REVIEW OF DEVELOPMENTS IN TRANSPORT IN ASIA AND THE PACIFIC

2013

TRANSPORT AS A KEY TO SUSTAINABLE DEVELOPMENT AND REGIONAL INTEGRATION

UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

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Cover photograph: Xinhua/Qin Qing - Builders lay rails on a bridge along the Yuxi-Mengzi Railway in southwest China's Yunnan Province, March 10, 2012. The 142-kilometer Yuxi-Mengzi Railway section is part of international railway linkages.

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FOREWORD

This Review is published at an important time for future policy and planning of transport investments. Transport accounts for around 60 per cent of all fossil fuels used on the planet, around 30 per cent of all energy use and an estimated 23 per cent of global CO_2 emissions. To reduce these negative externalities, we need regional solutions today that will support sustainable development, solutions which are fuel efficient and which reduce pollution, congestion, accidents, and deaths on the roads, while meeting the needs of business, people and our planet.

Transport is an 'enabler', providing access to economic, health, education, and social services. That is why the 2012 United Nations Conference on Sustainable Development, or Rio+20, recognized the importance of the efficient movement of people and goods, and access to environmentally sound, safe and affordable transportation as a means to improve social equity, health, resilience of cities, urban-rural linkages and productivity of rural areas. It also noted the need to take into account road safety as part of efforts to achieve sustainable development.

This Review examines emerging transport trends across the region, focusing on inter-modal regional connectivity and cross border facilitation. It provides an update on the status of the Asian Highway and Trans-Asian Railway networks, as well as progress in the development of intermodal linkages such as dry ports. For the first time, it also includes a chapter on inter-island shipping, which looks at the specific transport challenges facing ESCAP's member States and associate member States in the Pacific. It also explores options for upgrading urban mobility, while meeting the needs of diverse sections of the population.

The Review will contribute to the transformational shift which is needed to make our transport systems more efficient, cleaner, safer and more affordable, as well as more equitable, to the benefit of all.

Noeleen Heyzer
Under-Secretary-General of the United Nations and Executive Secretary,
United Nations Economic and Social Commission for Asia and the Pacific

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The term "East and North-East Asia" in this publication refers collectively to: China; Hong Kong, China; Democratic People's Republic of Korea; Japan; Macao, China; Mongolia; and Republic of Korea.

The term "North and Central Asia" in this publication refers collectively to Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan.

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The term "South and South-West Asia" in this publication refers collectively to Afghanistan, Bangladesh, Bhutan, India, the Islamic Republic of Iran, Maldives, Nepal, Pakistan, Sri Lanka and Turkey.

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CONTENTS

INTRODUCTION

Transport is an essential element in the development of Asia and the Pacific, and has played a critical role in the region's rapid economic growth. Transport networks facilitate the movement of people and goods, ensuring that labour, raw materials, products and ideas can move around easily and contribute to the social, economic and environmental betterment of the region. The challenge of the coming decades will be, however, to ensure that transport policies and investments contribute to more sustainable and inclusive development paths. Mitigating the negative externalities of transport is a necessary step in ensuring the sustainability and inclusiveness of transport networks.

Against this background, the Review of Developments in Transport in Asia and the Pacific will explore some of the major transport challenges in the region.

INTEGRATING TRANSPORT MODES TO OPTIMISE EFFICIENCY

With the growing importance of intra-regional trade, countries in the region can benefit from more direct land transport routes. To contribute to sustainable development, those land transport routes need though to be optimally integrated as simply building new infrastructure is unlikely to cope with expected increased in transport demand. In addition, it is essential that the physical infrastructures are developed in such a way that they create the conditions for a shift towards the most efficient transport modes. To understand the future of regional transport networks, Chapter 1 will review major infrastructure projects that could shape these transport systems in the years to come. Key policy initiatives that promote intermodal integration such as the Intergovernmental Agreement on Dry Ports supported by ESCAP will also be presented.

FACILITATING TRANSPORT MOVEMENTS ACROSS BORDERS

While having transport networks physically connected is important, they are only valuable to the extent they can be used by transport operators. For instance, having the right institutional agreements to facilitate transport across borders can be as important as the physical infrastructure required to transport freight. In that respect, there remain numerous bottlenecks throughout the region that add considerable cost to trading. Chapter 2 will therefore present a set of options backed by ESCAP and other United Nations bodies to tackle these non-physical barriers and to improve the transport logistic chain, notably by further taking advantages of new technologies.

CREATIVE APPROACHES TO FINANCING INFRASTRUCTURE INVESTMENT

In addressing the transport requirements of the region, the building and maintaining of transport infrastructure comes at a considerable cost and represents a large share of total public expenditure. Often traditional sources remain yet limited compared to the overall investment requirements of the region. As such governments are increasingly exploring innovative financing sources, with private-

public partnerships and intra-Asia collaboration becoming more common financing options. After assessing the overall financial burden for developing land transport in the region, Chapter 3 will elaborate on these innovative sources and will highlight the key factors as well as the opportunities to consider for expanding their contribution to regional transport development. The role regional actors such as ESCAP are playing in this context will also be discussed.

UPGRADING MOBILITY FOR SUSTAINABLE AND INCLUSIVE DEVELOPMENT

In a region where a majority of the region's wealth is generated in cities and where an increasing percentage of its population resides in urban area, sustainable development can only be achieved if residents can access the many social and economic opportunities cities present. However, recent development trends raise significant questions as regards the sustainability of the transport model currently pursued requiring urgently actions to be taken to enhance people's mobility and to create liveable cities in the long run. In addition, mobility cannot be sustainably improved without tackling the major challenge of improving road safety, which currently takes a terrible economic and social toll in the region. These challenges will be further detailed as part of Chapter 4 together with a series of projects and initiatives that are making positive change to the current situation. Policy options promoted by ESCAP and other international organizations to make mobility more sustainable and inclusive will also be highlighted.

TRANSPORT CHALLENGES OF SMALL ISLAND COUNTRIES IN THE PACIFIC SUBREGION

Finally, improving connectivity is not only a critical issue for the Asian continent. The people and businesses of archipelagic and island developing countries also need to have access to safe, reliable, regular and affordable transport services to be able to achieve sustainable and inclusive development. In that respect, Chapter 5 will showcase some recent initiatives undertaken to progress on these critical issues and will outline the results of a high-level meeting on the matter supported by ESCAP and other organizations, which was held in Suva in July 2013

While the Asia and Pacific region faces tremendous transport challenges, there are also numerous examples from countries in the region of innovative and effective solutions to these issues. This Review of Developments in Transport in Asia and the Pacific aims to highlight not only the problems but also the progress being made throughout the region in meeting transport challenges. It is hoped that these successes can be shared, learnt from, replicated and built on to promote an economically, socially and environmentally sustainable Asia and the Pacific in the future.

CHAPTER 1

INTEGRATING REGIONAL TRANSPORT NETWORKS

FOR MANY YEARS, COUNTRIES IN THE ESCAP REGION HAVE UNDERSTOOD THE IMPORTANCE OF HAVING EFFICIENT TRANSPORT INFRASTRUCTURE TO ACCESS AND COMPETE ON THE WORLD MARKET AND PARTICIPATE IN GLOBAL SUPPLY CHAINS.

While international trade has relied predominantly on maritime transport as the most efficient and cost-effective mode to move vast volumes of cargo, the recent growth in intra-regional trade has increased the relevance of more direct land transport routes within the region. It is expected that as the economic size of trading partners in the region increases and transport connectivity improves, intra-regional trade will continue to increase significantly. Illustrating this trend, while China was the fourth largest trading partner for the members of the Association of Southeast Asian Nations (ASEAN) in 2000, after the United States of America, Japan and the European Union, it has been the first one since 2009. Bilateral trade between China and ASEAN members reached $232 billion in 2010, up from $32.3 billion in 2000. Over the same period, India's trade with ASEAN members has grown at an annual average growth rate of close to 20 per cent, reaching $55 billion in 2010, while its trade with China also jumped from $7.6 billion in 2003 to $66.6 billion in 2012.[1]

To meet the growing transport demand resulting from increased intra-regional trade, there is a critical need to upgrade and expand the capacity of regional transport networks, notably by better integrating different transport modes. However, developing regional land networks requires a high level of coordination, with each international transport link depending on a shared commitment from all participating countries along a corridor. To facilitate the process, ESCAP has been supporting its member countries in identifying key regional networks through a series of corridor studies.

Following these studies, two networks were identified and formalized through two Intergovernmental Agreements, namely: the Intergovernmental Agreement on the Asian Highway Network, which came into force in July 2005, and the Intergovernmental Agreement on the Trans-Asian Railway Network, which came into force in June 2009, respectively. These networks now comprise 143,000 km of roads and highways and 117,000 km of rail routes of international importance respectively.

These agreements play a catalytic role in the coordinated planning and construction of roads and railway lines of international importance. Recent progress and development of these two networks will be reviewed in the first section of this Chapter.

The second section of this Chapter will present the different ongoing initiatives related to the integration of these land transport networks. For governments, the challenge lies in providing better access to goods and services in support of economic and social development, while at the same time minimising the negative externalities arising from a rapidly growing transport sector. In this regard, the realization of an international integrated intermodal transport and logistics system for the region is essential for the optimization of existing infrastructure and re-balancing between existing modes. In particular, it enhances the options for freight to move on more environmentally friendly modes such as railways and inland water transport. A critical initiative led by the ESCAP in this respect is the development of a network of dry ports of international importance and promotion of inland container depots.

BOX 1.1
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

DEVELOPING REGIONAL INFRASTRUCTURE

The role which land transport plays in regional economic integration depends greatly on the quality of the related infrastructure, the absence of 'missing links', the existence of common technical standards as well as the level of non-physical barriers (e.g. administrative hurdles at border crossings). The following section elaborates the progress made in these areas, with the exception of non-physical barriers which are addressed in Chapter 2.

ASIAN HIGHWAY

A one billion people network

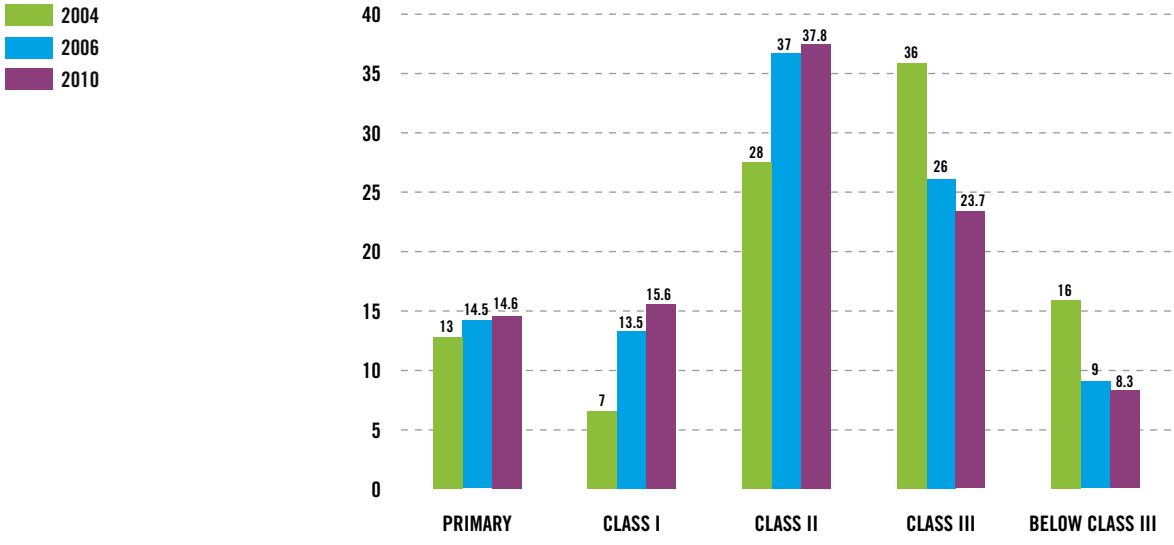
The Asian Highway (AH) network provides the critical road links between countries of the region. While the AH network represents less than one percent of the total length of all roads in the ESCAP region, it is estimated that it connects close to one billion people or 50 per cent of the total urban population in the participating countries.[2]

The relevance of the network, however, depends on the quality of the roads. Poor road quality can act as a deterrent for international transport due to the resulting high vehicle operating costs or long journey times. Although the quality of the AH network across and within member countries remains uneven, significant efforts have been made to upgrade or extend road sections. As indicated in Figure 1.1 below, between 2006 and 2010, member States upgraded about 9,300 km or 6.5 per cent of the AH network to a higher design class. Data collected by ESCAP from members of the Asian Highway showed that as of the end of 2010, Primary and Class I sections covered about 30 per cent

BOX 1.2
DEFINITION OF AH ROAD CLASS

Road Class refers to the Asian Highway classification and design standards, which provide the minimum standards and guidelines for the construction, improvement and maintenance of Asian Highway routes. Design standards such as the number of lanes, the design speed, the minimum radii of curve or the type of pavement are among the criteria differentiating the AH Road Class. For instance, Primary refers to access-controlled highways while Class III is regarded as the minimum desirable standard. For further technical details on each Class, please refer to the Annex II of the Intergovernmental Agreement on Asian Highway. [3]

FIGURE 1.1
PROGRESS IN UPGRADING ASIAN HIGHWAY ROUTES, 2004-2010



of the network, while Class II and III sections accounted for 62 per cent of the network. The proportion of roads under class III fell from 16 per cent to 8 per cent of the total network during the period between 2004 and 2010 (see Box 1.2 for more information on Road Class definition).

Despite progress in the upgrading of the Asian Highway, a significant proportion of the network in some countries still falls below class III standards and requires considerable investment to meet the minimum standards. Notably, almost two-thirds of 11,915 km of roads under class III are in Afghanistan, Mongolia, Myanmar, Pakistan and Tajikistan. The upgrading of the AH sections that do not meet the minimum class III standards is particularly important, given that many of these roads are vital for these countries to connect to neighbouring countries as well as for the region as a whole. An example of how a project in one country can impact regional connectivity as a whole is given in Box 1.3.

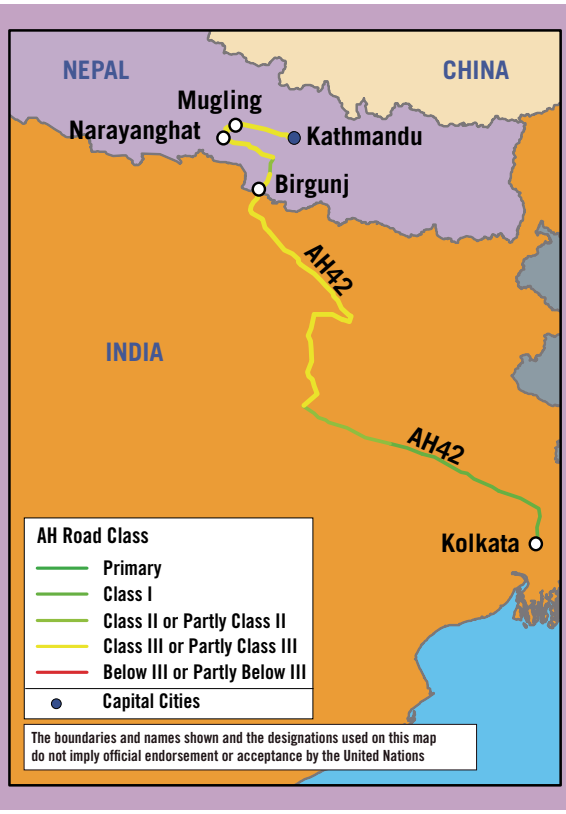
While land transport is important for all countries in the Asia-Pacific region, it is vital for the landlocked developing countries (LLDCs) who rely mainly on land connections to access world markets. Thanks to the strong commitment of countries and various bilateral and multilateral efforts, particularly under the Central Asia Regional Economic Cooperation (CAREC) initiative, major achievements in developing and upgrading the Asian Highway routes have been achieved in these countries.[5] Approximately 30 per cent of the AH roads in these countries (corresponding to more than 10,000 km) have been improved since 2004. Over this same period, the portion of AH routes below the minimum class III standard has decreased from 32 per cent to 18 per cent, leaving about 6,800 km of AH routes that need to be upgraded to meet the minimum standard. The cases of two landlocked countries, Nepal and Tajikistan, are presented in greater detail in Box 1.4 and Box 1.5.

BOX 1.3
ASIAN HIGHWAY (AH1) IN SOUTH-EAST ASIA

An upcoming project that could enhance regional connectivity is the "Tri-lateral Highway Project" connecting India (Moreh) and Thailand (Mae Sot) through Myanmar along the AH 1. This project is expected to result in improved connectivity between the South and South East Asia subregions. The current status of the road quality is indeed relatively poor as most road sections in Myanmar are either only Class III or below. The Government of India is providing a loan of $500 to the Government of Myanmar, part of which is intended for work on this project. The project is scheduled for completion in 2016.[4]

PHOTO:
Below Class III road section in Myanmar on the AH2

BOX 1.4
ASIAN HIGHWAY (AH42) IN NEPAL



With bilateral and multilateral funding assistance from China, India, and development banks, Nepal has been implementing a number of road projects. These have mainly involved the upgrading and improvement of existing roads between Nepal and India, which is by far Nepal's largest trading partner, accounting for about 60 per cent of Nepal's trade and providing its main point of access to the sea. Such improvements are needed as it is currently estimated that inland transport can take anywhere between 10 to 20 days to travel from Kathmandu to Kolkata, a distance of around 1,100 km.[6] Reducing key infrastructure bottlenecks in Nepal, as well as adopting modern approach to border management between the two countries is the objective of a $100 million project scheduled to start in 2013. Included in this project are the upgrading of the Narayanghat-Mugling road section of the Asian Highway (AH42), which carries approximately 90 per cent of Nepal's international trade traffic (about 6,000 vehicles per day), as well as infrastructure improvements at Birgunj inland container depot (ICD) in order to reduce the time spent at borders (for recent developments related to the ICD will be further detailed in the section below on dry ports).[7]

BOX 1.5
ASIAN HIGHWAY NETWORK IN TAJIKISTAN

Tajikistan has implemented a number of road projects to improve its domestic and inter-country connectivity with Afghanistan, China, Kazakhstan, Kyrgyzstan and Uzbekistan. It has constructed and/or rehabilitated 1,650 km of highways in its territory, improving road communication between Dushanbe and border points with China, Kazakhstan, Kyrgyzstan and Uzbekistan. Ongoing projects in neighbouring countries will also have an impact on Tajikistan's regional connectivity. These projects include the rehabilitation of the Shymkent-Tashkent road section (estimated at $350 million) and the upgrade of the Almaty–Horgos road section (estimated to cost more than $1 billion).

To support the development of the AH network, ESCAP has carried out numerous activities over the years. Recently ESCAP has been involved in the implementation of a project on "Promotion of Investment in the Asian Highway Network: Prefeasibility Studies of Priority Sections". Under this project, ESCAP provided technical assistance to Bangladesh, Kyrgyzstan, Mongolia and Myanmar to undertake prefeasibility studies of selected priority routes and promote investment in the Asian Highway. National workshops to build capacity to undertake prefeasibility and investment studies were also delivered in those countries. Additionally, ESCAP has organized four meetings of the Working Group on the Asian Highway where proposals for amendments to the Intergovernmental Agreement are considered. These meetings facilitate cooperation on road transport planning among the participating countries.

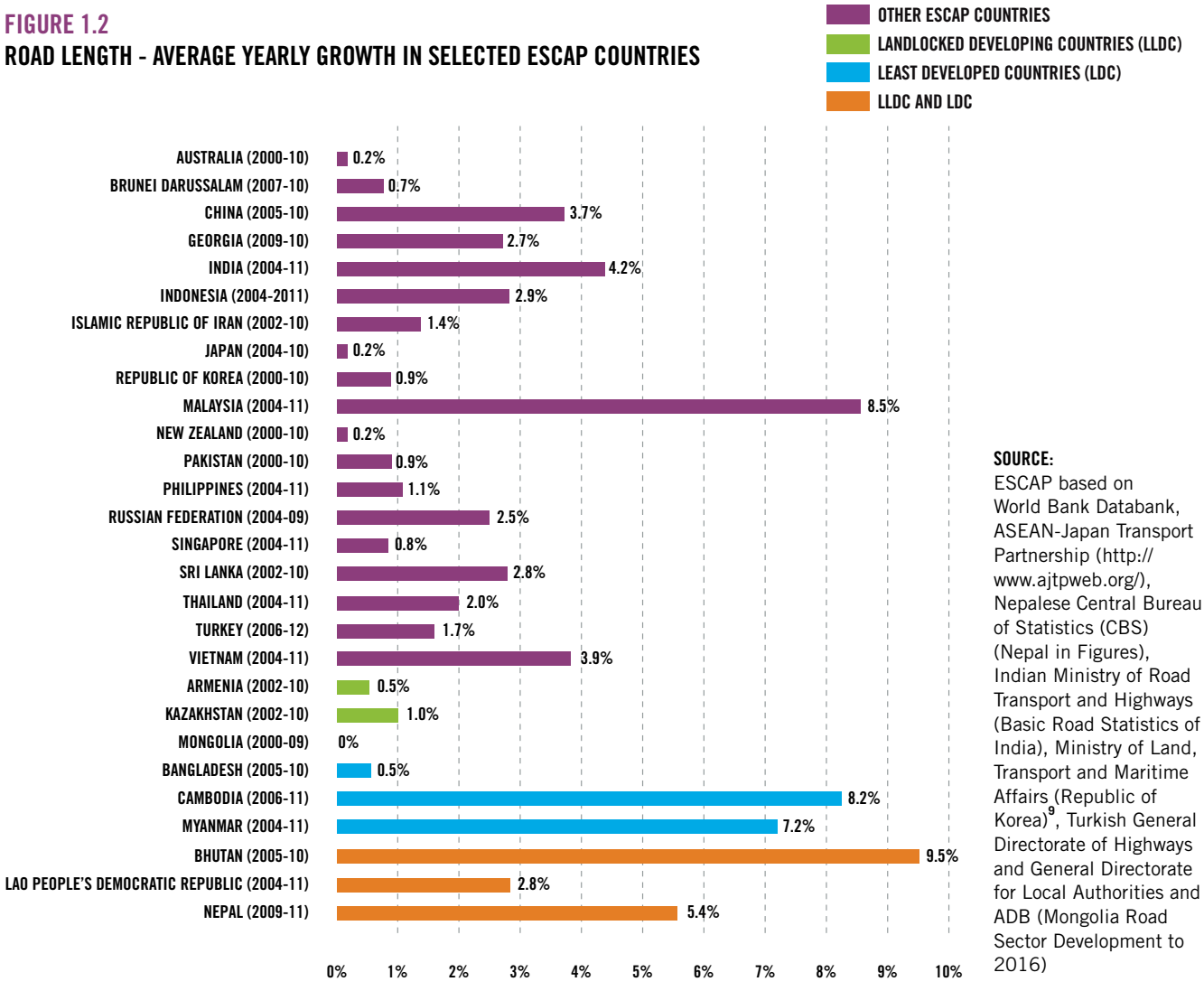
OTHER ROADS EXPANSION

More than 300,000 km of roads added every year[8]

While countries in the ESCAP region are currently linked by the Asian Highway network, there are still infrastructure gaps within countries which hinder the utilization of this network. Indeed, this infrastructure acts as a feeder for regional networks like the Asian Highway. In that respect, investments in national overall road networks also have an important impact on regional connectivity.

In that respect, it is worth noting that the overall length of the network has continuously increased for all countries in the region, as detailed in Figure 1.2.

FIGURE 1.2
ROAD LENGTH - AVERAGE YEARLY GROWTH IN SELECTED ESCAP COUNTRIES



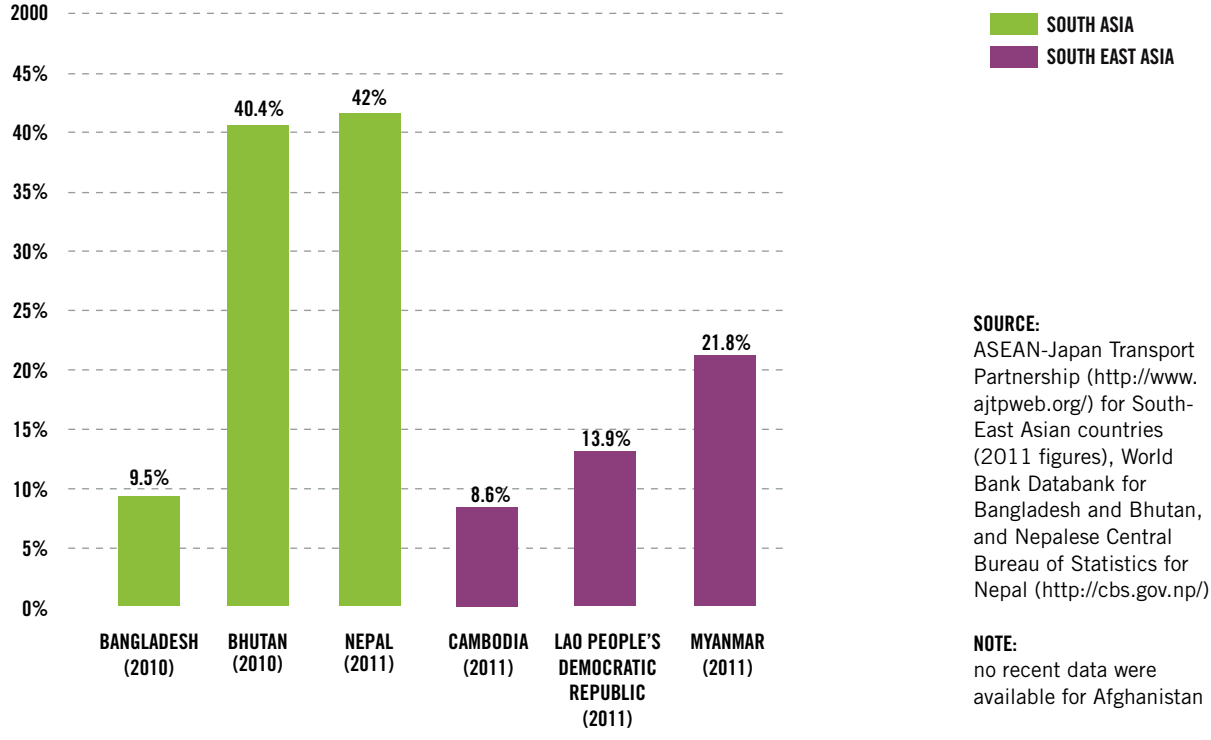
SOURCE:
ESCAP based on World Bank Databank, ASEAN-Japan Transport Partnership (http://www.ajtpweb.org/), Nepalese Central Bureau of Statistics (CBS) (Nepal in Figures), Indian Ministry of Road Transport and Highways (Basic Road Statistics of India), Ministry of Land, Transport and Maritime Affairs (Republic of Korea)[9], Turkish General Directorate of Highways and General Directorate for Local Authorities and ADB (Mongolia Road Sector Development to 2016)

In absolute terms, road expansion has been particularly impressive in China and India, with both having a road network of several million kilometres. In China, the average yearly increase in highway kilometres for the period 2009-2011 was above 125,000 km. In India, the overall network has increased by over a million kilometres since 2004 (mainly rural roads as the total length of national and state highways has increased by 36,086 km to 234,832 km over the same period (2004-2011)). Unsurprisingly, countries with very dense networks like Japan, Singapore or Bangladesh, or with well established transport systems such as Australia and New Zealand have experienced lower growth rates. Most growth has actually occurred mainly in the Least Developed Countries (LDCs), which have a relatively lower starting baseline and strong needs for infrastructure expansion.

The growth rate in the total network length is, however, only one indicator of the development of the road sector. As mentioned before, the condition of the road is probably as important as the size of the network. For instance, while the growth rates in LDCs are particularly encouraging, one should not overlook that these networks remain largely unpaved (see Figure 1.3). On the other hand, some countries which appear to have relatively low growth rates have nonetheless invested heavily in developing or upgrading their major road infrastructure. For instance, Turkey has almost doubled its network of highways during the 2006-2012 while its average yearly growth for the whole network was only 1.7%.

Finally, expanding road networks should be considered in conjunction with road maintenance issues, as each additional kilometre will increase the overall need for maintaining existing assets. Allocating sufficient resources for maintenance has historically proven to be a challenge for countries in the region (see Box 1.6). This is particularly important as inadequate expenditure on road maintenance can significantly increase the long run costs to the owner of the road (usually the government), as well as the vehicle operating costs for road users.

FIGURE 1.3
PAVED RATIO IN ESCAP LEAST DEVELOPED COUNTRIES (LDCS)



SOURCE:
ASEAN-Japan Transport Partnership (http://www.ajtpweb.org/) for South-East Asian countries (2011 figures), World Bank Databank for Bangladesh and Bhutan, and Nepalese Central Bureau of Statistics for Nepal (http://cbs.gov.np/)

NOTE:
no recent data were available for Afghanistan

In conclusion, the figures presented in this section confirmed that impressive progress in road networks has been achieved in the region. This should contribute to improved access for the population, as well as create the possibility for a larger share of the population to benefit from regional integration. Such improved connectivity remains, however, highly dependent on the quality of the infrastructure, which in turn depends on adequate design, planning, financing and maintenance practices.

BOX 1.6
ROAD MAINTENANCE - A CRITICAL BUT NEGLECTED ISSUE

Policy reforms for road maintenance and road funds were introduced in the region nearly 20 years ago by ESCAP, the World Bank and other development partners. Despite progress in some countries, however, road maintenance remains a major challenge for most countries in the region. This is partly due to the fact that motorization rates are increasing, while governments continue to construct new roads without due attention to the management and maintenance of existing road assets.

In this regard, ESCAP, the World Bank in Viet Nam, and the Directorate of Roads of the Ministry of Transport of Viet Nam, jointly organized an Expert Group Meeting on Road Maintenance and Management in May 2013 in Hanoi, Viet Nam. The meeting brought senior government officials from South and South-East Asia together to discuss current issues in road maintenance, including challenges such as insufficient and irregular funding for maintenance; the low level of priority given to maintenance by policy-makers; the challenge of coordination amongst different agencies involved in maintenance; and ways to involve the private sector, local people and communities in the maintenance process as the issue of maintenance cannot be addressed by governments alone. The development of a "maintenance culture" and change in attitudes towards maintenance was stressed, as well as the need to approach roads using a life-cycle approach so that the long term maintenance needs were appropriately "costed" into the planning and construction phases. In particular, the meeting noted the urgent need to improve the maintenance of rural roads was highlighted, as these roads served as lifelines of communities in rural areas. Future work by ESCAP in this area will aim to revitalize the road maintenance initiatives started in the 1990s and to re-establish road maintenance as an important issue in the international development agenda.

NOTE:
Women from the Lang Chanh District, Thanh Hoa province of Viet Nam, working to maintain local roads to their village" (May 2013)

Trans-Asian Railway network as a catalyst for regional cooperation

RAILWAY INFRASTRUCTURE

While the road sector has remained the key focus of investment throughout the region, significant progress has been achieved to improve rail connections within and between countries of the region. In particular, increased resources have been directed at modernizing existing infrastructure and replacing old rolling stock. These efforts, however, have not been uniform across the region. A short overview of rail infrastructure in the Asia-Pacific region is provided in the next section, followed by a more in-depth analysis of regional corridor development and the role of the Trans-Asian Railway network.

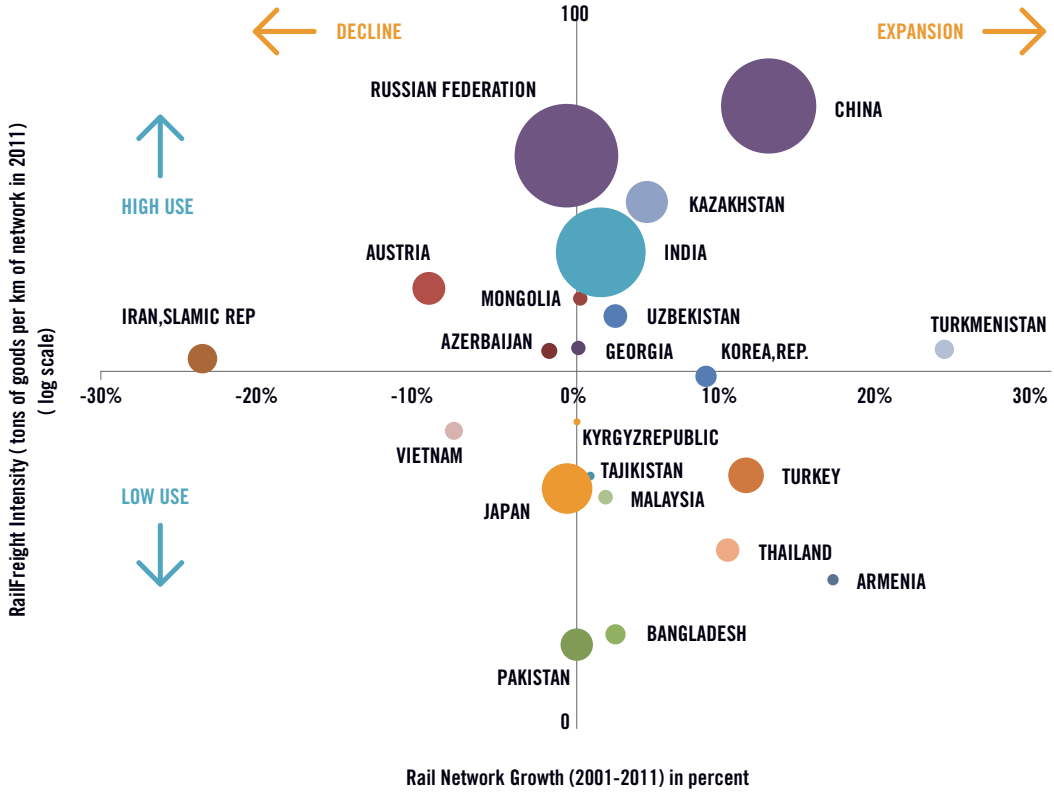
Recent trends in the Railways

Figure 1.4 below gives an overview of the current situation regarding the size of the network in each country, its expansion (percentage of growth over the period 2001-2011) as well as the intensity of its use for freight transport, estimated on the basis of annual average tonnes of freight per each km of the network (ranging from 38.7 tonnes per km of network for China to 0.23 tonnes per km of network for Pakistan).

The figure also shows that rail freight in the region has so far been dominated by four major players, China, India, Kazakhstan and the Russian Federation (upper half of the chart) which are also among the countries having the longest rail network in absolute size (represented by the size of the bubble on the chart). Unsurprisingly, countries with active mining industries, such as Australia and Mongolia, are also intensively using their rail network for freight movements. In 2010, the Government of Mongolia approved the expansion of the country's rail network by over 1,800 km of new heavy axle-load routes to connect the country's deposits of mineral ores to international markets.

It can be observed that South East, South and South West Asian countries (with the exception of India) currently have a fairly low usage of rail in comparison with road.

FIGURE 1.4
STATUS OF RAIL DEVELOPMENT IN THE ESCAP REGION



NOTE:
Bubble sizes are proportionate to the total length of the network in each country
Source: ESCAP based estimates using World Bank Databank http://databank.worldbank.org/data/home.aspx

Most of these countries carry only limited freight volumes by rail, and although they provide an important service for passenger transport, many railway organizations are operating without profit or at a loss due to various factors, including lack of investment in networks and limited flexibility in setting passenger ticket prices. However, some countries are starting to invest more seriously in their railway networks. For example, Turkmenistan has increased the size of its network by 26.2 per cent, while Turkey has increased its network by 10.6 per cent, in particular through the construction of high-speed lines. Some recent developments in rail infrastructure and ongoing initiatives to improve railway operational efficiency are described in the next section.

Future Infrastructure Plans

Investment in railway infrastructure projects will be a critical factor in determining the attractiveness of rail for shippers and transport operators involved in cross-border freight movements in the region. In this respect, the construction of 'missing links' is particularly important to improve the operational readiness of regional rail linkages (see Box 1.7).

BOX 1.7
MISSING LINKS

A missing link results from the absence of physical tracks between the railway networks of neighbouring countries or the absence of continuous railway infrastructure within one country. These missing links prevent the network from functioning as a continuous system. According to ESCAP estimates, these constitute about 10,500 km of rail track (or approximately 9% of the TAR network), mostly located in the ASEAN sub-region. While these links can be filled by transhipments to trucks, shippers are discouraged from using rail because of the longer transit time and higher costs.

In order to gain a better understanding of the emerging trends in the region, several key railway infrastructure projects aimed at improving rail connectivity at the regional level are presented below.

East-West Corridor in Central Asia

In Central Asia, rail routes are being developed to serve East-West transport demand. For instance, the Governments of Azerbaijan, Georgia, Kazakhstan and Turkey signed a Memorandum of Understanding in November 2012 to operate a Silk Wind container block-train service that will run

FIGURE 1.5
SELECTED RAIL PROJECTS IN CENTRAL ASIA IN THE REGION (PART I)

from Dostyk, the border station between China and Kazahstan, to Aktau, a Kazakh port on the Caspian Sea. From there, freight will be ferried across the Caspian Sea to the port of Alyat in Azerbaijan, for onward movement to Baku, Tbilisi and Kars in Turkey via the soon-to-be-completed Baku-Tbilisi-Kars rail project that will connect the rail networks of Georgia and Turkey. The project, which will enable continuation of container block-train services from China, will eventually offer a new route to Eastern and Southern Europe when the Marmaray project is completed (see Box 1.8). Transit along the corridor will further benefit from the construction of the $3.3 billion Zhezkazgan – Beineu railway link (988 km) approved in 2012 by the Government of Kazakhstan. This link would considerably reduce the carriage distance between Dostyk and Aktau (see Figure 1.5).[10] Additionally, in Kazakhstan the opening of a second border crossing point with China at Khorgos in December 2012 is expected to generate further trade between China and Central Asia. The opening of the border point took place in parallel with the construction of a rail section between Khorgos and Zhetingen (close to Almaty) and the establishment of the "Khorgos-East Gate" free economic area (see section below on dry ports).

Finally, other countries in Central Asia are also taking steps to improve their regional rail connections. For instance, a 268 km line from Kashi, China, through Osh, Kyrgyzstan, to Andizhan in eastern Uzbekistan has been in discussion since the late 1990s (see Figure 1.5). However, the high estimated construction cost of around $2 billion has so far prevented the project from being realized. The project received new attention in 2012 with the signing of a Memorandum of Understanding between China and Kyrgyzstan to commission the definition of technical designs. Meanwhile preparation for a feasibility study has already started and it is estimated that the project could shorten the route from China to Europe by 900 km (see Figure 1.5).[11]

BOX 1.8
THE MARMARAY PROJECT

The Marmaray project is one of the world's largest transport infrastructure projects currently underway. It aims to connect the Asian and European sides of Istanbul through 76.7 km of upgraded or new railways from Halkali to Gebze, including 1.4 km of immersed tube tunnel which will be the first rail crossing of the Istanbul Straits (an idea first mooted in 1860) and, at 55 metre below sea level, the deepest immersed structure in the world.

In addition, the over $3 billion project, which is set for completion in the last quarter of 2013, includes 12.2 km of bored tunnels and upgraded tracks totalling 19.6 km on the European side and 43.3 km on the Asian side. Three new stations will be constructed and 37 stations will be rebuilt, as well as an operation control centre. Adding to the engineering challenge and cost is the fact that the tunnels and stations are being designed to remain operational after an earthquake of 7.5 on the Richter scale. The tube tunnel will have three running lines, i.e. two for commuter and freight trains, while the third one will be for high-speed trains.

Istanbul's railway network currently caters for just 3.6 per cent of all journeys in the city. It is hoped that with the commissioning of the new rail link, the city will accommodate up to 28 per cent of all passenger journeys, bringing Istanbul on par with other major cities such as London and New York where the railways play a major role in passenger transport.

ESCAP photo

FIGURE 1.6
SELECTED RAILWAY PROJECTS IN THE REGION (PART 2)

North-South Corridor through Central Asia

In addition, as highlighted on Figure 1.6, projects are being implemented to establish north-south corridors linking Northern Europe to the Persian Gulf, along routes either on the western side of the Caspian Sea, i.e. via the Russian Federation and Azerbaijan, or on its eastern side via the Russian Federation, Kazakhstan and Turkmenistan. On the western side of the Caspian Sea, the Iranian Railways have been working for a number of years on completing the 372 km Qazvin-Rasht-Astara link. As of June 2012, 75 per cent of the 205 km section between Qazvin and Rasht had been completed, while work had started on the 167 km section from Rasht to Astara at the border with Azerbaijan. [12]

On the eastern side of the Caspian Sea, a 677 km rail link from Uzen (Kazakhstan) to Bereket-Etrek (Turkmenistan) and Gorgan (the Islamic Republic of Iran) is being built. About 137 km of the link will be in Kazakhstan, 470 km in Turkmenistan and 70 km in the Islamic Republic of Iran, where it will link with the country's main rail routes connecting to Bandar Abbas and the future port being developed at Chabahar. In May 2013, Kazakhstan and Turkmenistan celebrated the completion of a 146km line from Uzen (Kazakhstan) to Serhetyaka (Turkmenistan) as part of the project.

