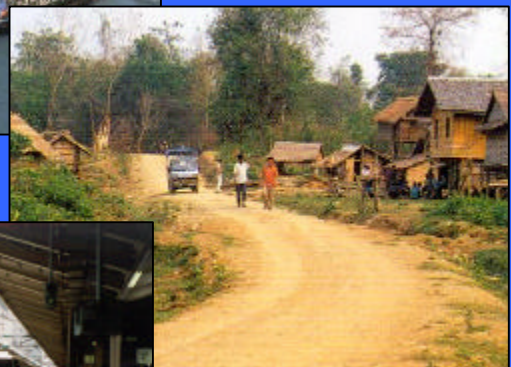


# REVIEW OF DEVELOPMENTS IN TRANSPORT IN ASIA AND THE PACIFIC 2007

*Special Issue: Emerging Issues and the Busan  
Ministerial Conference on Transport*



**ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC**

**REVIEW OF DEVELOPMENTS IN TRANSPORT  
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**United Nations  
New York, 2007**

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## Abbreviations

AADT	Average annual daily traffic
ADB	Asian Development Bank
ALTID	Asian land transport infrastructure development project
AH	Asian Highway Network
ANTLER	Asia-Pacific Network of Transport and Logistics Education and Research
APRAD	Asia-Pacific Road Safety Database
APT	Asia-Pacific Telecommunity
ARRB	Australian Road Research Board
ASEAN	Association of Southeast Asian Nations
ASEAN Transit Agreement	ASEAN Framework Agreement on the Facilitation of Goods in Transit
ASNet	ASEAN Road Safety Network
BOT	Build-operate-transfer projects (a type of public-private partnership)
BPD	Business Partners for Development
caparazzi	camera + paparazzi
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CDB	China Development Bank
CIS	Commonwealth of Independent States
CMR	Convention on the Contract for the International Carriage of Goods by Road
ECAFE	Economic Commission for Asia and the Far-East (old name of ESCAP)
ECE	Economic Commission for Europe
ECO	Economic Cooperation Organization
EGM	Expert Group Meeting
ESCAP	Economic and Social Commission for Asia and the Pacific
EuroRAP	European Road Assessment Programme
FAL convention	Convention on Facilitation of International Maritime Traffic
GIS	Geographic Information Systems
GRSF	Global Road Safety Facility
GRSP	The Global Road Safety Partnership
GMS	Greater Mekong Subregion
GMS Agreement	GMS Agreement for Facilitation of Cross-border Transport of Goods and People
GNP	Gross national product
GTZ	Société allemande pour la coopération technique (“Deutsche Gesellschaft fuer technische Zusammenarbeit GmbH”)
ICT	Information and communication technology
IDFC	Infrastructure Development Finance Corporation, India
IIFC	Infrastructure Investment Facility Centre, Bangladesh
IIFCL	India Infrastructure Finance Company Limited
IPFF	Investment Promotion Financing Facility, Bangladesh
IRAP	International Road Assessment Programme
IRF	International Road Federation
IRU	International Road Transport Union
JBIC	Japan Bank for International Cooperation
KfW	German Development Bank (“Kreditanstalt fuer Wiederaufbau”)
NCAP	New Car Assessment Programmes
NGO	Non-governmental organization
NO <sub>x</sub>	Nitrogen oxides
ODA	Official development assistance
OECD	Organisation for Economic Cooperation and Development



PIARC	World Road Association
PMGSY	Pradhan Mantri Gram Sadak Yojana (a rural road development programme in India)
PPI	Private Participation in Infrastructure
PPP	Public-private partnership
PRSP	Poverty reduction strategy papers
Revised Kyoto Convention	World Customs Organization International Convention on the Simplification and Harmonization of Customs Procedures
SAARC	South Asian Association for Regional Cooperation
SIDA	Swedish International Development Cooperation Agency
SCO	Shanghai Cooperation Organization
SPECA	United Nations Special Programme for the Economies of Central Asia
TAR	Trans-Asian Railway Network
TEU	twenty-foot equivalent unit (container)
TIR Convention	Customs Convention on the International Transport of Goods under Cover of TIR Carnets
TRACECA	Transport Corridor Europe-Caucasus-Asia
UNeDocs	United Nations electronic documents standard
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNRSC	United Nations Road Safety Collaboration
WHO	World Health Organization

## EXECUTIVE SUMMARY

The *Review of Developments in Transport in Asia and the Pacific* is a biennial publication of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). This *Special Issue* of the publication reports on the outcomes of the ESCAP Ministerial Conference on Transport which was held in Busan, Republic of Korea, from 6-11 November 2006.

Part One of the publication reviews key emerging transport-related issues in Asia and the Pacific that were identified by the Ministerial Conference. These include: (a) regional cooperation for transport infrastructure, (b) cross-border transport facilitation, (c) financing of transport infrastructure and public-private partnerships, (d) transport and the Millennium development Goals, (e) sustainable transport, (f) road safety, and (g) transport logistics.

Part Two reports on the outcomes of the Busan Ministerial Conference, including the *Ministerial Declaration on Transport Development in Asia and the Pacific*, its regional Action programme, the *Ministerial Declaration on Improving Road Safety in Asia and the Pacific*, and their endorsement by ESCAP Commission Resolution 63/9 of May 2007.

**PART ONE:**

**EMERGING ISSUES IN TRANSPORT IN ASIA AND THE PACIFIC**

## I. TRANSPORT INFRASTRUCTURE AND REGIONAL COOPERATION

In order to realize the new opportunities for economic and trade development brought by globalization, countries require efficient transport infrastructure and services to enable them to access neighbouring, regional and global markets. While much progress has been achieved in the development of regional transport networks, including the Asian Highway and Trans-Asian Railway networks, as well as the maritime shipping network, increased coordination among different modes of transport will allow countries to link more efficiently to international production networks and to international markets in the era of globalization.

The present chapter discusses key issues in developing networks and intermodal facilities such as inland container depots and dry ports. It also presents preliminary estimates of the capacity and investment required for transport infrastructure development to accommodate the expected increase in intermodal traffic in the region up to 2015. The chapter proposes elements of a regional programme that could be implemented in that period to strengthen regional cooperation in policy formulation and implementation for transport infrastructure development.<sup>1</sup>

### A. Introduction

With the gradual removal of barriers to trade and investment under the World Trade Organization and through regional trade agreements, the volume of world trade has continued to grow. Companies have enjoyed new opportunities for strategically sourcing materials and components worldwide, selecting locations for key production and distribution facilities at the global level and selling products wherever there is demand. Global production networks have been formed whereby industries specialize in the production of components which are shipped from different sources to a location for final product assembly. This phenomenon has been particularly marked in Asia, where regional production networks have been established, resulting in increased intra-industry trade.

Traditionally, most Asian countries have relied on maritime transport for their export and import trade. The continuing evolution of maritime containerization has been a significant factor contributing to the emergence of the global and regional production networks. With maritime shipping playing such a crucial role in global trade and often being ahead of developments in land transport infrastructure, public and private sector investments have naturally concentrated in the coastal areas where the economy has also been boosted by the development of commercial centres and the establishment of industrial estates and special economic zones.

Together, these developments have resulted in rapid economic and social development for populations in the coastal areas, while the hinterlands and the landlocked countries have faced more challenges in integrating into the global economy. An important future challenge is therefore how to

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<sup>1</sup> This chapter draws on ESCAP document E/ESCAP/MCT/SGO/3, Busan, 6-8 November 2006.

extend the benefits of globalization to the hinterlands of all countries in the region, including landlocked countries.

With successful implementation of the Asian land transport infrastructure development project (ALTID) in formulating and formalizing the Asian Highway and Trans-Asian Railway networks, the region has created new opportunities for expanding agricultural and manufacturing production in inland locations in both landlocked and transit countries consistent with the more recent Almaty Programme of Action.<sup>2</sup>

The present chapter reviews the progress of member countries and the secretariat in developing more efficient regional transport infrastructure. It also reviews the potential for intermodal facilities, such as inland container depots and dry ports, not only as an integral part of an integrated intermodal transport network for Asia but also as an important focus for production networks, where economic activities similar to those that exist around seaports can be promoted. The chapter proposes elements of a regional programme that could be implemented in the period up to 2015 to strengthen coordination and cooperation in infrastructure development so as to realize the transport vision of the region.

## **B. Progress achieved in the development of regional transport networks**

The identification and formulation of the Asian Highway and Trans-Asian Railway networks took place through a series of corridor studies carried out from 1994 to 2001. The identified networks now comprise 141,000 km of road and 81,000 km of rail routes of international importance.

The formalization of the networks was implemented through intergovernmental agreements. The Intergovernmental Agreement on the Asian Highway Network entered into force on 4 July 2005. The Intergovernmental Agreement on the Trans-Asian Railway Network was adopted at the sixty-second session of the Commission in resolution 62/4 of 12 April 2006, and was signed at the Ministerial Conference on Transport, Busan, on 10 November 2006.

Once the Intergovernmental Agreement on the Trans-Asian Railway Network enters into force, the two agreements will play a catalytic role in the coordinated construction and upgrading of international roads and railway lines in Asia and will assist member countries in making better use of their land transport infrastructure by creating intermodal transport opportunities.

The working groups established under the two agreements will be important forums in which to discuss issues and exchange information relating to the further development, upgrading and improvement of the operational efficiency of transport in the region.

