2001) assisted member countries in enhancing their national capabilities and improving transport efficiency with significant progress made towards the formulation of intra- and interregional linkages through the Trans-Asian Railway, the Asian Highway, facilitation and shipping-related programmes.

A second Ministerial Conference on Infrastructure held in Seoul, Republic of Korea, in November 2001 adopted the Seoul Declaration on Infrastructure Development in Asia and the Pacific and mandated activities to be undertaken during Phase II (2002-2006) of the New Delhi Action Plan, thereby recognizing the vital role of ESCAP in assisting its member countries in dealing with transport-related issues in a coherent manner at the regional and subregional levels. The Declaration gave ESCAP a renewed mandate to continue to pursue the development of the Trans-Asian Railway and Asian Highway networks with particular focus on formalizing the two networks and coordinating future work towards the identification of an integrated intermodal transport system, including linkages to and from the main ports and container terminals in the region.

Finally, a third Ministerial Conference on Transport held in Busan, Republic of Korea, in November 2006, adopted a Regional Action Programme (RAP) for Transport Development in Asia and the Pacific. The RAP recognizes the Asian Highway and Trans-Asian Railway networks, formalized through related intergovernmental agreements, as two major building blocks for the realization of a vision of an international integrated intermodal transport and logistics system for the region. The activities to be carried under Phase I (2007-2011) of the RAP aims inter alia to promote an integrated approach to transport planning with a view to facilitating the emergence of efficient logistic in the region. An important aspect of these activities is the development of efficient connection to hinterland areas to move away from the past pattern of development which has seen economic benefits concentrating mostly in coastal areas.

II. THE IMPLEMENTATION OF ALTID

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, i.e. nearly the entire Asian continent,

which it encompassed. Another one was the disparities in land transport network development in the countries and subregions concerned, and, finally, the resource availability of individual member countries. As a result, a specific strategy was adopted for the implementation of ALTID. This strategy comprised the four following elements:

1. Major emphasis on project implementation at the subregional level. This was particularly important to make the project more manageable by ESCAP, while reinforcing the ownership of the member countries through the full involvement of existing subregional groupings as partners in the implementation process. Such major regional groupings were, for example, the Association of South-East Asian Nations (ASEAN), the Economic Cooperation Organization (ECO), the South Asian Association for Regional Cooperation (SAARC) and later the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).

2. A step-by-step approach through a series of corridor studies to assist in the formulation of rail and road networks, the establishment of minimum route standards and requirements as well as the identification of physical and institutional bottlenecks impeding transport efficiency and, consequently, constricting the trade capabilities of countries.

To assist member governments in identifying the respective networks, a set of criteria was adopted (see Box 1) with emphasis on minimizing the number of routes to be included in the networks and making maximum use of existing infrastructure.

Box 1. Criteria for including specific links into TAR and AH networks

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

3. 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. The tool for doing so was ESCAP resolution 48/11 of 23 April 1992 on Road and rail transport modes in relation to facilitation measures through which the

Commission recognized that harmonized transport facilitation measures at the national and international levels were a prerequisite for enhancing international trade. Resolution 48/11 lists seven international conventions (see Box 2) which ESCAP promotes at the regional and subregional levels with a view to assisting member countries access global markets by improving the efficiency of transport and reducing the associated costs.

Box 2. International conventions listed in ESCAP Resolution 48/11

- Convention on Road Traffic (1968)
- Convention on Road Signs and Signals (1968)
- Customs Convention on the International Transport of Goods under Cover of TIR Carnets (1975)
- Customs Convention on the Temporary Importation of Commercial Road Vehicles (1956)
- Customs Convention on Containers (1972)
- International Convention on the Harmonization of Frontier Controls of Goods (1982)
- Convention on the Contract for the International Carriage of Goods by Road (1956)

4. Finally, in implementing the ALTID project, promotion of close ***international cooperation*** with other United Nations agencies, including ECE and UNCTAD,[2] as well as other governmental and non-governmental organizations such as the International Union of Railways (UIC) and the Organization for Cooperation of Railways (OSJD), the International Road Transport Union (IRU) and International Road Federation (IRF) has been an important aspect of the strategy adopted by ESCAP. Through the development of synergies between programmes, the efforts of each organization or agencies remained more focused and the limited resources available were optimized. Most importantly, through this process of partnership, the ALTID project gained widespread international recognition and received greater focus by national governments in the definition of policies. For example, through an ECE/ESCAP joint programme of work, the two regional commissions are developing activities to implement ESCAP resolution 52/9 of 24 April 1996 on Intra-Asia

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

and Asia-Europe land bridges. The joint programme gives new momentum to the formalization and operationalization of the Trans-Asian Railway and Asian Highway networks with focus on specific issues such as building the missing links and giving specific importance to the development of those land transport linkages that provide access to and from major ports for the landlocked countries of Asia. This issue was highlighted in Resolution 54/199 adopted in January 2000 by the United Nations General Assembly which recognized that the higher cost of transport for landlocked countries is an obstacle to their economic development compared with other countries and that their limited access to sea ports restrict their ability to compete effectively on the international market. Recognizing the need for the international community to increase its focus on related issues, the international ministerial conference on transit transport cooperation was held in Almaty in August 2003, and a comprehensive Programme of Actions was defined aiming to secure access to and from the sea, improve the competitiveness of exports, reduce the costs of imports, address problems of security and operational efficiency along trade routes.