Meanwhile, bogie changing facilities are being built at the border between Turkmenistan, which operates on a 1.520mm gauge, and the Islamic Republic of Iran which operates on a 1.435mm gauge.

As regards rail development in Armenia, the Government has cleared the way for a feasibility study for a 316-km single-track electrified line section to link the national network to that of the Islamic Republic of Iran at Meghri. In January 2013, a tripartite agreement was signed by representatives of Dubai-based investment fund Rasia FZE, Russian Railways (RZD) subsidiary South Caucasus Railway (SCR) and the Armenian Minister of Transport and Communications. In 2012, Rasia FZE signed a concession agreement with the Armenian government to develop the project on a public-private partnership (PPP) basis. The project has an operating term of 30 years with an option for a 20 year extension.

South and South West Asia

Across South and South West Asia, a number of activities are being undertaken, with a selection presented in the following paragraphs.

In Afghanistan, following the successful completion and commissioning of the 75 km line section between Khairaton and

Mazar-i-Sharif, the Government has defined an ambitious rail development master plan aiming to develop connectivity with its neighbouring countries, thereby offering the long-term prospect of fast rail transit between countries of Central Asia and the ports of Chabahar and Bandar Abbas in the Islamic Republic of Iran and Gwadar and Karachi in Pakistan.

Among the routes included in the plan, the most advanced is the northern east-west corridor with a distance of about 1,250 km from Shirkhan Bandar (border with Tajikistan) to Herat via Mazar-i-Sharif, and two branches to border points with Turkmenistan. Related to this corridor, the presidents of Afghanistan, Tajikistan, and Turkmenistan signed a Memorandum of Understanding in March 2013 to construct a railway line of 400 km that will link the three countries from Aqina to Shirkhan Bandar. The project is expected to be completed by 2015. Other routes in Afghanistan have also been discussed such as a rail link from Kundus to Torkham (Pakistan) via Kabul or a branch line from Pakistan to Kandahar.

In Pakistan, the doubling of railway track between Lahore and Karachi is ongoing. On completion of this project, sectional capacity will increase from 18 to 34 trains daily, while journey times from Lahore to Karachi will be reduced by one hour for mail/express trains and seven hours for freight trains. A feasibility study to connect the seaport of Gwadar with Afghanistan and China by rail will be initiated by the Government of Pakistan in the near future. Additionally, the Government of Pakistan has indicated its interest in developing a high-speed line using technical assistance from China.

In India, the start of construction on an initial 343-km double-track electrified section between Kanpur and Khurja as part of the Delhi – Kolkata dedicated freight corridor marks another significant step towards improved freight transport in the region.

FIGURE 1.7
SELECTED RAIL PROJECTS IN AFGHANISTAN

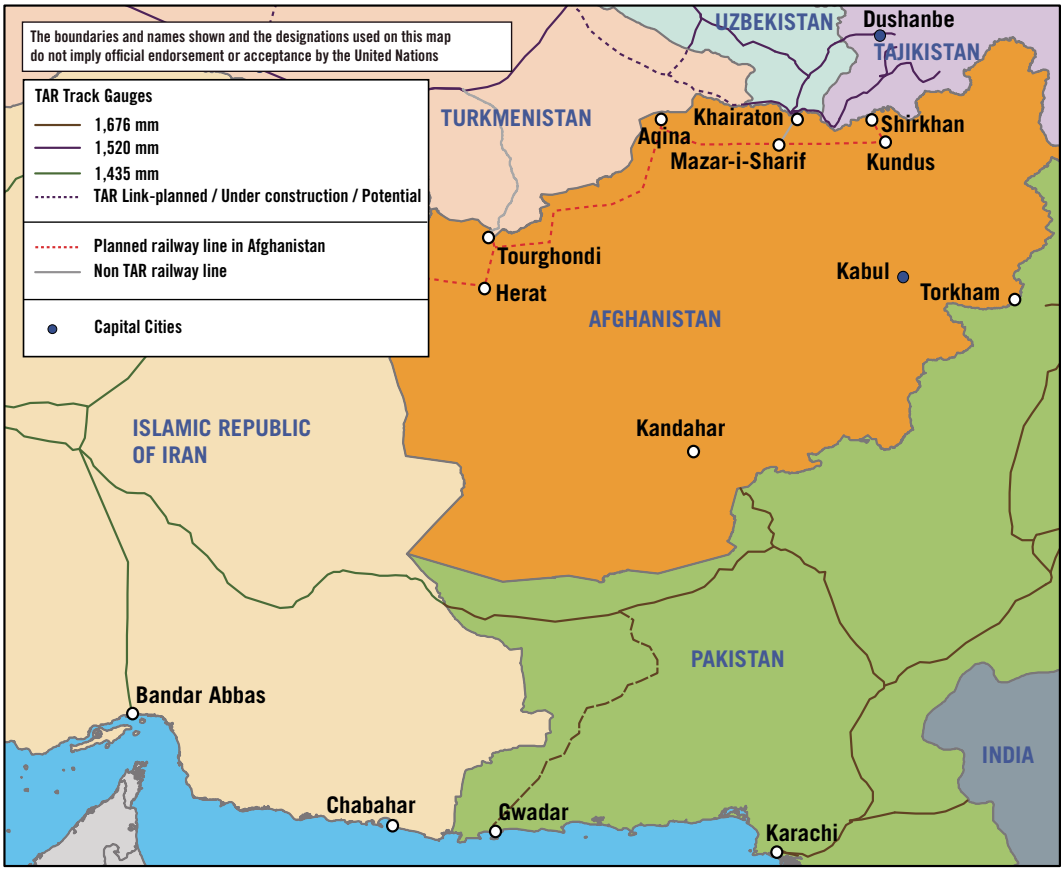
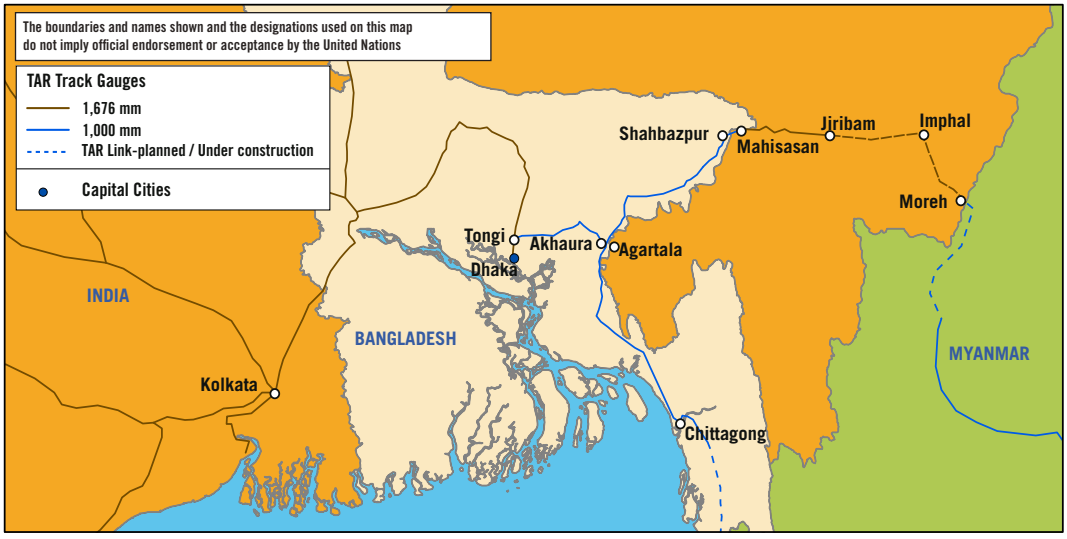


FIGURE 1.8
SELECTED RAIL PROJECTS IN SOUTH AND SOUTH-WEST ASIA



In addition to developing its domestic rail network through a continued policy of track doubling, gauge conversion and electrification, India is also cooperating with its neighbouring countries to facilitate rail network development and put in place efficient cross border linkages. In this regard, work is continuing on the Jiribam-Imphal rail section as a first step towards reaching the border with Myanmar at Moreh. India is also collaborating with Bangladesh to put in place the 11km Agartala (India) – Akhaura (Bangladesh) rail link that will open a new corridor between the two countries, while substantially improving transport connectivity between the north-eastern states of India and the rest of the country and offering access to the port of Chittagong.

Meanwhile, in 2012 the Asian Development Bank and the Government of Bangladesh signed a loan agreement worth $150 million to help improve capacity, efficiency and safety of the country's railway system. The assistance will help complete double-tracking of the 64km of section Tongi-Bhairab Bazar of the Tongi–Akhaura line. The assistance forms part of a $430 million multi-tranche financial package agreed between the Bank and the Government of Bangladesh in 2006 to revamp the entire railway system.

Two other important projects approved by the Government of Bangladesh are (i) the restoration of cross-border rail operation with India along the Shahbazpur-Mahisashan line section, which was closed to traffic in 2002 due to poor track condition; and (ii) the $2.9 billion road-rail Padma bridge that will connect Dhaka with the southern and south-western regions of the country.

FIGURE 1.9
SELECTED RAIL PROJECTS IN SRI LANKA

Finally, India is also lending financial and technical assistance to Sri Lanka. It recently provided a $800 million loan for the completion of the 43 km section Madawachi–Madhu section of the Colombo – Talaimannar line (see Figure 1.9). Meanwhile, Sri Lanka has also received a $278 million loan from China to finance the first phase of the 115 km Matara-Kataragama railway extension project.[13] The funds will be used for the initial 26.8 km Matara-Beliatta section of the railway line, which is currently under construction. The other two phases are Beliatta to Hambantota and Hambantota to Kataragama.

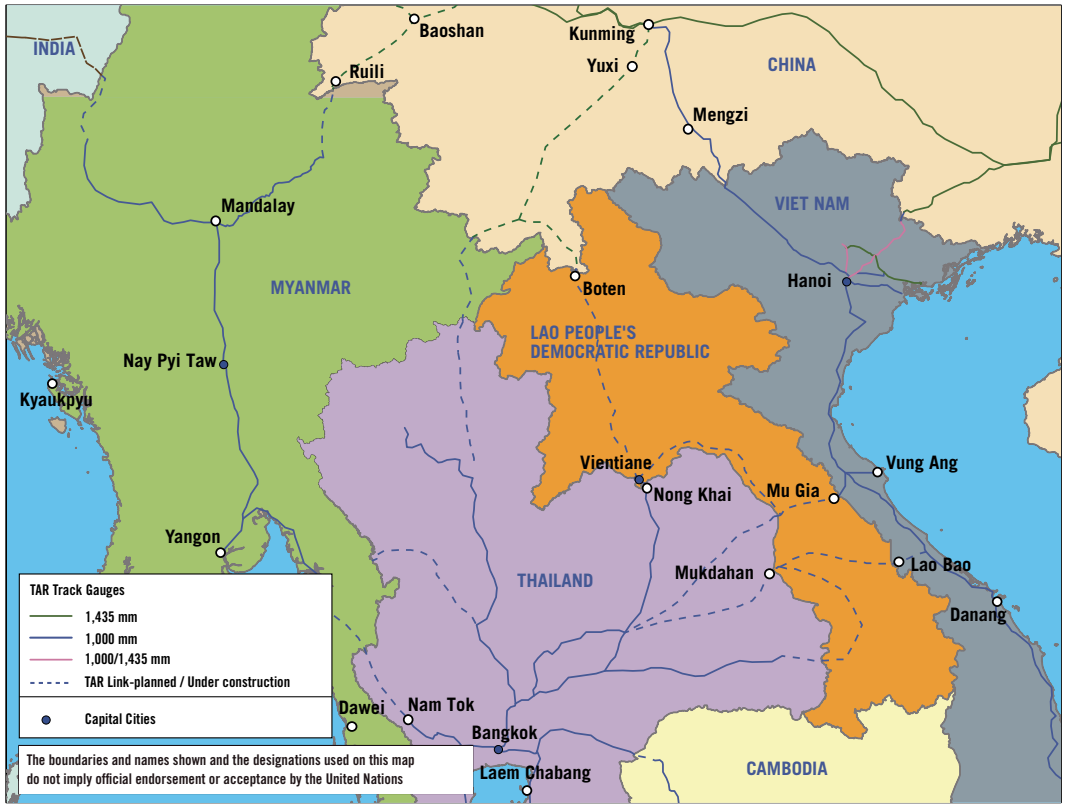
South-East Asia

In the ASEAN subregion, the need to develop subregional rail linkages has long been recognized by governments and railway organizations, and related activities are being implemented by the ASEAN secretariat under the Singapore-Kunming Rail Link (SKRL) project as part of the Master Plan on ASEAN Connectivity. Infrastructure development in the subregion is also the focus of the ADB's Greater Mekong Subregion (GMS) initiative. To facilitate the financing of major infrastructure projects under the Master Plan, an ASEAN Infrastructure Fund was established in 2010, which is supported by funding from both ASEAN members and the ADB (see Chapter 3).

Some concrete progress has been made recently in the subregion. For example, in February 2013, Chinese Railways opened the 141 km line between Yuxi and Mengzi, which will contribute to the development of rail links between China and Viet Nam. Work has also started on the 330 km Chinese section from Dali to Ruili with a view to connecting the rail networks of China and Myanmar (work started on the Dali-Baoshan section in 2008 and on the Baoshan-Ruili section in 2010). When the Dali-Ruili section is completed, the plan is to extend it over 868 km to Myanmar's deep sea port at Kyaukpyu on the Bay of Bengal.

Another major infrastructure project in the subregion is the development of an industrial and logistics zone in Dawei, Myanmar, with related developments in port infrastructure, highways, railways and industrial estates. An important component of the project is the rail link that will come from Kunming, China via Boten in Lao People's Democratic Republic, before following the line from Nongkhai to Bangkok in Thailand. From Bangkok, the line would follow the west-bound alignment that currently stops at Namtok, from where a new line will be constructed to cross into Myanmar and go to Dawei (approx. 110 km).

FIGURE 1.10
SELECTED RAIL PROJECTS IN SOUTH-EAST ASIA



However, the mega project is estimated to cost $58 billion and is fraught with political, economic and financial uncertainties. Attracting foreign and private investors will require substantial changes in Myanmar's investment laws. In addition, financial considerations have also delayed progress on the 417 km rail project just mentioned between Vientiane to Boten in Lao People's Democratic Republic. The $7 billion project is now expected to be financed with loans from China (feasibility study completed in June 2012).[14]

This project is part of an ambitious master plan of the Laotian government to develop a modern rail infrastructure and connect it to the networks of China, Thailand and Viet Nam. This master plan also includes a 450 km line from Vientiane to Mu Gia at the border with Viet Nam (pre-feasibility study completed in March 2011), as well as a 222 km line from Mukdahan at the Thai-Lao border to Lao Bao at the border with Viet Nam, (pre-feasability study completed in September 2009) with an onward link to Viet Nam's Danang port. As regards the latter, in November 2012 the Laotian government awarded a 50-year concession contract worth $5 billion to a Malaysian contractor which will have to construct and operate the railway.[15]

On a smaller scale, the extension of the rail link from Nongkhai, Thailand, to Vientiane, for which Thailand has agreed to provide financial support, could be finished by 2014 (the first step of which was completed in March 2009 with the inauguration of a 3.5 km extension of the Thai network from Nongkhai to Thanaleng in Lao People's Democratic Republic). Coupled with the development of an Inland Container Port in the vicinity of Vientiane, the line will facilitate rail movement to the port of Laem Chabang (140 km south-east of Bangkok) on the Gulf of Thailand and, further south, to the port of Port Klang (Malaysia) on the Strait of Malacca.


Kimbae Park

In Viet Nam, an investment programme worth $9.5 billion over three years was approved by the parliament in 2012, paving the way for the country's railway to undertake significant modernization work on key corridors of its network. The package focuses on raising line speeds to 120 km/h on large sections of the predominately metre-gauge network, in particular on the 1,500 route-km main line between Hanoi and Ho Chi Minh City (completion expected for 2015). Through these projects, Viet Nam Railways expects to increase freight volumes from 7 million tonnes in 2011 to 13.7 million tonnes by 2015 (+95 per cent), while increasing passenger ridership from 12 million passenger-journeys to 17.7 million (+47.5 per cent).[16]

In Thailand, the Government has proposed a package for infrastructure development of around $65 billion to finance projects which could start already in 2014. These projects are part of the Government's long-term development plan, which are being expedited by a commitment to infrastructure investment in view of the forthcoming ASEAN Economic Community in 2015. The largest share of the package, i.e. approximately $43 billion, is expected to be directed towards developing or improving the country's rail network, including through the construction of four high-speed passenger lines (see Box 1.9) and the doubling of 3,000 route-km of metre-gauge lines. This is expected to have a considerable impact on the connectivity of Thailand with its neighbours once the missing links have been put in place.[17]

Other important projects being implemented or considered for passenger rail transport in the region include an agreement between the Governments of Malaysia and Singapore to build a high-speed line between Kuala Lumpur and Singapore under a PPP modality, for which construction and land acquisition costs could reach $8 billion. Completion of this project is envisaged for 2020. In addition, another fast passenger line under consideration using the PPP modality is the 144 route-km between Jakarta and Bandung in Indonesia, to be opened by 2018.[18] Meanwhile, the Government of Indonesia is also developing a number of coal lines in the Kalimantan and Sulawesi regions of the country under PPP modalities.

BOX 1.9
PROJECTED HIGH-SPEED LINES IN THAILAND

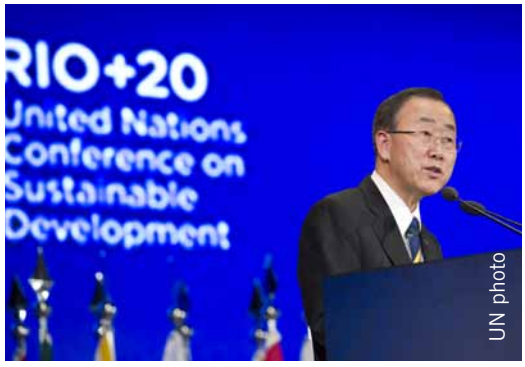
Bangkok – Nakhon Ratchasima: 256 km, $5.3 billion
Bangkok – Hua Hin: 225 km, $3.85 billion
Bangkok – Rayong: 221 km, $3.1 billion
Bangkok – Chiangmai: 745 km, $12 billion

PROMOTING INTERMODAL INTEGRATION

While being an important step, building infrastructure is likely to be insufficient to meet the growing transport demand if not combined with an increased level of integration between the different transport modes. Promoting intermodal integration is not only useful from an economic perspective; it is also a means to improve the sustainability of transport systems in the region. To date, the focus on development of sustainable transport has been very much on urban transport (mainly passenger transport),[19] but increasingly attention is being given to issues relating to the "greening" of long distance freight transport as well as the need to better integrate different transport modes.

A number of socio-economic considerations give added urgency to the development of an integrated intermodal transport system. The growth of world populations and their increasing affluence will continue to amplify global demand for traded products. At the same time, existing modes which are mostly being used independently are being stretched to capacity, and policy makers realize that the building of new infrastructure will not be able to keep pace with this increase in demand. Finally, at a time when the environmental performance of many industries is improving, the transport sector remains a major contributor to greenhouse gas emissions and continues to be highly dependent on fossil fuels for its operation. In this regard, the outcome document "The future we want" adopted at the United Nations Conference on Sustainable Development (Rio+20) in June 2012 calls for governments worldwide to put in place policies to provide better access to goods and services in support of economic and social development, while at the same time minimizing the negative impacts of a rapidly growing transport sector.

In this context, developing intermodal transport corridors seems to offer a framework within which the above concerns can be addressed in an inclusive manner. These corridors provide a framework for



countries to put in place efficient intermodal transport and develop their logistics industries, thereby giving the ESCAP region an opportunity to keep its global economic position, expand benefits for the labour market, and continue to improve the standard of living of its people.

International intermodal corridors are, however, marked by a large number of interfaces between numerous stakeholders at the planning and operational stages. Achieving modal integration will thereby require making these interfaces extremely efficient. In addition, the links between these interfaces need perform smoothly to be able to reap the full benefits of intermodalism. Different initiatives are being pursued to promote these interfaces, particularly through the development of dry ports is gaining importance, while many efforts are also concentrating on enhancing connections between inland logistic hubs and key maritime ports.

DRY PORTS

A key intermodal facilitator

To enable the emergence of truly intermodal networks, the interfaces between the different transport modes need to be improved. With the support of ESCAP, governments in the region have developed and adopted the Intergovernmental Agreement on Dry Ports, which will be open for signature at the second session of the Forum of Asian Ministers of Transport in November 2013. Such an agreement should serve as the basis for the coordinated development of these

critical nodes in an international integrated intermodal transport and logistics system.

It is anticipated that formalizing the development of dry ports through an intergovernmental agreement will (a) promote international recognition of dry ports, (b) facilitate infrastructure investment by attracting strong commitment of member States and increased financing from international banks and bilateral donors, (c) encourage a more harmonized approach to the development and operation of dry ports in the region through enhanced collaboration with the private sector, and (d) contribute to the development of an efficient logistics industry in member States. Some of these benefits are elaborated below.

BOX 1.10
WHAT IS A DRY PORT?

A "Dry Port" provides all of the services of a port except for the loading of cargo to and from seagoing ships. It may be distinguished from an Inland Container Depot (ICD) in that it can accommodate all types of cargo, whereas an ICD specializes in the handling of containers and containerized cargo.

A win-win solution

Provided they are correctly planned and respond to well-identified needs, dry ports can provide significant advantages to shippers, as well as to the governments that support their development. The two different perspectives are presented below.

The "Shipper" perspective

From a shipper perspective, the existence of professionally managed dry ports connected to different transport modes creates the right conditions to realize a shift towards a more efficient transport mode. Having access to well equipped and connected inland logistics centres, shippers can take advantage of the efficiency of rail transport or inland water transport over long or medium distances more easily, while limiting road transport to the "last mile" of their trips.

Dry ports can also improve regional network connectivity by lessening the burden created by mandatory transhipments. The latter can include breaks of gauge in the rail network or obligations to change vehicles due to regulatory provisions. These can be handled optimally at dry ports where modern trans-loading equipment should be available.

BOX 1.11
WHAT IS A BREAK OF GAUGE?

A break-of-gauge occurs when the railways of neighbouring countries have different track gauges as, for example, between China and Kazakhstan, or the Islamic Republic of Iran and Turkmenistan. However, discontinuity of track gauge also occurs within individual domestic railway networks. Such is the case, for example, in Bangladesh, India and Viet Nam. Various techniques exist to overcome these discontinuities. They include transhipment, bogie exchange and the use of variable gauge bogies.

In addition, dry ports can serve as logistic hubs where functions like distribution, packaging, labelling or warehousing could be outsourced with the objective of reducing the overall cost through economies of scale. Consolidation of LCL (Less than container load) shipments can also be realised at these facilities, resulting in additional cost savings.

Finally, when provided, the possibility of accessing round-the-clock customs services can be very valuable in facilitating the clearance of all administrative documents related to transport activities.

The "Government" perspective

Ideally, national economies would reap the financial benefits from investments in such facilities through trade opportunities triggered by higher logistic efficiency. Meanwhile, governments can collect increased revenues in corporate taxes, the private sector can gain from enhanced competitiveness, and the local population can have access to wider employment opportunities.

Indeed, efficient transport and the clustering of industries and logistics services around intermodal interfaces play a critical role in the decision of industries to establish production units at specific locations. As such, developing dry ports may create economic stimuli by attracting manufacturing, agricultural processing and associated activities. In addition, dry ports could be developed into special economic zones with a much broader industrial and service base. Similar growth potential has existed around seaports that have brought prosperity to coastal areas by clustering economic activity and services, which has in turn attracted further economic factors of production, particularly a constant pool of mobile and well-trained labour, in a self-perpetuating process.

Other positive spillovers can also be expected. For instance, by allowing an increased shift from road to rail for medium-long distance trips, dry ports can have a moderating impact on the number of kilometres travelled by trucks, which should ultimately result in reduced road maintenance costs, fewer road accidents and lower greenhouse gas emissions. This would be particularly significant for port cities, which may also benefit from reduced congestion from trucks servicing their ports.

Finally, budgetary investments should be relatively limited as activities at dry ports have the potential to be profitable, making dry ports a good candidate for private investments through PPP solutions. Public investments would nevertheless be expected to provide connecting transport infrastructure, water supply systems, power supply systems, and customs services. On the other hand, the private sector could finance, provide and operate the container handling equipment.

Box 1.12 describes some of the activities implemented by ESCAP over the past year to enhance the capacity of member countries to plan, develop and operate dry ports of international importance

BOX 1.12
ESCAP RECENT INITIATIVES TO PROMOTE DRY PORTS

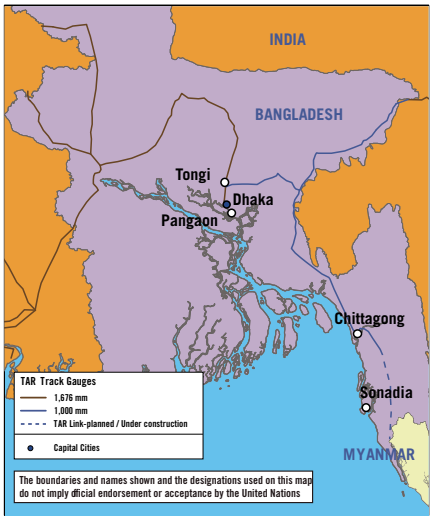
ESCAP is working on a review of best practices in the establishment and operation of dry ports. Areas under review cover (a) features of a Dry Port, (b) insight into possibilities and problems for Dry Port realization, (c) consideration for options for Dry Port funding and management, (d) communication between Dry Ports and other actors in the logistics chain, and (e) description of ICT technologies for efficient Dry Port management. Case studies / best practices in the ESCAP region as well as Europe and North-America will then be used to draft policy guidelines which can assist transport policy makers of the region in planning Dry Ports in their countries. The initial review findings were presented at a subregional seminar held in Busan, Republic of Korea, on 11 and 12 June 2013 for countries of North and Central Asia and East and North Asia. ESCAP is planning to hold a similar sub-regional meeting for countries of South and South-East Asia in 2014.

Selected examples of dry port development in the region

Recognizing that an important factor in unlocking trade is the availability of adequate logistics facilities and services, a number of countries have started to implement projects to develop modern facilities or upgrade existing ones. Table 1.1 below lists selected dry ports in the ESCAP region

TABLE 1.1
SELECTED DRY PORT PROJECTS IN THE ESCAP REGION

BANGLADESH



In addition to the existing ICD operating in Dhaka located in a heavily congested area adjacent to the Kamalapur Passenger Railway Station, the construction of a new ICD at Pangaon on the Buriganga River near Narayanganj, about 13 km by waterway south of Dhaka, was completed in late 2012 and is expected to operate from August 2013. This facility, which is being developed jointly by the Bangladesh Inland Waterway Authority (BIWTA) and the Chittagong Port Authority (CPA), will be operated under a contract awarded to a private operator under a competitive bidding process. The overall development cost of this facility is approximately $23 million and it will have an annual handling capacity of 116,000 TEU initially, later expanding to 160,000 TEU. According to CPA representatives, carrying costs through waterway will be much cheaper than by road and railways and it will take 16 hours to carry goods from the Chittagong end.[20]
A second ICD has been proposed at Dhirasram Bazar (close to Tongi industrial area), some 28 km by road and rail north of Dhaka. It is understood that this facility was proposed in conjunction with the development of the deep-sea port at Sonadia. While plans for the development of this facility have yet to be finalized, its expected capacity will be several times that of the ICD at Pangaon. Located on the Chittagong – Dhaka rail corridor, the facilities are expected to substantially reduce the cost of container movements.

INDIA

In India, in view of the region's containerization trends, the Government set up the Container Corporation of India Limited (CONCOR) in March 1988 with the prime objective of managing changes in India's logistics industry. Since its creation, CONCOR has put in place an extensive network of 62 Inland Container Depots, of which 48 are export-import depots. The terminals are almost always linked by rail to the Indian Railway network, unless their size or location dictates that they be linked by road. The efficiency of interfaces between agencies and modes has seen CONCOR container traffic jump from 1,044,728 TEU in the year 2000-01 to 2,604,311 in the year 2011-12 (mainly transported by rail).[21] The dry port policy of CONCOR is taking on new relevance under the Government's Delhi-Mumbai Industrial Corridor project, which includes the construction of a dedicated freight corridor (DFC) with a number of logistics parks along the route.

INDONESIA

In Indonesia, the Government has long been implementing several dry port projects, most notably at Gedebage, Surabaya, Solo and Cilegon. However, the Government's flagship project in the area of dry port development is the Cikarang Dry Port, strategically located in Jababeka Industrial Estate, which lies in the heart of the biggest manufacturing zone of west Java and is a manufacturing base for over 2,500 industrial companies. These companies generate over half the total container throughput of Indonesia's main container port at Tanjung Priok which, in 2011, handled over 4.7 million TEU. Approximately 200 hectares are allocated for Cikarang Dry Port, which is accessible by the highway and railway system. Being the extension gate of Tanjung Priok, document formalities for port clearance and customs clearance are completed at Cikarang. The development of Cikarang Dry Port is one of several initiatives by the Government of Indonesia to streamline and increase the country's competitiveness.

KAZAKHSTAN - CHINA

The Governments of China and Kazakhstan have been cooperating on the development of the "Khorgos-East Gate" free economic area located in the south-east of Kazakhstan, just a kilometre away from Kazakhstan's border with China. The area includes Khorgos International Centre for Cross-Border Cooperation, centres for trade activities, a dry port, a transport and logistics complex, an industrial area and space for industrial companies. The project, which is included in the strategic plan for the development of Kazakhstan by 2020, has an estimated cost of around $3.5 billion, of which around 75 per cent is to be covered by private investments.

REPUBLIC OF KOREA

In the Republic of Korea, Uiwang Inland Container Depot (ICD) – located 25 kilometres from Seoul – was developed in 1992 by Korean Railroad and a number of private transportation companies. It currently handles over 1 million TEU per year. The provision of rail sidings at the site has contributed to a modal shift towards rail transport and contributed to reducing road congestion and CO_2 emissions along the Seoul-Busan corridor. Currently, the site has a capacity to handle 36 trains per day. The facilities at Uiwang have also contributed to reducing congestion at the port of Busan while providing employment to 1,000 people and generating tax revenues for local government.

NEPAL

As already mentioned in this Chapter (see Box 1.4), the Government of Nepal has developed the Birgunj ICD with World Bank financial support. The ICD has a 12 km rail link to the Raxaul railhead at the Nepal-India border with further rail connection to the Kolkata/Haldia port complex in India. It is equipped with the automated United Nations-sponsored system for customs data (ASYCUDA). To ensure smooth movements of trade the Government of Nepal concluded a rail service agreement with India for the operation of dry ports. The Birgunj facilities are leased to the private sector for operation. It currently handles containers, tank wagons for liquid cargo, and flat wagons for bilateral break-bulk cargo, receiving an average of around 15 - 16 freight trains per month. In a country in which climate change and global warming can have serious consequences, the potential for emission reduction of the rail-based Birgunj facilities is an important reason behind the further development of the facilities.

UZBEKISTAN

The Government of Uzbekistan is developing intermodal corridors and dry ports in the country, in particular at Angren in the Tashkent region, to serve the Andijan, Namangan and Ferghana regions of eastern Uzbekistan, and Navoi, 350 kilometres south-west of Tashkent. The Navoi dry port has been developed in connection with the Navoi Free Industrial Zone (FIZ) close to the international intermodal hub at Navoi airport which began operation in 2009 under management of Korean Air. The facilities are located along major subregional road, rail and aviation routes to capitalize on the country's transit potential. Concomitantly, the Government has implemented a number of policies in the form of tax incentives and exemption of customs fees to encourage industries to cluster in the Navoi FIZ.

What is holding back modal shift?

ROAD - RAIL -MARITIME LINKS

While the previous section highlighted the ongoing initiatives to enhance inland interfaces of international transport corridors, this section will investigate the potential for increasing the use of rail for transporting goods from inland centres to key maritime ports. This issue is particularly important as improving the efficiency of these critical rail-port links is instrumental for the success of intermodal transport corridors and ultimately for the sustainability of Asian transport systems.

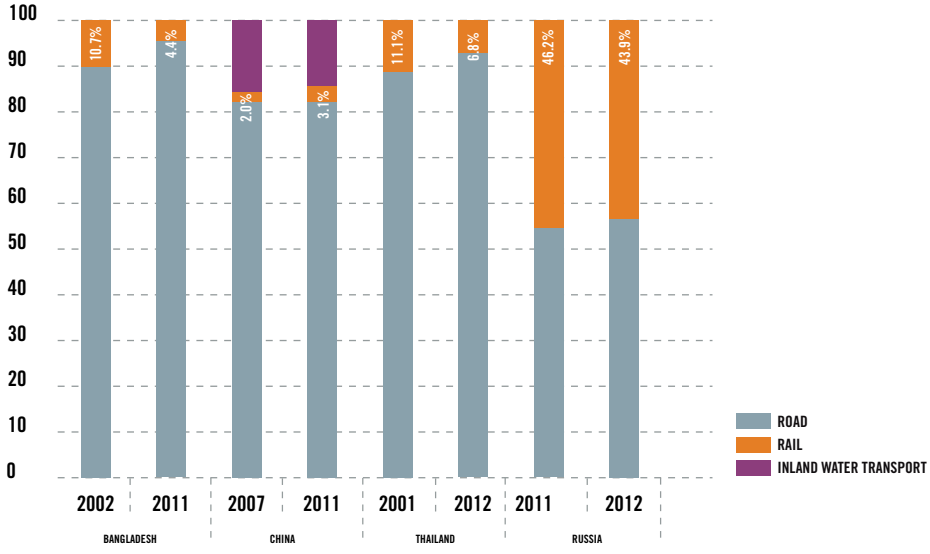
Current Modal split

To have a better understanding of the current situation in the region, a short review of the modes of transport used between selected inland centres and key maritime ports in four countries has been conducted. These countries include Bangladesh, China, Thailand and the Russian Federation.

For Bangladesh, the traffic flow between Dhaka and Chittagong, the Bangladesh's sole container port located 264 km by road and 346 km by rail southeast of Dhaka was studied; while for Thailand, the link between the largest Thai port (Laem Chabang International Port handling approximately 6 million TEU in 2012) and the rail-served Inland Container Depot (ICD) at Lard Krabang was considered. As regards the Russian Federation, three ports in the Far East have been included, namely Vladivostok, Vostochny, and Nakhodka, which together handled close to 1.5 million TEU in 2012. In the case of China, no detailed figures were readily available as regards rail-carried containerized freight per 'origin-destination' so the country's overall port throughput was compared to the volume of containers transported by rail at a national level. The key results are presented in Figure 1.11 below.

What is striking from the above Figure is that the market share of rail over carriage by roads remains very low in most countries, despite widely acknowledged advantages of rail from an economic and environmental point of view (see Box 1.13). For instance, rail container volume in China represented less than 2% of the overall port throughput in 2007. [24]

FIGURE 1.11
ESTIMATED MODAL SHIFT IN THE SAMPLE AREA



NOTE:
Data for this figure was mainly drawn from publicly available online sources, and should therefore be treated as estimates.

BOX 1.13
COMPARATIVE ADVANTAGES OF RAIL OVER ROAD

- Cost competitive mainly over medium distances (e.g. 300+ kilometres) due to economies of scale (many tons of freight and passengers can be moved via a singe vessel) [22] ;
- Energy efficient and low carbon emission. A study estimated that CO2 emissions by rail are almost 8 times less than trucks for freight carried over a distance of 700 kilometres while it was twice more energy efficient;[23]
- Smaller land requirement for right-of-way and smaller impact on water drainage or nearby waterways.

Another interesting result which is not reflected in Figure 1.11 is that the volume of freight transported by rail has actually increased in all four countries. However, it has increased less rapidly than the volume of container throughputs handled in most related ports, resulting in a diminishing modal share for rail in all countries but China.

With all forecasts predicting continued economic growth for the fast-developing countries of the ESCAP region, the challenge is to put in place a transport system best able to provide the services that are necessary for their continued, long-term economic and social development, while reducing inefficiencies and imbalances, and safeguarding against the harmful effects that transport activities generate. Against this background, the rest of this section will try to identify some policies and actions that can be implemented to trigger modal shifts.

Conditions for modal shift

The overall volume of containers traded between Asia and Europe and within Asia represents a sizeable market. Through greater cooperation and coordination amongst railways in the Trans-Asian Railway network, the railways have the potential to develop efficient land-bridge operations which offer shippers a guaranteed level of services at rates which are competitive with those of competing modes.

The high safety record of railway, its substantial possibilities for fast transit times and its potential for improved levels of services, including the use of modern Information and Communication Technologies, are inherent assets on which the railways can capitalize to increase their market share. The fact that current container volumes moving by rail are marginal shows that these qualities are not readily perceived by shippers or freight forwarders. Some options to address this issue are presented below.

Common standards and operating principles

One of the reasons why shippers may be reluctant to use rail, especially for international routes, is because rail is not viewed as one solid, reliable transport mode but as a conglomerate of various systems without unity. Yet, examples exist which show that the trend can be reversed. The growth of intra-Asian trade, together with the need to promote the development of hinterland areas, offers a vintage opportunity for the railways to develop and promote the image of a unified, efficient and, above all, quality-conscious transport operator.

To achieve this, one important step will be to ensure that all concerned (all staff in each railways and other administrations) are aware of their respective responsibilities and of how the performances of each of them fit into the global transport process and ultimately relate to the success of the enterprise. One of the main challenges in setting up international services is to define and maintain clear areas of accountability for every single part or function within the international transport chain. Keeping up service quality at the desired level in a complicated transport chain demands:

- full awareness of customer demands and the importance of total quality management systems among the entity in charge of developing and monitoring services,
- a great degree of personal accountability and constant motivation of all partners along the whole transport chain,
- care for all performance details of the

product purchased by the customer.

Delivering high quality services is all the more important for transport operators as delivery is instant and visible: trains are on time or not; services match promises or do not; the final invoice has or does not have last-minute, unannounced add-ons; goods are delivered undamaged or not. Examples where rail has managed to effectively compete with other transport modes are along the so-called "Northern Corridor" which are further developed in Box 1.14.

BOX 1.14
SERVICE ON THE NORTHERN CORRIDOR

In the Russian Federation, container block-train services along the Trans-Siberian main line continued to show impressive growth. While standard container services take 11 to 14 days to cover the 9,400 km distance between the port of Nakhodka and Moscow, in May 2013 Russian Railways, together with its TransContainer subsidiary and Vostochnaya Stevedoring Co., launched an express service that shortened the travel time to 7 days. This improved transit time is the result of extensive investments by Russian Railways to increase capacity along the main line.

In China, a 5-days-a-week direct rail freight service was launched in May 2011 between the Port of Antwerp, Europe's second-largest port, and Chongqing, the industrial hub in China's southwest. Westbound cargo largely includes automotive and technological goods, and eastbound shipments are mostly made up of chemicals. Meanwhile, since September 2011, Schenker Rail Automotive, the German Railways' automobile specialist in rail freight transport, has managed some 200 container trains filled with automobile parts travelling from Leipzig and Wackersdorf in Germany to the BMW Shenyang plant in the Liaoning province of China. In both cases, while rail freight routes are more expensive than maritime shipping, the 20 to 25-day rail transit times are twice as fast as their ocean-going counterparts, presenting a very attractive business opportunity for high-value-added products such as automobiles.