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<sup>2</sup> Almaty Programme of Action: Addressing the Special Needs of Landlocked Developing Countries within a New Global Framework for Transit Transport Cooperation for Landlocked and Transit Developing Countries (*Report of the International Ministerial Conference of Landlocked and Transit Developing Countries and Donor Countries and International Financial and Development Institutions on Transit Transport Cooperation, Almaty, Kazakhstan, 28 and 29 August 2003* (A/CONF.202/3) annex I).

The Intergovernmental Agreement on the Asian Highway Network has made it easier for member countries to secure grants and loans to upgrade the Asian Highway routes. The Network is recognized as a priority in national highway planning in many countries. Development of the Asian Highway has been incorporated into national plans in Cambodia, India, the Islamic Republic of Iran, the Lao People's Democratic Republic, Nepal, Pakistan, Thailand and Viet Nam (Figure 1, Box 1).

The Asian Highway will continue to serve as a coordinated plan for the development of the road network in the region, being given priority for development, upgrading and financing. The secretariat is working with member countries, potential donors and international financing institutions to promote the financing of priority projects on the Network.

**Box 1: Priority given by countries to development of the Asian Highway**

The upgrading and development of the Asian Highway has been receiving priority attention from member States. Examples are: (a) the Fourth Five-year Development Plan (2005-2009) of the Islamic Republic of Iran envisages development of the Asian Highway; (b) the Asian Highway routes have received priority attention in the Association of Southeast Asian Nations (ASEAN), with the result that the Asian Highway routes in Indonesia, Malaysia, Singapore and Thailand conform to the Asian Highway standards or higher standards, and all Asian Highway routes in Cambodia and the Lao People's Democratic Republic are committed for upgrading with construction in progress; (c) the Asian Highway connecting four metropolitan cities, New Delhi, Mumbai, Kolkata and Bangalore, and the North-South corridor are being upgraded to four lanes under the National Highways Development Project in India; (d) the international community is assisting Afghanistan in rehabilitating and restoring most of the Asian Highway routes to re-establish regional connectivity; (e) Mongolia is implementing the Millennium Road Project, which includes the development of all Asian Highway routes in Mongolia; and (f) China is developing 35,000 km of a high-standard national trunk highway system which includes the majority of Asian Highway routes in China.

Figure 1: Asian Highway Route Map



The successful implementation of Trans-Asian Railway activities has been mirrored by a string of encouraging results marked by increased freight and passenger volumes being transported and new international container block-train services launched by the region's railways (Box 2).

**Box 2: Increased international railway container traffic and block-train services in the ESCAP region**

Railway container traffic has shown the ability to meet shippers' requirements for efficient international services. During the period between 2001 and 2005, the numbers of twenty-foot equivalent units (TEUs) carried along the Trans-Siberian Railway increased by over 200 per cent. Other notable achievements include 250 per cent growth in the number of TEUs on the Malaysia-Thailand landbridge since the launch of the service in June 1999 and 83 per cent growth in international TEUs on Indian Railways in fiscal year 2004/05 over 2000/01. New international container block-train services have also been launched. In March 2002, the railways of Belarus, the Russian Federation and Mongolia launched an international container block-train service between Brest and Ulaanbaatar, followed two months later by a similar initiative by the railways of China and Mongolia with the launch of a regular service between Tianjin and Ulaanbaatar. These services proved popular with shippers and became the precursor of the extended service launched in March 2005 between Hohhot in China's Inner Mongolia Autonomous Region and Duisburg in Germany. In 2005, cross-border rail traffic between India and Pakistan (Munabao-Khokropar) was reopened.

The development of land transport infrastructure alone cannot improve the efficiency of transport. The growing volume of the cross-border movement of goods and people demands smooth cross-border transport. Although many regional, subregional and bilateral initiatives have been taken to eliminate impediments, further work is still required.

**C. Development of intermodal interfaces as an integral part of international transport networks and a focus for economic development**

While the development of individual modes of transport remains important, the coordinated development of integrated transport networks will further promote the cost-effective and timely delivery of goods.

The Asian Highway and Trans-Asian Railway agreements are the two important building blocks for realizing the vision of an international integrated intermodal transport system in Asia, as envisaged by the Ministers at the Ministerial Conference on Infrastructure, held in Seoul in November 2001 and reflected in the Seoul Declaration on Infrastructure Development in Asia and the Pacific adopted by the Conference (see E/ESCAP/1249). For this vision to be realized, new action is now required in order to integrate the two networks with connections to maritime shipping and ports.

The ever increasing volume of containers arriving in the main ports of the region is placing increasing pressure on its land transport infrastructure. The use of containers also offers an opportunity to address the issue of integration as they are easily transferred between modes of transport. These features have led to the expansion of port capacity and increased the quality of



transport services in the immediate vicinity of ports. These same benefits of containerization can facilitate the development of intermodal transport to help bring prosperity to the region's hinterland areas located along the routes of the Asian Highway and Trans-Asian Railway networks.

The secretariat has been undertaking an ongoing study to provide forecasts of maritime container trade, future shipping and port capacity and investment requirements from a regional perspective. Preliminary results of a recent updated forecast are provided in section III of the present document. The study has been used extensively by member countries as a basis for policy dialogue in formulating shipping and port development policies and strategies, such as public-private partnerships, in infrastructure development, as evidenced by repeated requests from countries to the secretariat to update the forecast periodically. The secretariat is now working with the Korea Maritime Institute to expand the container forecast study to include the intermodal aspects, so as to provide detailed quantified and consistent forecasts of the structure of the container transport network linking the major ports with the main hinterland areas of production and consumption, giving particular attention to intermodal linkages with landlocked and transit developing countries in the region.

Integration requires a number of inland intermodal interfaces which are strategically located at cross-over points where networks of different modes converge. These cross-over points can be inland container depots, dry ports, logistics centres, freight villages or stations of international importance. By facilitating the coordinated planning of different transport modes and logistics activities, future intermodal interfaces will facilitate the flow of goods through the transport chain.

The ability of rail to offer guaranteed transit times as well as better door-to-door speeds, while moving large volumes in one single movement at a fraction of the energy cost associated with other land transport modes, gives it a pivotal role in the region's integrated intermodal transport network. The Intergovernmental Agreement on the Trans-Asian Railway Network identifies stations of international importance in which container handling and customs clearance services are available,<sup>3</sup> creating opportunities for inland container depot and dry port development within the region's transport network (Box 3 and Figure 2).

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<sup>3</sup> See Commission resolution 62/4 of 12 April 2006, annex I to the Agreement.

**Box 3: Integrating rail and maritime shipping**

There is growing acceptance that rail has an important role to play in the national and international movement of goods and people. A number of factors speak in favour of greater utilization of rail transport in Asia, and between Asia and Europe, including (a) the long land transport distances within and across Asia and between Asia and Europe; (b) the sustainability of the rail mode in terms of its reduced impact on the environment and its greater energy efficiency; and (c) the ability of rail to clear landside port areas quickly to avoid congestion.

In the United States of America, railroads have signed contracts with trans-Pacific shipping lines to provide fixed-day services adhering to the schedules of shipping lines. This arrangement allows containers from Asia unloaded from vessels on the west coast to be delivered on the east coast in 72 hours, which is reportedly four to six days faster and less costly than the all-water route. These tailored services have played a major role in the growth of intermodal rail transport in the United States. Between 1984 and 2002, rail services departing from the west coast increased from 1 to 241 trains per week. Rail services are now moving 60 per cent of containers arriving by sea for destinations inland. These services have also created economies of scale, which have resulted in rail freight rates that were 30 per cent lower in 2004 than in 1981, and 60 per cent lower in inflation-adjusted terms.

The major benefit of the development of intermodal transport is increased efficiency of goods distribution between production centres and between producers and consumers. This efficiency is primarily measured in terms of the cost, transit time and reliability with which the goods travel between dispatchers and end-users.

Figure 2: Stations of international importance on the Trans-Asian Railway network



Efficient interfaces optimize fleet utilization, thereby reducing the idle time of vessels in ports and rail wagons in yards, as well as inventory costs. This creates large savings and allows railways and shipping lines to be more competitive. When reflected in transport rates, these savings lead to more balanced mode utilization in the transport sector and, for specific transport modes, generate higher levels of traffic and revenues to maintain or renew assets and improve the service level.

The realization of these benefits by public or private transport operators and businesses requires coordination between policymaking bodies at the regional, provincial and local levels and between different ministries and agencies within individual member countries.

Intermodal interfaces are an integral part of an international integrated intermodal transport system, as they are not only nodes that connect inland areas to the coastal production networks efficiently but also become part of the production network that will stimulate economic development in the inland areas. Services available at the intermodal interfaces may expand from cargo handling for transshipment to value-added logistics services, such as packaging, labelling and storage, and further evolving towards import/export processing, industrial parks and special economic zones for the assembly, manufacturing and agricultural processing of goods. This will require additional land space, a cost-effective and reliable supply of energy and water and relevant support of information and communication infrastructure with common technical standards. All of this will require close coordination and cooperation in terms of planning, assessment and operations among all transport-related ministries and other relevant sectoral ministries, including the environment, industry, information and communication technology, energy and trade.

Ultimately, the intermodal interfaces could act as inland growth centres which would provide the local people with increased job opportunities, thereby preventing massive migration towards larger cities which are often ill-equipped to absorb a sudden influx of labour.