III. 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 14,000-km rail link between Singapore and Istanbul (Turkey), and possible onward connections to Africa and Europe. This link therefore offered the potential to greatly shorten distances and reduce transit times between countries and regions, while being a catalyst for the notion of international transport as a tool for trade expansion, economic growth and cultural exchanges.

The international events that punctuated the 1960s, 1970s and early 1980s influenced the momentum of the concept 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 corridors studies (see box 3) reflecting the regional approach adopted to implement the project was published. The studies followed similar methodology and principles, namely: to (i) identify the links according to the ALTID criteria (see box 1 above), (ii) assess their conformity with a set of technical requirements (e.g. loading gauges, axle-load, speed), and (iii) appraise the compatibility of operational practices on both sides of different national borders to evaluate the possibility of cross-border movements (e.g. couplers, length of trains). In addition, the “software” aspects of transport were reviewed with particular attention to tariff-related issues and

Box 3. TAR-related corridor studies carried out by ESCAP

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, the Lao People's Democratic Republic, Malaysia, Singapore, Thailand and Viet Nam)
3. Development of the Trans-Asian Railway: Trans-Asian Railway in the Southern Corridor of Asia-Europe Routes (1999); (countries concerned: Bangladesh, China, India, Islamic Republic of Iran, Myanmar, Pakistan, Sri Lanka, Thailand and 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, Islamic Republic of Iran, Kazakhstan, Russian Federation and Turkmenistan)

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 movements impossible on some of the linkages.

The ***break-of-gauge*** issue. The mainline railway networks making up the TAR network incorporate five different track gauges,[3] i.e. 1,676 mm, 1,520 mm, 1,435 mm, 1,067 mm and 1,000 mm.[4] A break-of-gauge occurs when the railways of neighbouring countries have different track gauges posing a problem of operational discontinuity.[5] The rail border crossings at which a break-of-gauge occur on the Trans-Asian Railway network are indicated in Box 4 (see also Map 1). Various techniques exist to overcome these discontinuities. They include transhipment, bogie exchange and the use of

[3] The track gauge is the distance between the inner surfaces of each rail and is conventionally measured in millimetres.

[4] It must be noted that other gauges are also found in some countries (e.g. 762 mm in India) but these line are not part of the Trans-Asian Railway network.

[5] Discontinuity of track gauge also occurs within individual domestic railway networks. Such is the case, for example, in Bangladesh or India.

Box 4. Countries located on the TAR network between which a break-of-gauge occurs

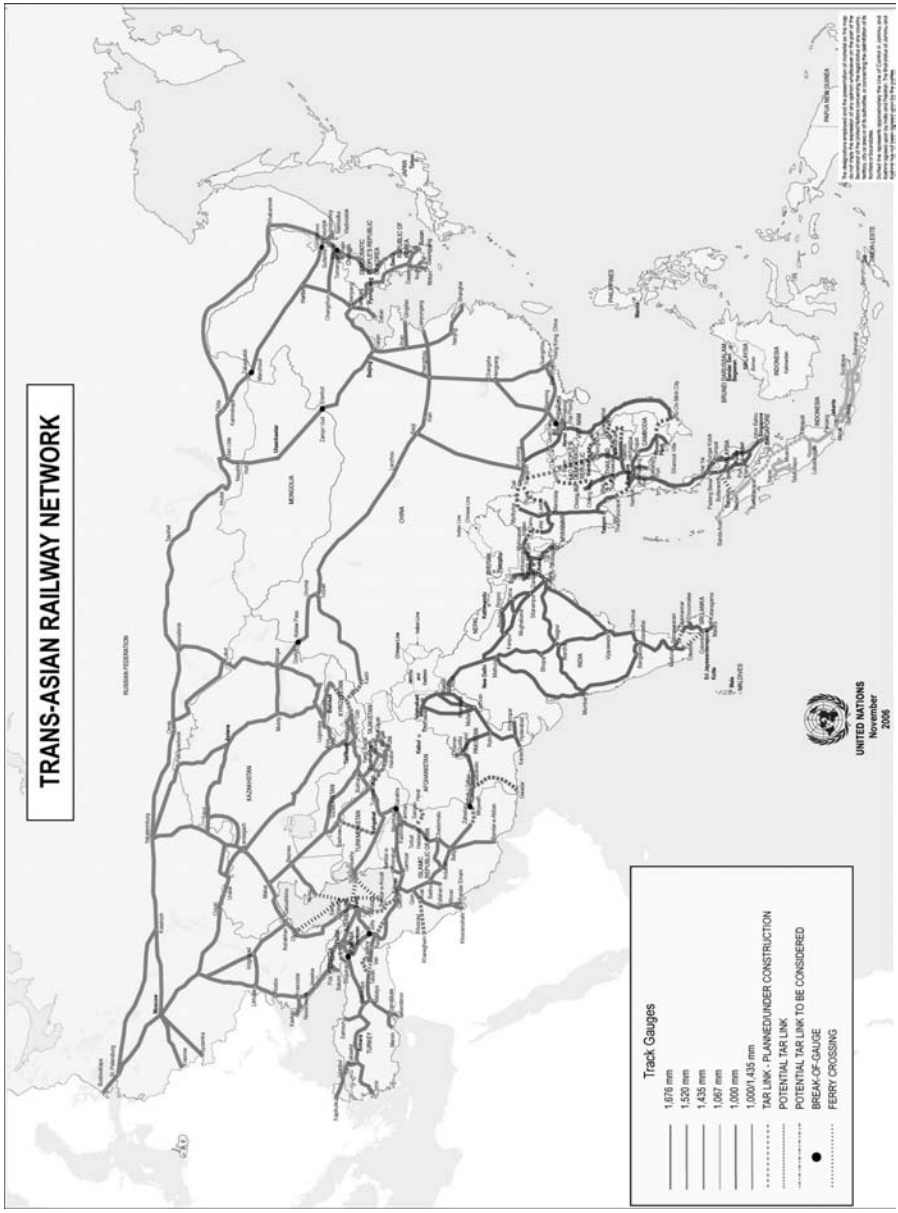
1. China (1,435 mm) and Viet Nam (1,000 mm)
2. China (1,435 mm) and the Russian Federation (1,520 mm)
3. China (1,435 mm) and Mongolia (1,520 mm)
4. China (1,435 mm) and Kazakhstan (1,520 mm)
5. Democratic People's Republic of Korea (1,435 mm) and the Russian Federation (1,520 mm)
6. Islamic Republic of Iran (1,435 mm) and Turkmenistan (1,520 mm)
7. Islamic Republic of Iran (1,435 mm) and Azerbaijan (1,520 mm)
8. Turkey (1,435 mm) and Armenia (1,520 mm)