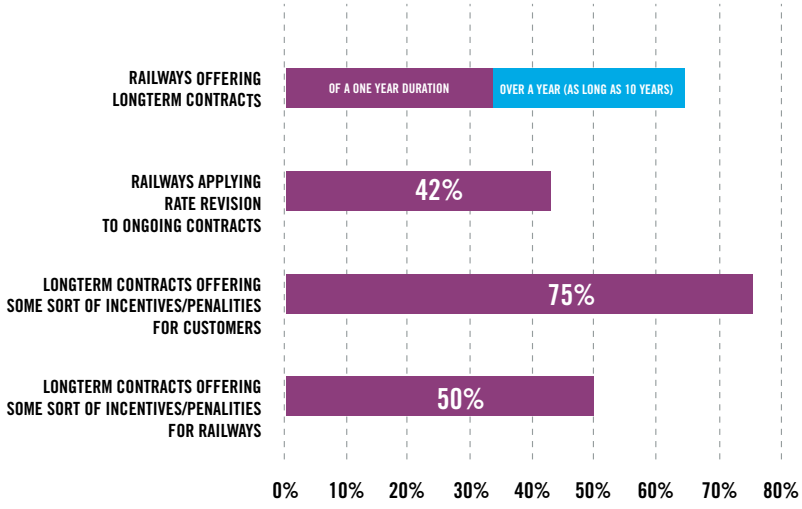
Adequate pricing practices

Of particular importance in the relationship between railways and shippers is the issue of rates. While shippers understand that moving volumes has a price and that transport operators need to generate sufficient revenues to cover costs and maximize the net income earned for each individual shipment, they have greater difficulty accepting frequent or sudden rate volatility. Such fluctuations in rates make budgeting difficult and often force businesses to absorb the cost changes as they are often not in a position to put up the selling price of their products.

In a 2012 survey of railway organizations carried out by ESCAP, 33.5 per cent of respondents admitted changing rates twice a year or more. Meanwhile, 58.5 per cent of railway use media or website to announce rate hikes with only 25 per cent using direct contact to inform customers.

Negotiating long-term contracts between shippers and railways could therefore be a suitable solution offering more stability in the long run. It is, however, important that the terms and conditions governing these contracts be transparent and available to all. In this way, rail tariffs would be transparent and predictable, making them comparable to shipping tariffs which have historically been negotiated under the framework of long-term contracts. To be effective, the terms of the contracts negotiated in good faith have to be observed. This applies to the rates of freight being moved under some form of contractual arrangements. Yet the survey shows that some of these practices are still to be followed in many countries of the region (see Figure 1.12).

FIGURE 1.12
RAILWAY LONG-TERM CONTRACT PRACTICES



SOURCE:
ESCAP 2012 Survey of railway managers

At a country level, it is worth noting the recent offer by Russian Railways[25] to completely de-regulate tariffs for transit transportation of containers, as well as for perishable goods and aluminium products.[26] Such a move introduces the possibility of negotiating long- term contracts with container customers that could embody tariff incentives based on the container volumes committed to rail over a specified period.

Capacity constraint alleviation

The pressure for continuous cost-reduction in industries, and the development of modern management methods favouring limited stock and just-in-time deliveries, makes it compelling for shippers to turn to transport operators with near-perfect records in terms of reliability, punctuality and frequency. Those critical elements will not materialize if railways continue to have serious capacity constraints and leave shippers "screaming for space". Yet, the 2012 survey revealed that 58.5 per cent of railway organizations experience such constraints in one or more of the following areas: mainline capacity, terminal capacity or shortage of rolling-stock.

These capacity constraints have a direct impact on the frequency of services that railways can offer, and therefore diminish their capability to ensure that the intervals between two consecutive services of a certain type match a shipper's production pace, avoiding a situation whereby the shipper has to create and keep significant stocks.

For railways in the TAR network, putting together competitive schedules will result not so much on speed during main line operation, as on the organization of operations between terminals at both ends of the routes. This translates into a reduction of stops and a reduction in the length of the stops that are unavoidable. In this respect, Box 1.15 described how the design of a port can greatly influence the productivity of rail operations.

BOX 1.15
OPTIMIZATION OF PORT LAYOUT PLANS

Very few, if any, ports of the region have layouts which are compatible with the efficient operation of container trains. Typically, rail loading/unloading tracks are of insufficient length to accommodate full length trains and are located too far from berth-side container stacks to allow single lift loading and unloading operations using port handling equipment, such as portal cranes or reach-stackers. Consequently, far from encouraging a modal shift from road to rail, the layout of most ports actually reinforces the predominance of road transport for container movements. The elimination of container double handling as much as possible inside ports could significantly reduce costs as well as the efficiency of container services by rail.

Priority settings

Another way to reduce the number of stops is to afford freight block-trains the same priority as "flagship" passenger trains in the scheduling of services as well as in the daily running of operation. While this idea frequently receives a nod from railway managers, in practice unprofitable passenger services still often get priority over more remunerative freight services.

The 2012 survey showed that 88 per cent of railways give priority to long-distance passenger trains. None of the railways mentioned freight as receiving top priority and when block-trains move up the priority ladder, it is only to second place (only 25 per cent of respondents) or third place (62 per cent of respondents).

The low priority given to freight also has an impact on punctuality. In the quoted 2012 survey, 37.5 per cent of railway organizations still rated their punctuality record as average, and of those, 65 per cent admitted not informing their customers of new expected arrival times, preventing shippers from making contingency plans.

The emergence in different countries (e.g. China) of high speed passenger rail programs may alleviate freight capacity constraints. This is because the development of high speed rail passenger services necessarily involves the construction of lines dedicated exclusively to the operation of specialized, high technology electric train-sets at speeds of up to 350 km per hour. This new passenger-only rail infrastructure[27] will release track capacity by diverting passenger traffic from existing mixed-traffic lines.

Having dedicated tracks for freight could also help solve these traditional conflicts between freight and passenger services. In India, the Government has developed a vision of dedicated freight corridors across the country. In the first phase, two corridors will be constructed, namely a 1,839-km eastern corridor from Ludhiana to Sonnagar and a 1,483-km western corridor from New Delhi (Dadri) to Mumbai.

Customized services

Understanding the value of specific services in a shipper's supply chain and production pattern is essential if services are to match requirements. Yet, in this area, shippers often express frustration at the lack of understanding among transport operators of their supply chain needs and the impact of service deficiencies on their business activities further up the chain. In this regard, railway organizations still need to develop a proactive approach in the way they develop and maintain relationship with customers. Indeed, the 2012 survey showed that while 73 per cent of railway organizations claim that they assess the value of the service in the overall supply chain of customers, 58 per cent of them have no policy to differentiate market segments and only 50 per cent of them have specific officers to handle container traffic.

In some countries, institutional reforms have been implemented to customize services according to different market segments. In the Russian Federation, for example, this was achieved by creating 63 subsidiary companies (e.g. JSC TransContainer or Rail Passenger Directorate) under the state-owned railway company RZD. The capital of some profitable subsidiaries was opened to the public while some joint ventures were created with local government for suburban passenger services, allowing local governments access to financial support for loss making services. [28]

In China, the importance of having a specialized agency to manage the development of and to operate intermodal rail services was recognized in 2003. For this purpose, the China Railway Container Transport Corporation (CRCTC) was established as a wholly owned subsidiary. More recently, the CRTC was re-established as a joint venture company, CR Intermodal, with private sector shareholding added to its own shareholding, including those of: NWS Holdings of Hong Kong (container service provider); CIMC (container manufacturer); Luck Glory (Hong Kong based investor); and DBML (subsidiary of the German railway company, Deutsche Bahn). The re-structuring of its container logistics operations with an infusion of private sector shareholding seems to have provided

the commercial and logistical expertise necessary to manage these operations profitably and in a manner satisfying the needs of container customers.

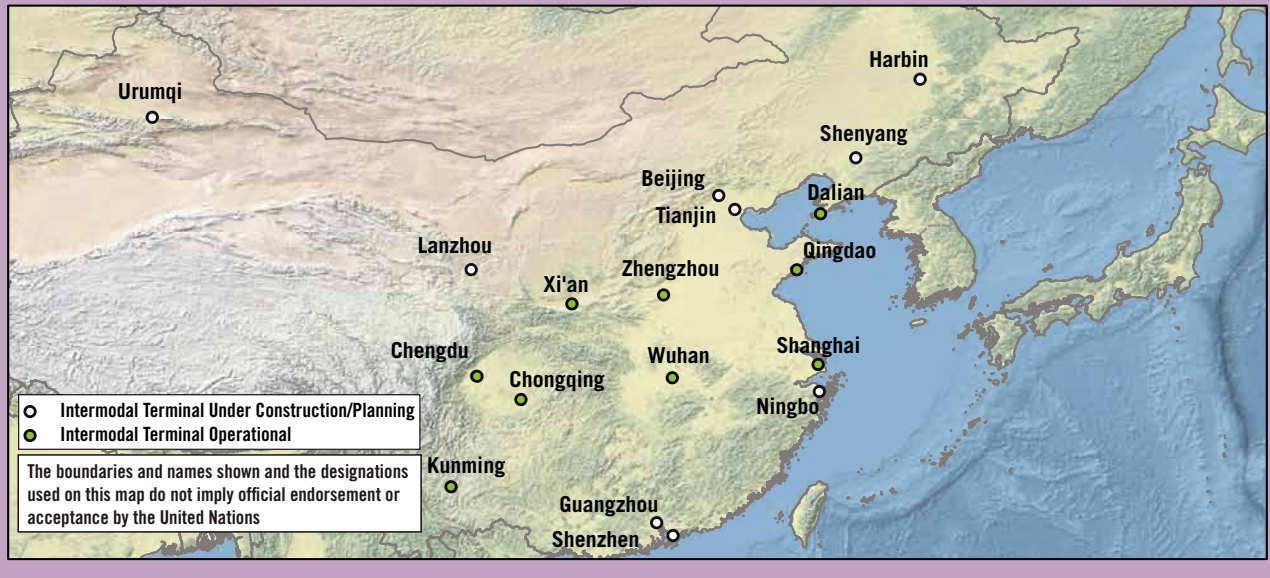
Use of cost efficient rolling stock technology

In a highly competitive environment like the transport industry, railways have to continuously seek solutions to raise productivity. In this respect, different attempts have been made to increase the payload of container block-trains. In China, the approach has been to develop a network of inland intermodal hubs based on port-hub and hub-hub through-operation of fixed formation container trains, each comprising 40 double-stack wagons and conveying up to 160 TEU (see Box 1.16). Double-stack container trains have the potential to reduce the cost of freight as they can double the capacity of standard single tier wagons, but with only a marginally greater tare weight (22 tonnes vs.19.5 tonnes). In India, double-stack operation has also been used for a number of years. For example, Pipav Railway Corporation (a joint venture between the Ministry of Railways and Gujarat Pipavav Port Limited) has been operating double-stack container train since 2006, notably on the 270-km rail section that it constructed under a PPP modality between the Pipavav port terminal and the Indian Railways railhead at Surendranagar (Gujarat). [29]

BOX 1.16
INTERMODAL HUBS AND DOUBLE STACK OPERATION IN CHINA

China offers excellent conditions for intermodal container transportation. The relocation of production facilities from the coastline to central China will increase average transport distance and further raise the attractiveness of combined rail solutions which have a competitive edge in medium to long distances. Against this backdrop, the development of intermodal transport is receiving renewed attention with a target to increase rail container volume to 10 million TEU (from about 5 million TEU currently) over a medium term horizon.

To accompany this growth, China is investing in facilities and track infrastructure. Significantly, over the period 2010-2020, Chinese Railways is planning to adapt about 16,000 km of its railway routes for the operation of double stack container trains and to establish a network of dedicated rail container terminals, connecting the ports with key inland manufacturing centres. By 2020, this network is expected to comprise of 18 major intermodal rail hubs and 40 mid-size container freight stations. Out of the 18 intermodal hubs to be interconnected to themselves and the ports by double stacked container rail services, nine of them are already operational. 30



Another approach has been implemented in the Russian Federation where longer single tier wagon having a capacity of two 40ft containers have been deployed, resulting in a total train length of slightly less than 1,000 metres. While en-route infrastructure can accept trains of this length, it appears that the limited length of container loading/unloading tracks of the ports in the Far East of the country requires the splitting and re-assembly of trains in marshalling yards outside the port.

Both approaches have limitations. For the double stack concept, limitations include those imposed by structure and loading gauge restrictions on many trunk lines throughout the region. The Chinese Railway Corporation has a commitment to overcome these restrictions on its existing lines, but the adaptation of its network requires investment on a scale which would be beyond the financial resources of most countries of the region. A similar observation can be made about the approach of the Indian Railways which is focusing on the construction of new dedicated freight lines to operate block-trains.

On the other hand, the alternative approach of the Russian Railways to achieve increased container haulage capacity by adopting long single tier wagons imposes other limitations, such as the need for tracks with long curve radii, while the continuing use of short single tier wagons offers limited scope for capacity expansion.

There is an intermediate solution involving the use of a single tier wagon of 20.2 metre length with capacity to load three 20ft containers (the “3 TEU wagon”). So far, this type of wagon has been used mainly on the standard gauge railway networks of Australia and, most recently, the Republic of Korea, but it can also readily be applied on narrower gauge networks which already have the requisite axle load limit of 20 tonnes. Its loading efficiency is identical to that of a skeletal 2 TEU wagon, but trains comprising only 27 x 3 TEU wagons can carry the same number of containers as trains comprising 40 x 2 TEU wagons, with a small saving in train length and a large saving in unit operating costs, owing to the smaller number of wagons required and the lighter overall train gross weight.

It should be noted that the three technologies presented above depend on the widespread use of containers. While container traffic has increased tremendously over the last decade (almost tripled from 107 million TEU in 2000 to 302 million TEU in 2010 in the

NOTE:
Example of a double stack container train

ESCAP region[31]), there remain some scope to further increase levels of containerization in the region. For instance, whereas the level of containerization as a percentage of general cargo is higher than 70 per cent in China and Europe, and is of the order of 68 per cent and 54 per cent respectively in the United States and India, it is still only around 35 per cent in the Russian Federation.[32]


RHD, Bangladesh

Coherent policies across mode

While transport operators can only try to increase the attractiveness of the services they provide, policy makers can significantly impact the level playing field in which each transport mode operates. Three examples of policies that can affect users' modal choice are outlined below.

Investment strategies: Allocation of public investments in transport infrastructure across sectors significantly influences the competitiveness of each transport mode. For instance, investment in high quality multi-lane road access to ports will be detrimental to rail competitiveness. As will be further elaborated in Chapter 3, the road sector has traditionally received substantially more investment than rail. As such, there is a need to have consistent principles that apply across transport modes instead of having individual sub-sector approaches.

Recovery of road maintenance costs: There is little evidence that the road maintenance costs caused by heavy trucks are adequately recovered from operators in any country of the region. In some countries, road maintenance costs are recovered in total from fuel taxes, vehicle import duty, and fixed registration and license fees, but implicit in these tax receipts there is a large cross subsidy from private vehicle to commercial vehicle operators. The railways of some of the region's countries (e.g. Thailand) are able to offer container haulage rates which are competitive with road transport but still sufficient to cover at least incremental capital and operating costs. Other countries, however, risk not being able to recover their incremental costs by maintaining artificially low trucking rates. In such cases, artificially low trucking rates could both damage the profitability of the railways and deny them access to container traffic. Despite the desire of many of the region's governments to avoid regulation of the transport industry, there is at least a need to take action to create an equitable basis for modal competition, which will in the longer term ensure a shift towards sustainable transport.

Application of road axle load limits: Most countries in the region apply limits on the gross weights, or axle loads, of cargo carrying trucks in order to restrict damage to road surfaces, but few enforce these limits rigorously. In some countries, truck weight limits are reinforced by the application of limits on truck dimensions. While the main aim of these restrictions is to preserve road surfaces, it can also encourage modal shifts for some types of freight transport, as long as alternative modes are available.

In conclusion, the above points have highlighted that if railways are to fulfil a greater role in the region's transport system, rail freight needs to become more shipper-friendly, cost efficient and customer-focused, while government policies need to be more comprehensive and clearly spell out the respective role of each mode in the country's transport system.

END NOTES

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[24] http://www.crintermodal.com/en/about_us.asp accessed on 4 September 2013

[25] www.rzd-partner.com accessed on 20 September 2013: "RZD offers to deregulate tariffs on transit transportation of containers, perishable goods, and aluminium products", 13 August 2013.

[26] Container tariffs are currently partially regulated. Approximately 56 per cent of current container tariff levels are subject to discounts off scheduled charges for empty running where customers provide their own containers and/or wagons. The remaining 44 per cent of current tariff levels, covering the provision of infrastructure and locomotives, applies to loaded running and is set by the Ministry of Transport of the Russian Federation. The absolute level of this portion is fixed, i.e. it is not subject to discount or negotiation (source: A.T.Kearney Inc (2010))

[27] High-speed lines can also be used for light freight such as mail and small parcels as traditionally handled by specialized courier services.

[28] World Bank (2011).

[29] http://www.pipavavrailway.com/news.htm accessed on 4 September 2013

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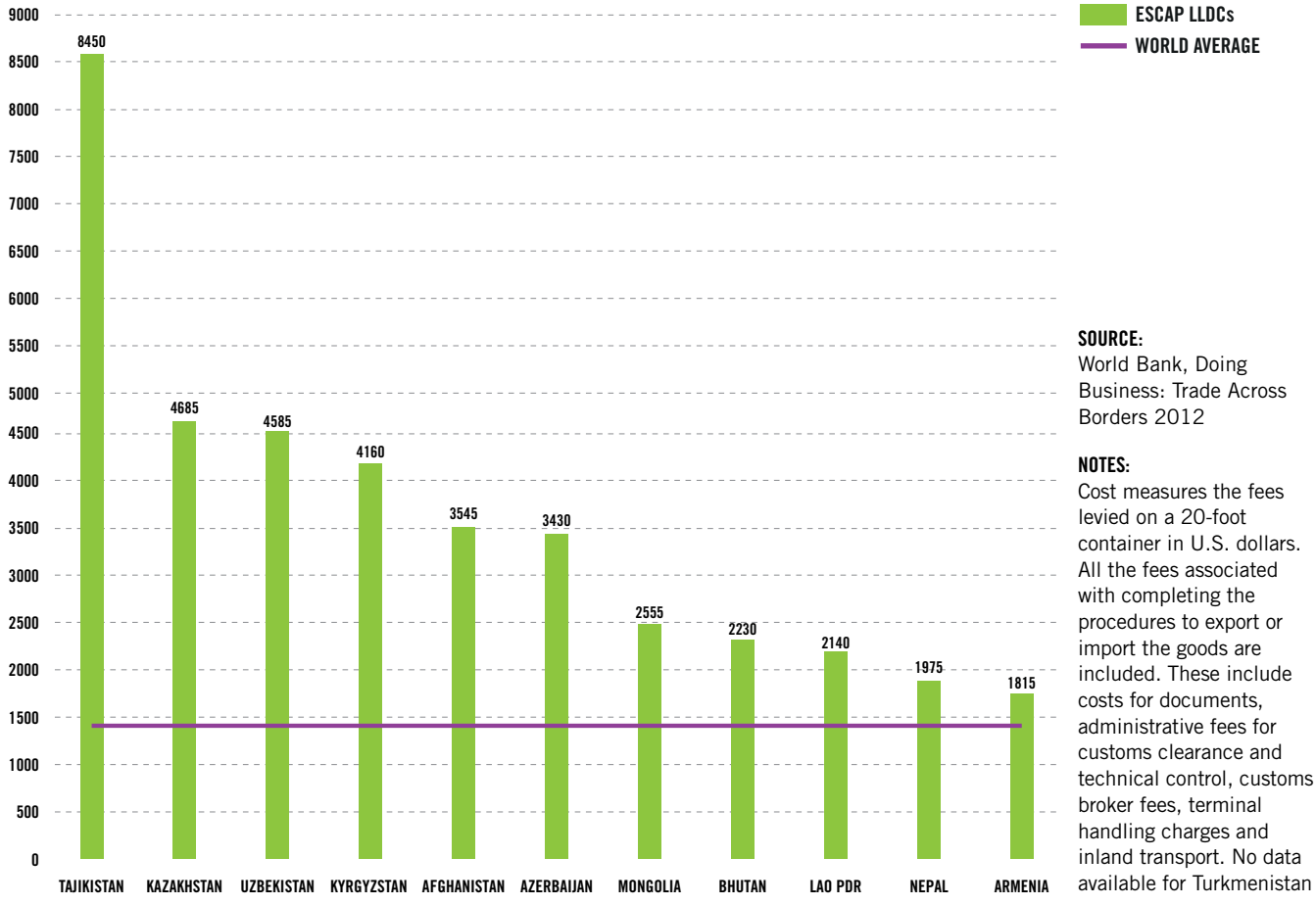
CHAPTER 2

FACILITATING OPERATIONS ON REGIONAL TRANSPORT NETWORKS

WHILE THE DEVELOPMENT OF TRANSPORT INFRASTRUCTURE IN THE ESCAP REGION HAS BEEN OUTLINED IN THE PREVIOUS CHAPTER, THESE REGIONAL NETWORKS ARE VALUABLE ONLY TO THE EXTENT THAT THEY CAN BE EFFICIENTLY USED BY TRANSPORT OPERATORS. THIS IN TURN DEPENDS ON WHETHER, FOR INSTANCE, OPERATORS ARE ALLOWED TO OPERATE BETWEEN DIFFERENT COUNTRIES AND THAT THEY CAN CROSS BORDERS IN A TIMELY AND COST-EFFICIENT MANNER. IN THAT RESPECT, GOVERNMENTS PLAY A CRITICAL ROLE IN FACILITATING CROSS-BORDER TRANSPORT. HAVING THE RIGHT INSTITUTIONAL AGREEMENTS TO FACILITATE TRANSPORT AS WELL AS TRADE, CAN BE AS IMPORTANT AS THE PHYSICAL INFRASTRUCTURE REQUIRED TO CARRY FREIGHT.

Although international trade is largely transported by sea due to the cost advantages provided by this mode, land transport remains critical for regional economic exchanges as it is commonly used for short and medium distances as well as for long distance haulage, particularly when minimising time is important. For countries which are landlocked, it is the only available option for accessing world markets. For these landlocked countries, Figure 2.1 highlights how physical and non-physical barriers are ultimately reflected in transport costs, with many paying more than double the world average export or import transport costs.

FIGURE 2.1
COST TO EXPORT (US$ PER CONTAINER)



SOURCE:
World Bank, Doing Business: Trade Across Borders 2012

NOTES:
Cost measures the fees levied on a 20-foot container in U.S. dollars. All the fees associated with completing the procedures to export or import the goods are included. These include costs for documents, administrative fees for customs clearance and technical control, customs broker fees, terminal handling charges and inland transport. No data available for Turkmenistan

Many of these costs can, however, be reduced through the removal or lessening of cross-border barriers, which in turn can improve regional connectivity and facilitate stronger social and economic ties between countries. In the past two years, continuous efforts have been made by governments in the ESCAP region and their development partners, including ESCAP, to improve regional land transport connectivity.

This chapter summarizes some of the key measures that have been taken to:
- Tackle non-physical barriers to cross border transportation;
- Improve efficiency at border crossings; and
- Adopt information and communication technology (ICT) in the logistics sector to improve logistics performance and reduce costs.

TACKLING NON-PHYSICAL BARRIERS TO TRANSPORT ACROSS BORDERS

Many countries in the region have taken actions to remove or ease these barriers to cross-border transport. These include participation in international transport facilitation conventions, and the formulation of subregional or bilateral agreements. Despite these measures, however, safe, smooth and efficient cross-border and transit transport continues to be plagued by various impediments. For example, it is not uncommon in the ESCAP region for cargo and trucks to be checked several times along the same journey; for trucks not being allowed to cross borders, resulting in costly transhipment and empty backhaul; and for professional drivers to have to undergo long and cumbersome visa procedures. These legal and administrative hurdles, combined with often high charges for entry or transit, significantly raise the cost of transport and thereby increase the price of traded goods.

A lack of a long term vision and comprehensive approach for regional transport facilitation has resulted in many efforts and initiatives being developed in relative isolation, leading to fragmented results and, in some cases, even creating new barriers due to conflicting agreements and projects. With this issue in mind, ESCAP member States adopted the Regional Strategic Framework for the Facilitation of International Road Transport (RSF) at the ESCAP Ministerial Conference on Transport held in Bangkok in March 2012 (introduced in Box 2.1).[1] A similar framework is under preparation for international railway transport. Together these two frameworks should provide a strategic vision for the region to address international land transport facilitation challenges.

As part of the RSF, a Regional Network of Legal and Technical Experts for Transport Facilitation had been established. The network is a key modality for building an effective legal regime and technical capacity for international transport facilitation in the region. It aims to assist member countries in upgrading the professional level of their officials and experts involved in transport facilitation, as well as provide legal support for a variety of tasks such as accession to international transport facilitation conventions, the formulation of relevant agreements, measures and projects, and the harmonization and coordination of different legal instruments on transport facilitation. As of 30 June 2013, more than 80 officials and experts from 27 ESCAP member States had applied for membership of the network. The first regional meeting of the network is planned for December 2013 in Bangkok, Thailand.

BOX 2.1
REGIONAL STRATEGIC FRAMEWORK FOR THE FACILITATION OF INTERNATIONAL ROAD TRANSPORT (RSF)

The RSF identifies six fundamental issues for the facilitation of international road transport and provides long term targets, coupled with the process to achieve them. It also provides seven modalities for addressing the challenges to smooth and efficient transport by road in the region.

The six fundamental issues cover: road transport permits and traffic rights, visas for professional drivers and crews of road vehicles, temporary importation of road vehicles, insurance of vehicles, vehicle weights and dimensions, and vehicle registration and inspection certificates.

The seven modalities include: building an effective legal regime, wider application of new technologies, development of professional training for international road transport, establishment/strengthening of national facilitation coordination mechanisms, promotion of joint control at border crossings, promotion of economic zones at border crossings, dry ports and logistics centres, and further application of facilitation tools.

The RSF will serve as a primary policy document for ESCAP member States and their development partners to increase coordination among different facilitation agreements, projects and measures to avoid inconsistency and conflicts in planning, formulation and implementation. This will increase the effectiveness of facilitation efforts being made by member States and their development partners.

The implementation of the RSF will not only significantly contribute to achieving regional and subregional transport connectivity by reducing transport costs and delays in the transport process, but it is also expected to improve road safety, transport security and reduce vehicle emissions caused by long transit times and a large number of empty runs.

For further information: http://www.unescap.org/ttdw/common/TFS/RSF/RSF.asp

The rest of this section briefly lists examples of recent actions taken by member countries and their development partners to build an effective legal regime for cross-border and transit transport. A practical tool for assessing different possibilities for cross-border transport is also introduced.

A lengthy but critical process

BUILDING AN EFFECTIVE LEGAL REGIME

Different possibilities exist as to how to regulate international transport activities. As a first choice, it is recommended to apply international conventions and subregional agreements wherever possible in order to avoid the situation whereby transport users have to comply with multiple requirements along a single transportation route. Bilateral agreements can then cover areas or issues which cannot be addressed through these international or regional agreements. Recent developments in the region related to these different types of agreements are outlined below.

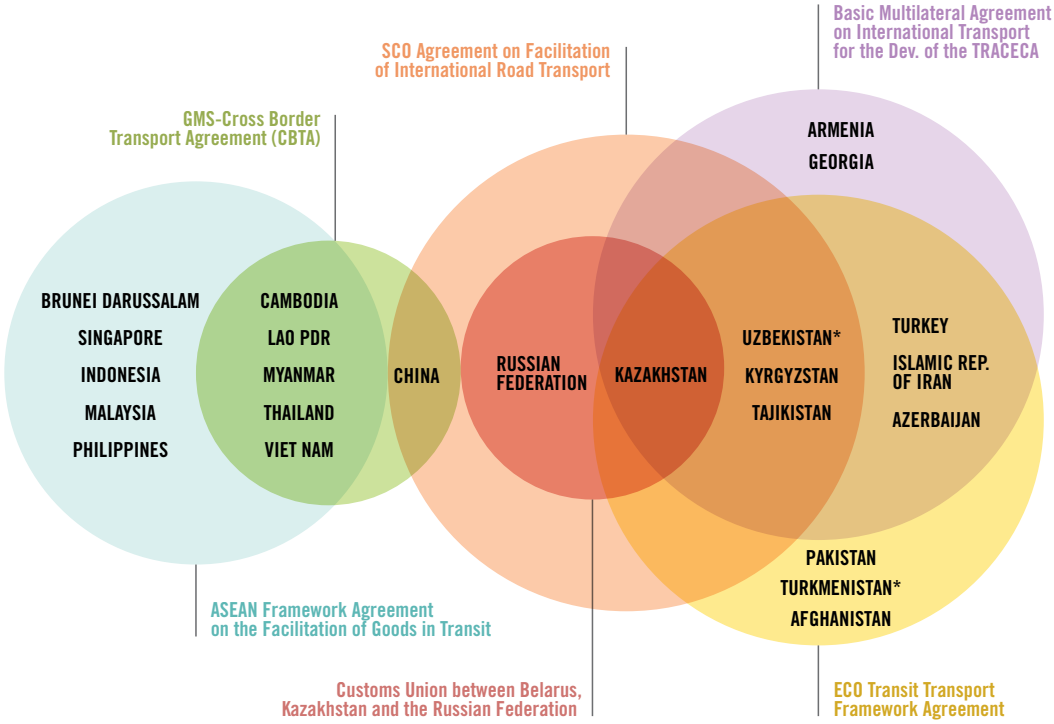
Participation in international transport facilitation conventions

In 1992, the ESCAP Commission adopted a resolution on transport facilitation, namely resolution 48/11 on Road and Rail Transport Modes in relation to Facilitation Measures. This resolution recommends that countries in the ESCAP region, if they have not already done so, consider the possibility of acceding to seven core international Conventions relating to transport facilitation:

- *Convention on Road Traffic* (Vienna, 8 November 1968), which is designed to facilitate international road traffic and to increase road safety by establishing standard traffic rules among the contracting parties;
- *Convention on Road Signs and Signals* (Vienna, 8 November 1968), which standardizes the signing system for road traffic (road signs, traffic lights and road markings) in use internationally;
- *Customs Convention on the International Transport of Goods under Cover of TIR Carnets* (TIR Convention) (Geneva, 14 November 1975), which offers a practical solution for facilitating transit of cargoes without requiring extensive and time-consuming border checks at intermediate borders while, at the same time, providing customs authorities with the required security and guarantees;
- *Customs Convention on the Temporary Importation of Commercial Road Vehicles* (Geneva, 18 May 1956), which allows the temporary admission of vehicles used in international road traffic without payment of import duties or import restrictions;
- *Customs Convention on Containers* (Geneva, 2 December 1972), which describes for instance the conditions for the temporary admission of containers (e.g. marking of containers) and for the transport of goods under Customs seal;
- *International Convention on the Harmonization of Frontier Controls of Goods* (Geneva, 21 October 1982), which aims to streamline administrative procedures and reduce the number and duration of controls carried out by customs authorities; and
- *Convention on the Contract for the International Carriage of Goods by Road* (CMR) (Geneva, 19 May 1956), which relates to various legal issues concerning transportation of cargo by road.

A table showing the status of participation by ESCAP member States in these seven conventions is provided in Annex I. Recent changes include the accession of Azerbaijan and Tajikistan to the Convention on Road Signs and Signals and the International Convention on the Harmonization of Frontier Controls of Goods in 2011. Like Kyrgyzstan and Uzbekistan, Azerbaijan has now acceded to all seven conventions recommended by resolution 48/11, while Tajikistan has now acceded to five of the seven conventions.

FIGURE 2.2
SELECTED SUBREGIONAL TRANSPORT AGREEMENTS IN THE ESCAP REGION



SOURCE:
ESCAP (Please note that only some of these agreements are already in force).
* While being ECO (Economic Cooperation Organization) member states, Turkmenistan and Uzbekistan are not yet parties to the agreement ECO Transit Transport Framework Agreement (Turkmenistan is nevertheless a signatory to the Agreement).[2] Turkmenistan is also a participating country in the Technical Assistance Programme of TRACECA without having signed the related Agreement.[3]

NOTE:
Only countries in the ESCAP region are indicated. Some agreements include other countries outside the region.

Formulation and implementation of subregional framework agreements

Over the years, countries of the region have also been developing subregional framework agreements designed to facilitate the movement of goods, people and vehicles across borders. According to ESCAP estimates there are now 42 such agreements signed in the ESCAP region. Figure 2.2 summarizes some of the subregional agreements relating to transport facilitation.

Among recent progress made, it is worth noting that in June 2012, member States of the Shanghai Cooperation Organisation (SCO), with assistance from ESCAP, concluded their negotiation on the draft Agreement between the Governments of the Shanghai Cooperation Organisation Member States on the Facilitation of International Road Transport and its annexes. Under this agreement, some 15,500 kilometres of road routes are to be initially opened, including a road from Lianyungang, China to St. Petersburg, the Russian Federation. Through this agreement, two more seaports in China and the Russian Federation will be accessible for transit traffic to and from Central Asia.

Cross-border transport in Central Asia has also been impacted by the Customs Union between Kazakhstan, Belarus and the Russian Federation formed in 2010. For instance, a study found that trucks leaving Kazakhstan and entering the Russian Federation enjoy significantly shorter time after the Customs Union, with the average border crossing time decreasing from seven to two hours.[4]

Among GMS (Great Mekong Subregion) countries, Lao People's Democratic Republic, Thailand and Viet Nam concluded in 2012 an amended Memorandum of Understanding to extend the routes of the East-West Economic Corridor to their capital cities – Vientiane, Bangkok and Hanoi – as well as to major

seaports – Laem Chabang in Thailand and Hai Phong in Viet Nam. This initiative will expand the geographical scope of transport services and offer flexibility in transport routes for operators.

Another key development towards building an effective legal regime is the recent Joint Declaration paving the way towards negotiation of a unified railway law (URL) that 37 Transport Ministers and other high-level government representatives signed on 26 February 2013 in Geneva. The Declaration contains the commitment of countries along Euro-Asian rail transport lines to work together to establish unified legal conditions for railways that are equivalent to those existing already for other modes (road, air, inland water and sea) to allow transport of cargo and containers by rail across countries with a single transport contract, a single consignment note and under a single liability and claims system.

Finally, a Memorandum of Understanding (MoU) on cooperation, especially in the area of transport, was signed in August 2012 by the Governments of the Islamic Republic of Iran, Pakistan and Turkey. The MoU promotes the Istanbul-Tehran-Islamabad freight rail link along the Trans-Asian Railway network, a distance of 6,566 kilometres. This link connects the capital cities of the three countries and offers potential extensions into Central Asia and Europe.

Bilateral agreements

More than 100 bilateral agreements related to international road transport have been signed in the region. Some recent developments on these agreements are briefly presented below

China and Mongolia renewed their agreement on international road transport and its protocol in June 2011. The renewed agreement opened 36 transport routes that run through 13 border crossings between the two countries, and introduced long-term multiple entry permits for the carriage of goods to complement the existing short-term single entry permits. The two countries also commenced a pilot implementation of a unified Customs manifest in November 2011 as a first step towards joint Customs control. Within one year, this unified Customs approach had processed 180,000 manifests. With its successful implementation, the pilot project was extended to other major border crossing between the two countries. Electronic data exchange has been proposed to further simplify formalities at border crossings.

China and Viet Nam amended their bilateral agreement on road transport in October 2011, and signed a new protocol for the implementation of the agreement in May 2012. Under this agreement, transportation routes were extended from either side of the respective borders to allow Chinese vehicles to access the Vietnamese capital of Hanoi and Hai Phong seaport, while Vietnamese vehicles may access important economic centres in China, such as Guangzhou, Shenzhen, Kunming and Nanning. Operations of this nature commenced in August 2012.

Also in August 2012, Kazakhstan and Kyrgyzstan moved to simplify formalities and procedures at their border crossings through the implementation of a single-stop inspection point for vehicles, goods and passengers at border crossings. It is a result of the Agreement between the Government of Kazakhstan and the Government of Kyrgyzstan on Joint Control at the Kyrgyz-Kazakh Borders, signed in 2006.

ESCAP photo

A practical tool

ASSESSING DIFFERENT OPTIONS FOR CROSS-BORDER TRANSPORT

Building an effective legal regime is a lengthy and complex process as many years are required to negotiate and complete the legal process needed for the entry into force of transport facilitation agreements. In the absence of comprehensive transport agreements, different measures are, however, available to improve the efficiency of cross-border transport.

To be able to assess these measures, the ESCAP secretariat developed the Efficient Cross-border Transport Models (Box 2.2) in order to support inter-country initiatives for improving the efficiency of cross-border transport by road and rail. The model provides a methodology to evaluate various options for cross-border transport, including options such as through transport without trans-loading at border crossing, manual trans-loading, and trailer swap and container swap.

BOX 2.2
EFFICIENT CROSS-BORDER TRANSPORT MODELS

The Efficient Cross-Border Transport Models provide a relatively simple way of comparing practical solutions that are adaptive to the variety of challenges present in cross-border operations of land transport. The models demonstrate how, even in an environment with limited or no inter-governmental arrangements, goods and passengers can still be moved more efficiently across borders and for onward carriage.

With the models, governments can evaluate various options for cross-border transport, which in turn can inform negotiations on the organization of transport functions such as manual transloading, trailer swaps or container swaps at border crossings. The assessment considers overall costs to governments and the business sector, operational efficiency, level of difficulty in implementation and transport reliability, offering a comparison between different options.

With recent technological advancements in the trucking industry, the models make use of prime mover-trailer systems and commercial cooperation to overcome institutional barriers and conflicts of commercial interests in international land transport. The models can also reduce concerns about safety and security with entry of foreign vehicles in the region and minimize the need for difficult cross-border arrangements, such as visas for drivers, driving licenses, vehicle insurance, temporary importation of vehicles, standards of vehicles and transport permits. Similarly, the models also provide good practices for efficient inter-country railway operations.

Further information is available at http://www.unescap.org/publications/detail.asp?id=1511.

IMPROVING EFFICIENCY AT BORDER CROSSINGS

Improving the efficiency of border crossings is an important step towards easing economic and social barriers to trade and transport between countries. As Figure 2.3 highlights, the burden associated with Customs procedures varies greatly across the ESCAP region, with both inefficient and efficient procedures present in the region.

To assess the hurdles created by border crossings, systems such as the ESCAP Time-Cost-Distance methodology has been used to measure time and costs incurred in transporting various types of goods across different countries. The CAREC program uses such a method along six transport corridors in ten countries, namely: Afghanistan, Azerbaijan, China, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Turkmenistan and Uzbekistan.

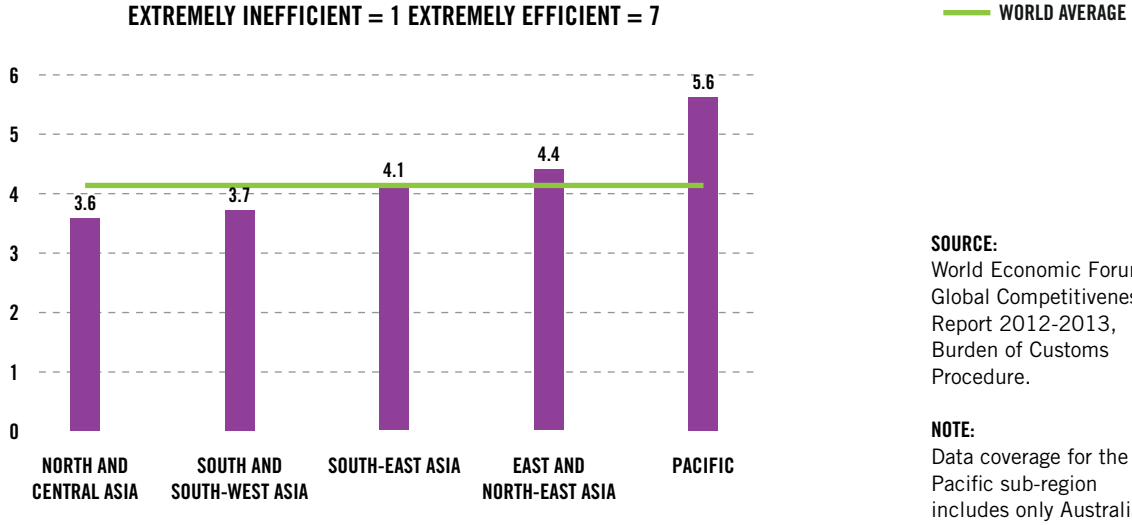
According to the data collected in the third quarter of 2012, the time taken to clear a border crossing point in these corridors was on average 9.6 hours (7.7 hours for road transport and 23.5 hours for rail) with some extreme cases of more than 40 hours at particular border crossing points. Major road transport delays were mainly due to long periods of waiting in queue at crossings, while for rail, delays were predominately caused by the break of gauge on the railway network.[5]

The extent of these delays at border crossings, both for road and rail transport, illustrates the huge potential that exists in the region for improving the cross-border movement of goods and people. While institutional agreements can address some of the non-physical barriers that cause such delays, other tools and technologies can be adopted that improve the efficiency of crossing borders.

Use of modern equipment at border crossings

The adoption of technological improvements at border crossings presents countries, and the region as a whole, with significant opportunities to improve land transportation. Improvements largely come in the form of modernization and the wider use of technologies such as vehicle/container

FIGURE 2.3
BURDEN OF CUSTOMS PROCEDURES



SOURCE:
World Economic Forum, Global Competitiveness Report 2012-2013, Burden of Customs Procedure.