#### **D. Capacity and investment requirements**

Growing trade between countries in Asia and the Pacific and their trade partners from both outside and within the region will continue to place high demands on transport infrastructure. Container transport is expected to remain the preferred means of maritime transport owing to its considerable advantages, and the region will continue to see a persistent increase in container traffic, pushing countries to establish adequate infrastructure for intermodal container transport.

According to the preliminary results of the secretariat's recent update study, the global maritime container trade is expected to grow at an annual rate of 7.0 per cent during the next decade from 101 million TEUs in 2005 to 198 million TEUs by 2015.<sup>4</sup> Container trade flows to, from and within Asia are likely to increase at a much higher rate, thereby increasing the share of Asia in the total world containerized trade to 62 per cent by 2015. The study estimates also show that, among the

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<sup>4</sup> ESCAP, *Regional Shipping and Ports Development Strategies (Container Traffic Forecast)* (2006 update) (forthcoming).

three major trade routes related to Asia, that is, the Asia-Europe, trans-Pacific and intra-Asian routes, intra-Asian trade will show the strongest growth rate, at 10.6 per cent per year until 2015. The total volume of international container handling in the ports of countries of the ESCAP region is expected to increase from 142.7 million TEUs in 2002 to 427.0 million TEUs in 2015, an annual average growth rate of 8.8 per cent. Table 1 shows estimated container port throughputs of selected countries and ports in the region.

The increased volume of containers moving through the ports will place considerable stress on land transport and require faster and more efficient intermodal connections to the hinterlands. At the same time, as seamless delivery constitutes an important competitive advantage for container transport, a greater degree of synergy between modes of transport is expected. Door-to-door delivery services will further integrate rail and road transport. The inland expansion of container traffic will be the driving force for cooperation between maritime and other modes of transport, such as rail and road.

**Table 1: Container port throughputs of selected Asian countries and ports (Thousands of twenty-foot equivalent units)**

Country or area/port		2004	2015	Annual average growth rate (percentage)
China		52 556	159 788	10.6
	Shanghai	14 557	37 776	9.1
	Shenzhen	13 650	37 893	9.7
Hong Kong, China		21 984	29 461	2.7
India		4 267	11 666	9.6
	Mumbai/Jawaharlal Nehru	2 589	6 966	9.4
Japan		15 987	26 155	4.6
	Tokyo/Yokohama	6 076	10 304	4.9
	Kobe/Osaka	4 186	7 527	5.5
Malaysia		11 264	33 559	10.4
	Port Klang	5 244	14 343	9.6
	Tanjung Pelepas	4 020	15 139	12.8
Republic of Korea		14 299	34 917	8.5
	Busan	11 430	26 383	7.9
Singapore		21 311	48 763	7.8
Thailand		4 856	9 895	6.7
	Laem Chabang	3 529	8 439	8.2

Source: 2004 (actual) – Lloyd's Marine Intelligence Unit, *Containerisation International Yearbook 2006* (London, 2006).

2015 (forecast) – ESCAP study estimates.

In order to accommodate the mounting container traffic, it is essential that countries of the ESCAP region develop the infrastructure necessary for containerized transport systems, which includes highway and railway networks, port facilities and intermodal interfaces. In addition, the expansion of containerization inland will require corresponding intermodal facilities at inland locations, particularly at most major border crossings, to ensure seamless land transport. The border-crossing infrastructure should provide facilities for customs, warehousing and, if applicable, cargo transshipment. It should also provide facilities for such functions as scanning and screening.

The secretariat recently carried out a study of infrastructure requirements to 2015.<sup>5</sup> In the study, total annual average investment requirements in transport infrastructure for the ESCAP region were estimated at \$261 billion from 2005 to 2015, of which \$224 billion was required for developing countries. The study further estimated that, if other infrastructure sectors such as energy, telecommunications, water and sanitation and disaster preparedness and rehabilitation were included, the total infrastructure investment requirement would be \$608 billion per year until 2015.

Furthermore, realizing the vision of an international integrated intermodal transport system will require balanced investment in the different modes of transport infrastructure as well as intermodal interfaces. For Asian and Pacific container ports alone, it is estimated that 735 new container berths will be required to meet the future container port traffic demands in 2015, which can be translated to \$46 billion of estimated investment requirement. It is estimated that, in addition to the \$26 billion currently being invested or committed, about \$18 billion is required in order to upgrade and improve 26,000 kilometres of the Asian Highway network.<sup>6</sup> For the Trans-Asian Railway network, it is estimated that building single-track lines on the 13 missing links over a total of 6,237 km will require about \$14.6 billion. Countries are already implementing projects to develop their railway infrastructure. For example, China proposes to invest \$240 billion to bring its networks to 100,000 km by 2020 and modernize it with electrification and double-tracking.

**Table 2: Investment requirements for transport infrastructure development (Billions of United States dollars)**

Sectors	North-East Asia	South-East Asia	South Asia	Central and South-West Asia	Total
Container ports <sup>a</sup>	30.38	11.98	2.82	0.8	45.98
Asian Highway <sup>b</sup>	3.24	4.64	2.25	7.30	17.43
Trans-Asian Railway <sup>c</sup>	0	10.34	3.60	0.64	14.58

Notes: <sup>a</sup> Until 2015.

<sup>b</sup> A total of 121 priority projects.

<sup>c</sup> A total of 13 international missing links.

<sup>5</sup> ESCAP, *Enhancing Regional Cooperation in Infrastructure Development Including that Related to Disaster Management* (United Nations publication, Sales No. E.06.II.F.13).

<sup>6</sup> ESCAP, *Priority Investment Needs for the Development of the Asian Highway Network* (ST/ESCAP/2424) (forthcoming).

In particular, additional investment will be required to develop intermodal interfaces such as inland container depots and dry ports as well as border-crossing facilities. A number of dry ports and inland container depots will emerge, to accommodate the region's increasing needs for intermodal transport. Assuming that Asia will gradually move towards utilizing dry ports to develop the hinterlands, the secretariat estimates that there may be a need for 312 dry ports compared with a little more than the 100 existing ones. This will require huge investments as the infrastructure costs at each particular inland container depot cover land allocation, container handling equipment, information and communication technology infrastructure, administrative, warehousing and maintenance facilities.<sup>7</sup>

For the 12 landlocked countries in the ESCAP region and the neighbouring transit countries, infrastructure investments are critical. Close dependency on neighbouring countries and geopolitical factors are pushing landlocked countries to consider multiple corridors, providing at least minimal infrastructure in each possible direction. Part of the infrastructure, built in the light of geopolitical considerations, will be left underutilized and therefore the efficiency indicators for infrastructure constructions in these countries are going to be lower.

In view of the large investment requirements in transport infrastructure as well as in other sectors, it is becoming increasingly necessary to find innovative financing solutions, which may come from various sources, ranging from public to public-private and private financing.

The lack of financial resources to meet the increasing demand for transport services also necessitates that increasing emphasis be placed on the effective management and maintenance of transport infrastructure.

At the same time, increasing importance is being placed on enhanced cooperation among countries in the coordinated development of transport infrastructure, as countries consider investment within their own territories as well as across borders and along intermodal transport routes to ensure the smooth movement of products to regional markets (Box 4).

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<sup>6</sup> For example, it cost \$28.4 million to develop three inland container depots in Nepal.

**Box 4: Example of collaboration with donors in promoting investment: upgrading of Asian Highway Route AH4-Ulaanbaishint-Hovd Yarantai in Mongolia**

In July 2005, ESCAP and the Asian Development Bank (ADB) undertook a joint mission to Mongolia with the objective of promoting investment in the Asian Highway. The mission looked at the feasibility of the AH4 route (Ulaanbaishint-Hovd Yarantai), which is located in the western part of Mongolia and can provide a short transport connection between China and the Russian Federation.

The project was initially discussed and identified at an ESCAP expert group meeting held in 2002, in which experts from China, Mongolia and the Russian Federation participated. The discussion among the experts was facilitated by ESCAP and a representative of the ADB Country Office in Mongolia. Later, a pre-feasibility study was commissioned with the support of ADB, and a feasibility study on the road linking China through Mongolia was undertaken by the Russian Federation. It is now expected that the construction of 725 km of road will be carried out in several phases. As part of the regional cooperation initiative, project preparation work for funding by ADB is proceeding under its Project Preparation Technical Assistance.

## **E. Conclusion**

In order to realize the new opportunities for economic and trade development brought about by globalization, countries require efficient transport infrastructure and services in order to access neighbouring, regional and global markets. While much progress has been achieved in the development of regional transport networks, increased coordination among different modes of transport will allow countries to link more efficiently to international production networks and also to international markets in the era of globalization.



## II. TRANSPORT FACILITATION

With new developments in road and rail networks and the opening up of land border crossings, countries in the ESCAP region are becoming increasingly aware of the need to address impediments to the smooth movement of goods and people. While government authorities grapple with difficulties in applying traditional controls to goods and people crossing national boundaries, the business sector calls for speedy formalities and transparent policies and regulations to reduce transport costs and improve operational efficiency. This involves the need to protect national interests and the need for a harmonized approach among countries along specific transport routes. These issues also have to be addressed in a coordinated manner by a large number of government ministries and authorities in keeping with bilateral and subregional agreements and international conventions.

The present chapter outlines the key measures for the facilitation of international land transport in terms of the establishment or strengthening of national coordinating mechanisms, the improvement of legal frameworks and the application of new technologies (including information and communication technology) and facilitation tools. The chapter discusses the constraints in the region and proposes an integrated approach in addressing facilitation issues to achieve the smooth and efficient movement of goods and people across the region.<sup>8</sup>

### A. Introduction

With new developments in road and rail networks, countries in the ESCAP region have opened hundreds of land border crossings and routes for international transport. Traffic through these border crossings and routes has increased rapidly in the past five years and annual traffic through some border crossings in the region exceeds 10 million tons.