adjustable bogies.[6] While it cannot be denied track continuity between countries would be desirable, the interruption caused by break-of-gauge does not have to be a major obstacle to the commercial attractiveness of international rail services. Certainly so when it comes to international container block-train services. With limited exceptions, break-of-gauge occurs mostly at border points where a range of operations already require trains to observe mandatory stops. These operations are generated by railway needs (e.g. change of locomotives, change of crew) or the requirements of other administrations (e.g. Customs, border police, etc.). Well-designed and well-organized facilities allow for transhipment to take place within the time allocated for these other activites, the disappearance of which cannot yet be realistically envisaged. In the least optimized case of a train hauling 45 container flats carrying two 20-ft containers each and on the basis of 4 minutes per move with only one crane in action, total transhipment time would take 6 hours. This duration represents a fraction of total end-to-end transit time over landbridge distances of several thousands kilometres.

The ***'missing link'*** issue. A 'missing link' is the absence of physical linkages between the railway networks of neighbouring countries or an absence of continuous railway infrastructure within one country, often due, in this latter case, to local geography. Missing links between networks of neighbouring countries are due either because the link was never there in the first place, or

[6] 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.

Map 1. Trans-Asian Railway Network



because it ceased to exist due to political events. Bridging the former[7] will require 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 and how a particular project fits into the national transport development plans of the countries concerned will 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 investments are to be sought. Meanwhile, bridging and, more importantly, operating the politically-induced missing links, requires a high-level of bilateral cooperation and understanding.

In recent years tangible progress has been achieved in moving forward towards the construction and operationalization of a number of missing links. In North-east Asia rail infrastructure was established to reconnect the railways of the Democratic People's Republic of Korea (DPRK) and the Republic of Korea (ROK). Trial runs took place between the two countries in May 2007 raising hope of future full operation of trains along the Trans-Asian Railway Northern Corridor.

Work is also under way in the Islamic Republic of Iran to reconnect the country's rail infrastructure with that of neighbouring Pakistan with the completion of work and inauguration of cross-border services scheduled for early 2008. The railways of the Islamic Republic of Iran are also active in laying tracks to connect their rail system with that of Azerbaijan in the northern part of the country.

Meanwhile, in February 2007, the governments of Azerbaijan, Georgia and Turkey signed a framework agreement to strengthen cooperation. The Agreement includes the Baku-Tbilisi-Kars rail project that encompasses the construction of the missing link between Akhalkalaki in Georgia and Kars in Turkey.

In South Asia, India has sanctioned the construction of the first 100 km of a planned 315-km line to its border with Myanmar and feasibility studies have been completed for the remaining 215 km.[8]

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[7] It must be noted that the construction of missing links may result in additional break-of-gauge points. Such will be the case, for example, when the link between the Islamic Republic of Iran and Pakistan is completed.

[8] "Trans-Asia gaps to be plugged", *International Railway Journal,* May 2007.

Finally, some signs of movement are also perceptible in South-east Asia where in the past ten years an ad hoc working group has worked under the aegis of the ASEAN secretariat to look at ways to concretize the Singapore-Kunming Rail Link (SKRL) project. Work has started in China's Yunnan Province on a US$ 1.9 billion 350-km line from Dali to Rueli on the Myanmar border. China is also active on other sections of the TAR network with the construction of a 142-km section from Yuxi to Mengzi to the west of the existing metre-gauge line to Viet Nam and a 559-km line from Yuxi to Mohan to connect with the Lao People's Democratic Republic. Chinese railway corporations have also submitted to the Government of Viet Nam a feasibility study for the construction of a US$ 438 million 128-km line from Ho Chi Minh City to the Cambodian border provided it is matched by a line to Phnom Penh on the Cambodian side of the border.[9] Meanwhile, under technical assistance from Thailand work is under way to build a 3.5-km line section to extend rail infrastructure across the friendship bridge from Nongkhai (Thailand) to Thannaleng (the Lao People's Democratic Republic) as a first step towards a full connection to Vientiane, and the Government of Malaysia has donated to Cambodia the track components necessary to the reconstruction of the 48-km missing link between Poipet and Sisophon. Once in place, the section will allow cross-border rail movements between Cambodia and Thailand.