NOTE:
Data coverage for the Pacific sub-region includes only Australia and New Zealand.

scanners, automatic vehicle/container recognition systems, automatic radiation detection systems, automated passport control system and portable passport readers, automatic vehicle weight and dimensions control systems, and automatic health-check, portable detection and laboratory test equipment. All of these technologies can improve the efficiency of border crossings.

A selection of these technological advancements and their application in the region are presented below.

Vehicle/container scanners

Vehicle/container scanners are mostly used by Customs authorities, with the main objectives of revealing unauthentic declaration of goods and preventing the smuggling of drugs, arms and ammunitions, weapons, historical and cultural values, poisonous substances, furs, tobacco and other sensitive commodities.

A fixed vehicle scanner installed in Mongolia at the border crossing with China is shown in Figure 2.4, while a mobile vehicle scanner installed in Viet Nam at the border crossing with Lao People's Democratic Republic is shown in Figure 2.5.

FIGURE 2.4
FIXED VEHICLE SCANNER INSTALLED IN MONGOLIA

FIGURE 2.5
MOBILE VEHICLE SCANNER INSTALLED IN VIET NAM

Vehicle/container recognition systems

Automatic vehicle/container recognition systems are traditionally used at seaports. However, they are increasingly being introduced at land border crossings where they have a great potential to improve the efficiency of clearance. With automatic vehicle recognition systems at border crossings, vehicles can automatically be released within a few seconds.

China uses an electronic border crossing system for most Customs clearances. As at the end of 2012, most major land border crossings in China had adopted automatic vehicle recognition and release systems. In Ruili, Yunnan Province of China, such a system was launched in May 2011. In Manzhouli, Inner Mongolia Autonomous Region of China, a more comprehensive automatic vehicle clearance system with automatic vehicle recognition was developed in 2012. The Government plans to expand this system from Customs to the administration of Quality Supervision, Inspection and Quarantine.

Typically, automatic vehicle/container recognition systems work by capturing images of the container code and/or vehicle license plate numbers in real time with a camera, encrypting and then transmitting them to the computerized operating system. At the same time, the images of license plate number or container code can be displayed on the screen of the control officer operating the system at the border-crossing. The control officer can thus remain at the workstation and does not need to approach the vehicle or container to note the plate number or code and then input them into the computer system. By cross-referencing this data with the relevant database, the license plate number can be used to verify the country of the vehicle (container) registry, the carrier's previous export/import operations, transport permit, operating license, as well as the driver's records. Comparison with information on the vehicle/container in the Customs database can also be made.

The database may contain information about any infringements previously made by the carrier on the territory of the country. Risk assessment and elaboration of decisions for appropriate control measures for the particular vehicle can be made accordingly.

Optimising the use of existing equipment

The ESCAP secretariat conducted a study in 2011-2012 analysing existing practices, modern equipment and systems, and solutions used at border crossings. From this study a conceptual model of integrated controls at border crossings was developed which can be used by member countries as a guide for the technical design of information management and workflows at border crossings. An overview of the model is described in Box 2.3.

BOX 2.3
MODEL ON INTEGRATED CONTROL AT BORDER CROSSING

The Model on Integrated Controls at Border Crossing provides a template for the more efficient flow and sharing of information among various agencies at border crossings through the application of modern technologies and streamlined processes for documents and procedures. It can help minimize interventions by various border agencies, while maintaining sufficient controls and security.

As any border checks require information collection, processing and decision-making, the model considers the procedures at border crossings as information flows. It provides a new concept of integrated use of ICT-based systems and equipment at land border crossings on the basis of sharing information required for control purposes among the border management government agencies. The key component of the concept is the Border Crossing Management Information System (BCMIS), which is based on integration of information flows and application of modern equipment and technological solutions to capture and process the required information on goods, vehicles and drivers (and crew) crossing land borders, mainly by road.

Application of the model will enhance the functioning of all control authorities and expedite their procedures for releasing vehicles and goods at border crossings.

Further information on the Model on Integrated Controls at Border Crossings is available at http://www.unescap.org/publications/detail.asp?id=1509.

The key challenge in the application of new technologies at border crossings predominately rests in the reluctance of cross-border control authorities to share information. The sharing of databases and tracking information would greatly improve the efficiency and effectiveness of inspections and clearances, fully utilising the benefits offered by modern equipment.

In a positive step towards border crossing integration, in April 2012, India opened its first modern Integrated Check Post (ICP) at the border with Pakistan. It is part of the Government's plan to build 13 ICPs at its borders with Bangladesh, Myanmar, Nepal and Pakistan. The purpose of this plan is to enhance security and facilitate trade and transport between India and its neighbouring countries. An ICP provides a single location equipped with modern technologies to house all control authorities, such as immigration, Customs and quarantine, and services, such as banks, clearing agents and cafeteria, as well as cargo facilities including cargo inspection sheds, warehouses, parking and cargo processing. A dedicated authority, the Land Ports Authority, has been set up to provide administration, coordination and management of all ICPs.

REAL-TIME TRACKING OF VEHICLES AND GOODS

Developments in Information and Communication Technology (ICT), Satellite Positioning Systems (SPS), Cellular Communication Systems (CCS), Radio Frequency IDentification (RFID) technology and Geographical Information Systems (GIS), also offer a tremendous potential to deal with challenges in cross-border and transit transport. Combined use of these technologies can secure and track vehicles and goods in real-time, thereby allowing control authorities, transport companies and shippers to take timely action. Meanwhile, such use provides an opportunity for carriers to enjoy simplified formalities and greater freedom of operations across borders.

Many countries in the region are using either part or all of these technologies to address various aspects of transport. For example, China and Viet Nam have made installation of an SPS device compulsory for vehicles transporting passengers and dangerous goods. Such devices are also required for transit transport in the new agreement on transit signed between Afghanistan and Pakistan. Electronic seals (e-Seal) are being used extensively to secure and track the movement of containers in China, the Republic of Korea and Thailand. The Customs authorities in Shenzhen, China, Hong Kong, China and Thailand are using tracking systems based on these technologies to facilitate the movement of bonded goods between Customs zones, and for transport of containers from inland places to border crossings.

The use of RFID seals in Thailand

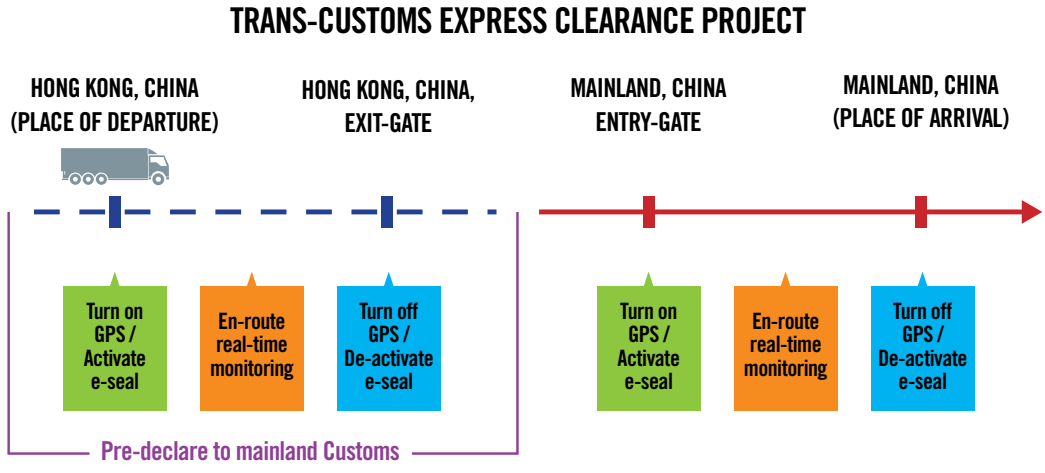
RFID seals and internet-based tracking has been used in Thailand since 2006 when a Secure Free Zone project was launched. The purpose of the project was to facilitate movement of Customs bonded goods among the free trade zones located around Bangkok through an electronic cargo tracking system. The first phase of the project provided electronic cargo tracking and surveillance between the free trade zones around Bangkok, namely Nava Nakorn Industrial Estate, Hi-Tech Industrial Estate and Bang Pa-in Industrial Estate. In August 2009, Phase 2 of the project was initiated by extending Phase 1 to Suvarnabhumi International Airport and in July 2011, Phase 3 was started to track cross-border movement of goods between Malaysia and Thailand. Recently it was proposed to extend the system for transport between Thailand and Viet Nam through the Lao People's Democratic Republic.

FIGURE 2.6
RFID READERS IN THE FREE TRADE ZONES

The use of electronic seals in China

Shenzhen Customs introduced the Trans-Customs Express Clearance system in 2007. The objective of the project was to expedite vehicle clearance at land ports and at the same time secure control of goods and vehicles in transit. The original design of the system under the project is shown in Figure 2.7. The deactivation and reactivation of the electronic seal and turning on and off of the Satellite Positioning System (SPS) device have, however, not been launched due to institutional barriers, resulting in two separate systems being concurrently in use by the Customs authorities of mainland China and Hong Kong, China.

FIGURE 2.7
ORIGINAL DESIGN OF TRANS-CUSTOMS EXPRESS CLEARANCE SYSTEM



In mainland China, it was reported that 3,300 vehicle trips used the system in April 2011. Fast lanes for the users of the system have been opened at checkpoints. The transport operators that use the system are required to register with Customs, while the vehicles or containers used need to meet specifications set by Customs and be certified by Customs. As reported by officials from the Shenzhen Customs, the system together with advance submission of documents reduces overall clearance time from 2-3 hours to 1 hour. At the checkpoint, the system takes a few minutes to clear a vehicle.

On the side of Hong Kong, China, the system was launched in 2010 and named the Inter-Modal Transhipment Facilitation Scheme (ITFS)[6], to be used at airports and seaports for onward transport by road up to land ports. The cargo is inspected only once, either at the airport or at the land ports. The users have to register with the Customs and use accredited e-seal and SPS equipment on vehicles that are also registered in the Road Cargo System.

The ESCAP Model

In 2011, ESCAP developed a model for monitoring cross-border movement of vehicles, known as the Secure Cross-Border Transport Model (see Box 2.4). The system may help alleviate the concerns of the control authorities and allow them to provide a more facilitated environment for cross-border transport. Meanwhile, the system can also help operators and shippers to track their vehicles and goods.

BOX 2.4
SECURE CROSS-BORDER TRANSPORT MODEL

The Secure Cross-Border Transport Model provides a conceptual and standard basis for design of a cross-border vehicle monitoring system using new technologies, including ICT, SPS and E-seals. The model prescribes standardized components, their interaction and institutional requirements for its application in the cross-border transport.

It demonstrates how the use of these technologies can secure and facilitate trade and transport, while taking care of the concerns of control authorities, giving the control authorities the confidence they need to open up more international land routes for international trade and transport. It also allows transport operators to manage safe and efficient operations.

Further information is available at http://www.unescap.org/ttdw/common/TFS/SCBM.asp.

RAISING LOGISTICS EFFICIENCY AND EFFECTIVENESS

As economic globalization continues, larger quantities of goods will flow in the international supply chain and transport users will need to offer high quality logistics services to meet stakeholder preferences and satisfy customer demands.

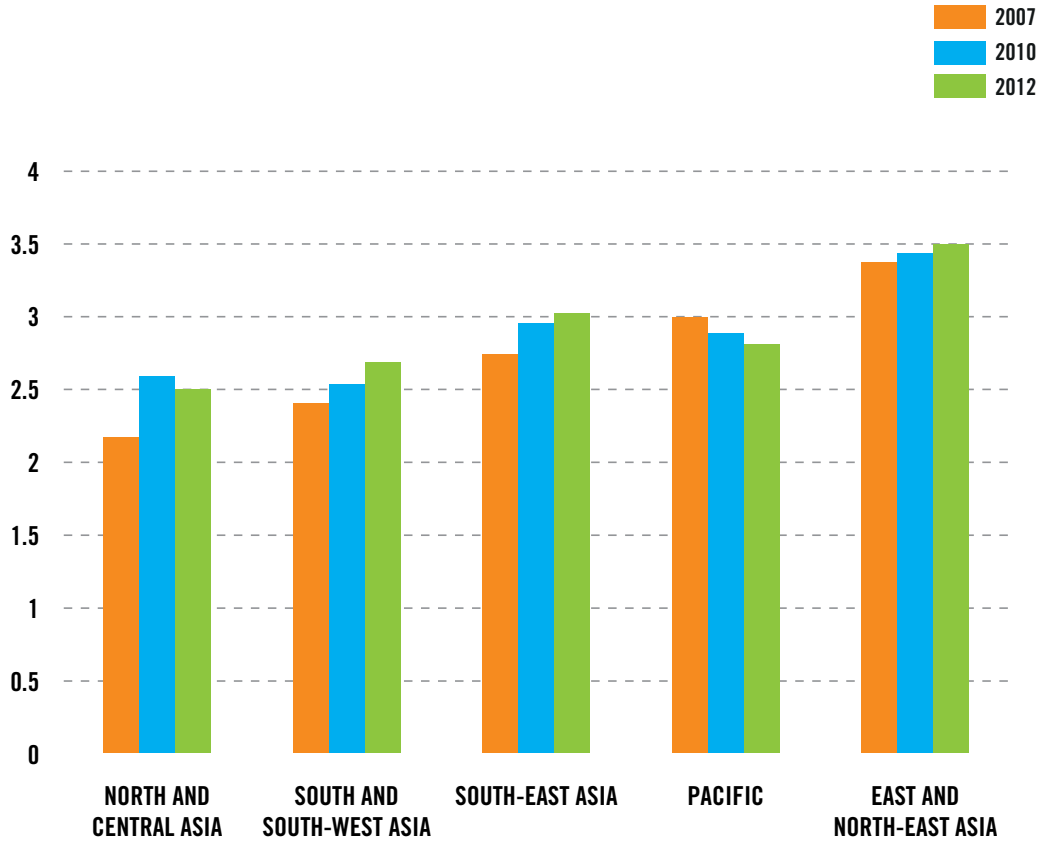
ESCAP region has been progressing faster than the rest of the world

RECENT DEVELOPMENT

In recent years, the ESCAP region has generally improved its logistics performance relative to the world average. According to the World Bank's "Logistics Performance Index" (LPI), in 2007 the ESCAP region scored marginally below the world average, scoring 2.68 against 2.73 out of a total of 5. However, in the five years to 2012, the regional average has increased at a faster rate than the world average, and at last measure the performance of the two was almost identical.

However, while logistics in the ESCAP region have been improving, there is considerable variance in the performance of countries within the region. As Figure 2.8 illustrates, there is significant variation between the best performing logistics sector, East and North-East Asia (with a LPI of 3.5) and the worst performing, North and Central Asia (with a LPI of 2.5).

FIGURE 2.8
LOGISTICS PERFORMANCE INDEX (1=LOW TO 5=HIGH) – ESCAP SUB-REGIONS.



SOURCE:
World Bank, Logistics Performance Index: Connecting to Compete 2012

NOTES:
Logistics Performance Index (LPI) is the weighted average of the country scores on the six key dimensions: Efficiency of the clearance process (i.e. speed, simplicity and predictability of formalities) by border control agencies, including Customs; Quality of trade and transport related infrastructure (e.g. ports, railroads, roads, information technology); Ease of arranging competitively priced shipments; Competence and quality of logistics services (e.g., transport operators, customs brokers); Ability to track and trace consignments; and Timeliness of shipments in reaching destination within the scheduled or expected delivery time.

A key component of the progress made in the logistics sector relates to the increased use of ICT, which has facilitated clearance processes, the tracking of consignments, and the exchange of information among transport operators.

The following section presents recent initiatives launched in the region in the specific area of ICT.

Different stages of implementation in the region

USE OF ICT IN LOGISTICS

The evolution of Information and Communications Technology (ICT) has provided immense opportunities to improve and integrate processes involved in electronic logistics, both from an international and domestic perspective. Electronic logistics, or e-logistics, provides a dynamic set of communication, computing and collaborative technologies that makes key logistical processes to be more customer-centric by electronically sharing data, knowledge and information between supply chain partners. The ultimate objective of electronic logistics is to deliver the right products in the right quantities at the right place and time to the right customer. Functions of electronic logistics include, among others: order forecasting, interactive tracking, inventory alerts, performance evaluation and report notification. Electronic logistics does not replace transport optimization systems, but rather can be integrated into and enhance such systems.

National Electronic Logistics Networks

Control authorities have an important role in promoting efficiency through more streamlined clearance systems. This has been recognized in many countries and addressed through the inclusion of computerized clearing and document management systems into national logistics plans.

However, the development of electronic logistics systems vary widely in the Asia and Pacific region, with some countries having a well developed electronic logistics and many other countries just beginning on this path. For example, according to the World Bank's "Doing Business, Trading across borders" report of 2012, a single window system, which enables cross-border traders to submit import and export regulatory documents at a single location, is used in only 47 per cent of countries of the ESCAP region (based on an evaluation of 46 countries in the region).

The level of development or complexity of what is commonly referred to as a single window systems can nevertheless differ significantly. As every import-export must be declared to Customs, most countries introduce electronic trade facilitation by first starting with electronic Customs declaration systems. This is the first step for the development of the national Single Window.

In Pakistan, for instance, some stations such as Karachi Airport and Port Qasim are already using a web-based One-Custom system, and custom authorities are planning to implement a fully computerized customs clearance system at all customs stations in the country. Work is also being carried out to arrange harmonized formats for producing electronic versions of international trade documents.

In the next step of development, the paperless Customs system is usually extended by integrating other Government agencies who issue other kinds of electronic export/import permits and certificates.

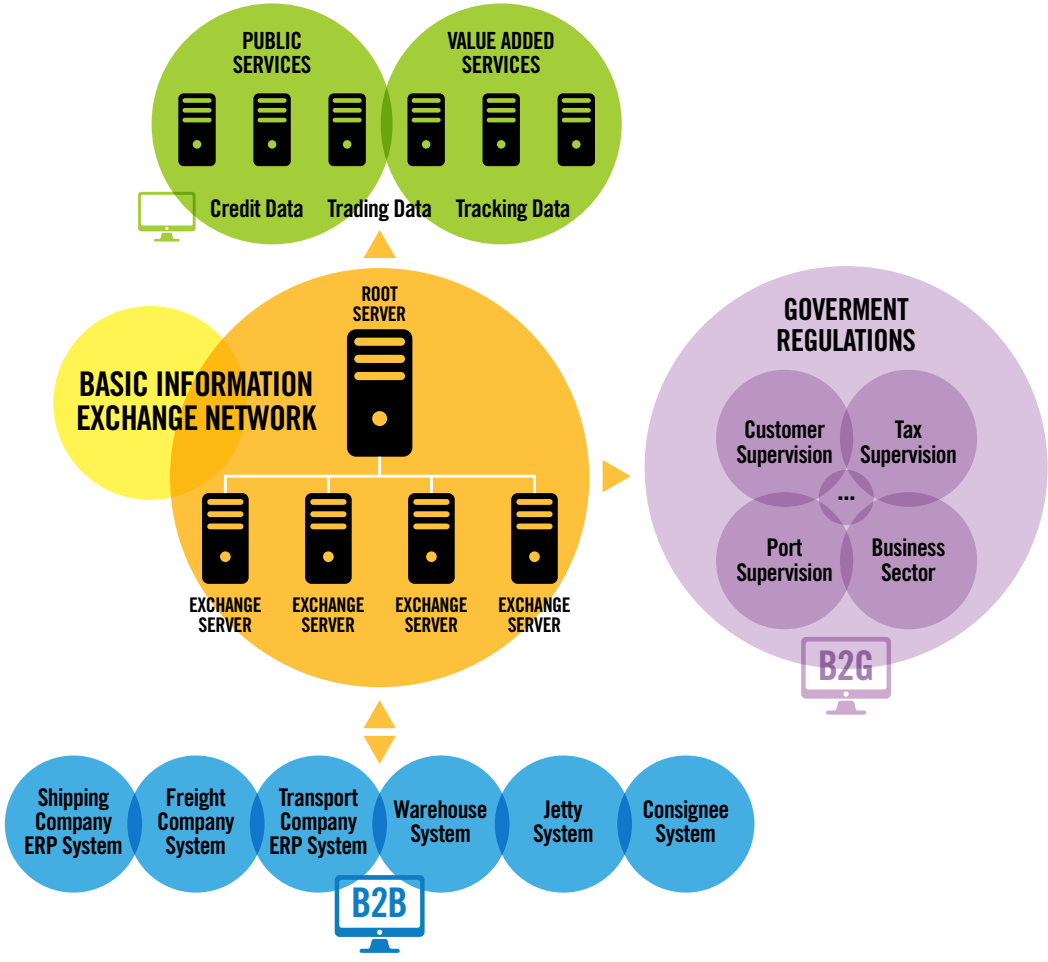
For instance, in the Philippines, the national Single Window has been in use since 2009, and by the mid-2013 it included 30 government agencies that issue permits, licenses and clearances. As such, the system improves access to information for logistics service providers on the progress of applications and registrations with government agencies, improving at the same time the service they provide their customers. The system also increases the transparency and predictability of government processes, and provides a direct link to customs for faster goods clearance.

Another example is Sri Lanka, where the document management modernization plans include the development of information sharing systems between agencies involved in business registrations. International standards in Customs information management have already been introduced though the implementation of ASYCUDA (Automated SYstem for CUstoms Data) software developed by the United Nations Conference on Trade and Development (UNCTAD).

A subsequent development of an electronic logistic system is the creation of an integrated national logistics platform interlinking the administrations, companies and service sectors along an entire chain of import-export operations.

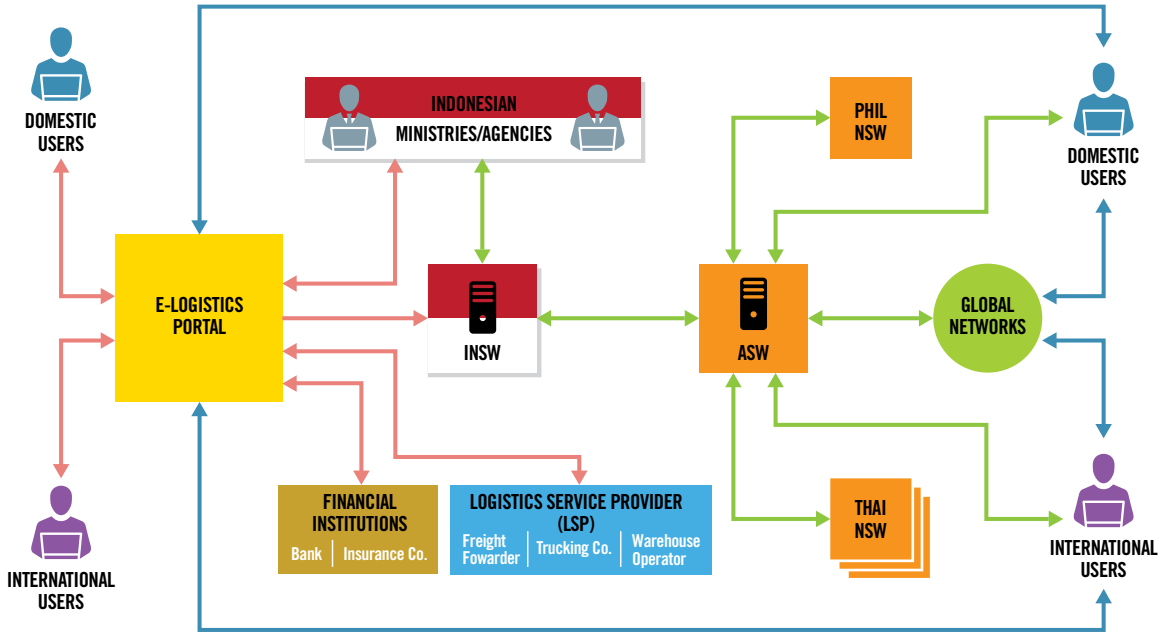
In China, for example, a national system called the National Transport and Logistics Information Platform (LOGINK) was started in 2009. LOGINK, an electronic data exchanging network developed by the Ministry of Transport of China and Zhejiang Province with the participation of private companies and associations, provides an interface for logistics information sharing and querying. Participation in the network encourages companies and other logistics partners to harmonize their internal data management systems to comply with the framework and standards provided by LOGINK. Through the network, individual users can access and share information relevant to the supply chain, increasing transparency and efficiency in the supply chain. Overview of the system is provided in Figure 2.9.

FIGURE 2.9
OVERVIEW OF LOGINK



SOURCE:
Adapted from a presentation made at the Regional Seminar on Development of Efficient and Effective Logistics Systems, Hangzhou, China, 7-8 May 2013

FIGURE 2.10
INDONESIA NATIONAL ELECTRONIC LOGISTICS OPERATING SYSTEM SCHEME



SOURCE:
Adapted from a presentation made at the Regional Seminar on Development of Efficient and Effective Logistics Systems, Hangzhou, China, 7-8 May 2013

NOTE:
INSW stands for Indonesian National Single Window and ASW for ASEAN Single Window)

In Indonesia, the National Logistics System Blueprint approved in 2012 outlines the integration of the National Single Window (incorporating G2G and B2G interaction) with a Customs Advanced System and eTrade-Logistics system (offering a B2B interface). The National Integrated Trade, Logistics and Intermodal Transport Messaging Hub System will therefore bring together both the trade system (flow of documents) and the port system (flow of goods). The expected benefits include both faster export/import document clearance, and accelerated cargo handling in export/import goods traffic.

In the Republic of Korea, the development of e-logistics was given high importance with formation of a national e-trade committee under the chairmanship of the prime minister in 2003. To support the development of e-trade in general and e-logistics in particular, an enabling legislative framework was put in place. This included enactment of e-Trade Facilitation Act, Digital Signatures Act, Electronic Transaction Act and amendment of Foreign Trade Act and Customs Law.

BOX 2.5
THE REPUBLIC OF KOREA E-LOGISTICS NETWORK (KL-NET)

KL-Net was established in 1994 to reinforce national competitiveness and promote efficiency of logistics through logistics information. It uses up-to-date technologies to upgrade domestic and international shipping and port logistic information systems. Its shipping and port business solution includes establishment of PORT- MIS (Port Management Information System), ATOMS (Container Terminal Operations System), GTOMS (General Cargo Terminal Operations System), PLISM (Port logistics system for maritime business). The e-logistics systems comprises of automated shipping and tracking systems, manifest consolidation systems, integrated container management systems, electronic delivery order service, logistics billing support systems, import and export transport integrated management services, facility system, among others.

SOURCE:
www.klnet.co.kr

Subregional Initiatives Relating To Electronic Logistics System

Supply chains, and therefore transport operations, are becoming increasingly complex. At the same time, the increasing use of ICT in all aspects of life creates an expectation for immediate information and transparent processes. However, to achieve this requires considerable effort in terms of information management. To ensure the visibility of the entire supply chain, it is necessary for private companies to interconnect with other information nodes such as port, terminals and other companies, and set up a system of information sharing. Without a unified information system, all these connections need to be made separately, with different interfaces. In the case of container status tracking for example, an enterprise may have to connect its management system to hundreds of ports around the world. This results in heavy workloads, low efficiency, high cost and inconsistencies.

In this regard, a number of subregional initiatives have been successful in improving cooperation and more efficient international logistics.

For example, ASEAN member States signed an Agreement to establish and implement the ASEAN Single Window in December 2005. Its objective is to expedite cargo clearances among ASEAN member states and with their trading partners. In March 2013, the exchange of the intra-ASEAN certificate of origin and Customs Declaration Document was tested among seven ASEAN members, which led to the start of the operation of the scaled-down Single Window system. Eventually the system will support the exchange of certificates of origin and advance cargo information.

Of high priority in the implementation of the ASEAN Single Window is the legal framework, both at the national and regional levels, to allow the acceptance of electronic documents, recognition of electronic signatures, protection of confidentiality and privacy of data, clear and consistent rules on data retention and archiving, and commonly accepted procedures for dispute settlement.

In North East Asia, the Third China-Japan-Republic of Korea Ministerial Conference on Transport and Logistics in 2010 established the Northeast Asia Logistics Information Service Network (NEAL-NET). NEAL-NET was designed as a cooperation mechanism to promote the sharing of logistics information among the three countries. The primary mission of NEAL-NET is to unify the basic standards of logistics information exchange, in addition to promoting research and technical exchange among the participating countries. The NEAL-Net members include a range of stakeholders, including logistics companies, maritime ports, research institutes, IT vendors, associations, government agencies and academic institutions.

To achieve a unified interface, the logistics chain was abstracted to nodes (e.g. port), with specified objects (such as container or vessel) and events (e.g. estimated time of arrival). For each node, the data items to be shared were identified and a code set agreed for each data item. In the process of coding, priority was given to compliance with existing international standards. The interface was then implemented in the participating ports.

In addition to decreasing the cost of information sharing through unified standards, NEAL-NET aims to increase the timeliness of the information acquired. In the traditional system, a relay-relay system is in place for information management, meaning the information is passed on from one stakeholder to another, for example from the port to the shipping agents and then shipping companies. Through the integrated system, information can be shared directly, reducing delays. Currently the NEAL-NET system mainly focuses on maritime transport, but is expected to be extended to other modes of transport in the future.

ANNEX I

STATUS OF ACCESSION OF ESCAP MEMBERS TO THE INTERNATIONAL CONVENTIONS LISTED IN COMMISSION RESOLUTION 48/11, AS OF 14 AUGUST 2013

COUNTRY OR AREA	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 (CMR) (1956)
GROUP I: MAINLAND ASIA							
Afghanistan			X	X			
Armenia	Ø		Ø		Ø	Ø	Ø
Azerbaijan	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Bangladesh							
Bhutan							
Cambodia				X			
China					X		
Democratic People's Republic of Korea							
Georgia	Ø	Ø	Ø		Ø	Ø	Ø
India		X					
Islamic Republic of Iran	X	X	X			Ø	Ø
Kazakhstan	Ø	Ø	Ø		Ø	Ø	Ø
Kyrgyzstan	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Lao People's Democratic Republic						Ø	
Malaysia							
Mongolia	Ø	Ø	Ø			Ø	Ø
Myanmar							
Nepal							
Pakistan	X	X					
Republic of Korea	S [1]	S	X		X		
Russian Federation	X	X	X		X	X	X
Singapore				X			
Tajikistan	Ø	Ø	Ø			Ø	Ø
Thailand	S	S					
Turkey	Ø		X	Ø	X	Ø	Ø
Turkmenistan	Ø	Ø	Ø				Ø
Uzbekistan	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Viet Nam							
GROUP II: ISLAND COUNTRIES							
Brunei Darussalam							
Indonesia	S	S	X		X		
Japan							
Maldives							
Philippines	X	X					
Sri Lanka							

NOTES:

X acceded before adoption of resolution 48/11.
Ø acceded after adoption of resolution 48/11.
S signature.
1 The Republic of Korea acceded to the Convention on Road Traffic (1949), while it remains as a signatory of the new version of the convention (1968).

END NOTES

[1] See document E/ESCAP/MCT.2/13 "Ministerial Declaration on Transport Development in Asia and the Pacific, including the Regional Action Programme for Transport Development in Asia and the Pacific, phase II (2012-2016) and the Regional Strategic Framework for the Facilitation of International Road Transport"

[2] http://www.ecosecretariat.org/ftproot/Documents/Stat_ECO_Agree_MOU.htm accessed on 6 August 2013

[3] http://ec.europa.eu/europeaid/where/asia/regional-cooperation-central-asia/transport/traceca_en.htm accessed on 7 August 2013

[4] http://www.carecprogram.org/uploads/events/2013/CPMM-Intl-Workshop/008_103_209_Corridor-Performance-Measurement-and-Monitoring-CPMM.pdf accessed on 16 September 2013

[5] CAREC Corridor Performance Measurement and Monitoring (CPMM) - 2012 Q3 report from http://cfcfa.net/wp-content/uploads/CPMM-2012Q3-EN.pdf

[6] Based on the website of Hong Kong Custom and Excise, http://www.rocars.gov.hk/en/ITFS.html , accessed 16 September 2013.

[7] G2G = Government to Government, B2G = Business-to-Government and B2B = Business-to-Business

[8] source: http://treaties.un.org/Pages/Treaties.aspx?id=11&subid=A&lang=en and http://www.unece.org/trans/conventn/legalinst.html, accessed on 14 August 2013

CHAPTER 3

FINANCING TRANSPORT INFRASTRUCTURE

IN THE LAST FEW DECADES, TRANSPORT INFRASTRUCTURE HAS PLAYED A CRUCIAL ROLE IN CONTRIBUTING TO THE RAPID GROWTH AND DEVELOPMENT OF THE ASIA-PACIFIC REGION. GOVERNMENTS THEREFORE RECOGNIZE THAT BUILDING AND MAINTAINING IMPORTANT TRANSPORT NETWORKS IS OF THE UTMOST IMPORTANCE. HOWEVER, THE ASSOCIATED COSTS ARE CONSIDERABLE, REPRESENTING A SIGNIFICANT SHARE OF TOTAL PUBLIC EXPENDITURE.

Against this backdrop, this chapter will review recent trends in transport infrastructure financing. Firstly, historical investments in the region will be presented, along with an analysis of traditional options for financing transport infrastructure. Secondly, the role of the private sector as an alternative source of financing will be further investigated, and different policy options for attracting and steering private sector contributions will be outlined. Finally, the growing importance of intra-Asian cooperation for addressing regional transport infrastructure challenges will be reviewed.

ASSESSING THE STATE OF TRANSPORT INFRASTRUCTURE INVESTMENTS

The several hundred billion dollar annual question

HISTORICAL SPENDING REQUIREMENTS

Before looking at the different options for financing transport infrastructure, it is first worth considering overall investment requirements for transport infrastructure in the Asia-Pacific region. Unfortunately, sizing these requirements is not a straightforward task, due to limited data about the magnitude of these investments. As a result, different approaches have been adopted to obtain estimates of transport infrastructure investments.

One source of useful data in this respect is the IMF's government finance statistics, which provides the allocation of budget spending per sector (including transport) for a few countries in the region. Based on these data, it can roughly be estimated that the respective governments of the region spend around $360 billion per year (or approximately 1.5 per cent of the current GDP) on transport.[1] Note that this figure is only a regional average that does not reflect the significant discrepancies in the level of investments among these countries. Indeed, some countries have experienced tremendous infrastructure expansion, while others have had more modest growth and others still have seen their networks, particularly railways, shrink (please refer to the first chapter of this publication for more details on network development in the region). Furthermore, the IMF data does not elaborate on the distribution of spending per mode of transport.

A relatively simple model to overcome the data limitations utilizes recent developments in infrastructure stocks to estimate the trends in both new transport infrastructure investments per country, and yearly maintenance requirements. The assessment requires that the infrastructure stocks be converted into capital costs using average unit costs.[2] Since land transport is the primary focus of this year's publication, only rail and road transport networks (as measured by road and rail network lengths) have been analysed using the model. The results for each sub-region are shown in the tables below.

Estimates of current average annual investment and maintenance requirements in the ESCAP region

TABLE 3.1
ROAD INFRASTRUCTURE

SOURCE:
ESCAP estimates - see explanatory notes for country groupings.

ESCAP SUB-REGIONS	NEW INFRA $BN	NEW INFRA (%GDP)	MAINTENANCE COST $BN	MAINTENANCE COST (%GDP)	TOTAL $BN	TOTAL (%GDP)
East and North-East Asia	95.5	0.65%	95.5	0.65%	144.3	0.99%
North and Central Asia	22.6	1.02%	22.6	1.02%	38.5	1.74%
South-East Asia	27.8	1.21%	27.8	1.21%	41.4	1.81%
South and South-West Asia	51.6	1.57%	51.6	1.57%	107.4	3.26%
Pacific	1.8	0.12%	1.8	0.12%	11.5	0.73%
GRAND TOTAL	**199.3**	**0.83%**	**143.9**	**0.60%**	**343.2**	**1.43%**

TABLE 3.2
RAIL INFRASTRUCTURE

ESCAP SUB-REGIONS	MAINTENANCE COST ($BN)	NEW CAPACITY (VALUE) $BN	TOTAL (VALUE) $BN	TOTAL (%GDP)
East and North-East Asia	3.7	3.0	6.6	0.05%
North and Central Asia	4.5	0.7	5.2	0.23%
South-East Asia	0.5	0.2	0.7	0.03%
South and South-West Asia	3.7	0.8	4.4	0.13%
Pacific	0.3	0.0	0.3	0.02%
GRAND TOTAL	**12.7**	**4.6**	**17.3**	**0.07%**

SOURCE:
ESCAP estimates - see explanatory notes for country groupings.

Significant assumptions have been made in computing the above estimates and so these results should be treated with caution. Nevertheless, three major conclusions can be drawn from the above tables:

1.
South and South West Asia are the subregions facing the highest transport requirements in terms of GDP.

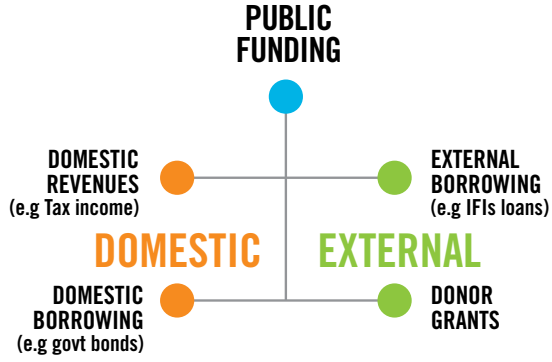
2.
The focus of the ESCAP region in the recent past has been on roads, with this sector overwhelming the rail sector in terms of estimated spending requirements. The rail sector represents only around 5 per cent of yearly estimated road spending. In fact, most rail requirement estimates are related to maintenance as only a few countries, such as China, India, Kazakhstan, Turkey, and Turkmenistan, have significantly invested in expanding their rail network. Table 3.2 should, however, not be interpreted as a forecast for future spending on rail infrastructure, as rail transport has gained momentum recently with the emergence of new high speed passenger train routes and dedicated freight corridors. In addition, the environmental advantages of rail transport might contribute in making it a higher policy priority in the years to come.

3.
Maintaining existing road assets is almost as costly as building new infrastructure. Maintenance amounts to 40 per cent of the total expenditure for road infrastructure on average. The estimated maintenance cost requirements for nine countries of the region actually exceed 2 per cent of their GDP (up to a maximum of 7.5 per cent). Such high levels of maintenance expenditure are likely to be unaffordable for most public budgets and might explain why some countries make significant savings on maintenance costs at the expense of road quality.

TRADITIONAL SOURCES OF FINANCING

Critical but not sufficient

Having estimated the spending requirements, it is worth considering the different options for funding transport infrastructure. Traditionally, transport infrastructure investments have been financed via public resources for which different funding options are possible, as described in the figures below.



In most cases, domestic funding makes up the significant share of public funding. However, it is difficult to clearly identify whether borrowing has been made for transport investments or for projects in another sector as all the domestic resources are reported together. Therefore, the following paragraphs will focus on the external financing side of public funding, specifically that provided by international finance agencies and donors.