Countries in the ESCAP region have also made considerable efforts towards subregional and regional integration by upgrading and interconnecting physical infrastructure and by further liberalizing trade regimes. Nevertheless, the level of facilitation remains below expectations, hampered by the non-physical barriers to trade and transport, which include complicated and frequently changing administrative procedures and documentation, duplicated inspections, high charges, varying legal requirements in different countries, the lack of inter-agency coordination and limited application of information and communication technology (ICT). Not all these impediments can be addressed through the simple modification of documentation and procedures. Some may require adjustments to policies and legal regimes.

Several countries in the ESCAP region are landlocked and rely on transit access to international markets through neighbouring countries. For these countries, the removal of transport barriers assumes special importance, as they have to move their goods across several borders and as a

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<sup>8</sup> This chapter draws on ESCAP document E/ESCAP/MCT/SGO/4, Busan, 6-8 November 2006.

consequence face transport costs which can threaten the competitiveness of their goods in foreign markets. Economic development in the region and emerging opportunities for intraregional trade are also creating a demand for landlocked countries to become “land-linking” countries and provide important transit services to their transit neighbours. In this regard, both landlocked and neighbouring countries can benefit from action taken to increase the efficiency of transit transport.

Some progress is being made at the national, subregional and international levels to reduce the delays and costs associated with cross-border and transit transport. At the national level, some countries have made progress in improving cooperation among government authorities to provide coordinated controls at borders, streamline and harmonize documentation, simplify formalities and procedures and improve border-crossing facilities. At the more sensitive international level, progress has been slower, particularly with respect to granting traffic rights and reaching agreement with respect to through transport operations. As a result, opportunities for increased intraregional trade are being lost.

### **B. Establishing or strengthening national facilitation coordinating mechanisms**

For countries in the ESCAP region, cross-border and transit transport is most heavily constrained by the excessive delays and costs incurred at border crossings. Time-consuming border-crossing and customs procedures, complicated non-standard documentation, poor organization and the lack of skills in the transport sector are some of the major contributing factors. The overlapping obligations brought about by several bilateral, trilateral and subregional agreements, the need for multiple bilateral agreements and the lack of a harmonized legal regime for transit transport, including arrangements for transit fees, further compound the complexity of the transport process.

Customs clearance of a trade consignment under the supervision of customs inspection officers located at the border constitutes just one of the processes to be completed in order to allow the passage of goods and vehicles across borders. Others may include the inspection of the passports and visas of drivers by the border police or immigration officials; the inspection of vehicles and drivers by transport or police officials in order to ensure compliance with national transport regulations; and the agricultural, veterinary and public health inspections carried out by officials of the relevant government agencies to ensure compliance with national quarantine and public health regulations. In addition, national borders are increasingly becoming the location for trade and transport activities mostly undertaken by the private sector, such as the storage, transshipment and consolidation or deconsolidation of cargo, as well as international banking, insurance and other trade service activities.

If only the administrative processes at borders are considered, it is possible to identify a list of up to 20 separate procedures required by up to eight separate government authorities which must be completed before cargo-carrying vehicles and transport-operating staff may move across national frontiers.

For transport facilitation issues to be addressed effectively, a comprehensive and integrated approach is required involving the relevant government ministries and agencies concerned with trade and transport, and the private sector. Good collaboration between the public and private sectors is crucial for the formulation and implementation of facilitation measures.

Very few countries in the ESCAP region have in place coordinating mechanisms that could fulfil all of the tasks required. The mechanisms already established within the region vary widely in terms of their role and form.

### **1. Collaboration mechanisms in the ESCAP region**

In the past five years, some progress has been made by countries in the ESCAP region in the establishment of national mechanisms for the coordination of transport facilitation initiatives. In most cases, these mechanisms have taken the following forms:

- A joint trade and transport facilitation body
- A transport facilitation body
- A transport coordination body for a specific project
- A meeting for the coordination of specific initiatives

At the subregional level, countries in South-East Asia have established national transit transport facilitation bodies which are coordinated at the subregional level by a Transit Transport Coordinating Board as required by the ASEAN Framework Agreement on the Facilitation of Goods in Transit (ASEAN Transit Agreement) of 1998.

In the Greater Mekong Subregion, countries have established national transport facilitation bodies which, at the subregional level, cooperate through a joint committee under the Agreement for Facilitation of Cross-border Transport of Goods and People (GMS Cross-border Transport Agreement) of 2001.

The three countries in the south Caucasus, namely Armenia, Azerbaijan and Georgia, have established national trade and transport facilitation bodies focusing on public and private partnerships in accordance with Recommendation No. 4 on national trade facilitation bodies adopted by the United Nations Centre for Trade Facilitation and Electronic Business in 2001. These countries, together with others in Central Asia, have also established national coordinating bodies for the implementation of the project on the development of the Transport Corridor Europe-Caucasus-Asia (TRACECA). Some Central Asian countries have established coordination arrangements for the facilitation of international transport under the overall national transport commissions.

In South Asia, Nepal and Pakistan have established national trade and transport facilitation bodies, which have benefited from being the focal point in implementing trade and transport facilitation projects executed by the United Nations Conference on Trade and Development and

financed by the World Bank. India has a specific mechanism to organize meetings and coordinate among relevant ministries and authorities responsible for international transport.

In North-East Asia, China has established a national transport facilitation committee following the arrangement in the GMS Cross-border Transport Agreement, and Mongolia has established a national committee for trade and transport facilitation, as recommended by the ESCAP secretariat.

## **2. Strengthening facilitation mechanisms in the ESCAP region**

The Almaty Programme of Action recommended that landlocked and transit developing countries should consider establishing, where appropriate, and/or strengthening existing national trade and transport boards or committees involving all major stakeholders, including the private sector.<sup>9</sup> The Commission, at its fifty-ninth session, held in Bangkok in 2003, expressed support for the framework of recommendations and the action plan on transit transport issues in landlocked and transit developing countries,<sup>10</sup> which include the provision of information on and analysis of examples of best practices in the establishment and operation of trade and transport facilitation committees with the support of advisory services.<sup>11</sup>

In order to assist countries in establishing or strengthening coordinating mechanisms, the secretariat, with financial support from the Government of the Netherlands, has undertaken a study on national coordinating mechanisms for trade and transport facilitation. The study reviews the development of the coordinating mechanisms in the region and in other parts of the world as well as the recommendations of international organizations. It also proposes a number of approaches to establishing effective coordinating mechanisms or strengthening the existing ones.

The ESCAP study found that most of the existing facilitation coordinating bodies suffer difficulties in operation and sustainability. Those difficulties result from lack of support from Governments, insufficient financing sources, inadequate recognition of their role and functions, inadequate organizational structure and incomplete representation of key stakeholders.

While international experience and good practices are useful for countries in establishing and strengthening national coordinating mechanisms, they have to be suitably tailored to meet specific needs according to national conditions. Specific guidelines taking into account the regional, subregional and national circumstances will be helpful for countries in establishing and strengthening their national facilitation coordinating mechanisms.

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<sup>9</sup> Almaty Programme of Action: Addressing the Special Needs of Landlocked Developing Countries within a New Global Framework for Transit Transport Cooperation for Landlocked and Transit Developing Countries (*Report of the International Ministerial Conference of Landlocked and Transit Developing Countries and Donor Countries and International Financial and Development Institutions on Transit Transport Cooperation, Almaty, Kazakhstan, 28 and 29 August 2003* (A/CONF.202/3), annex I), para. 37(f).

<sup>10</sup> See *Official Records of the Economic and Social Council, 2003, Supplement No. 19* (E/2003/39-E/ESCAP/1298), para. 111.

<sup>11</sup> See E/ESCAP/SB/LDC(6)/1, transmitted under E/ESCAP/1282/Rev.1, para. 52.

Information- and experience-sharing among the national facilitation coordinating bodies constitute a beneficial approach for them to improve their operations and coordinate with each other. The sharing of information can take place at the subregional level. A regional forum could provide the necessary platform for the national coordinating bodies to share information and experiences, network among themselves for future cooperation and seek international assistance for further development. The forum could meet every two years with the participation of all the national coordinating bodies in the region and some selected similar bodies from other regions and international and subregional organizations, as well as international financial institutions. The secretariat could, upon request, provide services to the forum to assist in networking the national coordinating bodies and organizing the meetings.

The first Regional Meeting on Trade and Transport Facilitation for Landlocked and Transit Countries, held in Bangkok in October 2005, expressed support for regional meetings of national facilitation bodies for the exchange of ideas and best practices, which was endorsed by the Committee on Managing Globalization at its second session,<sup>12</sup> held in Bangkok in October 2005, and further generally supported by the Commission at its sixty-second session, held in Jakarta in April 2006.<sup>13</sup>

### **C. Improving legal frameworks for international transport**

Land transport, by its nature, requires that countries make arrangements for the passage of goods and people across national boundaries. These arrangements could relate to cross-border transport, where two countries trade with each other, and could also relate to transit transport, where goods and people move through third countries along international transport routes. Such arrangements are usually covered by international conventions, subregional agreements and bilateral (trilateral and quadrilateral) agreements.