Over fifteen years into ALTID, the TAR network looks as shown in Map 1 with each corridor presenting different characteristics in their configuration and operational readiness. In the Northern Corridor,[10] 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 developments vary between countries. In the Indochina and ASEAN subregion, the need to develop subregional rail linkages is now receiving full acceptance and related activities are being implemented by the ASEAN secretariat under the above-mentioned SKRL project, although funding is so far a stumbling block. In the North-South Corridor linking Northern Europe to the Persian Gulf, activities are being undertaken by the countries concerned to promote traffic along the corridor in an effort to capitalize on shorter transit times by rail as compared to maritime shipping.

9 "China backs Cambodian link", *Railway Gazette International,* July 2007.

10 Please refer to Box 3 for countries concerned by each corridor.

IV. TRANS-ASIAN RAILWAY, TOMORROW: OPPORTUNITIES AND CHALLENGES

A. The Intergovernmental Agreement

There is a growing acceptance that rail has an important role to play in the national and international movements of goods and people. A number of features speak in favour of a greater utilization of rail transport in Asia. (i) Twelve of the 30 landlocked countries of the world are located on the Asian continent with the nearest ports often several thousands of kilometres away, (ii) the distances linking the main origin and destination, both domestically and internationally, are of a scale on which railways find their full economic justification, (iii) the reliance on ports to connect national economies to the world's markets with the need to clear landside port areas quickly to avoid congestion, especially in the context of growing containerization and the development of intermodal transport, (iv) a number of countries are major exporters of mineral resources in the logistic of which rail transport plays a crucial role, (v) the continuing surge in the volumes of goods being exchanged, and (vi) the recognition of rail as an environmentally friendly and safe mode of transport.

Recognizing the above and also realizing that future growth in demand could no longer be met by an expansion in road infrastructure, governments of the region negotiated and adopted the Intergovernmental Agreement on the Trans-Asian Railway Network. Of the 28 member countries directly concerned by the Agreement, 18 signed the Agreement at the Ministerial Conference on Transport held in the Republic of Korea in November 2006, while the Government of India signed the Agreement at United Nations Headquarters in New York in June 2007. The current status of signatories is summed up in Box 5. The Agreement was developed with the idea that it will play a catalytic role in the coordinated development of railway infrastructure in Asia. The Working Group planned under the terms of the Agreement will meet every two years and will be a forum within which transport policymakers and railway managers will define a common vision, adopt joint programmes of actions, identify investment requirements and sources, and benchmark progress. It was also thought as a tool to evaluate investment requirements along international corridors and strengthen the case for railway expansion in loan negotiations with financial institutions such as the Asian Development Bank, the Islamic Development Bank or the World Bank. The first meeting of the Working Group will be organized as soon as the Agreement enters into force. Entry into force

Box 5. Intergovernmental Agreement on the Trans-Asian Railway Network – Status of signatories

Potential signatories:

Afghanistan, Armenia, Azerbaijan, Bangladesh, Cambodia, China, Democratic People's Republic of Korea, Georgia, India, Indonesia, Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, the Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Pakistan, Republic of Korea, Russian Federation, Singapore, Sri Lanka, Tajikistan, Thailand, Turkey, Turkmenistan, Uzbekistan and Viet Nam

The 19 signatories as of 31 July 2007:

Armenia, Azerbaijan, Cambodia, China, India, Indonesia, Islamic Republic of Iran, Kazakhstan, the Lao People's Democratic Republic, Mongolia, Nepal, Republic of Korea, Russian Federation, Sri Lanka, Tajikistan, Thailand, Turkey, Uzbekistan and Viet Nam

The Agreement remains open for signature at United Nations Headquarters in New York until 31 December 2008.

will occur on the ninetieth day following the date on which the governments of at least eight member States have consented to be bound by the Agreement.

To date the Trans-Asian Railway Network comprises of 81,000 km of lines of international importance identified through the corridor studies mentioned in the earlier part of this paper. Completing the network as shown on Map 1 requires building nearly 6,500 km of missing links for an estimated investment of US$ 15 billion. Promoting the construction of these missing links and promoting their operationalization will certainly be high on the agenda of the Working Group as they may have deep repercussions on the patterns of transportation within Asia as well as between Asia and Europe.

For example, when the reconnection of the railways of the Islamic Republic of Iran and Pakistan is supplemented by the construction of the link between the Islamic Republic of Iran and Azerbaijan, through-movements of cargo will become possible between Moscow and New Delhi over a rail distance that is substantially shorter than its maritime equivalent, i.e. 7,800 km for rail vs 14,000 km for shipping. Meanwhile, exploiting the reconnection of railways across the Korean Peninsula through the restoration of regular operation between the Democratic People's Republic of Korea and the Republic of Korea would boost economic exchanges in the Peninsula itself

and through-land transport from the port city of Busan to Europe will become possible along what will be the longest transcontinental landbridge in the world (over 12,000 km). Furthermore, with the prospect of connections with the railways of China and the Russian Federation becoming a reality, the outlook of transportation in North-East Asia will be transformed. In much the same way, the future connection between the railways of Cambodia and Thailand as well as the extension of the Thai rail infrastructure into the Lao People's Democratic Republic will allow an extension of the container landbridge that was successfully co-launched in 1999 by the Malaysian Railway (KTMB) and the State Railway of Thailand (SRT). Through the new infrastructure and the existing landbridge services Cambodia and the Lao People's Democratic Republic will both gain access to Malaysia's main ports, a most important benefit for the Lao People's Democratic Republic in view of the country's landlocked characteristic.

But putting the missing links in place will not in itself guarantee a transfer of traffic from road and shipping to rail. Two characteristics of railway that will bear heavily on the future development of freight by rail along the TAR network will be the structure of rail operation on the different railway organizations transited by the TAR routes, the ability of rail to attract investment from both public and private sectors and the commercial skills of railway organizations in determining services and pricing them.