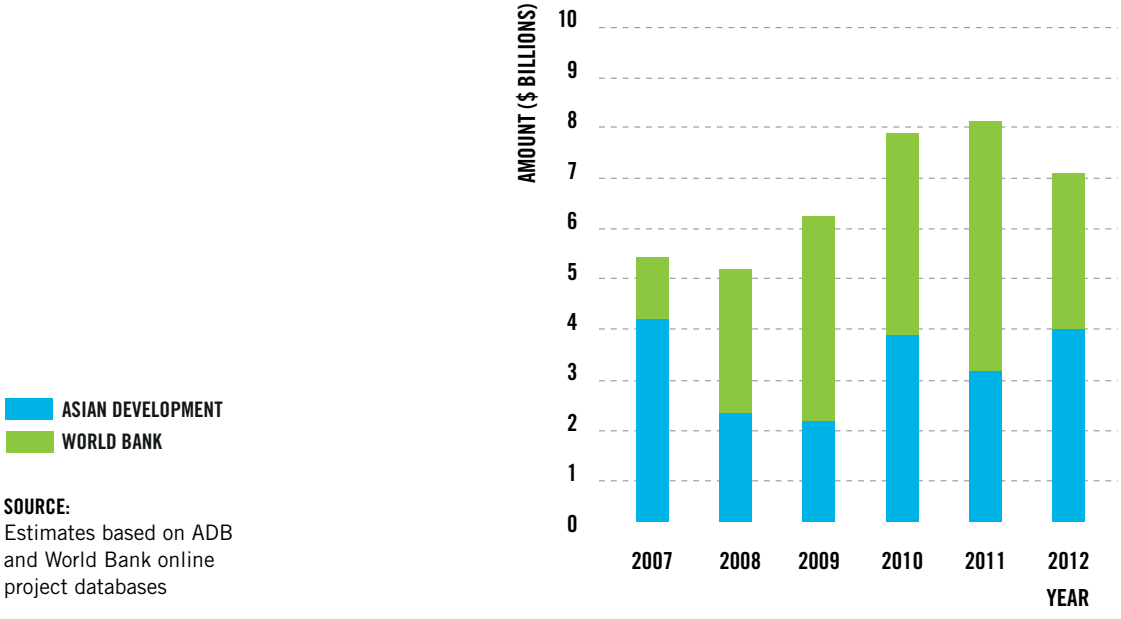
International finance institutions

International Finance Institutions (IFIs) have supported the financing of transport infrastructure projects in the Asia-Pacific region for many years. To estimate the importance of this source of financing for the countries of the region, projects supported by the Asian Development Bank (ADB) and the World Bank (WB) have been reviewed. These are the only two multilateral development banks covering the entirety of the ESCAP region and provide a fair basis for understanding the magnitude of international public finance in transport infrastructure financing for the region.[3] In order to perform such analysis, a database of approved projects for the period 2007-2012 has been created, using data from their online project databases and cross-referenced with their annual reports.[4] The key conclusions that can be drawn from the database are as follows:

On average, $7 billion are provided annually by these two multilateral development banks (MDBs) for transport projects in the ESCAP region, which is more or less equally distributed between the two banks. Transport remains one of the key areas of intervention for these institutions. For example, in 2012, approximately 30 per cent of total ADB finances were spent on the transportation sector.[5] The respective share of total approved financing in the transportation sector from 2007-2012 is shown in Figure 3.2:

Although China and India are the main recipients in absolute terms (both attract more than $1 billion per year on average), the amounts channelled through these countries represent only a small share of their estimated investment requirements (respectively less than 1 per cent for China and less than 2 per cent for India) compared to other countries in the ESCAP region. As shown in Table 3.3, the funding provided by the MDBs as a share of their estimated annual investment and maintenance requirements is highest for the Pacific and the North and Central Asia subregions. Considering other subregions, countries such as Viet Nam, Mongolia, Afghanistan and Bangladesh have benefited largely from IFI funding in developing their transport infrastructure. That is, of the aforementioned four countries, funds provided by the ADB and WB represent at least 10 per cent of their estimated requirements.

FIGURE 3.2
ADB AND WORLD BANK FINANCING FOR TRANSPORT PROJECTS (2007-2012)



SOURCE:
Estimates based on ADB and World Bank online project databases

TABLE 3.3
ADB AND WORLD BANK YEARLY AVERAGE INVESTMENTS IN THE TRANSPORT SECTOR IN $MILLION (2007-2011)

ESCAP SUB-REGIONS	ADB	WB	TOTAL	% ESTIMATED REQUIREMENTS
East and North-East Asia	572	788	1,360	0.96%
North and Central Asia	798	911	1,708	24.7%
South and South-West Asia	1,257	1,274	2,531	3.5%
South-East Asia	638	592	1,230	2.6%
The Pacific	106	39	145	64.3%
TOTAL (incl. regional project)	**3,387**	**3,604**	**6,991**	

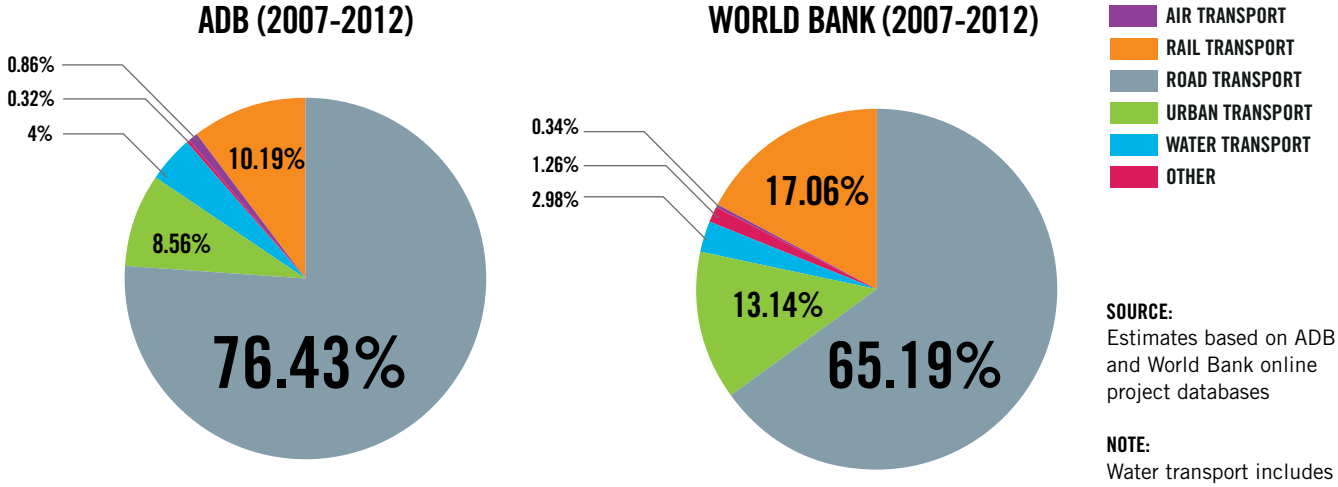
SOURCE:
Estimates based on ADB and World Bank online project databases and ESCAP calculations

NOTES:
The table only includes the countries which have benefited from ADB and WB in the last few years. For instance, the Pacific region in this table does not include Australia or New Zealand. Estimated requirements cover only the road and rail sectors.

While the vast majority of funding has been channelled in the form of loans (including concessional loans), the multilateral banks have also provided a significant amount of grant resources to support transport initiatives. Overall, $200 million per year has been directed either in the form of technical assistance or as grants. The main beneficiaries of these grant resources have been countries such as Afghanistan, Tajikistan, Kyrgyzstan, Lao People's Democratic Republic and the Solomon Islands.

In regard to modal split, the road transport sector remains by far the majority share sector for both the ADB and WB over the given period, confirming earlier mentioned conclusions. Nevertheless, the share of investment by the rail sector is significant, at more than 10 per cent for both institutions. It is also interesting to note that the Urban Transport subsector is gaining in importance. Though the subsector attracted only 6 per cent of their financing in 2007-08, its share grew to 18 per cent in 2011-12. Although a further breakdown of the Urban Transport sector by mode could not be conducted due to data limitations, the above information provides some insight into the significant role of Urban Transport in the coming decade.

FIGURE 3.3
MODAL SPLIT OF ADB AND WB INVESTMENT IN TRANSPORT (2007-2012)



SOURCE:
Estimates based on ADB and World Bank online project databases

NOTE:
Water transport includes both maritime and inland water transport projects.

Donor resources

In 2011, 25 Asian and 16 Pacific countries were net recepients of official development assistance (ODA), receiving a total of $27.4 billion and $2.2 billion in assistance respectively. [6] According to the latest global data, 5.7 per cent of global assistance resources are devoted to transport and communication infrastructure. Applying this global ratio to the Asia-Pacific region, it can be estimated that approximately $1.7 billion of development assistance is allocated to transport in Asia and the Pacific annually. Against the substantial transport resource needs of the region, grants may appear relatively limited in size. However, they remain critical for the poorest Asian countries where ODA easily exceeds 5 per cent of their Gross National Income. These countries include Afghanistan, Bhutan, Cambodia, Kyrgyzstan, the Lao People's Democratic Republic, and Tajikistan.

In conclusion, the preceding paragraphs give a sense of the significant role that international financing institutions and donors play in supporting transport infrastructure development. The involvement of these actors has certainly been instrumental to many of the transportation projects that have taken place in Asia and the Pacific, and are particularly crucial for the poorer countries of the region. However, it is worthy to note that the amount they are providing remains limited compared to the overall investment requirements of the region. The following sections present two approaches that can be adopted to complement traditional public funding: greater involvement of the private sector and intra-Asian collaboration on transport projects.

BOOSTING PUBLIC-PRIVATE PARTNERSHIPS IN THE TRANSPORT SECTOR

Given the massive financial requirements for developing and maintaining transport infrastructure assets, and the limited budgetary resources and borrowing capacities of governments, many countries have begun to use Public-Private Partnerships (PPPs) as alternative financing and delivery options.

In the context of transport infrastructure, PPPs refer largely to contractual arrangements between the public and private sectors, whereby the private sector provides building or rehabilitation works in exchange for operating rights over a relatively long period of time (often referred to as concessions). At the end of this period, the asset is transferred back to the public authorities. The above model is typically classified under the 'Build and/or Rehabilitate, Operate and Transfer' PPP model and its related variants, which will be the focus below.[7]

An improved implementation modality more than a financial mechanism

REASONS FOR ADOPTING THE PPP APPROACH

Access to private sector capital

Under PPPs, infrastructure projects are financed using private resources, and as such PPPs are considered a means to reduce pressure on the public budget or to realize projects which would not be otherwise feasible due to public financial constraints. Indeed, the immediate cash spending by the public sector for infrastructure is very limited, as the design and construction costs are largely paid for by the private sector. However, to help make the project financially viable, the private operator has to be remunerated for the services or goods provided via direct payments, such as road tolls from road users, and/or via government support, such as regular payments based on the availability of the transport infrastructure. In the latter case, the up-front cost is translated into a series of future regular payments, which are in fact comparable to a traditional loan repayment scheme. Therefore, careful estimations of future liabilities should be conducted as part of any PPP assessment.

Better allocation of risks

One of the key arguments for supporting PPPs is that the risks of infrastructure development are allocated to the economic partner who is best equipped to handle them. For instance, some past experiences suggest that construction risks could be more adequately managed by private operators, thereby making projects more likely to be delivered on time and on budget.[8] Management or procurement efficiencies are among the reasons explaining such differences in delivery performance between the public and private sectors. On the other hand, public authorities are usually in a better position to manage regulatory risks such as those linked to construction permits. They are also better placed for acquiring the necessary land, which is particularly important for transport projects. However, there is no 'one size fits all' type of risk allocation, and the distribution will largely depend on the specific characteristics of each project and the comparative advantages of each party. The principle should be that risks are allocated to create the incentives that will maximize each partner's capacity to reduce the overall costs of the project, while at the same time protecting the public interest.

Efficiency gains

Building on the expertise and comparative advantages of each partner, PPPs can yield substantial cost saving benefits. For instance, the innovative capacity of private operators could be leveraged in the planning, design and delivery phases to reduce the life-cycle cost of the project. Since the private operator is responsible for paying future maintenance costs, the private operator has an incentive

to integrate future cost implications in the design of the project. This is a way to solve 'short-termism' issues related to infrastructure building whereby cheap initial capital expenditures are encouraged without due regard to future maintenance cost consequences. Such efficiency gains are made possible as PPP contracts are specified in terms of outputs (that is, focusing on the service to be provided), rather than inputs (that is, the detailed specification of the infrastructure), thereby allowing flexibility for the private sectors to apply the best possible technical and operational solutions to achieve the desired results.

Yearly investment in PPPs has multiplied by 2.5 since 2001

RECENT TRENDS

Back at record high level

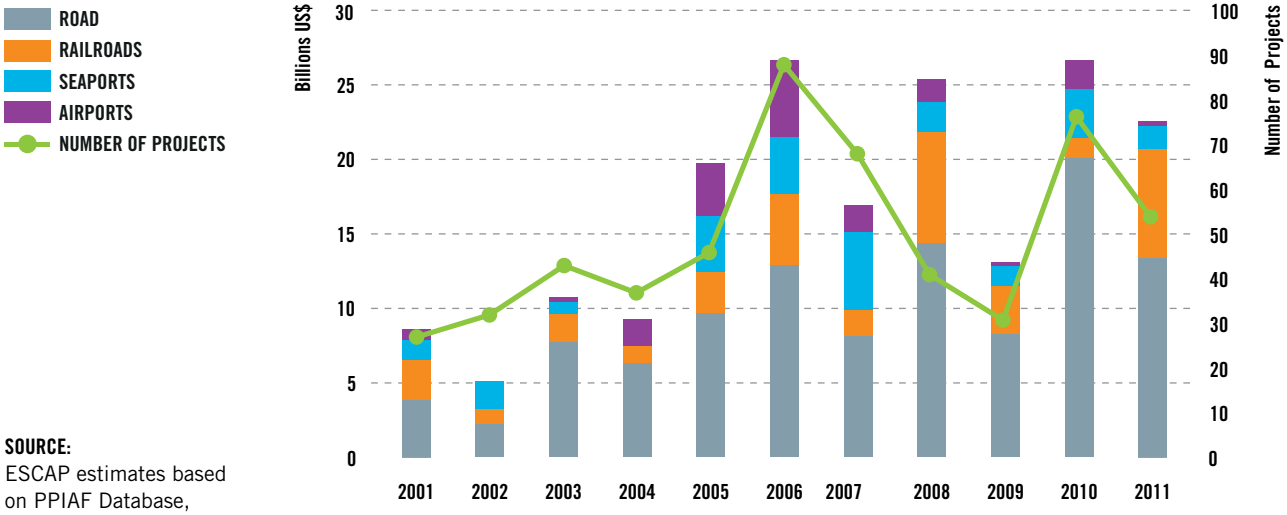
The resources mobilized through the PPP financial mechanism have been significant for the transport sector over the period 2001-2011, supporting some 550 projects in the ESCAP region at a total cost of close to $200 billion. After a brief dip in spending resulting from the financial crisis (2007-2009), the levels of investment with private participation are approaching historical highs, with more than $20 billion mobilized in 2011, despite a slight decline in the number of projects.

With regards to modal split, the lion's share of investment (58 per cent) was allocated to the road sector (mainly highways) followed by railways (18.7 per cent), sea ports (14.4 per cent) and airports (8.4 per cent). It is worth noting that railway projects are few in number but larger in size, averaging above $700 million compared with the average road and sea port project costing around $200 million.[9]

Geographically concentrated

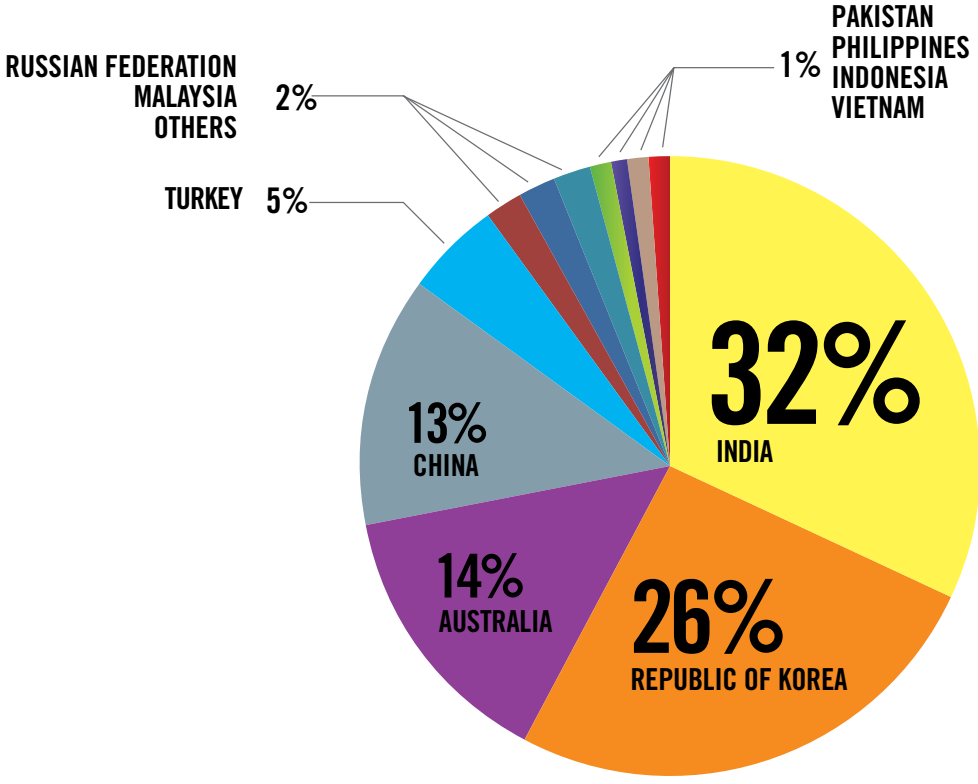
For the period 2001-2011, at least 19 countries in the ESCAP region have involved private sector actors in infrastructure development. However, as illustrated in Figure 3.5, the geographical intensity is largely unbalanced, with India attracting close to one third of total investments. Altogether, the five most active countries in the region channelled more than 90 per cent of the total volume for the period. It is worth noting that investments have targeted rehabilitation of existing assets, as well as the construction of new ones, in near equal proportions.

FIGURE 3.4
TRENDS OF PPPs IN TRANSPORT INFRASTRUCTURE IN THE ASIA-PACIFIC REGION



SOURCE:
ESCAP estimates based on PPIAF Database, PIMAC presentations and Infrastructure Australia website[10]

FIGURE 3.5
GEOGRAPHICAL DISTRIBUTION OF PPPS IN TRANSPORT INFRASTRUCTURE (2001-2011)



SOURCE:
ESCAP estimates based on PPIAF Database, PIMAC presentations and Infrastructure Australia website

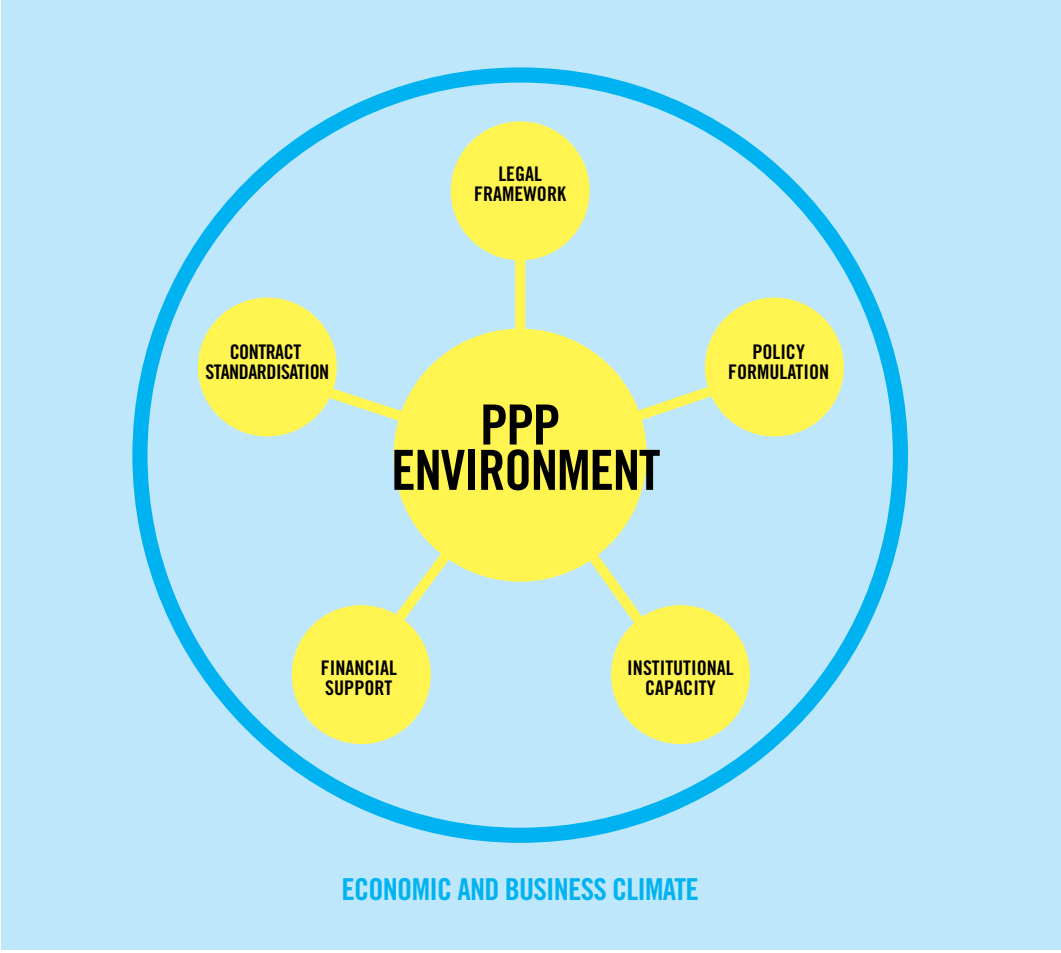
Only a limited share of investment needs is currently covered by PPPs despite significant amounts being channelled via such financial frameworks. Even in India, no more than 20 per cent of investments in the road sector were financed by private finance during the 2007-2012 plan.[11] Similarly, in the Republic of Korea, PPP investments in economic infrastructures (including transportation assets) dropped to around 10 per cent (2011 figure) from 15 per cent earlier. Based on these figures, it is clear that additional efforts are required should the countries in the region wish to enlarge the geographical use of the PPP structure or scale-up the amount delivered through these mechanisms.

POLICY OPTIONS AND REGIONAL PROGRESS

A complex mix of inter-related policies

Policy makers willing to support the emergence of PPP solutions for infrastructure development can act on several dimensions, highlighted in Figure 3.6. Each of these areas is important for the development of a flourishing PPP industry and all of them should be considered together given that they are mutually dependent and reinforcing. Regional progress and key issues related to these dimensions are presented below in greater details.

FIGURE 3.6
POLICY TOOLKIT TO SUPPORT PPP DEVELOPMENT

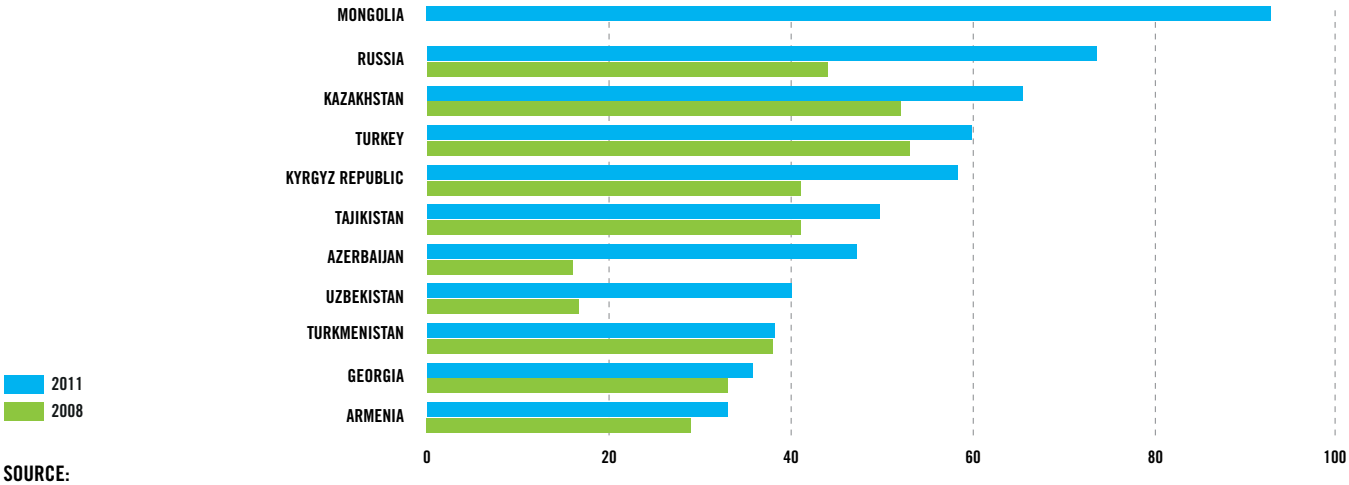


An adequate legal and regulatory framework

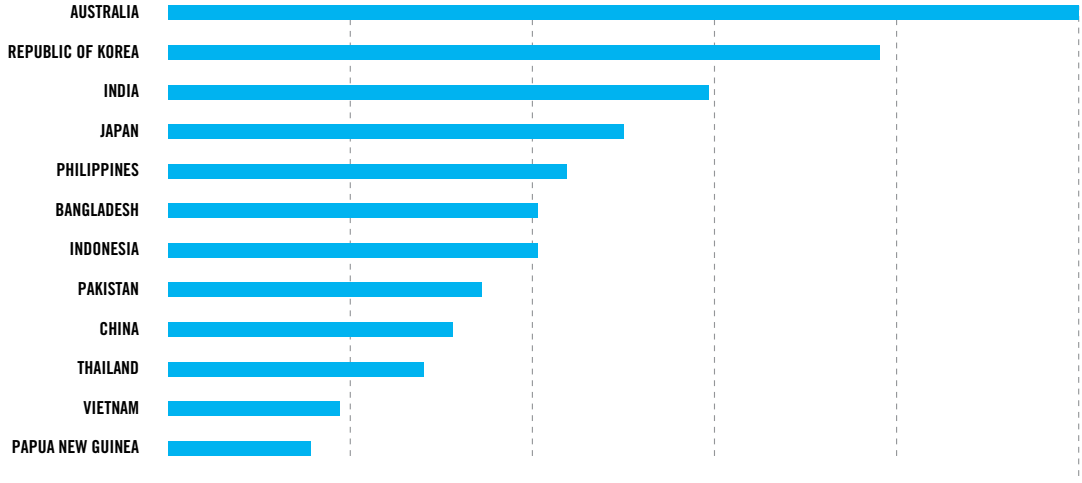
The legal framework applicable to PPP projects has to be clear with regards to which laws apply and what type of sectors or PPP models are eligible for the respective project. Precise identification of authorities empowered to award concessions or to enter into project agreements is also critical. To create such a clear and stable legal environment, some countries have developed dedicated concession laws. In this respect, the UNCITRAL Legislative Guide on Privately Financed Infrastructure projects, adopted in 2000, provide guidance on best international practice.

To estimate the progress made in complying with these international best practices, the European Bank for Reconstruction and Development (EBRD) conducts regular assessments in its countries of operation. The results of their latest study for ESCAP member countries indicate that substantial improvements have been made since 2008 in most countries, thereby testifying strong legislative activities (see Figure 3.7). However, it must be noted that only five of the eleven countries reviewed had a score above 50 per cent, meaning that substantial gaps remain. The Economist Intelligence Unit (EIU) carried out a similar exercise in 2011 for a select number of countries in Asia and the Pacific.[12] Their methodology differs slightly from the EBRD one and thus cross-comparisons are not possible. Nevertheless, the results from the EIU study also confirm that most countries in the region are taking legislative steps to improve their PPP frameworks.

FIGURE 3.7
PERCENTAGE OF COMPLIANCE OF THE LEGAL AND REGULATORY FRAMEWORK WITH BEST INTERNATIONAL PRACTICES



SOURCE:
EBRD 2012
Concession/PPP Laws
Assessment



SOURCE:
EIU Infrascope 2011

A consistent policy orientation

PPP projects typically take several years to be developed and are often politically sensitive. As such, PPPs are vulnerable to government change which could result in a position reversal regarding any public-private partnerships. At the same time, private operators face considerable entry costs when entering a market. For example, private operators have to carry out full due diligence of the legal and fiscal environment and are unlikely to do so if the policy direction of the government are unclear.

Against this backdrop, the development of a national strategy for PPPs could mitigate such political risk by building a wide support and a long-term vision for the sector. For instance, the 2013 Thai legislation on PPPs requires for a 5-year PPP National Strategy, which will serve as a roadmap for the development of PPP projects in Thailand.[13] In order to secure public acceptance for PPPs, it is important to both encourage stakeholder participation early enough in the development process of projects, and to apply a transparent selection process, thereby reassuring the public that national assets are not being sold off.

In addition to mitigating political risks, developing a long-standing strategy, with a series of PPP projects planned, provides an incentive to the private sector to enter the market. Given the institutional costs of developing a comprehensive PPP framework, it is also recommended that these costs are amortized on a minimum number of projects. In this respect, the Australian National Public Private Partnership Policy states that any infrastructure project with a capital cost that exceeds Australian $50 million (approximately USD $46 million) will be considered for PPP.

When defining the projects to be implemented through a PPP, attention should however be paid to both the absorption capacity of the private sector (how many private actors are capable of doing the projects), and the transaction costs (some studies mentioned a minimum project size of around $30 million is needed to absorb these fixed costs).[14] Finally, the use of PPPs for mega-projects requires careful consideration as they may be too complex or too politically sensitive for the private sector to deliver.

A supportive institutional arrangement

Many governments have established specialized PPP Units in order to develop and supervise PPP projects. These PPP units have generally been successful in playing a 'catalytic' role in promoting and implementing private projects. They have been particularly relevant in building internal capacity as they allow the concentration and availability of the required expertise through the accumulation of experience and the possibility of adequate training. India, Bangladesh, the Philippines, Malaysia, Indonesia, Mongolia, Australia and Kazakhstan are a few of the countries that have PPP units or a similar institutional arrangement. However, their function and location in the government differ as does their overall performance.

Building up such internal capacity is particularly relevant to PPPs given the information asymmetry characterized in transport PPP projects, whereby the private sector might have more information than the public sector on critical elements of the project (for example, for construction cost estimates). If not handled carefully, such information asymmetry may result in too larger concessions being given to the private sector during the negotiation phase. In this respect, both centralising experience in a single unit and carrying out robust feasibility could help to mitigate the aforementioned risk. Sufficient internal capacities are also necessary to ensure adequate performance monitoring during the life of the project. Indeed, PPPs are not only about procurement but also about long-term relationship management.

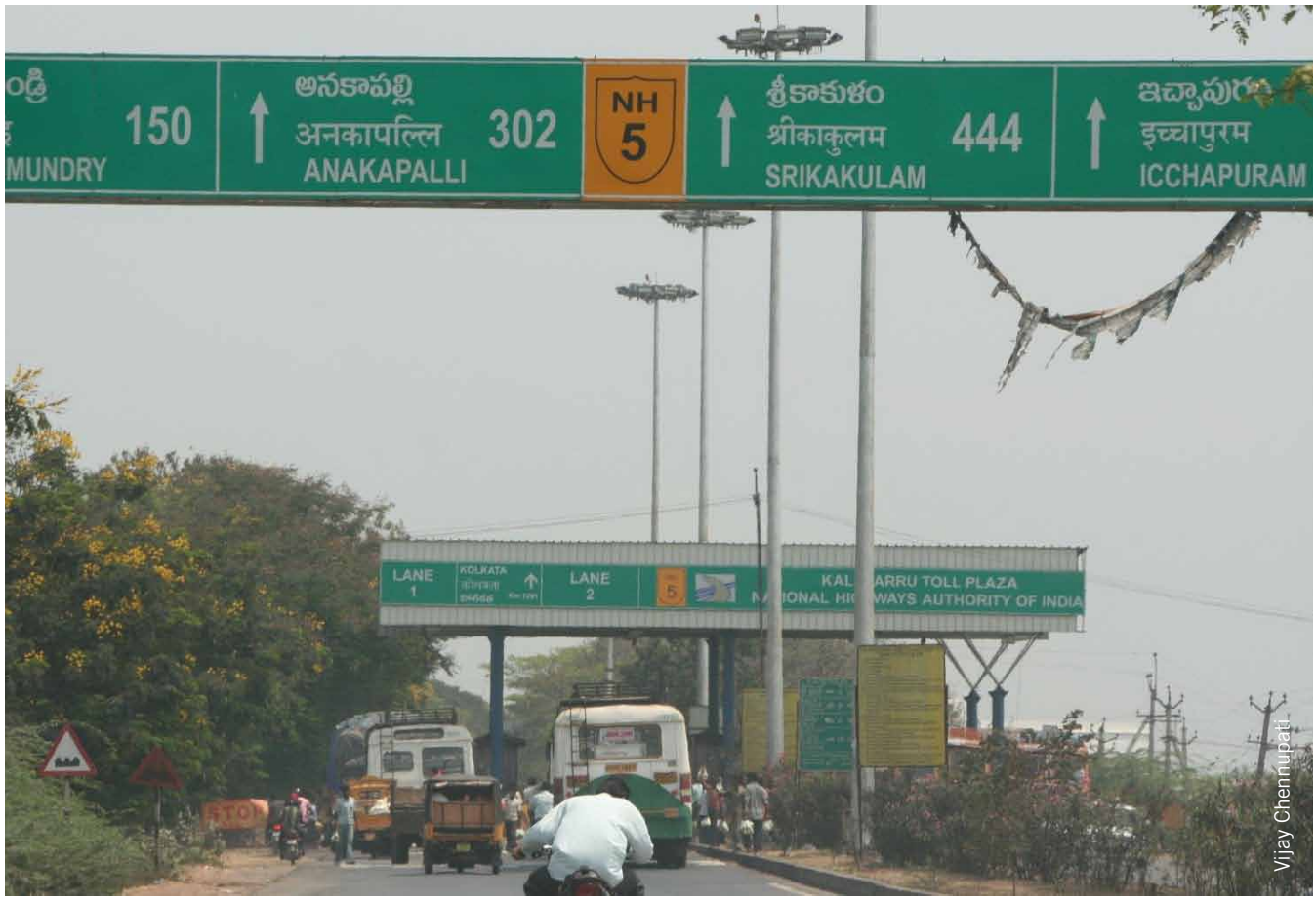
Finally, capacity building should not exclusively target the central government as many projects are executed at a sub-national level. According to the EIU study previously mentioned, around 90 per cent of Australia's PPP are administered at the state level, and many Indian States have their own separate PPP laws and regulations.

A body of financial support measures

In order to attract private investors, governments often have to provide financial support to these actors to make PPP projects financially viable. Providing such support can be perfectly sensible. The economic return on a transport project might be higher than its financial return, while subsidizes might be necessary to limit the future user charges to an affordable level, thereby maintaining access to transport services for a larger portion of the population. Different support mechanisms have been developed over the years and are presented below in turn.

Land

Transport infrastructure is highly dependent on the availability of land, the lack of which has been the source of numerous delays for many projects in the past. Therefore, governments can leverage their privileged positions to provide land or grant expropriation rights to the concessionaire (as done in the Republic of Korea, for example). Other solutions have also been tested to accelerate land acquisition for PPP projects. For instance, the Government of Indonesia has been operating Land Funds to partly cover the risk faced by private operators if the land acquisition costs turn out to be significantly higher than projected.[15]



Development rights have also been granted in some cases (predominately in the urban transport sector) whereby private operators commercially develop the land along or above infrastructure in order to raise additional revenues.

Construction subsidy

Grants such as those provided under Viability Gap Fund (VGF) mechanisms are designed to reduce part of the construction costs through a 'one time' payment. This approach has been one of the factors behind the success of PPPs in India whereby it can contribute up to 40 per cent of capital expenditures (the exact percentage is defined through bidding competition). Such a mechanism also makes it possible to apply standardized toll rates nationally whilst taking into account the specificities of each section of the network. For example, VGF contribution could be larger for a section less frequented. Besides India, other countries such as Indonesia and Bangladesh are also implementing VGF. In the Republic of Korea, construction subsidize can reach between 25-30 per cent for roads, 30-40 per cent for ports and up to 50 per cent for railways, provided that these subsidies are required to keep user fees at an affordable level.

Government payments

Revenues for the private operator have to be paid by public authorities for those PPP projects deemed not suitable for user charging schemes. In this respect, two main systems have been used in the transport sector: shadow tolls and availability payments.

'Shadow tolls' are tolls that could have been charged to users yet are paid to the concessionaire by the government. These tolls limit the risk resulting from a possible negative impact that the introduction of user fees has on traffic demand. For example, traffic could be diverted to a free alternative road of less capacity which will be a sub-optimal outcome. At the same time, the private operator keeps an incentive to provide high quality infrastructure in order to attract as many users as possible;

'Availability payments' model, whereby the concessionaire receives regular payments from the government based on a service being available, is a more convenient option for the private partner to adopt as the traffic risk stays with the state. The availability of the service can be measured via performance indicators. For example, the number of lanes in acceptable conditions can be measured using the road roughness index that assesses road quality. India is using this model for part of its highway development programs through the so-called 'Annuity Model'. In India, for the period 2007-12, 26 road projects with a total length of approximately 2000 kilometres were classified under such an implementation arrangement mechanism. This represents 12.6 per cent of the total length of national highways that are implemented through the PPP model, with the remaining majority being toll roads.

State guarantees

In order to attract private operators to enter such partnerships, Governments often guarantee private operators the mitigation of a certain number of risks. One type of guarantee that can be offered is the 'Minimum Traffic Revenue Guarantee' whereby the public partner guarantees revenues for a minimum number of vehicles at an agreed toll level. A similar system was in place in the Republic of Korea until 2009, whereby a significant share of the projected revenue was guaranteed by the State. However, the system was stopped as it was deemed too generous and was putting considerable pressure on the national budget; at the end of 2008, approximately $1.2 billion had been paid by the government in the form of minimum revenue guarantee subsidies.[16] Therefore, a risk sharing structure was introduced, through which the government ensures that the operational revenues of the PPP allow for a return at least equivalent to the government bond's rate. On the other hand, a reimbursement mechanism to the government is in place if revenues for the private sector grow beyond a specified threshold in the subsequent years of operation.

Overall, minimum revenue guarantees are important as they can ease private investors' concerns regarding actual traffic levels. This is particularly relevant as traffic forecasts tend to be overly optimistic on average for toll roads. A study has estimated that toll road forecasts on average have an optimistic bias of 23 per cent compared to the actual traffic.[17] Such bias is even larger in countries that do not have a strong history of having toll roads (that is, without benchmarking the 'willingness to pay' of users). As research did not show the same bias for roads without toll, it could be inferred that overestimation of traffic might be generated by the operator having a desire to win a long term contract and perceiving a probability to renegotiate future charges.

The government might also have to issue guarantees known as 'default guarantees' to facilitate private promoters in accessing commercial loans. For instance, the government could decide to carry out the obligations of the PPP company vis-à-vis its lenders upon default, in order to enhance the creditworthiness of the operation, as has been done for some projects in Turkey. Similar financial instruments have also been created to improve the ability of the private party to honour debt service during the initial operating period or

'ramp-up' phase of the project when risk of default is the highest. Indeed, the potential for project distress is at the highest during the early years of the lifecycle, when debts have been drawn and revenue cash flow has just started (that is, there is no longer a liquidity cushion). An example of these instruments is the Loan Guarantee Instrument for Trans-European Transport Network Projects (LGTT) developed by the European Investment Bank and the European Commission. Finally, some countries have also set up dedicated funds to issue guarantees designed to improve the creditworthiness of PPP projects. For example, the 'Indonesia Infrastructure Guarantee Fund (IIGF)' was created in 2010[18] and the 'Infrastructure Credit Guarantee Fund (ICGF)' of the Republic of Korea was established in 1994.

Beyond usage and default guarantees, a series of state guarantees have also been developed to cover other PPP risks. These include guarantees required for protecting private operators against policy risk (e.g. expropriation without compensation), force majeure (for example, natural disasters) or macroeconomic risk (for example, currency devaluation when revenues are in local currency).

Overall, all these guarantees might have substantial implications in the long run and should be carefully assessed.[19] As a basic principle, these guarantees should be limited in both time and amount, and should allow for sharing the potential economic upturn. There is also a growing demand and need to ensure that these guarantees are correctly reflected in national accounts.

Project Development Fund

Developing PPP projects can be costly and may require in-depth studies to be carried out. To encourage the emergence of PPP projects, some countries have (often with the support of donor agencies) set-up dedicated funds that can help finance preparatory activities. Such funds in the ESCAP region include the Project Development and Monitoring Facility (PDMF) in the Philippines, the PPP Technical Assistance Fund in Bangladesh, and the Infrastructure Project Development Facility (IDPF) in Pakistan.

Right level of support

This section on governmental support measures can be concluded by acknowledging that other mechanisms such as tax incentives have been used to further support private operators in PPP projects. While these supports have contributed to the development of PPP projects, they should not be too generous to avoid scarce public resources from being wasted. Ensuring a fair, competitive and transparent selection process should contribute to mitigate the above risk, as promoting healthy competition remains the most efficient way of bringing costs down.

However, in practice there might be different barriers that prevent such competition. According to KPMG, which conducted a review of these barriers in Australia, the most common issues are: an unknown pipeline of projects that are sporadic in nature; a perceived lack of commitment to PPPs; and the high magnitude of bid costs.[20] Difficulty in raising debt finance, and the lack of private actors having the required capacity and resources for partnering in the initiative could also be factors that lead to low levels of competition. For instance, around 70 per cent of PPP projects in the Republic of Korea were awarded to a sole bidder, with only about 30 per cent involving more than one bidder.[21]

Another more sophisticated mechanism to further confirm the opportunity for a PPP setup is the Value for Money (VfM) analysis. This involves comparing the costs of carrying out a project through a PPP versus the tradi-

tional government approach. It is worthy to note that these cost comparisons are subject to significant assumptions which make their implementation challenging especially in developing countries. Nevertheless, the exercise remains valuable in helping governments to understand the potential financial viability of a project at an early stage. For example, in the Republic of Korea, the Public and Private Infrastructure Investment Management Center (PIMAC) has been using such analyses.