#### **1. International conventions**

International conventions with worldwide coverage are the most effective legal instruments for harmonizing legal regimes that would facilitate interregional trade. With the opening up of new transport routes cutting across several subregions, international conventions can also contribute to the regional harmonization of the standards and rules required to ensure the facilitation of intraregional trade.

Resolution 48/11 on road and rail transport modes in relation to facilitation measures was adopted at the forty-eighth session of the Commission on 23 April 1992 as a component of the Asian land transport infrastructure development (ALTID) project. At its fifty-sixth session, in 2000, the Commission decided to extend the validity of resolution 48/11, and requested that reports on its implementation be submitted every two years.<sup>14</sup> The main objective was to give an impetus to

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<sup>12</sup> See E/ESCAP/1366, para. 50.

<sup>13</sup> See *Official Records of the Economic and Social Council, 2006, Supplement No. 19* (E/2006/39-E/ESCAP/1390), para. 198.

<sup>14</sup> *Ibid.*, 2000, *Supplement No. 19* (E/2000/39-E/ESCAP/1197), para. 242.

transport facilitation in the region, pursuing a step-by-step approach in accordance with developments in the transport sector and taking into account the needs of the member countries. Thus, in resolution 48/11, the Commission recommends that countries in the region consider the possibility of acceding to seven conventions originally developed under the auspices of the Economic Commission for Europe (ECE), as follows:

- 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 (TIR Convention), 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

At its fifty-fourth session, the Commission endorsed the refined strategy for the implementation of the ALTID project,<sup>15</sup> an important component of which was the “facilitation of land transport at border crossings and maritime transport at ports through the promotion of the relevant international conventions and agreements in Asia to improve the efficiency of international transport along land and land-cum-sea routes”.<sup>16</sup> In the deliberations on that subject, it was stressed that while accession to the conventions listed in resolution 48/11 was important, their implementation was the key to the improvement of international traffic at border crossings and ports, hence facilitating transport and trade between countries.

The refined strategy also suggested several additional conventions:

- Convention and Statute on Freedom of Transit, 1921 (Barcelona Transit Convention)
- Convention on Transit Trade of Landlocked States, 1965 (New York Transit Convention)
- Convention on Facilitation of International Maritime Traffic, 1965 (FAL Convention), as amended
- Conventions and agreements aimed at facilitating rail traffic

In 1998, the United Nations Special Programme for the Economies of Central Asia (SPECA) was launched to strengthen subregional cooperation in Central Asia and its integration into

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<sup>15</sup> See *Official Records of the Economic and Social Council, 1998, Supplement No. 20 (E/1998/40-E/ESCAP/1117)*, para. 230.

<sup>16</sup> See E/ESCAP/CTC(3)/2, para. 37.

the world economy,<sup>17</sup> The Programme is jointly supported and implemented by the ESCAP and the Economic Commission for Europe. The implementation of SPECA commenced with the identification of priority areas of cooperation and the formation of project working groups. In 1999, the working group on transport and border crossing indicated that for SPECA countries it would be useful to expand the content of resolution 48/11 to include several international conventions.<sup>18</sup>

More than a decade has passed since the adoption of Commission resolution 48/11, during which countries in the ESCAP region, having been profoundly influenced by the process of globalization, have undergone significant political and economic transformation. Some countries experienced major structural changes, opening their domestic markets to imports and enabling the key export-oriented sectors to thrive, while others took on the enormous task of transformation from centrally planned to market-oriented economic systems. Legal and institutional harmonization and enforcement have not yet been achieved at the level that had been expected when resolution 48/11 was adopted.

With the signing of the Intergovernmental Agreement on the Trans-Asian Railway Network,<sup>19</sup> international conventions on the facilitation of rail transport will become increasingly important for countries of the ESCAP region. The focus of resolution 48/11 was on road transport, and conventions on rail transport were not included. Some international conventions with potential benefits for transport facilitation, such as the World Customs Organization International Convention on the Simplification and Harmonization of Customs Procedures (Revised Kyoto Convention) of 1999, were developed subsequent to the adoption of resolution 48/11 and were thus not included. The resolution therefore needs to be reviewed to explore the possible inclusion of additional conventions that would facilitate both road and rail transport, and countries need to be provided with assistance in the evaluation of the conventions prior to accession and in their implementation.

## **2. Subregional agreements**

Four major subregional groups, the Association of Southeast Asian Nations (ASEAN), the Economic Cooperation Organization (ECO), the Greater Mekong Subregion and the Transport Corridor Europe-Caucasus-Asia (TRACECA) have entered into subregional agreements on international transport in the region.

The ASEAN member countries have concluded a series of agreements relating to transport facilitation, including the Agreement on the Recognition of Domestic Driving Licences issued by ASEAN Countries, 1985, the ASEAN Framework Agreement on the Facilitation of Goods in Transit,

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<sup>17</sup> The current members of SPECA are Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

<sup>18</sup> European Agreement supplementing the Convention on Road Traffic, 1971;  
European Agreement supplementing the Convention on Road Signs and Signals, 1971;  
Customs Convention on the Temporary Importation of Private Road Vehicles, 1954;  
Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP), 1970.

<sup>19</sup> See Commission resolution 62/4 of 12 April 2006, annex.

1998, the draft ASEAN Framework Agreement on the Facilitation of Inter-State Transport, the Agreement on the Recognition of Commercial Vehicle Inspection Certificates for Goods Vehicles and Public Service Vehicles issued by ASEAN Member Countries, 1998 and the ASEAN Framework Agreement on Multimodal Transport, 2005.

The Greater Mekong Subregion Agreement for Facilitation of Cross-border Transport of Goods and People was signed by the Lao People's Democratic Republic, Thailand and Viet Nam in 1999 and acceded by Cambodia, China and Myanmar subsequently. The Basic Multilateral Agreement on International Transport for Development of the Europe-the Caucasus-Asia Corridor (TRACECA) was signed in 1998 by the countries in Central Asia and South Caucasus as well as some countries in southern Europe. The Economic Cooperation Organization Transit Transport Framework Agreement was signed in 1998.

The above subregional agreements consist of framework agreements with supporting annexes and protocols. The majority of them are comprehensive in coverage with the Greater Mekong Subregion Cross-border Transport Agreement, for example, consisting of 16 annexes and 3 protocols. While subregional agreements can make a valuable contribution in addressing issues that are not covered by bilateral agreements or international conventions, at times they relate to issues already dealt with through bilateral agreements, thereby creating difficulties for countries in implementation.

The subregional agreements also indirectly facilitate the implementation of international conventions through the incorporation of the convention provisions into their annexes and protocols. Where the subregional agreements simplify and modify the provisions of international conventions, however, there could be difficulties for the countries when it comes to future accession to the international conventions.

The existence of several subregional agreements with differing standards and procedures along particular transport routes causes difficulties in implementation and creates confusion among border authorities and trade and transport operators. In cases where countries are parties to subregional agreements developed within two subregions, caution is needed to avoid overlapping obligations resulting in difficulties in implementation. In an ideal scenario, subregional agreements would be stepping stones to the accession of international conventions and lead to the harmonization of legal regimes relating to transport facilitation.

### **3. Bilateral agreements**

Around 100 bilateral agreements on the facilitation of road and rail transport have been signed by countries in the ESCAP region since 1990. The common features of most bilateral agreements are basic arrangements for transport across borders, such as traffic rights, transport routes, transport permits, charges and taxes and driving permits. Bilateral transport agreements usually refer to other bilateral or domestic legislation for customs and other controls. These agreements usually rely on designated competent authorities to work out the details of implementation and require that the authorities consult with each other to resolve any problems in implementation.



Some countries in the region have signed more than 30 bilateral agreements on international land transport with neighbouring and transit countries and as a result government officials face difficulties in monitoring and managing the implementation of a large number of agreements. This is particularly so in cases where there would be an overlap or inconsistency between the bilateral agreements and subregional agreements and international conventions. At a practical level, these conflicts create uncertainty for transport operators in their day-to-day work. While some ESCAP member countries have well-informed legal teams dealing with the preparation and implementation of legal instruments, the majority could benefit from regional guidelines. In view of the important role that bilateral agreements continue to play in moulding and shaping European road transport relations, in 1997 the European Conference of Ministers of Transport adopted the Draft Model Bilateral Agreement on Road Transport.

#### **4. Towards regional harmonization of legal regimes on transport facilitation**

International conventions provide a set of common standards for the Contracting Parties, but specific issues such as traffic rights or free circulation of goods, services, people and capital between countries are dealt with at the bilateral or subregional level between Governments. Thus, all three types of agreements, international conventions, subregional and bilateral agreements, have a role to play in facilitating international transport. It has been observed that in some cases in the ESCAP region the provisions of bilateral and subregional agreements overlap and even conflict with those of international conventions, which also hampers facilitation in the region. In other cases, the implementation of the international convention cannot achieve its full benefits for lack of territorial continuity, that is, one of the countries in a group with common interests or along international transport routes does not accede to or implement the convention. One of the possible reasons for the lack of significant progress in the accession to international conventions may be attributed to the lack of appropriate information on the objectives, key provisions, benefits and implications of the legal instruments.