B. Attracting investment

The traditional source of finance for infrastructure development in countries of Asia have been allocations from government budgets with the role and significance of these sources varying from country to country, reflecting such elements as the stage in social, economic and political development, the levels of disposable income, and the extent and efficiency of taxation regimes. Direct observation of the gap between required and existing transport facilities and services calls for massive investments to: (i) maintain existing railway assets, and (ii) expand these assets. Given the long lead time associated with rail infrastructure projects and their usually low return on investment, it is doubtful that they will ever be attractive to the private sector. In this context, rail infrastructure should typically continue to be a national asset provided by governments under its ownership and management. Governments could optimize the cost of providing the infrastructure through a system of usage charges that each individual government could fix at different level depending on practices vis-à-vis other modes and the necessity to ensure a level playing field for all modes. This would most likely be welcome by both rail users and rail operators as a means of safeguarding the high level of safety that rail

transport is credited for while creating the opportunity for market sensitive pricing. An added benefit is that by keeping ownership of transport infrastructure in general as well as responsibility for its long-term planning, governments will be able to exercise leverage to guarantee intermodal integration so that each mode can be used to deliver the best it has to offer.

Initiatives by governments to develop rail infrastructure along the Trans-Asian Railway should also recognize that the emergence of a truly operational network able to meet the current and future transport requirements of a globalized economy calls for greater balance between projects deemed of international importance and those of a purely national nature. This balance is all the more difficult to strike in a context of limited budgetary resources.

Aware of this problem, the ESCAP secretariat has initiated a study aiming to generate among its member countries a common global vision of rail infrastructure development. The process of multilateral consultation that the study will launch will help member governments agree on priority projects, make efforts at achieving greater synchronization in their implementation and acquire greater leverage to approach international financial institutions for assistance.

While government financing will be crucial for further rail infrastructure development, it does not mean that state authorities will not fund future projects in partnership with the private sector. Despite high growth in all areas of business activities, RZD's Vice-president acknowledged in late 2006 that a shortage of investment funds was leading to reduced throughput because of infrastructure problems on around 8 per cent of RZD's total track length and further recognized that the company had already gained very positive experience with public-private partnerships on a variety of projects to build new lines and upgrade the existing ones.[11]

Outside the provision of rail infrastructure a number of areas linked to rail operation lend themselves well to the involvement of private sector such as, for example, rolling stock procurement, yard operation, service definition/ marketing, property/land usage development. In rolling stock alone pressure is building up on most railways of the region to renew and expand their aging fleets of locomotives, coaches and wagons to cope with existing traffic and meet new demand. Requirements are high on all railways. The President of RZD recently stated that updating rolling stock was one of his company's priorities but recognized that the US$ 6.6 billion earmarked for the purpose

[11] "RZD faces a bright future", *International Railway Journal,* October 2006.

over the period 2007-2010 was not sufficient for timely modernization and for handling the traffic volumes envisaged in RZD's long-term plan for 2010-2015.[12] He illustrated his point by estimating that to meet the target for 2010 RZD needed to buy at least 20,000 new vehicles a year. He indicated that establishing and partly floating a new freight operating company could generate the finances for the required wagons.

In this respect examples abound in many countries – both in and outside the ESCAP region – of industries financing and operating their own rolling stock. This is particularly the case for heavy traffic such as coal, petroleum products or grain moving in unit trains between production sites and processing plants. For a number of years RZD has allowed independent private companies to own and use their own rolling stock, including locomotives. In India, Container Corporation of India (CONCOR) which was corporatized in 1988 and commenced business in 1989 with the aim of developing multimodal logistics using IR's network as the backbone for their operations also owns an increasing share of its fleet of specialized container platforms. The company recently acquired high-speed container flats capable of speed of 100 km/hour 1,900 such wagons have already been deployed on the main container routes.[13] The practice may be worth receiving attention from cash-strapped railways in need of rolling stock renewal. In South-east Asia, the container landbridge operation established by Malaysian Railways (KTMB) and SRT between Port Klang (Malaysia) and Bang Sue (Thailand) quickly turned into a success story with container volumes soaring from 21,640 TEU in 2000 to 58,224 TEU in 2004, i.e. 170 per cent over the period. However, 2006 traffic levels were back down to 42,520 TEU. The reason was a high rate of online failures of trains due mostly to locomotive breakdowns. Twenty-nine per cent of trains entering Thailand experienced online failures in 2005, 33.7 per cent in 2006 and in the period January to May 2007 the figure had risen further to 37.5 per cent.[14]

The system of letting private operators own and use rolling stock offers a number of advantage for railway organizations. Not only does it free investment capabilities for infrastructure projects, but it also leaves the responsibility and cost of matching rolling stock and demand in both volumes and nature with the private operators thereby exploiting their ability to react quicker to market-demand.

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12 "Investment will underpin RZD reforms", *Railway Gazette International,* January 2007.

13 Website of Container Corporation of India at www.concorindia.com. See more on CONCOR in a companion article in this volume.