Overall, promoting high standards of transparency in the selection process, as well as regards the financial implication of the support provided by public authorities, is critical to ensure an adequate level of accountability for the policy makers taking investment decisions.

A set of agreeable contract provisions

A key challenge in PPP projects is to ensure that the contract between the partners covers all the possible issues expected to arise during the life of the project, which is typically beyond 20 years. Both the variety of risks to be allocated and the uncertainties inherent to a long term horizon make the task of drafting a comprehensive agreement particularly complex.

The following two examples can illustrate the above difficulties. Firstly, future traffic demand can be significantly affected by the transport policy laid out by the government. Indeed, developing a rail connection next to a highway will influence the level of road traffic. Alternatively, introducing a toll regime on a highway could boost demand for rail transport. If the traffic risk is transferred to the private operator, then a compensation mechanism for incorporating the effects of future actions by the government might be required as part of the agreement. Such provisions in a PPP agreement should nevertheless be carefully drafted as they might constrain future governments' actions.

Secondly, the question regarding how the private investments will be remunerated at the end of contract can also be a delicate one and needs to be agreed upon in advance. Otherwise, the private operator will be inclined to divest during the last few years of its contract, as a result of which assets will be returned to the government in a relatively poor condition. Therefore, the termination value or the formula to calculate the asset value needs to be stipulated in the contract.

Several solutions have to be developed in order to facilitate the contracting. The standardization of documents and processes is the most common solution, and has been quoted as one of the key success factors for PPP arrangements in some countries. For instance, the development of model concession agreements and the standardization of bidding documents and technical standards have allowed rapid progress to take place in the road sector in India. The importance of maintaining some flexibility to cope with events difficult to forecast is also critical. For example, a 'traffic trigger' provision in the Brazilian road concession helps avoid the advanced fixing of investment plans because additional capacity works are triggered only once some traffic thresholds are reached.[22] Finally, it is worthy to note that a participatory approach involving early consultation with stakeholders can serve to identify potential issues which can otherwise be underestimated or even overlooked.

Defining a set of agreeable contractual provisions is also a learning process in finding out what type and level of risk the private sector is actually ready to take on. This is why the first PPP projects in a country typically require much more time than subsequent projects. However, the process should become significantly quicker once the parties have reached a common understanding on the standard contract provisions, and once the financial sector is familiarized with the terms of these contracts. Nevertheless, the procurement phase remains a relatively long process even in mature markets. For example, the time from the release of expression of interest (EOI) to the financial close for transport projects is around 18 months in Australia[23], and can easily take up to several years in less developed countries. According to some studies, PPP projects are actually more prone to delays than are traditional projects in the period prior to project execution.[24] The opposite is observed in the execution period. To avoid extensive delays, some countries such as India have defined a maximum period for reaching the financial close (i.e. the period following the award when the project sponsor has to secure the necessary financing with its lenders/investors). For instance, the mega project Izmir–Gebse highway in Turkey took three years to reach financial closing for an investment value equal to $2.8 billion.[25] Overall, financial crises can make financial closing particularly difficult as the risk appetite of traditional lenders such as commercial banks can be substantially reduced resulting in a decline in new projects.

Finally, monitoring the execution of the contract is probably as important as is defining the terms of it. Tracking the agreed performance levels, enforcing penalties foreseen, and resolving the disputes that will inevitably emerge are some of the key challenging tasks carried out throughout the duration of the contract. Again, the public sector should allocate sufficient resources and capacity for these projects in order to maximize the chances of success.

Creating a conducive economic and investment climate

The overall investment climate plays a significant role in influencing the interest of the private sector in PPP infrastructure projects. Among other factors, a stable macroeconomic situation, a supportive business environment and an efficient legal system are important

conditions to attract private investors. The availability of long-term financial sources such as long-term lenders or bond and equity financial markets are also essential factors that allow private investors to find the required funding for PPP projects.[26] In this respect, some countries have created dedicated infrastructure funds or specialized institutions to boost the provision of long term (mainly local currency) financing for infrastructure projects. Some examples of these funds or institutions are the PT Indonesia Infrastructure Finance (PT IIF); the Bangladesh Infrastructure Finance Fund Limited (BIFFL); and the Infrastructure Development Finance Company Limited (IDFC) in India.[27] Regional initiatives have also emerged, such as the ASEAN Infrastructure Fund which is expected to provide financing for a portion of public-private partnerships (first operations are scheduled to start in the second half of 2013).

The existence of a positive track record of PPP projects is also important to spur private sector interests. Indeed, one failed flagship operation might jeopardize the future of the market. A perception of low hold-up or expropriation risk by the private sector is critical in that respect, as is a fair compensation system for the private operator in the case of early termination by the government.

In conclusion, there are many factors and options that policy makers have to consider when promoting the emergence of PPP solutions for infrastructure development. To support the countries in addressing the challenge of developing PPP structures, ESCAP has been providing for several years technical assistance and policy advice as further detailed in Box 3.1.


Petr Vins

BOX 3.1
ESCAP LONG-LASTING POLICY AND TECHNICAL SUPPORT TO PPP

Developing knowledge products

Recognising that strong internal capacity of Governments at the national, sub-national and municipal/local levels is critical to promote, develop, operate and manage PPP projects, the ESCAP secretariat has developed several knowledge products. These products include a 'Guidebook on PPPs in Infrastructure', a 'Primer on PPPs in Infrastructure Development' and a 'Financier's perspective on PPPs'. Based on these products, training courses have also been offered online to provide general knowledge of the financial, contractual and legal aspects of PPPs.

Improving country readiness

As has been previously highlighted, the use of PPPs in the region is highly concentrated within a few countries, reflecting large difference in the legal, institutional and financial environments of the various ESCAP member countries. Against this background, the ESCAP secretariat has, in partnership with several member countries, developed an analytical tool over the years to help countries in assessing their PPP-readiness. This is the PPP-Readiness Self-Assessment tool which helps identify the key areas that governments need to address in order to involve the private sector more actively in the infrastructure development process. It serves as a basis to develop an action plan.

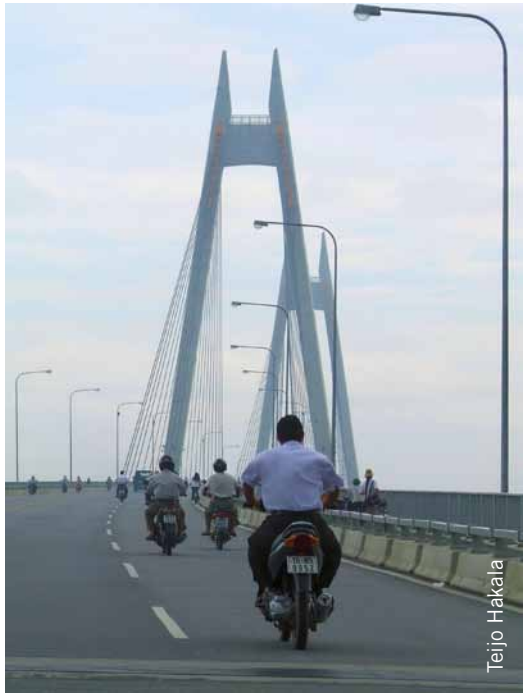
Raising political awareness

PPP projects cannot be developed without strong political support and a broad understanding of what can or cannot be achieved via the PPP approach. The ESCAP secretariat has purposefully supported countries in adopting this approach through the organization of high-level Expert Group Meetings and Ministerial Conferences on PPP for Infrastructure Development in Seoul (2007), Jakarta (2010) and Tehran (2012).

BUILDING INTRA-ASIAN PARTNERSHIP

While the previous section presented how the private sector could contribute to finance more transport infrastructure, this section will focus on multi-country cooperation as it has been identified as a key source for supporting regional projects.

Focusing on regional transport infrastructure is particularly relevant as regional networks have the potential to foster economic integration and generate additional growth. However, regional transport projects are by nature more complex than national ones, with the former necessitating much higher coordination efforts and the value generated depending extensively on all parties fulfilling their part of the works. The costs and impacts of regional projects may also be unequally distributed (or at least perceived so) among the participants, thereby resulting in further complexities and differing levels of commitment. In addition, institutional obstacles such as inefficient cross-border agreements can reduce the benefits deriving from these projects. For all of these reasons, regional transport projects often receive lower priority compared to national ones, which have a lower risk profile and a shorter gestation time.


Teijo Hakala

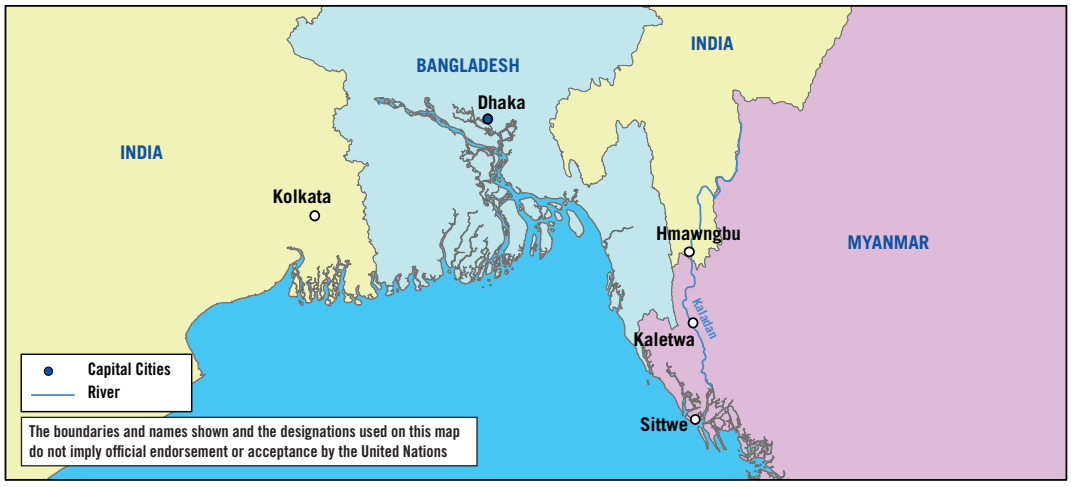
Financial constraints may also prevent some countries from carrying out projects that could potentially benefit the entire neighbouring region, as regional infrastructure performance is only as good as its weakest link.

With this in mind, some countries in the ESCAP region have provided financial assistance to other member countries to support them in developing their part of regional transport infrastructure. For instance, in addition to the DAC [28] donors such as Australia, Japan, New Zealand and the Republic of Korea, countries such as China, India, the Islamic Republic of Iran, Malaysia, the Russian Federation and Thailand have provided finance to low income countries of Asia including Afghanistan, Bangladesh, Bhutan, Cambodia, the Lao People's Democratic Republic, Mongolia, Myanmar and Nepal. The emerging trend of 'Intra-Asian' regional investments in infrastructure is outlined below, followed by a number of other potential vehicles for regional cooperation in infrastructure development.

EMERGING TREND

Existing intra-Asian cooperation is mainly bilateral

In recent years, Intra-Asian collaboration has emerged as a new and growing source of transport infrastructure financing. For instance, the Russian Federation, India and China contributed $3.6 billion of 'ODA like' funding in 2011, a sharp increase on recent years (68 per cent increase for China and an 86 per cent increase for India against 2007 contributions) [29]. Though, it is known that only a part of these resources are allocated to Asia and to transport infrastructure in particular, this growing trend offers new perspectives on the nature of regional cooperation in transport infrastructure in Asia and the Pacific. The following paragraphs present examples of selected transport projects benefiting from Intra-Asian regional cooperation. Most of these projects would most likely not have been undertaken without regional financial collaboration.

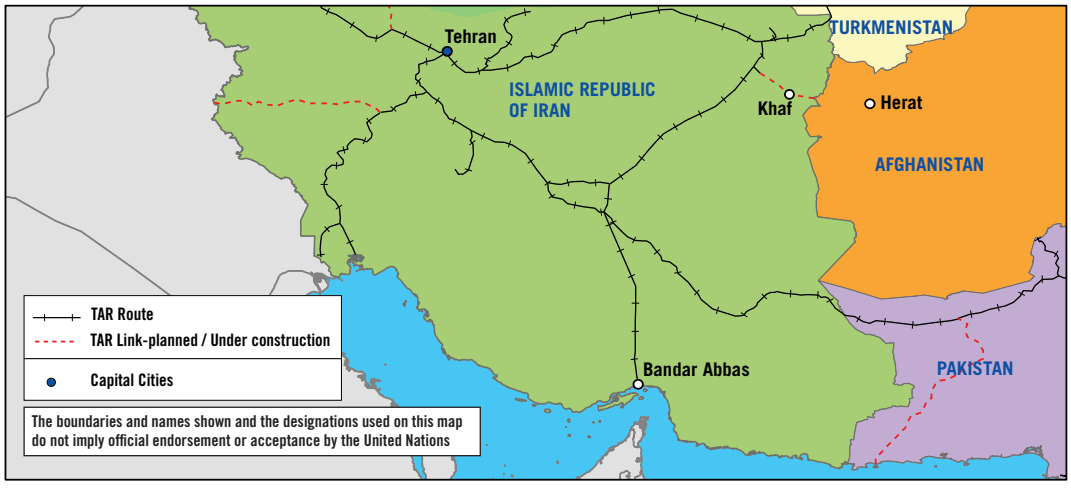


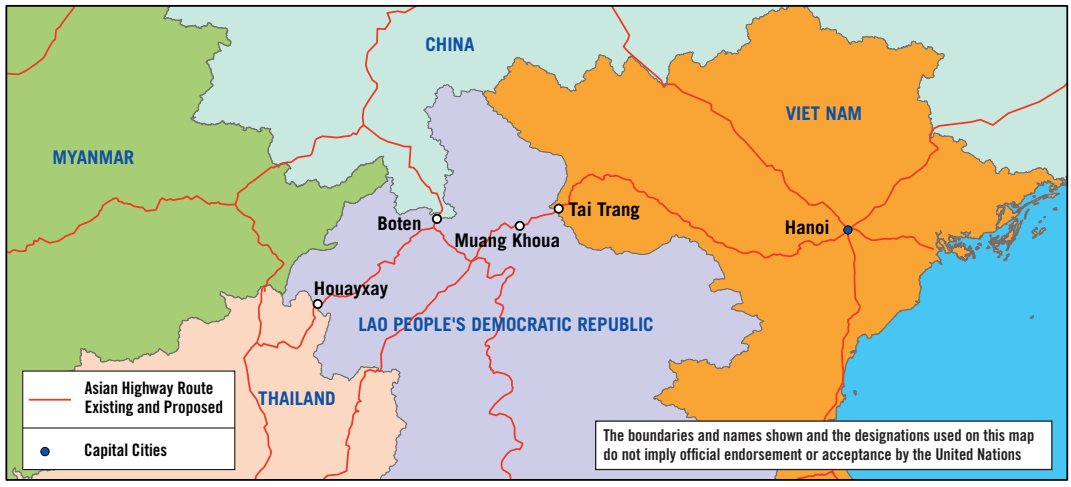
India – Myanmar: Kaladan Multi-Modal Transit Transport Project

The Kaladan Multi-Modal Transit Transport Facility envisages connectivity from the Indian port of Kolkata to Sittwe Port in Myanmar, subsequent inland water transport on the Kaladan river up to Kaletwa and finally road transport to the landlocked area of Mizoram in north-eastern India (after crossing the border at Hmawngbu). Funded by India, the project is expected to improve connectivity between India and Myanmar, as well as facilitate access to the sea for the landlocked states of Northeast India. The project is expected to be completed by 2014-2015. [30]

Iran (Islamic Republic of) – Afghanistan: Khaf-Herat Railway Project

The Government of the Islamic Republic of Iran plans to invest $75 million in the construction of the Afghanistan part of Khaf-Herat railway line, which will connect the country to the eastern part of the Islamic Republic of Iran. The first two sections in the Islamic Republic of Iran have already been completed. This regional rail project will enhance trade ties between the two countries. [31]





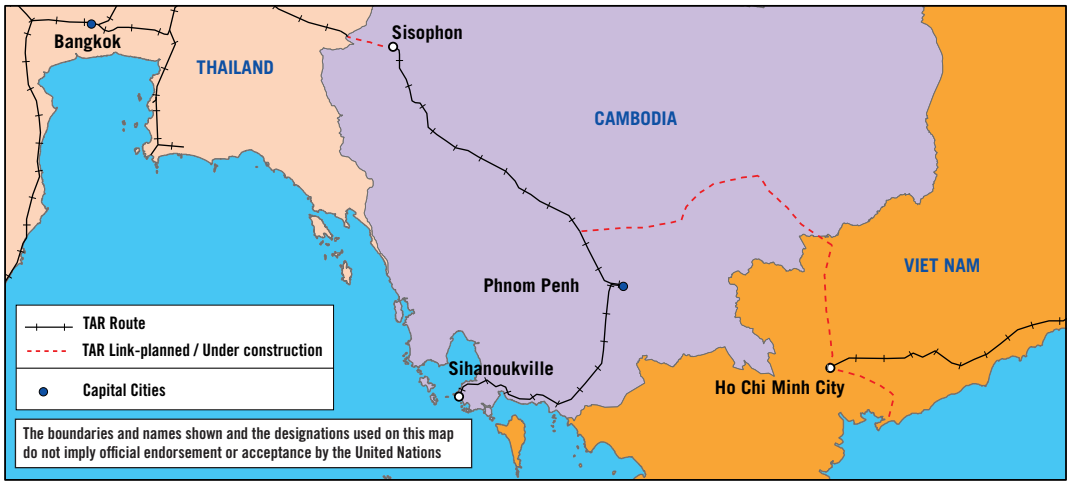
Thailand, China and Viet Nam with Lao People's Democratic Republic

GMS Northern Economic Corridor Project: Under this project, 228 km of the Asian Highway (AH3) in two provinces of north-western Lao People's Democratic Republic, from the Thai border town of Houayxai to the Chinese border town of Boten, was upgraded to an all-weather road. This improvement was partly financed with assistance from China ($39 million) and Thailand ($53 million). The road establishes a direct link between Thailand and China, thereby promoting transport and trade. The project was completed in June 2009. [32]

National Highway 2E project: The highway, linking Khoa district (Muang Khua) to the Tay Trang border gate with Viet Nam (68.2 km) was inaugurated in February 2013. The project should further boost exchanges between the two countries. The total investment for the road amounted to $43 million. This was the second project financed by the Vietnamese government within the borders of Lao People's Democratic Republic.[33] This road should be soon part of the Asian Highway network (AH13) as the related amendment to include this road section has already been proposed.

China - Kyrgyzstan: Rehabilitation of Bishkek–Torugart Road and Osh-Sarytash-Irkeshtam

The AH61 road from Bishkek-Naryn-Torugart (539 km) links China and the Republic of Kazakhstan through the territory of Kyrgyzstan and is one of the six priority transport corridors of the Central Asia Regional Economic Cooperation (CAREC) program of the Asian Development Bank. The Export-Import Bank of China provided the major portion of the financing, with $200 million lent for the implementation period 2010-2015. Another project in Kyrgyzstan which has benefited from Chinese assistance in rehabilitation efforts is the AH65 road from Osh-Sarytash-Irkeshtam (258 km), which was completed in 2012. [34]



Malaysia – Cambodia: Railway Rehabilitation Project

In addition to other donors such as Australia, the Government of Malaysia provided a $2.8 million contribution (grant-in-kind) to support the rehabilitation of rail infrastructure in Cambodia, which forms an integrated part of the Trans-Asian Railway network. The project aims at restoring the existing railway infrastructure through track rehabilitation and redevelopment. Train services started in December 2012 on the southern line of the rehabilitated network between Phnom Penh and Sihanoukville. [35]

While the list of projects presented above give an insight into what is possible through bilateral cooperation, the scale of the region's infrastructure needs raises the question of whether additional mechanisms have to be introduced to meet these needs. The following section introduces some alternatives approaches that could be considered for enhancing regional cooperation in the field of infrastructure financing, particularly by using existing resources in a more optimal manner or to leverage additional funding which otherwise would not be available.

FUTURE AVENUES

Could regional mechanisms bring some added value?

Although the region encompasses various institutional mechanisms for coordinating the development of regional transport infrastructure, such as the Working Group on the Asian Highway, very few are coupled with dedicated financial mechanisms that support the implementation of the projects identified. A number of existing as well as potential types of regional funding mechanisms are presented below.

Regional infrastructure fund

In 2010, ASEAN member States and the ADB set up the ASEAN Infrastructure Fund, with an initial equity base of $485 million, of which $335 million is provided by ASEAN members and the remaining $150 million from the ADB. One of the goals of the Fund is to support the implementation of the Master Plan on ASEAN Connectivity by lending $4 billion to ASEAN members through to 2020. While the Fund itself will function as a limited liability company, the ADB will administer the Fund, which is tentatively expected to finance approximately six infrastructure projects each year. In June 2013, it was announced that lending operations would begin in the second half of 2013, with a pipeline of around $1 billion in projects for the next three years. However, the ASEAN Infrastructure Fund may still not meet the needs of the poorest countries of the region, unless it can be combined with other sources of concessional lending.

A similar fund also exists in the South Asian Association for Regional Cooperation (SAARC), although its size is more limited.

Such infrastructure funds could serve in the future as a vehicle to mobilize resources from institutional investors such as pension funds, sovereign wealth funds or foreign exchange reserves, playing an intermediary role between investors and project sponsors.

Asian multi-donor platform

Another approach for enhancing regional cooperation is to develop a multi-donor platform designed to collect grants from different donors, and to subsequently allocate them to different implementing partners (i.e. financial institutions). As such, the grants provided by the multi-donor platform will complement the loans provided by participating international financial institutions. This approach has been used by the European Union (EU) and its member States whereby EU grants are used to leverage loans from different European national and multilateral public financial institutions. Two such mechanisms are relevant to the Asian region – the Investment Facility for Central Asia (IFCA) and the Asian Investment Facility (AIF) – both endowed with significant grants funds (the IFCA alone had around $80 million for the period 2010-2013). Transport is however currently not eligible under these frameworks, though this might be change in the future.

Such multi-donor mechanisms could be particularly relevant for the poorest countries in the region as grants could enhance the financial viability of the regional transport projects under consideration. By gathering all major actors active in infrastructure financing around a common financial mechanism, such a regional approach might have additional merits compared to traditional bilateral cooperation such as:

- supporting identification and prioritization of regional projects;
- providing a broader choice for channelling donor resources, as the platform will be open to various financial institutions;
- creating more transparency about both the funds provided and the strings attached, while improving exchange of information regarding the various regional projects developed;
- reducing administrative costs compared to an ad-hoc / case-by-case approach;
- facilitating collaboration among participating institutions, including at the project level (e.g. harmonization of procedures);
- offering a framework for developing new ideas and concepts to support the financing of future infrastructure projects.

Regional project preparatory facility

Another area where regional cooperation could be enhanced is in the creation of a facility to help countries prepare projects. Most countries lack bankable projects simply because they don't have the legal, project financing and technical expertise to design and formulate projects which are attractive to potential investors. To overcome this issue, some countries, such as Indonesia, have established dedicated 'Project Development Facilities' within their governments' institutional frameworks.

The preparation of regional transport projects are even more costly and time consuming due to the lack of data, such as cross-border traffic flows. Some analysts have called for the creation of an Asian Infrastructure Financing Fund (AIFF) to help governments prepare bankable regional projects.

While the three different approaches presented above offer new horizons for financing regional infrastructure, these approaches if pursued should capitalize on existing initiatives such as the ones supported by ESCAP described in Box 3.2.

BOX 3.2
ESCAP SUPPORT TO REGIONAL INFRASTRUCTURE FINANCING

The ESCAP secretariat has organized various events aimed at facilitating access to finance for key regional infrastructure projects. For instance, the first Asian Highway Investment Forum was organized in 2007, and a second one is planned for 2013. Such meetings provide an opportunity for participating countries, international financial institutions and the private sector to discuss investment priorities and prospects, as well as different approaches to financing projects. Furthermore, they support exchange of experiences related to the financing, development and operation of major highways. This was evident from an Expert Group Meeting that ESCAP organized in 2009 on 'Financing for Transport Infrastructure', which encouraged ESCAP member States to give high priority to projects that improve cross-border connectivity and help to 'operationalize' the Asian Highway and Trans-Asian Railway networks.

END NOTES

[1] 1.5 per cent is the average of total outlays in transport for countries for which data were available (source IMF – Government Finance Statistics online database). For 2010, such data were available for 13 countries in the ESCAP region.

[2] Overall, the approach followed is very similar to the one used in ESCAP (2006). More recent average cost estimates were however considered notably those coming from Dulac (2013).

[3] Only the Democratic People's Republic of Korea is not a member of these institutions.

[4] The analysis focuses on approved projects for the period such that closed/terminated and proposed projects have been excluded from the analysis. Please refer to the 'Statistical Annexes' in the respective ADB Annual Report for this information (HYPERLINK "http://www.adb.org/documents/series/adb-annual-reports" http://www.adb.org/documents/series/adb-annual-reports) and the 'Summaries of Operations Approved' in the respective WB Annual Report.

[5] ADB (2013a)

[6] Source: OECD - http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm

[7] According to World Bank PPIAF database, close to 90% of transport PPP projects (value terms) have followed these types of models in the last decade in developing Asia. The remaining proportion is mainly 'divesture' which is actually closer to privatization than to classical PPP models.

[8] Mott-Mac Donald (2002)

[9] Average total cost based on PPIAF Database (only developing countries)

[10] For high income countries, only projects for the Republic of Korea and Australia were included in the analysis, as some data were readily available for these countries. However, PPP investments in transport for other Asia-Pacific high income countries are deemed relatively limited. For example, the Japanese market is characterised by smaller projects primarily across social infrastructure (JETRO (2010)).

[11] Haldea (2013)

[12] EIU (2011)

[13] Source : http://www.nortonrose.com/knowledge/publications/75278/ppp-back-on-the-agenda-in-thailand accessed on 6 September 2013

[14] EIB (2009)

[15] "The land capping fund is available for toll road investors and provides private investors with downside risk protection should land acquisition costs significantly exceed initial estimates. The government will cover any changes in land acquisition costs above 110 % from the agreed price in the concession agreement or 2% of investment cost, whichever is higher" source Oxford Business Group – The Report Indonesia 2012.

[16] Kim et al. (2011)

[17] Bain (2009)

[18] For further details : http://www.pwc.com/id/en/publications/assets/thereport_indonesia2012_obg.pdf accessed on 6 September 2013

[19] Further information on State Guarantees is available in EPEC (2011)

[20] 'Bidding for PPP projects is expensive: typically $2.5 million at risk for projects with a capital value of $250 – 300 million, rising to $5 - 6 million for a $1 billion hospital and $30 million or more for a large $2 billion+ economic infrastructure project.' KPMG (2010)

[21] Kim et al. (2011)

[22] IFC (2012)

[23] KPMG (2010)

[24] Duffield (2008)

[25] http://infrapppworld.com/2013/03/megaproject-2-astaldi-and-turkish-partners-close-financing-for-2-8-billion-izmir-gebse-highway.html accessed on 6 September 2013

[26] Some specialised private equity funds have emerged to provide the equity part of infrastructure projects while large multinationals usually finance their equity investment themselves.

[27] Most transport project earnings are denominated in local currency. The availability of long term financing options in local currency is important to mitigate maturity and currency mismatch risk.

[28] DAC refers to the OECD Development Assistance Committee (DAC) which has grouped the world's main donors.

[29] Source: OECD - http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm accessed on 6 September 2013

[30] Source: Ministry of Development of North Eastern Region (http://www.mdoner.gov.in) accessed on 6 September 2013

[31] Source UIC - http://rameuic.com accessed on 10 June 2013

[32] Source: ADB http://www.adb.org/sites/default/files/PVR-202.pdf accessed on 6 September 2013

[33] Source: Ministry of Transport: http://www.mt.gov.vn/eDefault.aspx?tabid=10&catid=149&articleid=15904 accessed on 6 September 2013

[34] Source: Ministry of Transport and Communications of Kyrgyzstan / http://piumotc.kg/en/projects/ accessed on 18 August 2013

[35] Source: ADB (http://www.adb.org/projects/37269-013/fast-facts) and Toll Royal Railway http://www.tollroyalrailway.com/) accessed on 17 August 2013

CHAPTER

4

PROMOTING SUSTAINABLE TRANSPORT FOR INCLUSIVE DEVELOPMENT

AS RECOGNIZED AT THE UNITED NATIONS CONFERENCE ON SUSTAINABLE DEVELOPMENT (RIO+20) HELD IN JUNE 2012, TRANSPORT AND MOBILITY ARE CENTRAL TO DEVELOPMENT THAT IS ECONOMICALLY, SOCIALLY AND ENVIRONMENTALLY SUSTAINABLE. TRANSPORT NETWORKS FACILITATE THE MOVEMENT OF PEOPLE AND GOODS, ENSURING THAT LABOUR, RAW MATERIALS, PRODUCTS AND IDEAS CAN MOVE WITHIN AND ACROSS BORDERS AND CONTRIBUTE TO THE ECONOMIC, SOCIAL AND ENVIRONMENTAL BETTERMENT OF THE REGION. CHAPTERS 1 AND 2 OF THIS REVIEW IDENTIFIED REGIONAL TRANSPORT LINKS, BOTH RAIL AND ROAD, THAT PROMOTE SUSTAINABLE TRANSPORT FOR INCLUSIVE DEVELOPMENT.

With half the world's people now living in cities and towns, the provision of integrated and inclusive urban transportation systems is a critical challenge in the region. Meanwhile, the increasing numbers of fatalities due to road accidents in the region are a major cause for concern requiring urgent action. These two substantive issues, urban mobility and road safety will be further explored in this chapter, with innovative strategies and policies that could make transportation more sustainable and inclusive in the region. Examples of initiatives and projects that are making positive change will also be showcased.

UPGRADING URBAN MOBILITY

Transportation systems play a fundamental role in fostering cities that are, economically, socially and environmentally sustainable. The foundations of the successful cities of today lie, among other things, in past transport infrastructure policies and investments. While getting transport policy and investment right is a persistent challenge in all cities, the pace of city building in the developing world, coupled with enormous environmental and equality pressures, heightens this challenge and shortens the window of opportunity for making positive transport investments.

Inaction no longer an option

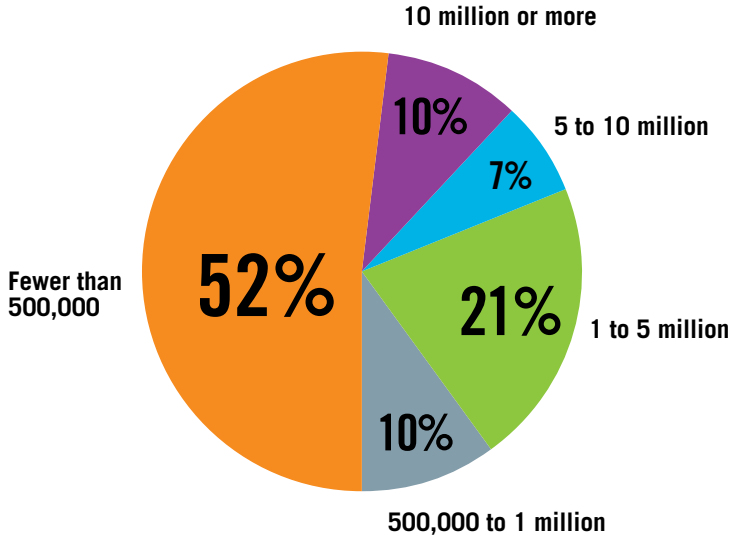
DRIVING FORCES

Growth Pressures

The world is undergoing the largest wave of urban growth in its history. By 2030, five billion of the world's population will reside in cities, with 95 percent of that growth occurring in Africa and Asia.[1] Much of the attraction towards cities is the economic opportunities they present, with over 80 per cent of the Asia-Pacific region's GDP produced in cities and towns.[2] Urbanization is thus seen as a key to economic growth. While rapid urbanization is often associated with the burgeoning of already large "megacities" (populations over 10 million), around half of the world's future urban population is anticipated to live in smaller cities of fewer than 500,000 people (Figure 4.1). These smaller cities require different transport and mobility solutions than megacities, particularly given their fiscal capacity. [3]

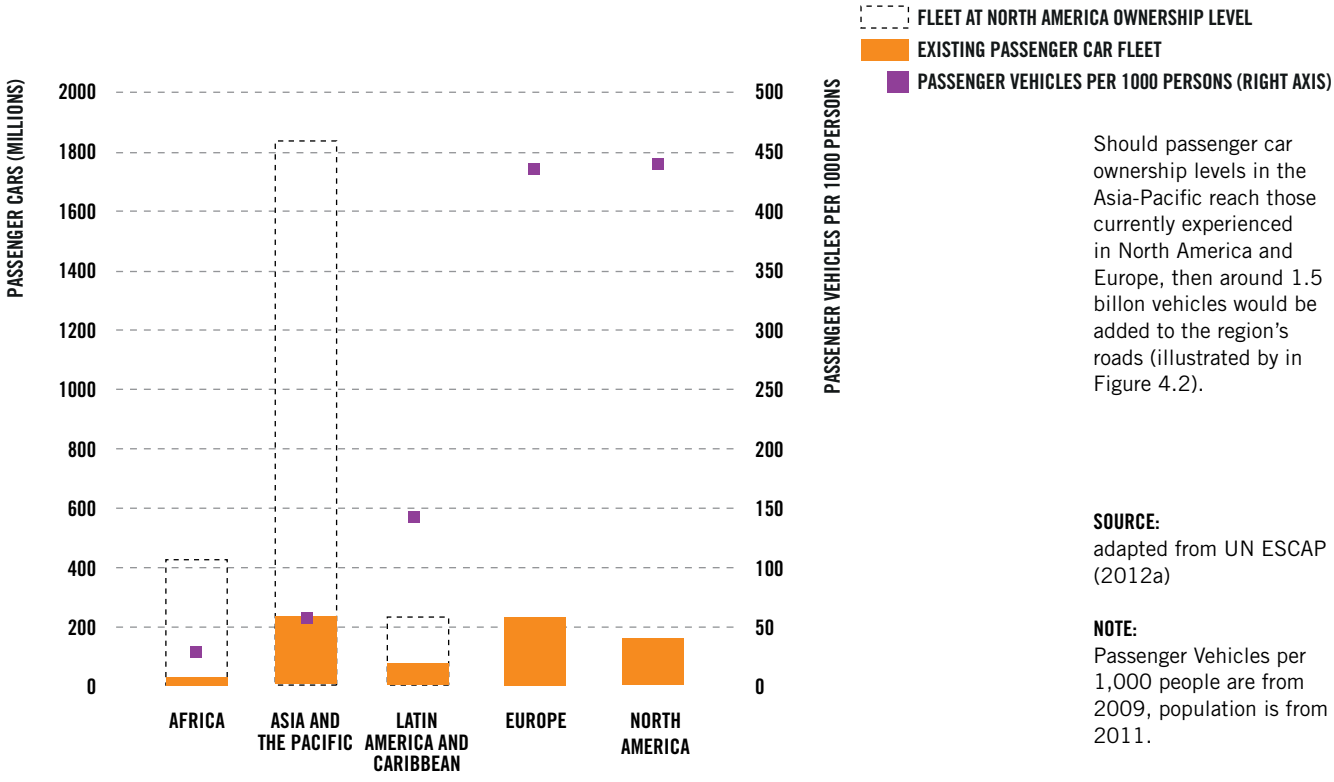
With cities as the engines of national growth and prosperity, transport and mobility in developing cities must account for the large disparity between rich and poor and ensure transport policies and the subsequent impact of those policies are inclusive. While absolute poverty is in decline around the world, urban poverty is increasing in many Asian and Pacific nations, with the poor urbanising even more rapidly than the population as a whole.[4] This inequality is most easily visualized in the presence of slums, which across the Asia-Pacific house approximately 30 per cent of urban residents, bringing issues of equality to the fore.[5]

FIGURE 4.1
WORLD DISTRIBUTION OF URBANIZATION (2010) BY CITY SIZE (POPULATION)



SOURCE:
UN DESA (2012)

FIGURE 4.2
PASSENGER CARS AND OWNERSHIP LEVEL



Should passenger car ownership levels in the Asia-Pacific reach those currently experienced in North America and Europe, then around 1.5 billon vehicles would be added to the region's roads (illustrated by in Figure 4.2).

SOURCE:
adapted from UN ESCAP (2012a)

NOTE:
Passenger Vehicles per 1,000 people are from 2009, population is from 2011.

With the benefits of urbanization and economic growth, great pressure is placed on governments to provide and maintain transport infrastructure that is both sustainable and inclusive. However, what has largely been observed is the growing dominance of the automobile as the primary provider of mobility and access in urban environments. Automobile ownership has increased dramatically across Asia, more than doubling in the last decade, with total numbers rivalling that of North America and Europe. [6,7]

While the total number of vehicles in Asia is high, relative to other regions Asian countries have a much lower rate of passenger vehicle ownership per 1,000 persons (Figure 4.2). But with the global vehicle fleet expected to triple by 2050, mostly from growth in developing countries, the number of vehicles per head of population could skyrocket, resulting in an enormous increase in the number of vehicles in cities already inundated with traffic, and far outweighing any environmental gains made through improved fuel efficiencies.

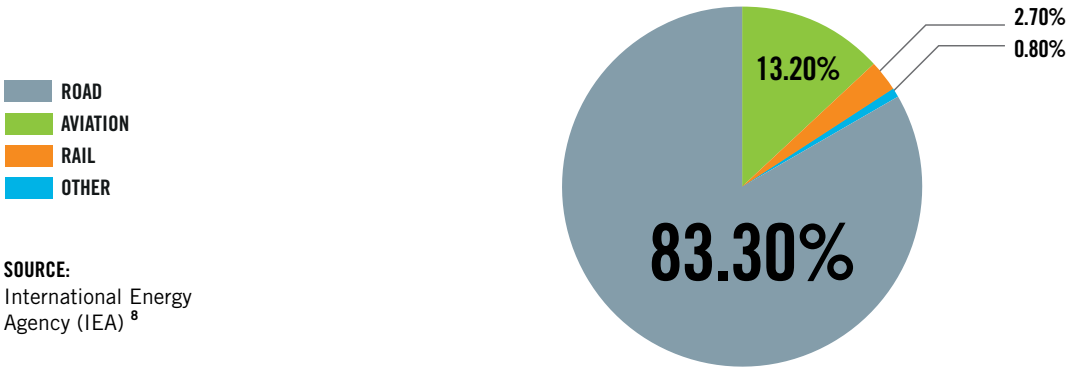
Negative Externalities of Transport

Societies depend on efficient transport to function and grow. At the same time, however, transport networks need to be developed in ways which minimize unacceptable adverse impacts. To date the rapid urbanization of Asian cities has, for the most part, resulted in cities that are heavily congested, are poor in urban amenity, suffer high levels of air pollution, emit substantial amounts of CO_2, inefficiently use scarce land resources, and present unequal access to opportunities for their residents.

While a "transport system" consists of multiple modes of transportation with all modes playing an important role in the overall system, many of the negative externalities attributed to the transport sector are a result of, or exacerbated by, the growth in automobile ownership and use.

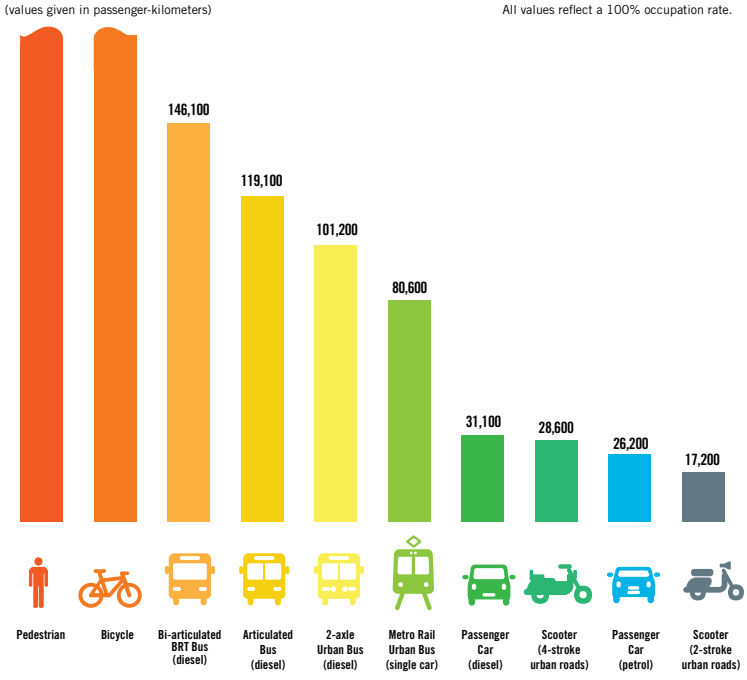
In urban environments, particularly dense urban environments that typify Asian cities, congestion on the transport network is a major issue and one that is growing substantially as urbanization intensifies.