Under phase II of the Regional Action Programme (2002-2006) of the New Delhi Action Plan on Infrastructure Development in Asia and the Pacific, endorsed by the Ministerial Conference on Infrastructure held in Seoul in November 2001, and subsequently also endorsed by the Commission at its fifty-eighth session in 2002, the secretariat is required to analyse international and subregional agreements that facilitate trade and transport to assist countries in putting in place a suitable legal regime that would facilitate international and transit transport.<sup>20</sup>

At its fifty-ninth session, in 2003, the Commission proposed that landlocked and transit developing countries should, with the assistance of donor countries and international organizations, enhance their bilateral and multilateral cooperation and promote economic and trade development within the region by formulating model framework agreements that could be utilized by countries to

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<sup>20</sup> See E/ESCAP/1249, annex I, para. 4.2.

facilitate and increase the efficiency of transit transport.<sup>21</sup> It also expressed support for the framework of recommendations and the action plan on transit transport issues in landlocked and transit developing countries,<sup>22</sup> which include undertaking a study to collate and review elements of existing and proposed agreements within the region and relevant international conventions on transport facilitation and to make proposals for regional harmonization.<sup>23</sup> At its sixty-second session, in 2006, the Commission requested the secretariat to provide assistance in acceding to international conventions on transport facilitation.<sup>24</sup>

The Almaty Programme of Action stated that international conventions on transport and transit, as well as regional and bilateral agreements, ratified by landlocked and transit developing countries were the main vehicles by which the harmonization, simplification and standardization of rules and documentation can be achieved.<sup>25</sup>

The ESCAP secretariat has thus collated and analysed the international conventions, subregional agreements and bilateral agreements on transport facilitation in the ESCAP region. The secretariat will endeavour to build on this work in order to provide transport policymakers and legislators in the ESCAP region with a clear understanding of the benefits and implications of acceding to and implementing the legal instruments. The aim of the continuing study will be twofold: first, analysing the extent to which Commission resolution 48/11 has been implemented, it aims to ascertain what benefits and challenges countries are experiencing in this regard and how successful resolution 48/11 is in terms of facilitating transport across the region; second, the study sets out an approach that would move the agenda of transport facilitation forward and give the process initiated by resolution 48/11 new momentum, reflecting the need of countries in dealing with the new realities of the twenty-first century.

#### **D. Promoting the application of new technologies for transport facilitation**

Among all the technologies that help to facilitate international transport, ICT has the most profound impact on documentation, formalities and procedures. Satellite positioning, electronic customs seals and bar codes can significantly improve the traditional ways of inspecting vehicles and goods.

All the countries in the ESCAP region have been exerting efforts towards customs automation through the use of computers or ICT applications. Under such systems, transport documents are lodged electronically together with trade documents. A broader system, the electronic “single window”, is also promoted in the region to cover all formalities and procedures for international trade

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<sup>21</sup> See *Official Records of the Economic and Social Council, 2003, Supplement No. 19 (E/2003/39-E/ESCAP/1298)*, para. 106.

<sup>22</sup> *Ibid.*, para. 111.

<sup>23</sup> See E/ESCAP/SB/LDC(6)/1, transmitted under E/ESCAP/1282/Rev.1, para. 53.

<sup>24</sup> See *Official Records of the Economic and Social Council, 2006, Supplement No. 19 (E/2006/39-E/ESCAP/1390)*, para. 198.

<sup>25</sup> See A/CONF.202/3, annex I, para. 12.

and transport. On 9 December 2005, the ASEAN member countries signed the Agreement on the Establishment and Implementation of the ASEAN Single Window, which sets the target of operationalizing national single windows in the original member countries, Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand, by 2008 and in the latest member countries, Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam, by 2012.

One difficulty encountered in the automation process is that often systems which are developed for use within individual countries cannot be exchanged with neighbouring countries. Another difficulty is that at times the existing formalities and procedures have been computerized without the necessary realignment through the full utilization of the advantages of ICT. Moreover, automation has often been undertaken within one sector without coordination with other sectors. Those problems impede the improvement of border-crossing processes and clearances brought about by ICT applications.

Preparation and planning prior to implementation are essential for the application of ICT in transport facilitation. In the preparation stage, an institutional coordination mechanism needs to be set up to enable coordination and consultation among all relevant stakeholders. In addition, existing documents, processes and legal or regulatory frameworks need to be mapped out and examined. The planning process should also be a re-engineering exercise to streamline and simplify documents and processes with the involvement of all stakeholders.

In the application of ICT, the adoption of international standards is helpful to ensure the harmonization of documents, formalities and procedures, and also the interchange of data between countries. In this context, the World Customs Organization Customs Data Model, the United Nations Layout Key and United Nations electronic documents (UNeDocs) can be helpful for the regional harmonization of documents and exchange of documents between countries.

With the developments in space technology, satellite positioning can be adopted economically to improve efficiency in the international transport process. The use of the satellite positioning system in road transport can remove concerns over uncontrolled movements of vehicles and help facilitate the opening of domestic routes for international traffic and reduction of the need for escort and inspections en route. The adoption of electronic customs seals further enhances the effectiveness of the satellite positioning system and increases the security of the transit process. In addition, the use of bar codes in documents would reduce the incidence of forged documents. The popular use of scanners for enclosed trucks, containers and packed goods significantly reduces the requirement for physical inspections.

Although these new technologies have provided tremendous opportunities for the improvement of inspections and clearances for cross-border formalities and procedures, the potential benefits have not been fully realized. The necessary adjustments have not been made to multilateral and bilateral agreements, domestic rules and regulations, requirements for documents and operational procedures of various controls to optimize the benefits of the new technologies. A comprehensive

study is required to examine the impact of new technologies, including ICT, on border-crossing controls of international transport, and the cost implications. Countries also need to exchange information and share experience in this particular area.

The Regional Action Programme (2002-2006) of the New Delhi Action Plan on Infrastructure Development in Asia and the Pacific, phase II, stressed the need for the adoption of simplified and seamless trade and transport procedures, including ICT application.<sup>26</sup> The secretariat has therefore prepared guidelines on the application of ICT for the simplification and harmonization of trade procedures and organized a series of training workshops in some landlocked countries. A further study is required to integrate ICT applications into cross-border procedures and more training workshops need to be conducted.

As noted earlier, at its fifty-ninth session, the Commission expressed support for the framework of recommendations and the action plan on transit transport issues in landlocked and transit developing countries, which include compiling information on the computerization of customs processes and electronic data interchange systems adopted by selected countries, including best practices, and developing guidelines and recommendations on information and ICT requirements for efficient transit transport in the region.<sup>27</sup>

#### **E. Promoting the use of facilitation tools for the identification of bottlenecks and monitoring the impacts of facilitation measures**

While ESCAP member countries have become increasingly aware of the need to identify, isolate and address friction points on international routes, they have faced a lack of simple and effective tools. In response to this need, the secretariat developed the Time/Cost-Distance Model, which quantitatively illustrates the time and cost spent in each segment of a route, including border-crossing points, pinpointing the bottlenecks that have to be addressed. The methodology was initially applied in 2002 to several transit routes in selected landlocked countries in the ESCAP region. It was later applied to the demonstration runs of container block-trains along the northern corridor of the Trans-Asian Railway. It was further used in projects in collaboration with other organizations. Recently, it was widely introduced through the project on institutional capacity-building for facilitation of international trade and transport in the landlocked and transit countries with extensive analysis of trade flows, transport routes, structured questionnaires for data collection, an implementation plan and transfer of ownership to the countries.

Providing a snapshot of the entire route, the ESCAP model can be used in conjunction with methodologies that have been developed by other international organizations to analyse the cost and time associated with one particular segment of the transport route, that is, the clearance of goods.

A methodology to undertake micro studies on the time consumed at a port or border crossing has been undertaken by the World Bank with its Trade and Transport Facilitation Toolkit, which was

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<sup>26</sup> See E/ESCAP/1249, annex I, para. 4.1.

<sup>27</sup> See E/ESCAP/SB/LDC(6)/1, transmitted under E/ESCAP/1282/Rev.2, para. 58.

first published in 2001 and applied in several World Bank projects in developing countries. It measures the average crossing time, customs clearance time, percentage of physical control and time for additional clearances as indicators of facilitation at inland border crossings. A guidebook has been prepared to assist the users in collecting data from various stakeholders through a set of standard questionnaires and analysing the data.

Another methodology, the Time Release Study, was adopted by the World Customs Organization in 1994 based on a similar initiative undertaken by Japan and the United States of America. The Study measures the average times consumed at each step of management control by the different authorities from ship arrival to final release of goods. The methodology can be used to identify both the problem areas and potential corrective actions to increase the efficiency of customs. A guidebook was published in 2002, and WCO, in cooperation with the World Bank, developed software in 2005 for the application of the methodology. This methodology has been used extensively in Japan and is now being applied in some developing countries.

The ESCAP Time/Cost-Distance Model has received wide acceptance among countries and international organizations. The secretariat has prepared preliminary guidelines on the application of the methodology and published a compendium on the ESCAP website of the transport route analysis undertaken so far. The guidelines on application of the Model need to be elaborated further and published, and training courses need to be organized to assist countries in addressing the institutional and technical problems relating to the application of the Model. Further cooperation with donors, international financial institutions and other organizations is also required to assist the countries financially in applying and maintaining the Model for major international transport routes.

## **F. UPGRADING THE SKILLS OF TRANSPORT OPERATORS**

In cases where transport rules and processes are not harmonized, transport operators undertaking international transport have to face more challenges at border crossings and overseas than in their home countries. They need to comply with unfamiliar national laws, rules and regulations, as well as formalities and procedures for border crossing. They also need to be aware of the requirements of relevant multilateral and bilateral arrangements.