14 Source: State Railway of Thailand.

C. Developing commercial skills

A few years ago the debate about the future of railway primarily focused on privatization. May be by lack of sufficient successful experiences to base a credible case on, talks now tend to give greater emphasis on public-private partnerships and commercialization of railways. Commercialization rests on a concept and a principle. The concept is that given the proper incentive and scope to exercise their managerial talent, there is no obvious reason why railway managers could not drive their organizations towards the same benefits that private managers are often credited with. Meanwhile, the principle is that railways do need to provide services which are demand-driven, customer-oriented, and results-led. In other words, if the market (or government in case of subsidized passenger services) will not pay for a service, it will not be offered. In this respect, if governments request that unprofitable services be maintained, they should be prepared to cover the difference between revenues and costs. While the President of RZD indicated that cross-subsidization of passenger services should be terminated, he also indicated that this should not be at the expense of passengers and the head of the Federal Passenger Agency created under RZD's reform package further stressed that the low level of competitiveness and profitability from passenger operation did not result from poor management but from the conditions imposed by the state to provide rail services for social reasons.[15]

If the above infers that capital will not be attracted to an unprofitable and over-regulated sector, it also means that when working in an unregulated sector subject to the rules of competition, flair and judgment have to be exercised to the definition, pricing and marketing of services. When this is the case, railways can prosper as is illustrated by the case of the KTMB-SRT landbridge (see above) until the service started to be plagued by locomotive failures. The success story of CONCOR provides another vivid illustration of railway managers' ability to serve a market. Over the decade 1997-2006, volumes transported by CONCOR soared from 703,542 TEU to 1,930,562 TEU. At the other end of the ladder, the 30 per cent rate increase imposed in early 2006 by RZD on Trans-Siberian services sent shippers from the Republic of Korea en masse into the arms of ocean carriers. As a result, total transit cargo railed to the Finnish border through the port of Vostochny in the Russian Far East – i.e. the mainstay of RZD's intermodal traffic along the Trans-Siberian main line – dropped by 90 per cent. The extent to which the 30-35 per cent reduction agreed in early 2007 by Russian Tariff Authority to raise the competitiveness of Trans-Siberian services will attract lost traffic back onto rail

[15] "Russian rail revolution enters final phase", *International Railway Journal,* October 2006.

will depend largely on how Korean shippers have been locked into their deep sea contracts with ocean carriers.[16]

These three cases illustrate that commercial success is in sight when services are developed keeping in mind a set of basic elements such as the cost of providing a particular service, shippers' needs, the assessment of the value of the service provided in a shipper's distribution system, and the offer made available by competing modes. This means that some market segments may not be so rewarding and may be left out, while others should be investigated without being overcharged. This is particularly important if railways are to capitalize on their intermodal quality to develop traffic and generate much needed resources to finance development along the routes of the TAR network.

V. MOVING PEOPLE OR CARRYING FREIGHT: WHAT MISSION FOR THE TRANS-ASIAN RAILWAY NETWORK?

The ALTID project was launched with the objective of addressing the mobility requirements of both people and goods. Today this objective remains unchanged. However, in practical terms, operationalizing the TAR network calls for a more discerning approach. While individual sections of the network – and mostly over their domestic stretch – will continue to cater for passenger traffic, the corridors in the network have been identified with international trade in mind and will primarily serve freight. This choice is also dictated by the need for railways to generate revenues of their own at a time when national budgets have to address a host of issues (e.g. health, education or national defence) that cannot be covered by the working of market forces. As seen above freight can generate substantial earnings, while passenger services are usually maintained at a heavy cost to governments. In addition, the TAR network has been designed with long-distance carriage in mind. Once affluent enough to travel long distances, people will most likely prefer air travel over surface transport, with due provisions being made for the special cases of future services aimed at exploiting the real – but nonetheless narrow – niche of railway tourism. Currently cross-border passenger traffic remains limited and takes place mostly between countries of Central Asia, the Caucasus region, and the Russian Federation in line with travel habits inherited from the Soviet Union.

So if freight, what kind of freight? As previously mentioned a number of ESCAP member countries are major exporters of mineral resources in the

16 "Trans-Siberian seeing thaw", *Containerisation International,* March 2007.

logistic of which rail transport plays a crucial role. This intrinsic advantage of rail in the movement of heavy bulk is clearly illustrated by traffic along the recently-inaugurated line section between Mashhad and Bafq in the Islamic Republic of Iran. Since its opening in May 2005 the line, which provides the landlocked countries of Central Asia with access to the Port of Bandar Abbas on the Persian Gulf, has handled considerable quantities of bulk liquids. Compressed gases, aggregates, chemical products and steel coils are also moving over the line with much of the traffic to and from countries of Central Asia.[17] Heavy hauls of coal, oil or petroleum products are also a common feature of rail operation in China and the Russian Federation.

The above shows that when it comes to serving freight, the TAR network is a versatile network. However, the concept of an Asia-wide railway finds its full justification in exploiting the intermodal nature of international trade. It is estimated that container traffic accounts for more than 50 per cent of international trade in volumes and about 90 per cent in value. Global container market reached 115 million TEU in 2006 and is growing at 10 per cent per year.[18] With 20 of the world's 30 top container ports located in the ESCAP region, countries are only too well aware of the phenomenon and the pressure it puts on their ports as well as land transport infrastructure.

American intermodal traffic by rail provides an interesting basis for comparison. In many instances, railroads have signed contracts with Trans-Pacific shipping lines with services adhering to schedules of shipping lines. These tailored services have obviously played a major role in the growth of intermodal traffic between 1984 and 2002 during which weekly services departing from the west coast have increased from 1 to 241 to move 60 per cent of containers arriving by sea for destinations inland. Overall, traffic tripled during the period 1980 to 2002 with intermodal accounting for 20 per cent of railroads' revenues in 2002.