FIGURE 4.3
CO2 EMISSION, ASIA-PACIFIC, BY TYPE OF TRANSPORT, 2010



SOURCE:
International Energy Agency (IEA) [8]

FIGURE 4.4
PASSENGER-KILOMETRES OF TRAVEL PER 1 TON OF CO2 EMITTED



SOURCE:
Adapted from ADB and GIZ (2011)

Congestion adds significant costs to both society and individuals through longer travel times, increased pollution, fuel consumption and CO_2 emissions, and general degradation of urban amenity. In the case of road congestion, the degraded amenity particularly affects and decreases the use of other, lower polluting road users, namely public transport, cycling and walking.

While congestion increases air pollution and CO_2 emissions, even without congestion the transport sector is a considerable emitter – globally responsible for one quarter of all the energy related CO_2 emissions. However, different transport modes emit considerably different amounts of CO_2. For instance, Figure 4.3 shows that road transport contributes to more than 80% of CO_2 emitted by the sector in the region while Figure 4.4 illustrates how many kilometres can be travelled for every one ton of CO_2 emitted by a passenger using different modes. To support policy makers in selecting the most effective measures to reduce CO_2 emissions in the inland transport sector, different initiatives are ongoing notably one that is implemented by the UN regional commissions as described in Box 4.1.


Kimbae Park

BOX 4.1
FOR FUTURE INLAND TRANSPORT SYSTEMS (FORFITS)

UN regional commissions are jointly implementing a project entitled "Development and implementation of a monitoring and assessment tool for CO_2 emissions in inland transport to facilitate climate change mitigation". As part of the project, a global status report on inland transport CO_2 emissions was prepared and the development of an inland transport (road, rail and inland waterways) emission measurement model called For Future Inland Transport Systems (ForFITS) is now complete. Such modelling tools can be a useful for comparing sustainable transport policies and assisting policy makers to select the most effective measures to reduce CO_2 emissions in the inland transport sector. Pilot exercises for the model and organization of regional and national capacity building workshops are planned, which will provide opportunities to learn about various emission measurement methods and mitigation policies as well, as to apply model.

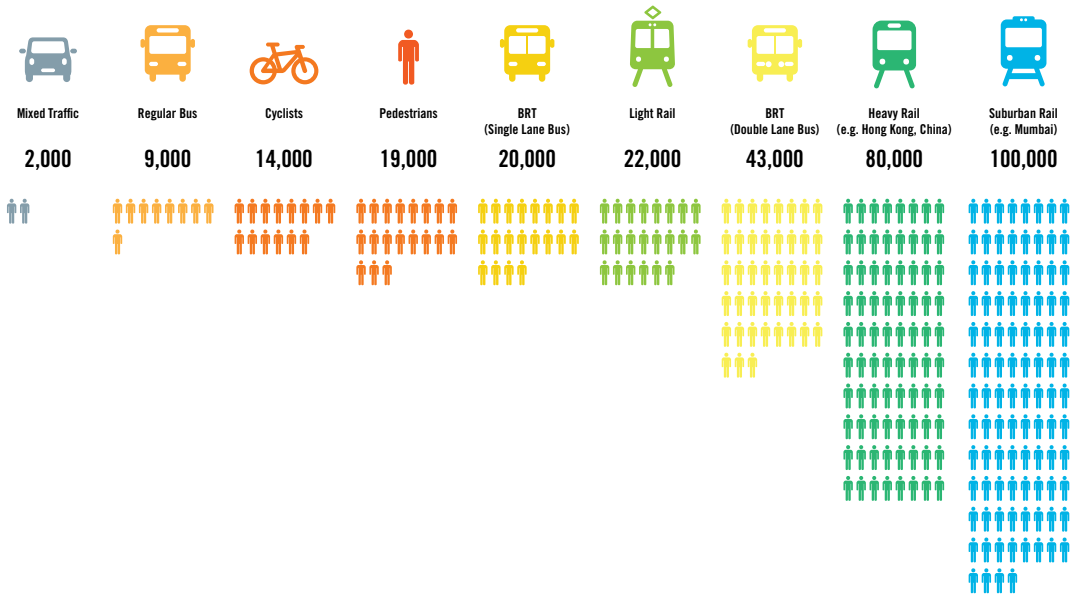
In terms of air pollution, an estimated 1.3 million premature deaths occur each year due to the effects of urban outdoor air pollution.[9] This is estimated to cost approximately 2 per cent of GDP in developed countries and 5 per cent in developing countries. Over 90 per cent of this air pollution is attributed to vehicle emissions, with older vehicles, poor vehicle maintenance, inadequate infrastructure and low fuel quality exacerbating the situation.[10]

The effects of high automobile ownership are not only felt through worsening congestion, poor air quality and rising CO_2 emissions. In cities, space is at a premium, but different modes move people with different levels of efficiency in terms of land consumption and corridor capacity (Figure 4.5). The automobile is by far the most intensive user of urban space. In North American cities, where automobile ownership is the highest, roads and parking space account for between 30 to 60 per cent of the total area of cities.[11] An automobile travelling at 50 km/h requires almost 600m² of land per travelling person, compared to around 30m² per passenger on a bus, 20m² for a bicycle, and only 8m² for a pedestrian.[12] In the high density cities of Asia, the allocation of vast amounts of land for automobile use is unsustainable and exclusive.

FIGURE 4.5
TRANSPORT MODE SPACE REQUIREMENTS

people per hour on 3.5 m wide lane in the city

BRT = Bus Rapid Transit



SOURCE:
Adapted from ADB & GIZ (2011)

Finally, as urban economies increasingly move towards "knowledge economies" [13] the relationship between high levels of accessibility and improved economic outcomes strengthens, as observed in countless international examples.[14] In dense urban centres the car is not only an inefficient mode for moving people in terms of land and energy use, but also in terms of carrying capacity. Such inefficient modes simply cannot move the number of people required to feed vibrant job- and service- rich urban cores. When a transport network reaches full capacity, accessibility is worsened, and the spatial distribution of opportunities becomes more distorted, giving further rise to issues of equality.

Inclusive or exclusive growth?

Transportation is a fundamental, yet often overlooked, element in alleviating disadvantage. Access to reliable means of transportation impacts heavily on quality of life, economic livelihoods, and social development. Inadequate mobility prevents people from being able to find or get to their jobs, their friends and family, education, health care or their other daily tasks.

Although disadvantaged is most commonly thought of in terms of low-income groups, it also includes people excluded based on gender, age or disability.

In alleviating economic disadvantage and poverty, access to transport is the second most significant contributor to economic growth, second only to education.[15] Without good transport the urban poor are further marginalized by their poor geographical location. Reducing poverty and making progress towards social and economic development requires a re-design and implementation of policies that acknowledge the impact of transportation on those in need.

Car dominant cities have been consciously or unconsciously promoted through government action or inaction, including through subsidies on fuel, parking and government or company car fleets; expansion of roads; priority of road

space for motor vehicles displacing cycling, walking and public transport; and land use planning, policy and design that has spread activities and incentivized the use of the car.

But a significant proportion of the urban populations of Asia and the Pacific cannot afford to own personal motorized vehicles, be they cars or two-wheelers, and hence their ability to access opportunities is entirely dependent on the availability of non-motorized transport (walking and cycling), informal transport, and/or public transport (which even then may be unaffordable).

Neglecting non-motorized transport investments and consistently prioritising automobile infrastructure can lead to mobility standards only being improved for a relatively small group of people. Moreover, without facilities to regulate the interaction between motorized vehicles and non-motorized vehicles, new infrastructure impedes on the accessibility and safety of all other users of the road, reflected in the high casualty rates of cyclists and pedestrians.[16]

ESCAP photo

AN EMERGING FRAMEWORK FOR TRANSPORT POLICY

Sustainable and inclusive urban transport is a fast emerging issue within the region and many initiatives are currently being undertaken to promote and advocate for sustainable transport policies. One key initiative in this respect is the EST (Environmentally Sustainable Transport) Forum supported by the United Nations Centre for Regional Development, in which ESCAP has actively participated over the years along with other development partners. Under this Forum, the Bangkok 2020 Declaration was developed, which includes "Sustainable Transport Goals for 2010-2020" in order to demonstrate a regional commitment to measures for achieving safe, secure, quick, reliable, affordable, efficient, people-centric and environmentally friendly transport in rapidly urbanising Asia. Further, a concept of a voluntary regional agreement on green freight in Asia is also being discussed. [17]

This commitment is centred on the framework of **"Avoid, Shift, Improve"** when formulating transport policy and investment decisions. To be sustainable and inclusive, all transport policy and investments should aim to:

- **Avoid** unnecessary transport;
- **Shift** to more sustainable modes; and
- **Improve** transport practices and technologies.

Within this framework, sustainable and inclusive transport advancements in the region will be presented.

Avoid – Shift – Improve

Lowering demand for transport without compromising user needs

AVOIDING UNNECESSARY TRANSPORT

Avoiding the need to travel is the most sustainable and inclusive way of improving urban mobility. Transport is not an end in itself; it is a tool that facilitates access. Improving access, be it to employment, schools, healthcare, social activities, etc. is the ultimate goal of transport, and can be provided by either proximity to an activity, or through the provision of infrastructure that bridges the challenges of distance.

Most urban activities are fixed to a specific spatial location and are thus subject to land use planning. Where and how activities in a city are spatially organized has an impact on the requirements of transport, but importantly, transport infrastructure also guides land use development patters. Transport and land use planning are therefore intrinsically linked, and can be used in tandem to avoid the need to travel at all. When dealing with changing urban landscapes, such actions can take years or decades for the benefits to materialize, and decisions made now about urban infrastructure can lock cities into positive or negative consumption and production models for years to come. However, this should not discourage planners and policy makers; the benefit stream of such endeavours is long, with many infrastructure investments continuing to influence urban form for decades, if not centuries after their construction (i.e. London, New York, Paris underground railways).

Furthermore, while most urban activities have a fixed spatial location, the development of information and communication technologies, particularly the internet, is increasingly untying activities from a specific location. As such, these technological developments can act as a substitute for physical travel, or provide opportunities for reducing travel.

Land-use and transport planning integration

Major transport infrastructure investments change accessibility patterns and influence the location choices of households and firms, stimulating development in desired locations (see Box 4.2 on Bangkok, Thailand). By the same measure, major changes in land use patterns influence the requirements of transport, including the number of trips, their destinations and their mode. The relationship between the two is mutually dependent.

The need to travel can be reduced or avoided through the integration of land-use and transport planning. When transport infrastructure is coupled with land-use planning that supports high-density, mixed-use developments, access can be improved by[19]:

1. Minimising travel by reducing the distance between activities – reducing total vehicle kilometres and promoting walking and cycling; and
2. Clustering trip origins and destinations – reducing the number of trips taken and making public transport a more attractive and commercially viable option.

As previously highlighted, personal motorized vehicle ownership has grown substantially in recent years, and to date, existing investments to improve urban transport have mostly centred on moving vehicles farther and faster. Coupled with land use policies that separate land use types, urban growth has tended to be greatest on the periphery of cities at low densities and with dispersed trip origins and destinations. This 'urban sprawl' growth pattern, commonplace in the region, has resulted in rising trip lengths, congestion and an urban form where personal motorized transport is often the only convenient option for traversing the city.[20] This urban growth model is neither sustainable nor inclusive.

BOX 4.2
MASS TRANSIT-LED URBAN CONSOLIDATION – BANGKOK, THAILAND

While Bangkok's transport and land use planning has long been heavily car orientated, investments in urban rail, both elevated (BTS) and underground (MRT), are showing signs of changing the cities spatial structure and reversing the trend of urban sprawl. These mass transit investments have improved the accessibility of central Bangkok and in turn changed the land dynamics of areas within close proximity of stations, spurring high density and mixed-use urban redevelopment projects. The concentrating of jobs and residents in centrally located areas accessible by multiple modes of transport is a more sustainable and inclusive spatial organization of the city than was previously occurring.

SOURCE:
Ratanawaraha (2013) Shifting urban development away from automobiles in Bangkok, Thailand

Promoting a more compact urban form that reduces travel requirements is a critical component in building cities that are more sustainable and inclusive. Such approaches locate people, jobs and services in areas within walking distance of public transportation, and are commonly referred to as Transit Orientated Developments (TOD). Transport connections in such developments are supported by zoning and planning regulations that support public transport use, walking and cycling. Throughout the ESCAP region, there are positive examples of transport and land use planning being coordinated to reduce the need for travel and improve the sustainability and inclusiveness of cities. For example, Eco-city Tianjin, a cooperation project between the governments of Singapore and China planned with the concept of green transport[21], aims to increase trips using public transport, walking and cycling.

Information and communications technologies

Information and communications technology can substitute or reduce the need for physical travel and is gaining momentum as a travel demand management tool throughout the world.

The widening accessibility and connection quality of the internet, coupled with developments in tele- and video-conferencing, present opportunities for people to access work, education, shopping, government services and social endeavours without having to physically travel. While information and communications technology is unlikely to be an adequate substitute for all travel and is not appropriate in many circumstances, using technology as a substitute for some travel can have a significant impact. Importantly, accessing opportunities via technology can particularly benefit groups that experience a higher risk of social exclusion than the general population, such as women, the young and the old, the poor, and persons with a disability.

Technology can also be used to avoid unnecessary or excessive travel by making transport connections more efficient. For instance, in Mumbai (India), a number of small start-up technology companies have developed internet and smartphone based apps that enable local taxi and rickshaw users to create and share rides (and the subsequent fare) with fellow passengers travelling on the same route.[22]

Policy impetus required

SHIFTING TO MORE SUSTAINABLE MODES

While designing cities to avoid the need to travel is the best way to improve the sustainability and inclusiveness of urban mobility, policies and investments that shift automobile travel to public transport, cycling and walking contribute substantially to building more sustainable and inclusive cities.

When travellers are deciding on which mode of transport to take for any particular trip, they ultimately decide based on an assessment of both 'push' and 'pull' factors. Push factors are those aspects of travel that discourage a user, while pull factors are those which attract them. In many situations push and pull factors relate to the same aspect of travel, but depend on whether the situation is negative or positive. For instance, too much road congestion will push a potential automobile user to instead take the train, but too little congestion and that same user may be pulled back to driving. Transport planners need to ensure that the mode they desire travellers to take is in fact the most logical choice for users. To improve the attractiveness of desired modes of travel, planners have the ability to influence both push and pull factors associated with urban transport.

Importantly, push and pull factors can be used in conjunction with one another, simultaneously discouraging one form of travel while incentivizing another. However, attempts to shift travel from one mode to another should not come at the expense of overall mobility standards. A transport strategy that simply adds cost and inconvenience to one mode of transport without providing an alternative should be discouraged, and consideration must be given to the potentially adverse impacts of interventions. This is particularly the case for the poor or disadvantaged, who have far fewer mobility options or alternatives to start with. Examples of push and pull factors that are being initiated in the region to encourage modal shift are detailed below.

Modal Shift - Push Factors

Many factors can push people away from automobile use and into more sustainable modes of travel. Some factors can be controlled by governments, such as increasing the cost of on-street parking (see Box 4.3 on Tokyo, Japan) or banning car travel on certain days (see Box 4.4 on Jakarta, Indonesia), while other push factors are more organic in nature, such as worsening congestion, globally increasing oil prices or concerns over personal safety or health.

BOX 4.4
CAR FREE DAYS – JAKARTA, INDONESIA

Jakarta suffers from poor air quality, with high levels of key pollutants consistently recorded. To reduce emissions and promote alternative, cleaner and healthier transport options, Jakarta held its first Car Free Day in 2007. The initial Car Free Day closed down one of the city's main avenues, and was held once a year. However, the initiative has proved so successful that since early 2012, Car Free Days have been held every Sunday in all five of Jakarta's municipalities.

SOURCE:
Jakarta Post (2012)

Some of the common factors that push individuals away from automobile use include:

- Congestion and high time cost;
- Increased monetary cost (e.g. congestion charges such as in Tehran, Iran (Islamic Republic of) / Box 4.5);
- Travel safety concerns and high accident rates;
- Travel bans or vehicles restrictions (e.g. Beijing, Shanghai, Guiyang and Guangzhou all limit the number of license plates that can be issued in any one year, while Beijing, Changchun, Chengdu, Guiyang, Hangzhou, Lanzhou, and Nanchang all enforce travel restrictions that limit the number of cars on the road on any given day)[23];
- Parking availability and cost;
- Environmental awareness; and
- Desire for healthier lifestyles.

BOX 4.3
PARKING POLICY – TOKYO, JAPAN

Generally considered a success in terms of parking regulation and travel demand management, Tokyo has a unique set of parking policies that have resulted in a highly market-oriented parking system. As a result of several key planning laws and requirements, local markets in parking have arisen. The key features are:

- Very low minimum parking requirements that exempt all small buildings,
- Limited provision and discouragement of on-street parking, and
- "Proof-of-parking" regulation (a vehicle owner must prove they have access to a night-time parking place before they can register their car).

The coming together of these policies has resulted in a significant proportion of people parking in commercial off-street parking compounds within the vicinity of their homes. Separating parking from the home encourages shorter trips and errands to be done on foot or by bicycle, while the lack of on-street parking frees road space for other road users (complimented by a 2006 law change bolstering the enforcement of illegal on-street parking).

A market-oriented mechanism in parking policy facilitates market-based pricing that responds to supply and demand conditions – putting a price on parking, and facilitating a more efficient use of parking resources and urban land.

SOURCE:
ADB (2011a)

Measures that are within the control of government are commonly referred to as Travel Demand Management techniques, and across the region many measures are being taken that actively push people away from using unsustainable modes of transport.

BOX 4.5
CONGESTION CHARGING – TEHRAN, ISLAMIC REPUBLIC OF IRAN

The urban heart of the capital of the Islamic Republic of Iran has long had a form of motorized vehicle demand management, with a Restrictive Traffic Zone in place since 1979 to address both traffic and security concerns. Vehicles were required to possess paper based permits to enter the 32 km² zone, with exceptions made for public transport, public taxis, emergency, diplomatic and military vehicles. However, difficulties in enforcement meant that as much as 35 per cent of vehicles entering the zone were unauthorized, with only 2 per cent caught and fined by police. To address these enforcement issues, and coupled with improvements to public transport services, the city developed an enforcement system based on automated number plate recognition cameras positioned at each of the 104 road entrances to the restricted zone. The system automatically identifies vehicle registration numbers that have not paid for an annual, weekly or daily pass and subsequently sends out violation notices.

Relative to the cost of alternative transport options, the congestion charge is high, with a day pass costing 123,000 Iranian rial (about $11.60), a week long pass 738,000 rial ($69.50), and an annual pass around 1,850,000 rial (US$174). By comparison a single ticket on the Tehran BRT ranges from 1,500-2,500 rial (S$0.10 to 0.20).

SOURCE:
Mehdi Hashemi, S. and Jalali, F. (2012), Tehran Urban & Suburban Railway Operation Co (2013) and Wilson, S. (2011)

Modal Shift - Pull Factors

While government policies and investments can discourage individuals from automobile use, of equal importance are pull factors that encourage travellers to use more sustainable and inclusive transport modes. Pull factors can include big and 'hard' infrastructure investments, such as metro lines, or 'soft' and more small scale initiatives, such as improved 'walkability' (see Box 4.6), accessibility to sustainable transport modes or connectivity between these modes (see Box 4.7).

Some cities have tried to pull people towards more sustainable transport options by providing a pleasant, safe and fast channel for non-motorised transport such as pedestrian and bike-friendly greenways. In China, for instance, 6,000 kilometres of greenways have opened in the last two years, and another 14,000 kilometres are planned. Another example in the region is the pedestrian greenway which replaced a six-kilometre elevated motorway in Seoul, Republic of Korea in 2005 and which attracts today over 64,000 visitors daily . As illustrated in Box 4.6, further progress is, however, required to improve cities' friendliness to non-motorised transport modes.

BOX 4.6
WALKABILITY INDEX – CLEAN AIR ASIA

SOURCE:
Clean Air Asia (2012)

While often a neglected mode of transport in the region, the quality of walking infrastructure is being highlighted through audits and regional benchmarking. Clean Air Asia and its partners have conducted 'walkability' surveys in 23 Asian cities to better understand the state of 'walkability' in the region. From these surveys a 'walkability' index score is given (0=lowest, 100=highest). Of the cities surveyed, pedestrian conditions were predominately rated as "walk at your own risk" or "pedestrians tolerated", with only one city considered "Pedestrian friendly" (Hong Kong). This consistent benchmarking of cities against various 'walkability' parameters can then be presented to policy makers and planners to improve walking conditions.

WALKABILITY SCORES OUT OF 100

Walk at your own risk

Chennai	40
Surat	42
Indore	43
Bangalore	44
Jakarta	45
Katmandu	47
Karachi	48

Pedestrians tolerated

Bhudaneshwar	50
Rajkot	53
Pune	54
Male	56
Lanzhou	57
Hanoi	57
Colombo	58
Kota	59
Cebu	59
Ho Chi Minch City	60
Davao	60
Ulaanbataar	62
Metro Manila	64

Pedestrians friendly

Hong Kong	70

BOX 4.7
BIKE SHARE AND MODAL INTEGRATION – CHINA

In the past five years bike sharing networks in Chinese cities have spread to over 60 cities. There are now over 250,000 bikes nationwide in the bike sharing fleet, more than in any other country in the world. While there is variation in the type of bike share system installed in different cities, most have gone with third-generation systems that substantially improve the usability and convenience of the system.

Guangzhou's bike sharing system is integrated with the city's popular Bus Rapid Transit (BRT) network, providing last kilometre travel options to BRT commuters. Bike docks are located at BRT stations, and the same smart-ticket can be used for both transport modes, with the first hour of bike hire free. Importantly, bike sharing allows the BRT to attract passengers from a wider radius, making affordable mobility available to more residents. With bike docks at every station, the system also allows passengers who would ordinarily only travel one or two stops on the BRT to instead take a bike, saving the user money and alleviating BRT crowding.

The environmental benefits of Guangzhou's bike share system have been considerable, with more than two thirds of bike share trips having replaced trips previously made by motorized transport, saving an estimated 636 tonnes of CO2 emissions annually.

SOURCE:
Ooijen, B. and Li, S.
(2013)

Some of the common factors that encourage more sustainable and inclusive transport choices include improvements in:

- **Public transport coverage and quality;**
- **Value for money;**
- **Priority measures that save time;**
- **Convenience; and**
- **Safety.**

As mentioned earlier, large investments in public transport infrastructure considerably influence travel choices as well as urban form. Across the region and particularly in China and India, major investments in metros and bus rapid transit (BRT) systems have recently taken place or are planned. Metro lines are the most efficient means of moving large numbers of people. However, such systems are costly, and for many cities BRT systems present a more achievable and realistic option given their resource limitations (BRT systems can cost as much as 10 times less than heavy rail systems). These cost savings in construction and operation can then be passed onto commuters, allowing for a greater spread of riders and improving the inclusiveness of the network.

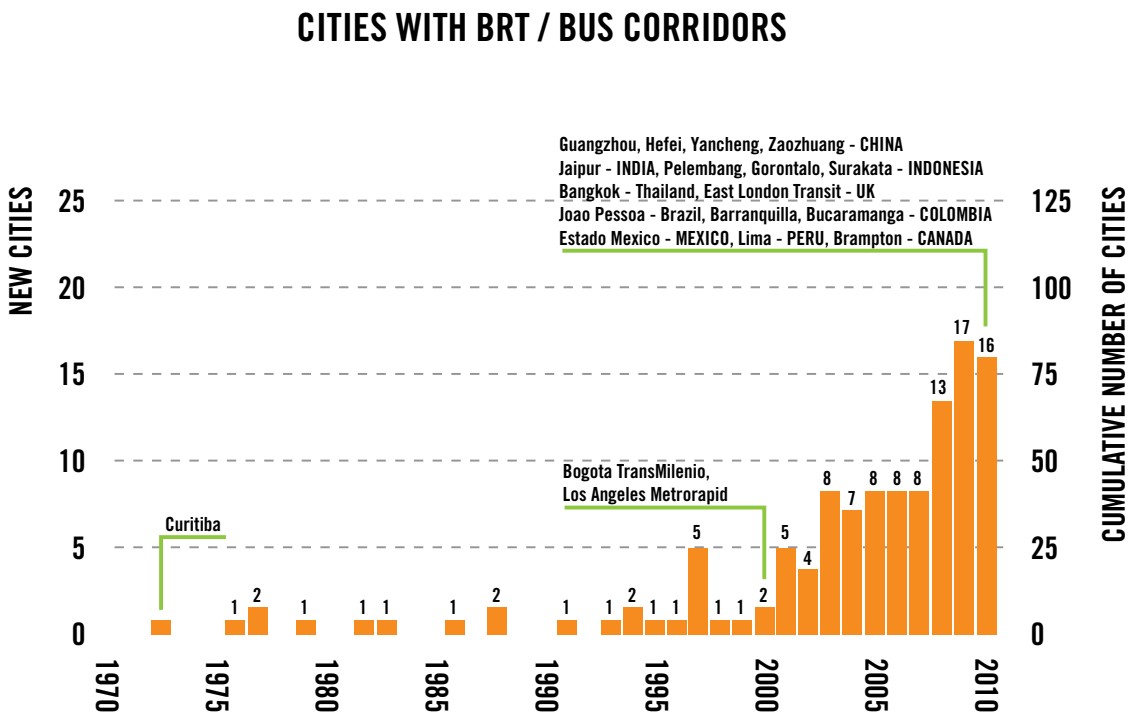
As per the "BRTdata.org" database, 39 cities within the ESCAP region have either a bus rapid transit system, buses with a high level of service, or improved bus corridors in operation. Figure 4.6 and 4.7 illustrate that BRT construction has risen rapidly in recent years while Box 4.8 described the specific case of BRT introduction in Lahore, Pakistan.

FIGURE 4.6
ADVANCED BUS SERVICES IN THE ESCAP REGION

AUSTRALIA	Adelaide, Brisbane, Melbourne, Sydney
INDIA	Ahmedabad, Bhopal, Indore, Jaipur, New Delhi, Pune, Rajkot
NEW ZEALAND	Auckland
THAILAND	Bangkok
CHINA	Beijing, Changzhou, Chongqing, Dalian, Guangzhou, Hangzhou, Hefei, Jinan, Kunming, Lanzhou, Lianyugang, Urumuqi, Xianmen, Yancheng, Yinchuan, Zaozhuang, Zhengzhou
TURKEY	Istanbul
INDONESIA	Jakarta
PAKISTAN	Lahore
JAPAN	Miyagi, Nagoya
REPUBLIC OF KOREA	Seoul
IRAN (ISLAMIC REPUBLIC OF)	Tabriz, Tehran
TAIWAN	Taipei

SOURCE:
BRT Center of Excellence, EMBARQ, IEA and SIBRT (2013)

FIGURE 4.7
BRT GROWTH WORLDWIDE



SOURCE:
EMBARQ (2010)

BOX 4.8
METRO BUS SYSTEM – LAHORE, PAKISTAN

Punjab Metrobus Authority

Lahore, capital of Pakistan's eastern province of Punjab, is home to over 10 million people, and until recently the only public transport options available were motorized rickshaws, private buses, minibuses, or taxis. Reflecting the lack of alternative transport options, vehicles registered in Lahore increased sharply from 95 vehicles per 1,000 people in 2001 to 238 vehicles in 2008, resulting in an estimated 8 million motorized trips on a usual weekday.

However, in February 2013 the city opened Pakistan's first Bus Rapid Transit (BRT) system, a 27 kilometre-long corridor linking the suburbs of Gajju Matah and Shahdra to the city centre of Lahore. The north-south route, consisting of 27 stations is served by 45 articulated buses that can transport up to 12,000 people per hour.

In a true example of knowledge and experience sharing, the Punjab Traffic Engineering and Planning Agency collaborated with counterparts in Turkey. The system was modelled on the Istanbul Bus Rapid Transport System, a Turkish construction company was partnered with, and investment funding from a Turkish firm was received. This partnership appears to have delivered considerable benefits, with the project being constructed and operational within a year, and the construction of the route costing in the region of $303.6 million against an initial estimate of $713-815 million, under half the original cost estimate. This BRT line may be the first of many for Lahore, with the Lahore Urban Transport Master Plan 2011 recommending a total of 7 BRT corridors for the city.

SOURCE:
Mahendra, A. (2013) and Punjab Metrobus Authority (2013)

Making the most of existing circumstances

IMPROVING TRANSPORT PRACTICES AND TECHNOLOGIES

Finally, planners and policy makers have the ability to improve the sustainability and inclusiveness of existing transport infrastructure and services. The adoption of environmentally cleaner fuels, vehicles and technologies, as well as the enforcement of environmental standards can significantly improve the sustainability of urban transport. The inclusiveness of transport can be improved through design provisions that enhance access for disadvantaged or vulnerable groups, particularly those with a disability and women.

Clean Fuels, Technology and Enforcement

Two of the worst air pollutants in urban environments are particulate matter (PM) and nitrous oxide (NOx). Across Asia and the Pacific, the prevalence of these harmful pollutants is high, spurred by an ever-increasing number of aging vehicles, old technology, and unclean fuels.

Fuel policies and subsidy schemes have a considerable impact on what types of fuels are used and through refinement can promote cleaner and healthier fuel choices. For example, in India a large gap exists between the price of diesel and gasoline due to fuel subsidies on diesel. This has lead to substantial increases in the sale and production of diesel vehicles, which now make up to 40 per cent of the Indian vehicle market.

New vehicles and technologies can also be incentivized or developed that reduce the environmental and health impacts of motorized transport. Initiatives can include the development of electric vehicle infrastructure (see Box 4.9), or the conversion of transport fleets to cleaner fuels (see Box 4.10).

Finally, minimum environmental standards for the performance of vehicles exist in many countries throughout the region. However, while such standards may exist, enforcement is a challenging task and in many cases is often neglected. Enforcement of standards presents a significant opportunity for governments to improve the environmental performance of motorized transport in their countries.

BOX 4.9
E-TRIKES – PHILIPPINES

SOURCE:
ADB (2013a)

The Philippine Government is working to promote the adoption of e-trikes and has launched an electric Jeepney The Philippines is home to over 3.5 million combustion engine tricycles and motorcycles, all of which have a dramatic impact on air quality and carbon dioxide emissions. The adoption of e-trikes would considerably lower the environmental impact of the tricycle industry. Furthermore, e-trikes produce no noise and zero tailpipe emissions. By 2016 the Government hopes to have 100,000 e-trikes on the roads, initially in Manila but ultimately across the country.

BOX 4.10
GREENER, CLEANER BUS FLEET – CHINA

In a bid to improve the environmental performance of China's bus fleet, the Asia Development Bank has earmarked $275 million of long-term funding for up to five Chinese financial leasing companies to support the leasing of cleaner buses. Cleaner actions include the leasing of compressed natural gas and liquefied natural gas vehicles, the conversion of existing fleets to cleaner technologies, and investments in ICT systems that improve fleet operations.

It is hoped the provision of stable long-term funds will ease funding bottlenecks and leverage co-financing, with the program expecting to finance at least 5,000 leased vehicles by 2018. The improvement of China's bus fleet could have substantial environmental impacts, with the program anticipating an annual avoidance of 1.31 million tonnes of greenhouse gases, while also improving air quality and transport options for lower income persons.

SOURCE:
ADB (2013c)

Improved Access, Safety and Affordability

Improving the accessibility and safety of urban areas benefits all members of society, but particularly disadvantaged or vulnerable groups within society, such as those with a disability and woman. In addressing the specific mobility requirements of these groups, governments should move away from accessibility as a welfare issue to an approach of accessibility as a human right, whereby every citizen has the right to participate fully in urban life.

Improving transport accessibility for disadvantaged and vulnerable groups means taking into consideration every stage of a journey. While it might be possible to access a low floor bus in a wheel-chair, this is of little use if the footpaths that lead to the bus stop cannot be navigated in a wheel-chair. While a metro station may be well lit and appear safe at night, if the streets that surround it are dark and deserted, issues of safety will remain ever-present.

Across the Asia-Pacific there are some 650 million persons with a disability, and with an ageing population, many more will have some form of impediment that makes accessing transport difficult or impossible. However, improving access for those with disabilities and the elderly not only relates to physical access, but also the presentation of information that is easily understood (such as 'wayfinding').

Women are also particularly vulnerable users of transport. Women rely more on public transport than men, but public transport is less safe in terms of the threat of violent assault. To improve the safety of urban mobility for women, gender responsive actions must be taken into account. Examples of strategies that can create safe gender-based transportation include:

- Bus routes that cater to women's schedules and the places they travel to;
- "Request stop" programs that allow women to get off closer to their destinations late at night and early in the morning;
- Subway station design features that prioritise the prevention of violence, as well as accommodate those who have experienced or feel the threat of violence;
- Women-only buses and subway cars in those cities where overcrowding is synonymous with the sexual, physical and verbal harassment and abuse of women (see Box 4.11);
- Provision of bike lanes so that women have alternative, flexible transport options; and
- Well-lit, clearly visible, emergency services-equipped sidewalks and pathways so that women can walk to and from public transport, as well as to and from their destinations.

BOX 4.11
WOMEN ONLY CARRIAGES

Lewd conduct, molestation and other forms of sexual harassment are commonly reported offences on many mass transit networks in the world, with incidences exacerbated by overcrowding. These offences particularly impact upon women, and to offer safer travel the train networks in several countries offer female only carriages. Such carriages are commonplace in Japan, India, Iran (Islamic Republic of), Viet Nam, Taiwan, Indonesia, the Philippines, and Malaysia.

Jaya Ramchandani

SOURCE: ABD (2011b)

To be inclusive transport also need to be affordable. In that respect, providing subsidies to public transport services can certainly be helpful. For instance, public transport in Seoul, Republic of Korea is very affordable due to government subsidies. A trip on the subway system costs around US $1, while the bus ranges from US $0.76 to $1.75. In addition, discounts are given to families and children while senior citizens, persons with a disability and children under six travel for free. Offering subsidized fares does, however, not go without risks as the financial sustainability of the transport operator, and subsequently his ability to deliver high quality services, depend then on the effective payments of subsidies by the public authorities. Therefore, subsidies need to be designed in such a way that they are also affordable for public budgets while providing sufficient resources for long-term development of the public transport operator.

Another option to contribute to the affordability of public transport is supporting the development of informal transport services as further detailed in Box 4.12.

BOX 4.12
INFORMAL TRANSPORT


Tash Dettman

INFORMAL TRANSPORT – INDONESIA

Informal transport networks come at little or no cost to government but provide affordable transport services to a large proportion of the urban population, particularly the poor. The Cities Development Institute for Asia (CDIA) conducted research in three medium-sized Indonesian cities and found that informal transport:

- Is flexible and drivers accommodate a wide range of demands and uses;
- Fills gaps in the formal transport network, picking up where formal transport networks end or are lacking; and
- Serves niches, with drivers adjusting routes, fares and schedules based on the needs of specialized user groups, including students, women, informal vendors and the elderly.

Informal transport compliments formal services, and if supported can provide a viable path for cities to solve urban transport needs. Support for the informal transport sector requires only minor investments to improve aspects such as safety, accountability, driver conditions, and integration with the formal sector.

CYCLE RICKSHAWS – INDIA

Across India it is estimated that more than 7 million cycle rickshaws are in operation, with over 600,000 in Delhi alone. The cycle rickshaw is a low cost and environmentally sustainable mode of transport for short trips. Able to integrate easily into other transport systems, the rickshaw can provide point-to-point service at a price within reach of low income earners.

SOURCE:
UN-HABITAT (2010) and Cities Development Institute for Asia (2011)

RAISING ROAD SAFETY AS A SUSTAINABLE DEVELOPMENT ISSUE

At the Rio+20 Conference in 2012, road safety was recognized "as part of our efforts to achieve sustainable development" in the outcome document of the Conference, "The future we want". This recognition highlights and reiterates the view that road safety in many countries of the region is an important development issue, considering its magnitude and the gravity of the negative impacts of road accidents on the economy, public health and general welfare of the people, particularly the poor.

ROAD FATALITIES

More than half of the world's total road traffic deaths are in the ESCAP region

Globally, road crashes kill about 1.24 million people and injure another 50 million each year. According to the Global Status Report on Road Safety, 777,000 or more than half of the world's total road traffic deaths in 2010, occurred on roads within the ESCAP region.[30] The economic cost of road crashes has been estimated at between 1% and 3% of GDP on average, but as high as 5% for some developing countries.

Despite the frequency of road accidents in the region, progress is mixed. While the number of global fatalities in 2010 remained similar to that in 2007, estimated road fatalities in the region as a whole increased considerably in 2010 compared to 2007.[31] Nevertheless, over this same period, 21 countries in the region reduced deaths on their roads, showing improvements are possible. Table 4.1 shows road traffic deaths by sub-region.

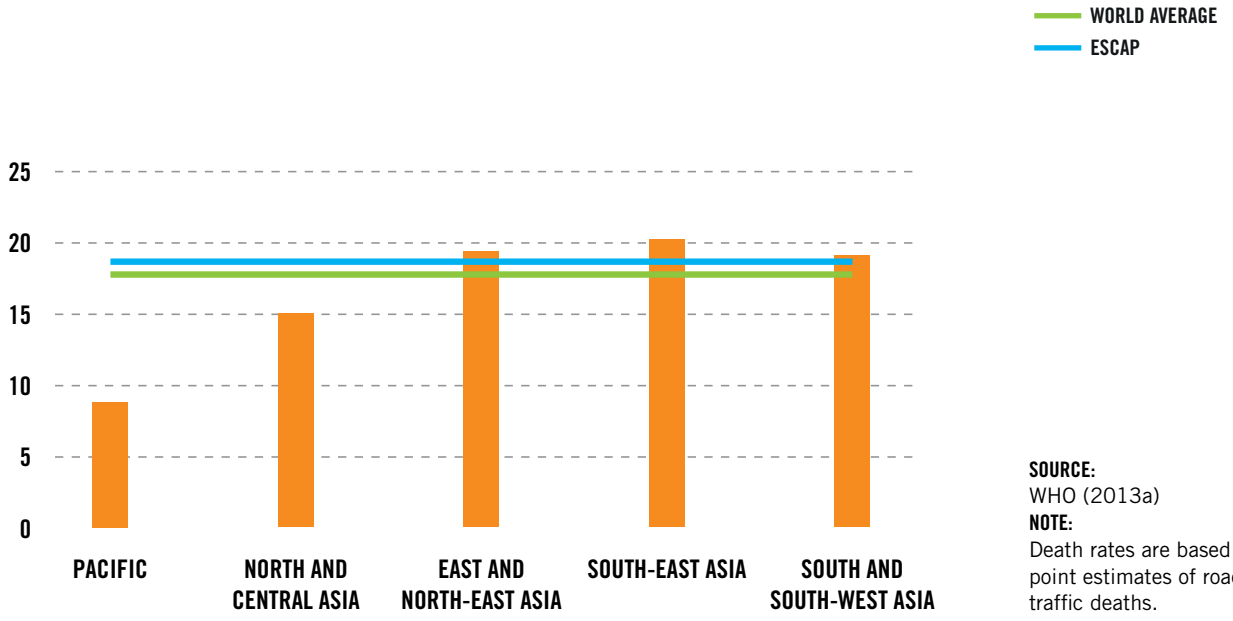
In reducing road traffic deaths, there has been progress in two sub-regions, with the number of road traffic deaths in the Pacific and North and Central Asian sub-regions declining, as well as in some countries of other sub-

TABLE 4.1
PROGRESS IN REDUCING ROAD TRAFFIC DEATHS IN ESCAP REGION

	REPORTED DEATHS (adjusted for 30-day definition)		ESTIMATED NUMBER OF DEATHS (using a model)	
SUB-REGION	**2007**	**2010**	**2007**	**2010**
Pacific	2,471	2,151	3,183	2,876
North and Central Asia	12,041	9,574	12,702	11,332
East and North-East Asia	145,950	108,455	270,067	319,064
South-East Asia	53,586	75,454	102,573	117,360
South and South-West Asia	151,203	172,361	311,126	326,381
ESCAP (% of the world total)	365,251 (55.23%)	367,995 (57.72%)	699,625 (56.69%)	777,013 (62.67%)
World	661,319	637,584	1,234,026	1,240,000

SOURCE:
WHO (2013a) / definitions of reported deaths and estimated deaths are included in this report

FIGURE 4.8
ROAD TRAFFIC DEATH RATES (DEATHS PER 100,000 POPULATION)



SOURCE:
WHO (2013a)
NOTE:
Death rates are based on point estimates of road traffic deaths.

regions (for example, Russian Federation and Turkey). However, the situation in East and North-East Asia, South-East Asia and South and South-West Asia, the three most populous sub-regions, worsened in 2010.