Insufficient knowledge of international transport on the part of operators often leads to conflict between countries. In some cases, drivers and operators frequently infringe local rules and regulations due to their lack of awareness of the different regulatory regimes, resulting in disputes between the competent authorities. Operators also occasionally undertake domestic transport overseas, being unaware of the fact that this may be prohibited by bilateral agreements.

With the further development of international land transport, dangerous goods will be carried by road in many areas. The carriage of dangerous goods by incompetent drivers will pose high risks to people and the environment. The use of standards which are lower than international norms for such carriage by transport operators will worsen this situation.

Four subregional groups, namely, the Commonwealth of Independent States (CIS), ECO, the Greater Mekong Subregion and TRACECA, have commenced the implementation of their subregional agreements on cross-border or transit transport. Each subregional agreement constitutes a particular system of transport and border-crossing arrangements. Implementation of the agreements requires extensive training of transport operators and drivers, as the systems adopted in the subregional agreements are often complex.

International land transport, in particular international road transport, is an evolving business for most countries in the ESCAP region, and there is a need for formal comprehensive training programmes. Most developing countries face difficulties in establishing training centres, determining the training content, preparing training materials and providing trained trainers. A few countries have established training courses for drivers and operators, and these programmes can be strengthened and shared.

The Almaty Programme of Action emphasized that efforts should be made to promote integrated training programmes encompassing all levels, from the top management to low-level operators, in both the public and private sectors, and requested international support for establishing training programmes.<sup>28</sup> The Regional Action Programme of the New Delhi Action Plan on Infrastructure Development in Asia and the Pacific endorsed by the Ministerial Conference on Infrastructure, held in New Delhi in October 1996,<sup>29</sup> also highlighted the need for training to build institutional capacity and assist in implementing transport agreements.

## **G. Conclusion**

The smooth and efficient movement of goods and people across borders in the region requires close collaboration between ministries and agencies and support from all stakeholders, including the private sector. Multilateral legal instruments relating to international transport can provide a mechanism for simplifying and harmonizing the documentation, formalities and procedures of border crossing. While progress is being made in these areas, there is awareness that much could be done to further reduce the delays and costs associated with border crossing in the region.

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<sup>28</sup> See A/CONF.202/3, annex I, para. 14(g).

<sup>29</sup> See E/ESCAP/1058, annex.

**Table 3: Status of accession of ESCAP members to the international conventions listed in Commission resolution 48/11, as at 30 September 2006.**

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)
<b>Group I: Mainland Asia</b>							
Afghanistan			x	x			
Armenia	q		q		q	q	q
Azerbaijan	q		q	q	q	q	q
Bangladesh							
Bhutan							
Cambodia				x			
China					x		
Democratic People's Republic of Korea							
Georgia	q	q	q		q	q	q
India		x					
Iran (Islamic Republic of)	x	x	x				q
Kazakhstan	q	q	q		q	q	q
Kyrgyzstan	q	q	q	q		q	q
Lao People's Democratic Republic							
Malaysia							
Mongolia	q	q	q				q
Myanmar							
Nepal							
Pakistan	x	x					
Republic of Korea	s <sup>a</sup>	s	x		x		
Russian Federation	X	x	x		x	x	x
Singapore				x			
Tajikistan	q	q	q				q
Thailand	x	x					
Turkey			x	q	x	q	q
Turkmenistan	q	q	q				q
Uzbekistan	q	q	q	q	q	q	q
Viet Nam							
<b>Group II: Island countries</b>							
Brunei Darussalam				x			
Indonesia	s	s	x		x		
Japan							
Maldives							
Philippines	x	x					
Sri Lanka							

Notes: x Acceded before the adoption of Commission resolution 48/11.

q Acceded after the adoption of Commission resolution 48/11.

s signature.

<sup>a</sup> 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).

### III. FINANCING OF TRANSPORT INFRASTRUCTURE AND PUBLIC-PRIVATE PARTNERSHIPS

Available funding from traditional sources falls far short of the investment needs of the transport sector. Consequently, there is a huge gap in investment in this sector in most developing countries of the region. With countries in the region facing this huge shortfall in investment and its negative consequences on economic growth, there is an urgent need to consider measures to meet these additional funding needs. Under these circumstances, countries have three principal options: first, to review the traditional sources of funds and explore additional funding from these sources; second, to investigate mechanisms for generating more resources from off-budget sources; and third, to consider a greater role for public-private partnerships and to identify and address the impediments to the development of such partnerships. The present chapter discusses these options.<sup>30</sup>

#### A. Introduction

The main traditional sources of funding for transport infrastructure development include allocations from government budgets, domestic and foreign loans and official development assistance. Governments are finding it increasingly difficult to meet their funding needs from these traditional sources, however. Consequently, there has been a need to diversify the sources of funding for transport infrastructure development in many countries.

In recent years, specific user taxes, earmarked funds, retained earnings, tolls and private sector participation have played an important role in infrastructure development in many countries. The role and significance of these sources vary from country to country, however, reflecting a number of factors, including the level of social, economic and political development; the level of sophistication of domestic financial markets; the levels of disposable income; and the extent and efficiency of direct and indirect taxation regimes.

The present chapter provides an overview of recent trends in the financing of transport infrastructure development in the countries of the region, their experiences, and the innovative financing arrangements that have emerged. It also proposes measures that may be considered for increasing the level of available funding, and issues that are perceived as being constraints and impediments to private sector participation. Finally, it raises issues for consideration by national Governments and identifies possible programmes of action at the national, subregional and regional levels.

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<sup>30</sup> This chapter draws on ESCAP document E/ESCAP/MCT/SGO/6, Busan, 6-8 November 2006.



## B. Public-sector financing of transport infrastructure

### 1. Introduction

Many countries in the region are currently implementing ambitious transport development programmes, particularly in the road and airport sectors. For example, 400,000 kilometres of new rural roads are expected to be built in China by 2020 and another 40,000 km of high-standard expressways are expected to be complete by 2007 for its national network. In India, about 368,000 km of new rural road construction is expected. In addition, about 45,000 km of highways four to six lanes wide are being developed, 5,418 km of which were completed by January 2005. In recent years Bangladesh has developed about 46,000 km of paved rural roads. In the Islamic Republic of Iran, major road, railway and port development programmes are being undertaken for the expansion and modernization of the transport infrastructure.

**Table 4: Financing needs of selected transport projects and programmes in the ESCAP region**

Region/ country	Transport subsector/ project	Financing need (US\$ billion)	Time frame	Comments
ESCAP region	Asian Highway	18.0	-	Upgrading and improvement of 26,000 km of highways in 26 countries
	Trans-Asian Railway	23.5	-	Construction of 13 missing links and double tracking of priority routes
China	Rural roads	47.7 (Y385.2 billion)	2006- 2010	325,810 km of new roads and paving of 675,535 km of roads
	Railway network expansion	250.0	By 2020	28,000 km of new lines
	Beijing-Shanghai high-speed link	24.7	-	1,320 km of high speed rail link
	Airports	17.4	5 years	44 new airports plus upgrading of existing ones
India	Rural roads	26.0	-	368,000 km of new rural roads and 370,000 km of upgraded roads
	National highways	48.9	2005- 2012	Development of 45,000 km of national highways in phases
	Dedicated freight corridor (rail)	11.0	-	Proposed 9,500 km of high capacity, high speed freight corridor
	Airports	9.0 (by government)	6 years	30 non-metropolitan airports

Source: Data compiled from various sources.

Table 4 provides examples of the financing needs of some selected major programmes and projects in the region. Table 5 provides estimates of the average annual transport investment needs in

the region. The estimated average annual investment needs for the developing countries of the region is US\$ 224 billion, representing about 36 per cent of total investment needs for all infrastructure sectors.

**Table 5: Estimates of average annual investment needs in the transport sector, 2005-2015 (Billions of 2004 United States dollars).**

Transport subsector	Developing Asian and Pacific countries		ESCAP region	
	2005-2010	2010-2015	2005-2010	2010-2015
Roads	161.0	206.0	185.0	231.0
Railways	7.7	8.2	8.8	9.3
Airports	8.7	10.9	14.6	18.5
Container ports	2.3	3.4	2.5	3.6
Urban mass transit	15.6	24.3	20.4	29.8
<b>Total</b>	195.0	253.0	231.0	292.0
<b>Annual average (2005-2015)</b>	224.0		261.5	
<b>All infrastructure</b>	608.4		NA	

Source: ESCAP, *Enhancing Regional Cooperation in Infrastructure Development Including that Related to Disaster Management* (United Nations publication, Sales No. E.06.II.F.13), pp. 38 and 140.

Note: Estimates are based on investment needs derived from sectoral studies by ESCAP. More recent data on railway investment needs in China show that the annual average would be larger than shown in the table.

A recent ESCAP study estimated that for all infrastructure sectors there was an investment gap in the order of US\$ 220 billion per year.<sup>31</sup> If a proportional gap in funding is assumed across the subsectors, the amount of the shortfall in the transport sector would be about US\$ 83 billion per year.

Using the methodology of a study by the World Bank,<sup>32</sup> the ESCAP study showed that investment of about 7 per cent, varying between 6.57 per cent and 6.92 per cent by subregion, of GDP per year was required for the infrastructure of the developing countries of the region. These figures are not inconsistent with the investments being made in the infrastructure sectors of China, Thailand and Viet Nam, which exceeded 7 per cent of national GDP per year. In a few other countries, investment was between 4 and 7 per cent of GDP per year.<sup>33</sup> However, in general, there is a huge shortfall in infrastructure investment in most countries.