Of course, there is a huge difference between Asia's government-owned, mixed-traffic railways and the North American privately-owned, heavy-haul freight railways. However, at least two key features of American railroads are not without relevance for the region, namely: the alliances they have developed with shipping lines and their integration into the global logistics chains of manufacturers.

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17 "Transit freight booms on Bafgh – Mashhad link", *Railway Gazette International,* January 2007.

18 " 'Tsunami of containers' offers opportunities and challenges for freight operators", *Railway Gazette International,* May 2007.

This last point is indeed essential if railways of the region are to prosper and attract private sector investment in a number of areas, especially rolling stock and intermodal facilities. Forecast shows that the expected increase in container movements worldwide will be larger for intra-Asian trade than for other directions of trade. Moreover, a study recently conducted by Japan's Ministry of Economy, Trade and Industry indicated that 70 per cent of intra-Asian trade is intermediate goods used in production with half being driven by final demand outside Asia.[19] Turning this potential into a source of substantial earnings requires that rail moves from a uni-modal approach to service-definition and operation to become a functional element of dynamic logistics chains that extend beyond – and are often controlled outside – national borders. For example, in 2006, Chinese ports alone handled about 30.9 per cent of the TEU handled in the world's top 30 container ports.[20] Yet, only an estimated 1 per cent of the containers loaded and discharged at the country's ports used rail for their overland travel despite the long distances involved. Inland costs to the coast from the provinces are often more expensive than the shipping cost from the port in China to the destination port.[21] Similar situations are also found in other countries of the region such as India where land freight cost is more than double in countries with more developed transport/logistics, i.e. US$ 0.07 per ton-km vs US$ 0.02 in Canada or US$ 0.037 in Japan.[22]

Developing rail traffic through improved logistics is an area of future cooperation between governments and private sector. The container landbridge between Malaysia and Thailand is an early precursor of such partnership. Trains have direct access from KTMB's main track to the Northport terminal to enable straddle-carriers to load and unload containers, thus saving time for customers. Currently, there are three major landbridge block-train operators – T.S. Transrail, Freight Management and Infinity Logistics Sdn Bhd – that operate on specific window-time on KTMB tracks. The operators offer a total of 16 block-train services to and from various international inland container depots in Thailand and Northport.

Private-sector rail operation is also off the starting-block in India. 14 private operators have been granted licences to operate container services on IR's network. In July 2007, APL India Lynx (APLIL) started operation between Loni ICD near Delhi and Jawaharlal Nehru Port in Mumbai. APLIL is

19 "Japan looks for improved competitiveness in Asia", *Containerisation International,* August 2007.

20 "Top slots", *Containerisation International,* March 2007.

21 "China's logistics solutions", *Containerisation International,* August 2007.

22 ESCAP draft study report *Promoting the role of the Asian Highway and Trans-Asian Railway Networks: intermodal interfaces as focus for development,* August 2007.

a joint venture between Hindustan Infrastructure Projects and Engineering (HIPE) and the Singapore-based shipping line Neptune Orient Line which is a parent company of American President Line (APL). The service was well-received by shippers with over 1,000 TEU carried in its first month of operation. APLIL now plans to invest US$ 60 million over the next two years to buy new equipment and start services on other corridors. The company also has plans to develop its own ICD in the northern state of Haryana.[23]

Intermodal traffic along the Trans-Siberian line in the Russian Federation is also expected to expand with Russian Railways implementing projects aiming to boost corridor capacity to 1 million TEUs per year. Traffic along the corridor had grown at a steady pace until the sudden rate increase imposed by Russian Railways in early 2006 (see above). European Rail Shuttle, a company based in the Netherlands, recently completed a trial run of fifty-two 40-ft containers of computer parts from Shenzhen in China to a destination in the Czech Republic offering a door-to-door transit time of 17 days, i.e. half the travel time offered by maritime shipping.[24]

In addition to the above and apart from the line construction projects already mentioned in the course of this paper, watchful eyes should also be kept on efforts to develop container terminals as well as ventures onto new territory such as the development of double stack container services. Chinese Railways, to name but one, have started to develop a network of 18 major intermodal rail hubs and 40 mid-size stations strategically located at ports and inland economic centres as part of the US$ 240 billion plan by the Ministry of Railways of China to upgrade and expand its network to 100,000 km by 2020. Each facility will cover 6 to 12 sq km and have a capacity to handle 200,000 – 300,000 containers a year with double-stack container services eventually linking these hubs.[25] In this latter area, India already stepped ahead of other railways when IR inaugurated its first double-stack container service in March 2006 between the Kanakpura ICD near Jaipur and Pipavat port in Gujarat.[26] Trials are also taking place on RZD's network with surveys of loading gauge clearance completed on routes from Moscow to Nakhodka, Novosibirsk, Murmansk and the Finnish border.[27]

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23 "APL India Lynx invests more, adding another train to JNP/Lori service", *Containerisation International,* August 2007.

24 "European Rail Shuttle joins Trans-Siberian Rail club, after successful trial", *Containerisation International,* August 2007.

25 "The Yangtze River transport Corridor", *Deloitte & Touche,* July 2006.

26 "IR tries double-stack service", *Railway Gazette International,* May 2006.