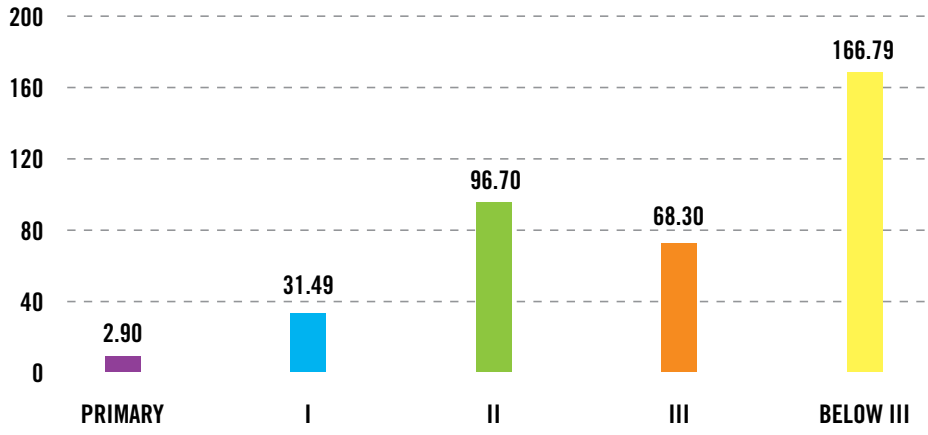
In terms of deaths per 1,000 people, the traffic death rate in South-East Asia was highest among the five sub-regions at 19.8 deaths per 100,000 population (Figure 4.8). Road traffic death rates in 14 countries (including China, India, Iran (Islamic Republic of), Kazakhstan, Malaysia, Russian Federation, Thailand and Viet Nam) were higher than the global average. However, of these, four countries brought down the death rates from their previous levels in 2007. For the other ten countries, the death rate increased further over this period.

The number of road users killed in road traffic crashes per population has been particularly high in emerging economies and newly industrialised economies. Regardless of motorization level, higher road traffic death rates per population are also linked to higher vehicle densities (i.e., vehicles per kilometre of road), which shows an important link between road safety and infrastructure development in general.

Road fatalities on the Asian highway network

Data on road safety components are contained in the ESCAP Asian Highway Database, including the number of road crashes and fatalities for each Asian Highway section. Road safety data (2010) are available for 45.5 per cent of the length of the Asian Highway, including 695 road sections (or 46.6 per cent of all sections), covering 64,818 km in 24 countries.[32] Figure 4.9 shows average fatality rates per billion vehicle-km by Asian Highway class.[33] It clearly illustrates that higher classes of road are generally much safer than lower classes of road, and that significant improvements in road safety may be achieved through upgrading of Asian Highway routes.

FIGURE 4.9
AVERAGE FATALITY RATES PER BILLION VEHICLE-KM BY ASIAN HIGHWAY CLASS



SOURCE:
ESCAP Asian Highway database
NOTE:
Please refer to the first chapter of this publication for definition of Asian Highway Road Class.

The upgrading of roads to access-controlled Primary Class and other higher classes has significant benefits in reducing fatality rates. Substantial improvement in terms of safety can also be gained when roads below class III are upgraded to the minimum class III standards. The road safety record for class II, however, show worse performance compared to class III, possibly due to other relevant factors, such as higher traffic flows, higher shares of motorized vehicles, and greater average travel speeds.

The upgrading of roads has also been linked to improved Asian Highway safety in many countries, particularly when the upgrades involved: (a) the construction of barriers to separate opposing directions of traffic and different types of vehicles; and/or (b) the improvement of road shoulders.

Vulnerable road users

Motorcyclists, cyclists, and pedestrians are collectively known as "vulnerable road users" or VRUs. Road fatalities among VRUs are a cause of serious concern in many countries, with half of the world's road traffic fatalities occurring among VRUs. [34] In the ESCAP region, road traffic deaths among VRUs account for nearly 55 per cent of total road traffic fatalities.

In recent years, most developing countries in the region have experienced rapid growth in vehicle ownership, making roads more dangerous for VRUs. The high rate of deaths and injuries among VRUs in the region, is, however not entirely explained by the growth in vehicle numbers, with vehicle mix also posing a considerable safety threat. There is a clear link between road safety and the provision of adequate and appropriate infrastructure facilities for different types of road users, as well as the enforcement of applicable laws. Despite some initiatives to address these issues, the high rate of pedestrian deaths in many countries, for example, clearly indicates inadequacies in the provision of appropriate infrastructure facilities, law enforcement and behaviour of road users.

Many road fatalities are avoidable

IMPROVING ROAD SAFETY

Motorcyclists and helmet use

Among all road users, motorcyclists are the most likely to die on the region's roads, making up 31% of all road deaths. At a sub-regional level, motorcycle deaths make up the largest share of all deaths in South-East Asia and the second biggest share in West and South Asia. Motorcyclists alone account for more than half of all road traffic deaths in four countries – Cambodia, Lao People's Democratic Republic, Malaysia and Thailand.

Despite being one of the highest risk factors, motorcycle deaths and injuries are avoidable. Research shows that wearing a good-quality helmet can reduce the risk of death from a road crash by 40 per cent and the risk from severe injury by over 70%.[35] 42 countries in the ESCAP region have adopted helmet laws at the national level and 2 countries have adopted helmet laws at the subnational level. While the adoption of helmet laws is encouraging, enforcement of such laws varies significantly from country to country. As a result, the motorcycle helmet wearing rate is estimated to vary from 10 to 99 per cent in the region.[36]

In addition to the adoption and enforcement of helmet laws, helmet standards are also a critical factor in determining the level of protection riders have. Only 25 countries in the ESCAP region have requirements for minimum helmet standards.[37]

Non-motorised road users and their safe traffic environment

Non-motorized transport is a viable alternative mode with the added benefits of being affordable, reducing air pollution and CO2 emissions, as well as conserving fossil fuels. Many countries in the region have a renewed focus on this mode of transport, with 19 countries in the ESCAP region adopting either national or subnational policies to promote the use of non-motorized modes of transport such as walking and cycling.

However, almost 200,000 lives of non-motorized road users (pedestrians and cyclists) were lost on the region's roads in 2010, accounting for over a quarter of total road traffic fatalities in the ESCAP region. The region's roads have become more dangerous for non-motorized road users, with 91 per cent of total deaths occurring in middle income countries where the rate of motorization has surged.

The availability of safe routes and crossings for pedestrians and dedicated bicycle lanes, which separate them from motorized road users, is necessary to enhance safe environments for non-motorized road users. However, according to the 2013 Global Status Report, only seven countries in the ESCAP region have a policy to separate VRUs from high speed traffic at the national level, while nine countries have a policy at a subnational level.

Furthermore, pedestrians and cyclists are especially at risk of injury due to excessive motorized vehicle speeds. Measures to reduce speeds, in particular in urban areas with high concentrations of VRUs, can significantly limit the incidence of death and injury. Studies show that a 5% cut in average speeds can reduce the number of fatal crashes by as much as 30%. [38]

While every country in the region has enacted national speed limits, the effectiveness of overall enforcement varies substantially. On a scale of 0 (no enforcement) to 10 (total enforcement), only 20 countries [39] in the ESCAP region score greater than 5. [40]

Other road traffic related laws

Helmets and speed limits are two of the five key risk factors in road safety identified by the World Health Organization. The other three key risk factors include drink–driving, insufficient use of seatbelts and insufficient use of child restraints. Addressing each of these risk factors is considered an essential component of comprehensive national legislation on road safety.

With the exception of child restraint laws, the adoption of laws relating to drink-driving and seatbelts throughout the region is encouraging; however, the level of enforcement varies widely between countries. Furthermore, in many countries these laws are not comprehensive enough to cover all aspects of the risk factors.

As indicated in the Global Status Report, except in a few developing countries (for example, Azerbaijan, Uzbekistan, and Turkey) and five OECD member countries (Australia, Japan, New Zealand, Republic of Korea and Singapore), the level of enforcement of the all road safety laws across the ESCAP region can be considered to be low to medium.

In conclusion, considering the alarmingly high and ever increasing rate of casualties from road crashes, coupled with the magnitude of negative impacts on the economy and social welfare, the issue of road safety has been on the global agenda for some time as further explained in Box 4.13.

TABLE 4.2
LEGISLATION ON ROAD SAFETY

SUB-REGION	TOTAL NUMBER OF COUNTRIES COVERED	NATIONAL SPEED LIMIT LAW	DRINK-DRIVING LAW	HELMET LAW	SEAT-BELT LAW	CHILD-RESTRAINT LAW	MOBILE PHONE LAW
	NUMBER OF COUNTRIES HAVING LEGISLATION						
Pacific	4	4	4	4	4	4	4
North and Central Asia	8	7	7	7	7	5	7
East and North-East Asia	6	6	6	6	6	4	6
South-East Asia	11	11	11	9	8	4	10
South and South-West Asia	12	10	8	9	9	1	8

SOURCE:
WHO (2013a)
NOTE:
For this table, information for the Pacific subregion are only from Australia, Fiji, New Zealand and Papua New Guinea.

BOX 4.13
ROAD SAFETY GLOBAL AGENDA AND ESCAP'S ROLES AND ACTIVITIES

Since 2003, the United Nations General Assembly has adopted seven resolutions calling for strengthened international cooperation and multisectoral national action to improve road safety.[41] In its resolution 64/255 of 10 May 2010 on improving global road safety, the General Assembly proclaimed the period 2011-2020 as the Decade of Action for Road Safety with a goal to stabilize and then reduce the forecast level of road traffic fatalities around the world by increasing activities conducted at the national, regional and global level. Further, the General Assembly, in its resolution 66/260 of 23 May 2012 on improving road safety, encouraged member States to develop national plans in line with the Global Plan for the Decade of Action for Road Safety 2011–2020. As noted above, the importance of road safety was also highlighted at the Rio+20 Conference in 2012.

For many years, ESCAP[42] has worked to improve road safety in the region in response to the General Assembly resolutions on road safety and has been mandated to assist the countries in the Asia-Pacific region in meeting their commitments under the Decade of Action of Action for Road Safety (2011-2020).

ESCAP's road safety role may be broadly summarized as being that of: an advocate of global and regional road safety best practices; a connector of road safety experts and officials and representatives from international organizations and charities active in the Asia Pacific region; and a disseminator of road safety information, data and statistics collected from member States.

In advocating global and regional road safety best practices, ESCAP provided technical assistance to governments to develop and refine their national road safety goals, targets and indicators in support of the Decade of Action through the organization of National Workshops in Road Safety. The national workshops on road safety were organized in collaboration with the relevant national Ministries of Azerbaijan, Bangladesh, Cambodia, Kyrgyzstan, Lao People's Democratic Republic, Mongolia, Nepal, Philippines, Sri Lanka, Tajikistan and Uzbekistan.

Through the organization of expert group meetings, ESCAP connects road safety experts and officials and representatives from international organizations and charities active in the Asia Pacific region to share and exchange best practices and experiences in specific themes set out in each of the meetings. Past themes included the development of regional road safety goals, targets and indicators; improving road safety on the Asian Highway network; data monitoring and collection; and vulnerable road users.

ESCAP also collects road safety data from countries in the region approximately every two years in conjunction with the expert group meetings on road safety. The collected data are available on the ESCAP website.[43]

END NOTES

[1] ITDP 2010a
[2] UN-HABITAT 2010
[3] Suzuki et al 2013
[4] Ravallion et al 2007
[5] UN-HABITAT 2010
[6] International Energy Agency Mobility Model 2011, in Wright 2012
[7] ADB & GIZ 2011
[8] Countries report to IEA through the OECD member site and non-OECD government site. The IEA secretariat does not adjust the data. Data obtained on 28 February 2012
[9] WHO 2011
[10] UNEP 2012
[11] ITDP 2010a
[12] adapted from VTPI 2011
[13] A knowledge economy is one where the value of what is being created is primarily based on intellectual capital. Knowledge industries are predominately in the service sector, and in the Asia-Pacific the service sector has grown significantly, comprising 25.8 per cent of jobs in 1991 rising to 36.4 per cent in 2007 (UN-HABITAT, 2010, p.76).
[14] SGS Economics and Planning 2011; UN-HABITAT 2010
[15] ITDP 2010b
[16] Tiwari 2011
[17] For further information on green freight agreement, please refer to http://www.uncrd.or.jp/env/7th-regional-est-forum/
[18] UN-HABITAT 2010
[19] World Bank 2009
[20] ADB and GIZ 2011
[21] Tianjin Eco City, http://www.tianjinecocity.gov.sg/bg_masterplan.htm.
[22] MacDonald, M. (2013)
[23] Zeng, H. (2013)
[24] Suzuki, H., Cervero, R. and Iuchi, K. (2013) and Ooijen, B. and Li, S. (2013)
[25] Kim, H., Koh, T., and Kwon, K. (2009)
[26] Jain, 2013
[27] Venter et al 2003
[28] UN ESCAP 2012b
[29] UN Women 2012
[30] WHO 2013a
[31] Based on estimated number of deaths (using a model). Detailed information about the estimation is available in explanatory note 3: Estimating Global Road Traffic Deaths of the WHO Global Status Report (2013)
[32] For more information on the Asian Highway network please refer to http://www.unescap.org/ttdw/index.asp
[33] The fatality rates in the figure are based on reported fatalities on 24.12 per cent of the length of the Asian Highway network, which includes 485 road sections (or 32.5 per cent of all sections) covering 34,370 km of highways in 23 countries for which the required data for calculation was available in the Database. It should be noted that fatality rates for all of 64,818 km of roads could not be calculated as necessary data for all sections was not available.
[34] WHO 2013a
[35] WHO 2013b
[36] WHO 2013a
[37] One of the internationally-accepted helmet standards is the UNECE R-22 (Protective helmets and visors). The regulation is provided under the UNECE Vehicle Regulation, the 1958 Agreement. More information about the UNECE R-22 standard can be found at http://www.unece.org/trans/main/wp29/wp29regs21-40.html.
[38] http://www.who.int/features/factfiles/roadsafety/facts/en/index3.html
[39] Australia, Azerbaijan, Cambodia, Georgia, Iran (Islamic Republic of), Japan, Kazakhstan, Maldives, Marshall Islands, New Zealand, Palau, Republic of Korea, Russian Federation, Samoa, Singapore, Tajikistan, Tonga, Turkey, Uzbekistan, Viet Nam
[40] WHO 2013a
[41] General Assembly resolutions 57/309, 58/9, 58/289, 60/5, 62/244, 64/255 and 66/260
[42] In accordance with several ESCAP resolutions such as: Resolution 63/9 (23 May 2007) which encouraged members and associate members to continue to act upon the recommendations contained in the Ministerial Declaration on Improving Road Safety in Asia and the Pacific; Resolution 66/6 (19 May 2010) on Improving Road Safety in Asia and the Pacific; and Resolution 68/4 (23 May 2012) which endorsed the Ministerial Declaration on Transport Development in Asia and the Pacific (The Declaration provides a board mandate to assist countries in the Asia-Pacific region in meeting their commitments under the Decade of Action for Road Safety)
[43] http://www.unescap.org/ttdw/roadsafety/RoadSafetyIndicators.asp

CHAPTER 5

STRENGTHENING INTER-ISLAND SHIPPING IN THE PACIFIC

INTERNATIONAL MARITIME SHIPPING ACROSS THE ASIA-PACIFIC REGION HAS DEVELOPED AT A RAPID PACE. HOWEVER, MANY PACIFIC ISLAND COUNTRIES AND TERRITORIES (PICTS) AND OTHER ISLAND AND ARCHIPELAGIC DEVELOPING COUNTRIES LACK EFFICIENT, RELIABLE AND AFFORDABLE SHIPPING SERVICES TO, FROM, AND BETWEEN THEIR ISLANDS. THIS IS DUE TO A NUMBER OF CONSTRAINTS AND CHALLENGES ARISING FROM THEIR PARTICULAR GEOGRAPHICAL LOCATION AND CHARACTERISTICS, AS WELL AS THE PARTICULAR NATURE OF THE SHIPPING INDUSTRY IN THIS SUBREGION AND THE WAY IN WHICH SHIPPING SERVICES ARE ORGANIZED, REGULATED AND FINANCED.

This Chapter describes the various constraints facing inter-island shipping in the Pacific and their possible consequences and relationships with other factors. It will then highlight a number of innovative approaches which some Pacific Island Countries and Territories have initiated, which demonstrate that through careful assessment and planning, strong political will and a resilient cooperative spirit, it is possible to effectively tackle these challenges.

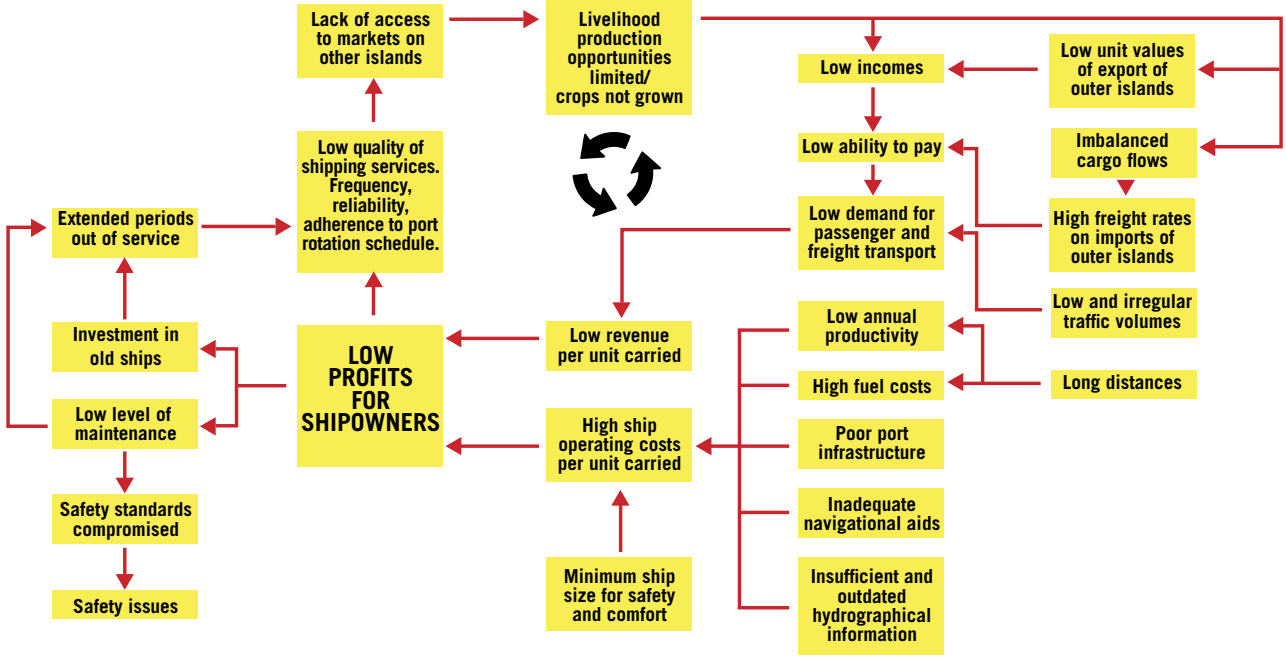
Constraints and consequences

Most of the constraints facing the PICTs are well-known and are shared by other countries which are located at a distance from international markets (such as Landlocked Developing Countries), or which have a narrow resource base in terms of energy, water and agricultural resources (which is common to many Small Island Developing States and Least Developed Countries). The most obvious of these is the distance between islands as well as to international markets. However, distances alone do not account for the relatively high costs of transport to and from the PICTs; freight rates from Australia to Nauru, for example, were cited as costing A$7,000, while only A$5,000 from China to Nauru for a distance that is at least double. Imbalanced cargo flows and low unit values of exports add to the challenge of matching ship size, service speed, and port capacity with low and often irregular traffic volumes.

Figure 5.1 shows the links between various constraints and their potential consequences. For example, the lack of safe, affordable and reliable shipping services limits access of populations to markets and other social opportunities, which in turn may result in low incomes for islanders and low ability to pay for shipping services. This low ability to pay reduces the ability of ship operators to make adequate profits, which in turn, leads to a further deterioration in the quality of shipping services.

The scale of operations, combined with the remoteness and the geographic spread of the islands, also make it relatively more expensive for individual ship owners and port owners to keep up to date with international regulations in safety and comfort. In addition, various institutional and organizational constraints contribute to making the provision of shipping services in the subregion one of the most challenging in the world, including the availability and allocation of budgetary, human and other resources to the maritime sector (including port infrastructure, navigational aids and hydrographical services), out of date or poorly enforced maritime legislation compared to international standards, the use of uninsured or uninsurable ships, limited enforcement of safety standards, inadequately trained seafarers, lack of transparency in the operation of government-owned fleets and in the awarding and monitoring of route licenses and contracts for subsidized shipping services.

FIGURE 5.1
LINKS BETWEEN CONSTRAINTS AND CONSEQUENCES



As can be seen from Figure 5.1, there are a myriad of factors which contribute to the specific challenges facing the PICTs, each of which may require concerted actions to address. To support Pacific countries in identifying means to address many of these issues, ESCAP, in collaboration with the International Maritime Organization, the Pacific Island Forum Secretariat (PIFS) and the Secretariat of the Pacific Community (SPC), convened a High-level Meeting on Strengthening Inter-island Shipping and Logistics in the Pacific Island Countries in July 2013 in Suva, Fiji, which adopted the Suva Declaration on Improving Maritime Transport and Related Services in the Pacific.[1]

The Meeting discussed various issues, including: (a) the production- transport nexus: domestic shipping services, (b) improving regional shipping services in the Pacific, (c) maritime infrastructure development, (d) sustainable maritime transport, and (e) information and data requirements for informed decision making and policy formulation. The Meeting also highlighted innovative solutions which both governments and the private sector are implementing to address them. These issues and solutions are described in more detail below.

Extending Domestic Shipping Services

The irregularity of domestic inter-island shipping services has a negative impact on the production and income generation potential of islands, as regular access to markets is crucial to planning production cycles and establishing reliable distribution mechanisms. Consequently, these islands are faced with a circular problem, where the lack of adequate shipping services limits the ability of islanders to generate the income sufficient to pay for the shipping services.

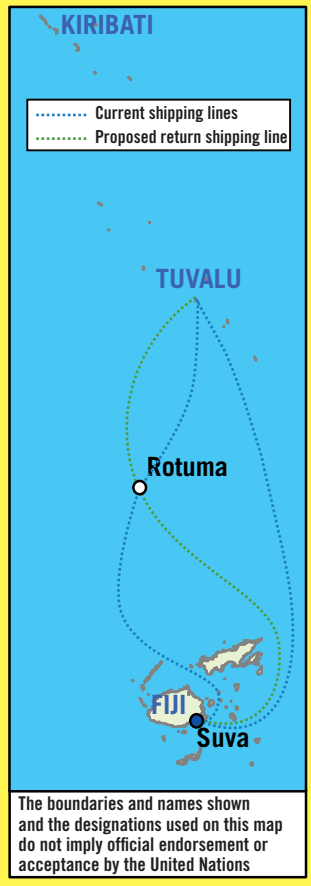
In addition, maritime cabotage, or reservation of the domestic trade of countries to carriers of that country, is a complex and sometimes emotive issue. The principle reason for its complexity is that it has a significant impact on stakeholders with different vested interests. In this regard, the Pacific Plan, endorsed by the Leaders at the Pacific Islands Forum meeting in 2005 and subsequently revised in 2007, is based on a concept of regionalism, meaning that countries should work together for their joint and individual benefits. Similarly, the Forum Principles on Regional Transport Services, adopted by the Forum Economic Ministers in 2004, declared a number of principles, emphasizing "(a) strategic alliances; (b) liberalization of the economic regulatory environment; (c) agreement by Forum Island Countries to regional cabotage, where they could benefit from more services and greater competition".

Box 5.1 describes the Rotuma-Tuvalu Bilateral Trade Agreement concluded between the Governments of Fiji and Tuvalu in 1998. The case shows that the increased production of a traded commodity and a reliable shipping service are essentially complementary in promoting economic development, and that there are opportunities to add commodity trade volumes to existing shipping services in the PICT. This would enable producers, exporters, shipping companies, importers to create business opportunities where they can increase their revenues. The case also illustrated that relaxation of cabotage rules can benefit both countries and service providers.

BOX 5.1
ROTUMA-TUVALU BILATERAL TRADE AGREEMENT

The Government of Fiji signed a Bilateral Trade Agreement with the Tuvalu Government in 1998 for the Fijian Island of Rotuma to export fresh root crops to Tuvalu. However, the Agreement did not become operational because of the lack of availability of a ship, the importer's capacity to sustain orders (Tuvalu-side), and lack of organization on the supply side (Rotuma-side).

Currently, an agreement has nevertheless been reached where a Tuvalu ship departs once a month from Suva Port to Rotuma (subject to the confirmed orders by the Tuvalu importers) with a combined free space for 20 tonnes of fresh and frozen commodities. Commodities from Rotuma are loaded on the ship en-route to Tuvalu. The ship returns straight back to Suva port from Tuvalu. The shipping agent, however, has indicated that he is willing to divert the ship to Rotuma on its way back to Suva to pick-up commodities and/or passengers destined for Fiji, subject to confirmation by both Government of Tuvalu and Government of Fiji (as the negotiations are ongoing). This trade initiative is expected to be extended to Kiribati.[2]



SOURCE:
Presentation by the IACT (Increasing Agricultural Commodity Trade) project funded by the European Union and implemented by The Land Resources Division of the Secretariat of the Pacific Community[3]

NOTE:
Shipping routes indicated for illustrative purpose only

Some governments are also considering direct interventions to encourage private operators to provide shipping services which are not otherwise commercially viable. Such interventions can be justified on the grounds that improved shipping services will increase the welfare of populations, especially on outlying islands. For example, in 2010 a franchise shipping scheme co-financed by the European Union, the Asian Development Bank, and the Solomon Islands Government was introduced. The scheme a) engages private sector shipping operators competitively, b) uses a minimum subsidy tender process, and c) implements an output-based approach where subsidies are tied to performance. It was envisaged that the franchise would lead to increased incomes and productivity of producers in remote rural areas, thereby increasing the number of passengers and freight revenues, and reducing the levels of subsidy. Initial results show significant increases in the number of passengers and cargo volumes in 2012, compared to those of 2010 and 2011. A similar scheme is under implementation in Vanuatu and that the long-standing franchise system in Fiji is currently being reviewed.

Improving Regional Shipping Services

The profit-maximizing behaviour of private sector ship operators encourages them to service ports with relatively high traffic volumes, efficient infrastructure and commodities that have remunerative freight rates. Conversely, ports with low traffic volumes and poor facilities, as well as commodities with low unit values, are poorly served by these operators, if at all. Niue, for example, currently receives one ship call every 28 days from a vessel that also calls at New Zealand, Fiji, Samoa, American Samoa, Tonga, and the Cook Islands.

For international shipping, the main policy to address service quality has been regulation of entry. This is practiced at both the national level, where ships providing international

services to some countries in the Pacific are required to be licensed (for example, Cook Islands, Nauru and Niue); and at regional level, where entry is regulated by groupings of countries. One example of the latter practice is the Micronesian Shipping Commission (MSC) of the Marshall Islands, the Federated States of Micronesia and Palau (Saipan and Guam being non-voting members) established in 1997. More recently, the Central Pacific Shipping Commission (CPSC) was officially launched on 4 August 2010. Box 5.2 provides some background on CPSC.

SOURCE:
Secretariat of the Pacific Community[5]

BOX 5.2
THE CENTRAL PACIFIC SHIPPING COMMISSION

After carefully studying shipping patterns in the region, the Secretariat of the Pacific Community found that the very close collaboration amongst shipping companies rendered little or no competition within the Pacific subregion, resulting in a cartel-like environment. Under these circumstances, an appropriate regulatory regime was needed to regulate these operations and to protect approved operators from "cherry pickers", especially in small market economies such as those which characterize the Smaller Island States (SIS). Smaller Island States is a term adopted by members of the Pacific Islands Forum and includes the Cook Islands, Kiribati, Marshall Islands, Nauru, Niue, Palau, and Tuvalu.

Consequently, the Ministers of a number of Smaller Island States agreed to establish the Central Pacific Shipping Commission, or CPSC, including Kiribati, Tuvalu, Marshall Islands, Nauru and possibly Wallis and Futuna. The objectives of the CPSC are: a) Facilitate access for Member States to international markets to promote national trade and commerce; b) Facilitate adequate and reliable frequency of shipping services to Member States to guarantee sufficient supply and inventory; c) Approve carriers to arrange services to all subregional Smaller Island States, thus carriers are to provide favourable route structures to serve all Member States' ports; d) Ensure affordable service rates in line with the local economies; e) Control competition based on the volume of cargo available and restrict number of carriers to remain commercially viable; f) Monitor conditions for cost-efficient shipping services; e) Promote sufficient or controlled competition thus monopoly is removed.

In September 2013, the Annual General Meeting of the Central Pacific Shipping Commission (CPSC) passed an endorsement for CPSC to become fully operational and have necessary enforcement abilities to regulate shipping in the central Pacific region. It is understood that under the new policies coming into effect on 1 January 2014, CPSC will issue shipping licenses to approved shippers with validity period of five years.[4]

It has also been observed that many countries in the subregion, especially the Smaller Island States, do not have direct shipping services to and from Asia, Europe and North and South America. While some shipping operators have aligned their route structures to accommodate some of these countries, in most cases the services are not commercially viable. Consequently, the development of efficient hub and feeder ports, as well as the geographical structure of feeder services, is of vital importance.

In May 2009 the Kiribati Shipping Services Limited (KSSL) signed an agreement with the Governments of Nauru, Tuvalu, Kiribati and Wallis and Futuna to provide regular feeder shipping services to those countries, using Suva as a transhipment point. The Secretariat of the Pacific Commission monitored the service provided by the company, noting in 2011 that it was providing affordable and regular services to Tuvalu, Nauru and Kiribati via Suva. [6] Research showed that as a short-term measure the service was effective, but in the medium term (after 18 months of operation) the service was struggling due in part to reliability and scheduling issues. The company has responded by purchasing another vessel.

Maritime Infrastructure

A study on "Ports located in small islands" prepared by the PIANC-IAPH Joint Working group[7] noted that many of the main ports serving deep sea shipping were built in the 1960s and 1970s. Similarly, the 2004 Pacific Regional Transport Study [8] revealed that "Many of the port facilities ... were built in the 1950s or 1960s, prior to containerization and such ports pose serious operational problems." However, some of those ports are currently being developed by using grants provided by donor countries, sometimes in the wake of a major disaster.

One example is King's Wharf in Suva which was upgraded in 2004/2005, including work on: (a) the restoration of King's Wharf to extend its life to 2020, (b) upgrade of King's Wharf to minimum seismic standards, (c) strengthening of the King's Wharf deck and

PHOTO:
Port Autonome de Nouvelle Caledonie (PANC)

reorientation of the container yard to improve the efficiency of cargo handling, and (d) ship-to-shore sewage to improve water quality control at Suva Port.

In New Caledonia, a master plan for the development of the 'Port Autonome de Nouvelle Caledonie' over the period 2003-2014 has been adopted. The plan comprises several extension and modernization works. For instance, the dredging of the access channel is scheduled to increase the port capacity to receive vessels with a draught of 12.5 meters (from 10.3 meters currently). An extension of the main wharf is also planned which will raise its length to 1000 metres in total. As regards traffic, the port handled approximately 5.2 million tons in 2012.[9]

In the Cook Islands, the recent redevelopment of Avatiu Harbour in Rarotonga has allowed larger ships to combine economically with other services to Tahiti, Tonga and Samoa, enabling more than two ships to service the Cook Islands. The increase in ship size and multi-country scheduling has also reduced freight rates.

Another significant element of maritime infrastructure is in navigational aids. In many places in the Pacific, these aids are limited or lacking effective 24/7 all-weather operations. While these shortcomings directly affect risk, they also impose direct financial costs as vessels may incur additional diversion costs and be limited to daytime operations. Recognising this issue, the Asian Development Bank and the World Bank have financed a number of projects with a navigational aids component, including in Papua New Guinea, Solomon Islands and Tonga. For example, in 2003, the National Maritime Safety Authority Act was promulgated in Papua New Guinea, establishing the National Maritime Safety Authority (NMSA) as the agency responsible for the maintenance and operation of navigational aids. One of the innovations introduced by NMSA was to establish Community Lighthouse Committees (CLCs) at all navigational aid sites to monitor lights, provide security, and conduct basic maintenance. In 2011, funds were also allocated for rehabilitation and construction of 63 day markers along the coastal waters

of Central, Milne Bay, Oro, Morobe, Madang East and West New Britain. Another 99 navigational aids will be replaced and 33 new aids installed under the recently signed ADB Maritime and Waterways Safety.

In addition to navigational aids, the accuracy of charts in many areas of the Pacific is poor. For example, in one of its national reports, the Cook Islands has stated that "the current state of nautical charting and the lack of coherent Maritime Safety Information (MSI) services may have a significant adverse impact on the Cook Islands economy as well as putting the safety of life at sea and protection of the marine environment at risk".[10] In this regard, the International Hydrographic Organization plays an active role in promoting hydrography-related activities in the Pacific, some of which are described in Box 5.3).

BOX 5.3
THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)

The IHO has encouraged the establishment of Regional Hydrographic Commissions (RHCs) to coordinate hydrographic activity and cooperation at the regional level. The South-West Pacific Hydrographic Commission (SWPHC) is the body that covers most of the Pacific Islands. SWPHC meets annually, with the twelfth Conference being scheduled for Port Vila, Vanuatu, 12-14 November 2013.

Land Information New Zealand (LINZ) and the Ministry of Foreign Affairs & Trade of the Government of New Zealand are also working on a South West Pacific Regional Hydrography Programme.[11] The outputs of this two year programme, started in 2012, include (a) a complete set of Electronic Navigational Charts published for Tonga, Samoa, the Cook Islands, Niue and Tokelau; and (b) an enduring Hydrography Risk Assessment Framework of the accuracy and adequacy of nautical charting coverage to improve understanding of the wider risks and priority areas for action by partner countries and donors.

Finally, in order to improve the subegion's capacity to conduct hydrographical surveying, a Memorandum of Understanding (MoU) between the IHO and SPC was signed in April 2011. Under the MoU, future hydrographical survey activities carried out by SPC will be coordinated with the regional hydrographical charting authorities, the SWPHC, and member countries.

Sustainable Maritime Development

The High-level Meeting on Strengthening Inter-island Shipping and Logistics in the Pacific Island Countries held in Suva also considered the three pillars of sustainability namely, economic, social and environmental. One of the major issues relating to the economic and social sustainability of maritime transport is ship acquisition. As in the case of maritime infrastructure financing, the principal sources of funds for capital expenditures on ships include public sector budget (current revenues or public borrowing); official development assistance, including concessionary loans and grants; the private sector, including banks; or a combination of these sources.

In a number of countries of the Pacific, government-owned vessels are used to carry project cargo or service routes that are not commercially viable. For example, the Government Shipping Services in Fiji has 14 vessels (of which 6 were reported as operational in 2009).[12] In 2011, it also purchased the MV Rogovoka II (a second hand navigational tender vessel) from Malaysia for a reported FJD 1 million (approximately $0.5 million).

In other cases, vessels are acquired through development assistance, especially from the Japan International Cooperation Agency (JICA). For instance, vessels so acquired include three Samoan ferries and a Tongan ferry. JICA has also undertaken a design study for a 525 DWT (deadweight tonnage) cargo passenger vessel and a 300 DWT landing craft vessel for Marshall Islands. Other examples include New Zealand, which is supporting Tokelau to build a new passenger ship. In the interim, charter services are in place to provide continuity of services.

Banks also support the financing of ships. However, individual ship-owners often have had to rely on their balance sheets. According to one newspaper report, a ship-owner in Fiji was reported as saying that "Some ship owners who have provided essential services in the past 20-50 years, have only been able to float because lending institutions have

accepted mortgage on real estate, which current operators inherited from their parents. In my case the property I inherited from my father when he died 35 years ago is still mortgaged to the financial institution that is still willing to finance our company." [13]

In the area of environmental sustainability of maritime transport, measures are being developed to prevent pollution from ships and to organize international cooperation in combating major incidents. For example, a Pacific Regional Marine Spill Contingency Plan (PACPLAN) has been prepared in response to the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), which requires Parties to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. The PACPLAN was originally developed in 2000, and underwent extensive review and modernization in 2012 before being endorsed in September 2013 at 24th Annual Meeting of the Pacific Regional Environment Programme (SPREP).[14]

Similarly, the development of adequate 'port reception facilities' for ship-generated waste and cargo residues, together with the establishment of systems which provide incentives for ships to use these facilities, are major elements in the process to reduce ships' discharges into the sea.[15] In this respect, a Regional Reception Facilities Plan (RRFP) has been prepared in response to the International Convention for the Prevention of Pollution from Ships (MARPOL). It is anticipated that the RRFP will be developed by the second quarter of 2014 for eventual submission to IMO's Marine Environment Protection Committee (MEPC) in 2014/2015.

Information and Data Requirements

Many Pacific Island Countries and Territories lack access to current and reliable transport data and information, which forms the basis for effective planning and decision making in the transport sector. In this respect, the Suva Declaration on Improving Maritime Transport and Related Services in the Pacific calls for the development, updating, benchmarking and monitoring various aspects of maritime transport, including the following specific areas:

1. Develop and regularly update inventories of ships;
2. Develop and regularly update inventories of maritime infrastructure and facilities (ports, wharves, jetties, dredged channels and navigational aids);
3. Strengthen data and information collection, including the monitoring of the adequacy of port and shipping services, as a basis for effective planning, decision-making and benchmarking;
4. Monitor the adequacy of shipping services in the Pacific, particularly regional shipping arrangements; and
5. Benchmark, monitor and improve the efficiency of trade and transport, including border control

It is clear that the there is scope for strengthening subregional cooperation for the sharing of information and data on the transport sector in the Pacific. Such cooperation can also support capacity-building activities for the use of such data in transport planning and forecasting, as well as in the identification of best practices, for example, in new technologies or financing modalities. In this regard, the implementation of the Suva Declaration on Improving Maritime Transport and Related Services in the Pacific, and other similar initiatives, will help countries to foster cooperation in data sharing and ultimately improve maritime connectivity in the Pacific subregion.

END NOTES

[1] The full text of the Suva Declaration on Improving Maritime Transport and Related Services in the Pacific and meeting presentations are available at http://www.unescap.org/ttdw/common/Meetings/TIS/Inter-Island-Shipping-2013/Inter-Island-2013.asp

[2] http://www.pmoffice.gov.fj/index.php/projects/rotuma-development accessed on 10 September 2013

[3] http://www.unescap.org/ttdw/common/Meetings/TIS/Inter-Island-Shipping-2013/ppt/I.2.Case-Study-SPC.pdf accessed on 25 September 2013

[4] http://www.pina.com.fj/index.php?p=pacnews&m=read&o=1610113101523f9e6a25f03f77c19e and http://www.spc.int/en/meetings/1386-central-pacific-shipping-commission-to-assume-regulatory-role-by-2014.html accessed on 25 September 2013

[5] http://www.unescap.org/ttdw/common/Meetings/TIS/Inter-Island-Shipping-2013/ppt/II.1.Shipping-Commissions-SPC.pdf

[6] SPC, Annual Report 2011, Part 1,

[7] Permanent International Association of Navigation Congresses (PIANC), Ports located in small islands, January 2008.

[8] Australian Agency for International Development (AusAID), Pacific Regional Transport Study, 2004, Canberra, AusAID/Government of Australia, p 37.

[9] http://www.noumeaport.nc/index.php/le-port/2-historique accessed on 9 September 2013

[10] Cook Islands National Report, 11 th South Western Pacific Hydrographic Commission Meeting Brisbane, Australia, 15-16 February 2012.

[11] http://iho.int/mtg_docs/com_wg/CBC/CBSC10/CBSC10-15A-LINZ%20Activity%20Design%20Document%20-%20CBSC%20Jun%2012.pdf accessed on 10 September 2013

[12] The Fiji Times ONLINE, Ships have big bill - Six of 14 operational, Thursday, September 2009 < http://www.fijitimes.com/story.aspx?id=129618 >

[13] The Fiji Times ONLINE, Shippers 'struggling', Monday, November 05, 2007 < http://www.fijitimes.com/story.aspx?id=73683 >

[14] http://www.sprep.org/general-news/pacplan-response-to-marine-oil-spills-endorsed-at-24th-sprep-meeting accessed on 25 September 2013

[15] http://www.emsa.europa.eu/implementation-tasks/environment/port-waste-reception-facilities.html accessed on 10 September 2013

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