27 In *Railway Gazette International,* March 2006.

CONCLUSION

Until only a few years ago many observers were writing out rail as ever being able to regain any significance in modern-day transportation market. Fortunately, this thinking seems to have been reversed and in many countries the level of investment channelled into railways – although well below what is consented to road transport – is getting ever higher. In the ESCAP region, while the lion's share of investment in rail projects goes to China, India and the Russian Federation, railway managers in other countries are also in an upbeat mood. Rail development is very much at the core of the modern transport system that the Government of the Islamic Republic of Iran is putting in place with investments in new lines, higher axle-load, state-of-the-art signalling and telecommunication technology, and modern motive power. Since 1994 – when the Iranian government decided to increase rail's share of the transport infrastructure budget to 30 per cent – Iran has built more new railway lines than any country except China.[28] Things are also astir in South-east Asia with Malaysia and Viet Nam taking a lead in railway development. In 2006, the Government of Malaysia unveiled its 9th Malaysia Plan setting out a detailed framework for economic development over 2006-2010. Under the plan KTMB was allocated US$ 1.08 billion for infrastructure and rolling stock investment. Meanwhile, Vietnam Railways (VR) is embarking on the construction of rail connections to seaports, mines, industrial parks and key economic zones around the country. VR expects to spend US$ 912.5 million on construction alone during 2007-2010 under a mixture of domestic and foreign investments.[29] Finally, Central Asian countries are also in an investment mood with, for example, Kazakhstan seeking bids for US$ 458 million worth of projects.[30]

Under its Trans-Asian Railway activities the ESCAP secretariat has identified a number of international rail corridors. Surveys among governments of the region have indicated that these activities have already provided substantial assistance to member countries by outlining guidelines on route alignments, technical standards and operational as well as commercial requirements for the development of railway lines and roads of international importance. The identified TAR network (and its road equivalent) is increasingly being included in national and subregional programmes for transport development. This is a first step. A second step is now to ensure that the

28 "Iran plans 50 per cent network expansion as Mashhad-Bafq line opens", *Railway Gazette International,* May 2005.

29 "Vietnam Rail Corp Plans Modernisation", *Asia Pulse,* 22 May 2007.

30 *International Railway Journal,* July 2007.

sections of each corridor are effectively developed according to commonly-agreed standards. Indeed, the attraction of container traffic to the TAR network depends in large measure on rail being able to offer cost effective and reliable services as compared to its competitors in the various corridors making up the network. In this regard, it is imperative that operational impediments be removed. While, as mentioned above, different track gauges do not have to be a major obstacle, incompatible train length and load, different axle-loads, incompatibility in rolling stock design (i.e. couplers, braking systems), different route capacity and train operation practices on individual rail systems along a specific corridor constitute much bigger barriers to efficiency and may create anxiety among shippers. In this area, it is hoped that the Working Group on the TAR network that will be established once the Intergovernmental Agreement enters into force will address these issues in a bold and forward-looking manner. It is also hoped that the Working Group will yield a common vision on priority investments and lead to a better synchronization between national procedures when it comes to taking projects off the drawing board and into implementation.

Step 3 is about operating the network. Once the technical bottlenecks have been removed, attention should focus on institutional bottlenecks and the joint definition and operationalization of services. In the longer term, 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 private sector need to be considered. The development of joint border stations to implement a “one-stop-shop” concept under which all rail and non-rail operations by the relevant administrations of two neighbouring countries are performed at one single location would also be a step towards greater operational efficiency. Synergies between rail and road as well as the development of cross-over points with maritime, inland water and air transport are only starting to be explored and require more in-depth work. All these activities would certainly gain from an infusion of private sector.

The rapid economic development of the ESCAP region presents a range of complex issues for the transport systems of member countries. Making rail a prime choice for shippers dictate a tall agenda such as providing capacity, procuring rolling stock, ensuring interconnectivity between modes, putting in place the necessary regulatory framework to invite private sector, and – last but not least – developing human resources in adequate numbers and with the needed technological skills. These issues constitute a daunting task for many countries in terms of planning and resource-mobilization. It also is a task that requires an increasingly high level of international cooperation as the

requirements for cross-border movements parallel the growth in international trade. But daunting as they are, these issues constitute a fascinating blue-print of actions for railway managers of the future. They also provide an area for ESCAP to facilitate dialogue and identify and promote best practices for the greater benefits of its member countries.

Box 6. Useful ESCAP website

Further information on related ESCAP activities can be obtained through ESCAP's Transport and Tourism Division website.

- **www.unescap.org/ttdw/index.asp**
- **www.unescap.org/ttdw/index.asp?MenuName=AsianHighway**
- **www.unescap.org/ttdw/common/TIS/TAR/tar_home.asp**

Finally, increasing the efficiency of inland transport is not a matter of transport planning only. The economic and social implications are enormous. Studies have shown that level of income, trade growth and income growth decline as distances from coastal areas increase. The results are: (i) social inequalities between cities within a certain perimeter of ports and the more remote provincial areas, and (ii) population shifts to cities that are not always prepared to receive a sudden influx of migrants. A recent study found out that China spends about 18.5 per cent of its GDP on logistics costs, compared with 10 per cent in the United States of America and Europe.[31] With a GDP of US$ 1,932 billion, the savings would finance more than half what the country plans to invest to realize its 2020 rail vision.

When environmental concerns are thrown on top, the increasing relevance of the rail mode and the impact of rail services beyond the mere transport sector of countries become even more apparent. These considerations were very much in the minds of ministers and transport policymakers who gathered for the Ministerial Conference on Transport in the Republic of Korea in November 2006. In the declaration that concluded the Conference, they clearly expressed a common desire to make the Trans-Asian Railway Network a major building block in the definition of an international integrated intermodal transport and logistics system serving the future economic prosperity of Asia and the well-being of its citizens.

31 "China's logistics solutions", *Containerisation International,* August 2007.