<sup>31</sup> ESCAP, *Enhancing Regional Cooperation in Infrastructure Development Including that Related to Disaster Management* (United Nations publication, Sales No. E.06.II.F.13), p. 141.

<sup>32</sup> M. Fay and T. Yepes, "Investing in infrastructure: what is needed from 2000 to 2010?", World Bank Policy Research Working Paper 3102 (Washington, D.C., World Bank, 2003).

<sup>33</sup> Asian Development Bank, Japan Bank for International Cooperation and World Bank, *Connecting East Asia: A new framework for infrastructure* (Tokyo, ADB, 2005), p. 34.

With countries in the region facing the huge shortfall in investment and its consequences for economic growth, there is an urgent need to consider measures to secure the additional funding needs for transport as well as other infrastructure. There are five major sources of financing in the transport sector: government budgets, official development assistance (ODA), off-budget resources, public-private partnerships and surpluses generated from existing transport organizations. The discussions contained herein focus mainly on funding from government budgets, off-budget resources and public-private partnerships.

## 2. Allocation from government budgets

Direct allocations from the government budget and donor funds continue to be the main source of investment funding in many countries, particularly in the road and railway subsectors. For example, in Pakistan from 2001 to 2005, 75 per cent of total expenditure on the transport sector came from investment programmes financed from the government budget and donor funds. When broken down by sector, these sources constituted 100 per cent of funding for railways, 86 per cent for roads and 65 per cent for ports and shipping. Civil aviation received no funding from these sources. The balance came from different off-budget sources, including self-financing and private sector participation.

In Sri Lanka, budgetary allocations and donor funds will be used to meet the entire investment needs of the country's road sector in 2006.<sup>34</sup> In addition, the road sectors of Bangladesh, Bhutan, Cambodia, Indonesia, Mongolia, Thailand, Turkey and many other countries receive most of their funding from direct budgetary allocations. The situation in ports and civil aviation is different from that of other sectors, because direct charges collected from users generate funds for self-financing. Ports and civil aviation are also different because the private sector is taking an increasingly important role in the development of infrastructure in these areas.

In recent years, budget allocations have increased in real terms in most countries to meet the growing investment needs. However, the share of direct budgetary allocations has declined over the years in many countries. For example, national budget allocations in China in 2004 provided only 3.6 per cent of total road investments for that year, which compares with 78 per cent in 1977 and 9 per cent in 1992.<sup>35,36,37</sup>

National budget allocations for road development programmes in India have increased in real terms but their share has declined. Contributions from a variety of off-budget sources, such as the

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<sup>34</sup> Sarojini Senanayake, Country paper presented at the Expert Group Meeting on the Development of the Asian Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety, Bangkok, 8-10 May 2006.

<sup>35</sup> Country paper presented on China at the Expert Group Meeting on the Development of the Asian Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety, Bangkok, 8-10 May 2006.

<sup>36</sup> Yoshitsugu Hayashi, Zhongzhen Yang and Omar Osman, "The effects of economic restructuring on China's system for financing transport infrastructure", *Transport Research A*, vol. 32 (1998), pp. 183-195.

central road funds, debt finance and private investments, now constitute a major part of funding. Budgetary allocations for the rural roads development programme in India represent only 23.4 per cent of the total investment. In Japan, only 0.4 per cent of the road sector budget for 2006 is from the general fund; the rest comes from a special road fund and toll revenues. In the Republic of Korea, the contribution of the national Government to the road sector budget in 2004 was about 58.3 per cent of the total, but most of this came from a special account called the Special Account for Transportation Facility.

There are three main reasons for the general trend towards lower levels of financing from direct budgetary allocation. First, the huge resource requirements motivated countries to explore various off-budget mechanisms.<sup>38</sup> Second, Governments are faced with competing demands from other sectors. Third, as a part of the decentralization process in many countries, such as India, Indonesia, the Philippines and Thailand, devolution of power to provincial and other local levels of government has been granted. This has created higher resource needs at the local level, leaving fewer budgetary resources available to the national Government for its own programmes.

It is likely, however, that, over the foreseeable future, significant levels of funding for transport infrastructure in many developing countries will have to be drawn from government budgets. Consequently, there is a need to continue to pay attention to this source of funds. There remains scope for Governments to increase their tax and non-tax revenues as a share of gross domestic product. This is particularly true in countries where there is a low ratio of revenue to GDP.

### **3. Off-budget financing**

These are a wide range of off-budget financing options that can be used to support the development of transport infrastructure. The most common forms are (a) direct user charges, which include fees and taxes; (b) debt financing, which includes borrowing from financial institutions and development banks; and (c) access to capital markets through different types of financial tools. An analysis of recent trends shows that off-budget sources are meeting an increasing share of total investment needs in many countries. Direct charges to users and beneficiaries are becoming more prevalent. Even in the road sector, where it is still common to think of roads as public goods, it is evident that the acceptance of toll collecting is growing in the region. Consequently, contributions from various off-budget sources are meeting an increasing share of total investment needs in many countries. This section provides an account of the off-budget financing sources that are now being practiced in the region.

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<sup>37</sup> Wang Ruijun and Li Yang Li Huaijian, "Government policy on provincial and rural road development in China", paper presented at the second ANTLER conference organized by ESCAP and Asian Institute for Transport Development, New Delhi, 14-15 April 2005.

<sup>38</sup> Financing of the massive interstate highway development programme in the United States of America in the 1950s and 1960s was undertaken through various off-budget means, i.e. mainly through market borrowings using a variety of financing tools.

(a) *User charges and indirect beneficiary payments*

(i) Earmarked taxes and user fees

Many countries have introduced special taxes, including a cess on transport fuel, vehicle purchase taxes and various user fees. The purpose of these special taxes is to generate funds for investment in the transport sector. Other countries have earmarked a certain percentage of the tax collected from fuel and other sources for the financing of transport projects, particularly in the road sector. Funds from these earmarked taxes meet a significant portion of their investment needs. Earmarked special taxes and user fees are in place in many developing countries, including China, India, Kazakhstan, Nepal and the Philippines.

China has introduced various road-related fees collected at the provincial level, which account for about 30 per cent of road funding. At the national level, 48.2 billion yuan was collected in the form of vehicle purchase taxes, which met 12 per cent of the total investments made in the road sector in 2004.<sup>39</sup> India also collects road user fees in the form of levies on transport fuel. For example, a 50 per cent share of the levy on diesel fuel is earmarked for rural roads. It is estimated that this will amount to Rs 176 billion (approximately US\$ 4 billion) in the first five years for the ongoing rural road development programme (see Box 5). In addition to meeting financing needs directly, guaranteed revenues from earmarked sources have been leveraged in China and India to mobilize additional funds from the market through various financial tools.

(ii) Dedicated road (maintenance) funds

Funds available to the road sector from government budgetary allocations are often significantly less than the amount required to implement new road projects and maintain the road network. Faced with this problem, Governments have taken measures to improve resource inflows and the effectiveness of the management of these resources through the establishment of a dedicated road fund. A number of countries in the region including India, Japan, Kazakhstan, the Lao People's Democratic Republic, Mongolia, Nepal, New Zealand, Pakistan, Papua New Guinea and the Philippines have created dedicated special funds for their road sector. In addition many states in India have also established their own road funds.<sup>40</sup> The revenues for such funds are obtained from levies and surcharges, which are often called user charges. These charges generally fall into three categories: vehicle licence fees, levies on fuel and tolls. Experience suggests that road funds have greatly helped countries to finance their road sectors. Road funds have been particularly effective at helping countries to meet perennial deficiencies in road maintenance.<sup>41</sup>

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<sup>39</sup> Country paper on China at the Expert Group Meeting on the Development of the Asian Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety, Bangkok, 8-10 May 2006.

<sup>40</sup> For more details on these funds, see D.P. Gupta, "Road funds: a case study of sustainable road maintenance in India", *Transport and Communications Bulletin for Asia and the Pacific*, No. 75 (United Nations publication, Sales No. E.05.II.F.34).

<sup>41</sup> Experience of road funds from countries in Asia, Latin America and sub-Saharan Africa can be found in the *Transport and Communications Bulletin for Asia and the Pacific*, No. 75, cited above.

## (iii) Tolls

While collecting fees directly from road users is a relatively new method in most developing countries of the region, toll revenues meet a significant portion of the road sector budget in developed countries. For example, toll revenues are expected to account for 14.4 per cent of Japan's total road sector investment budget in 2006.<sup>42</sup>

Despite discouraging initial experiences with toll collection in many countries, toll roads are now common in most developing countries of the region, including Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, the Philippines, Thailand and Viet Nam. In Pakistan, 74 toll sections are in operation on the national highways and another 14 have been approved by the National Highway Authority. In Pakistan, the expected toll revenues in fiscal year 2005-2006 were about PRs 4 billion, providing about 92 per cent of the funds of the dedicated road maintenance account. This money amounted to 57 per cent of the maintenance budget for the whole national road network.

In Indonesia, toll roads have existed since 1978. Currently, 650 km of toll roads are in operation in the country. Since the Indonesia Infrastructure Summit 2005, Indonesia has undertaken major programmes in toll road development. Transactions on 17 toll road programmes were undertaken in 2005. Concession agreements on four toll roads were also reached in 2005. For 2006, the Government is considering another 12 toll road projects.<sup>43</sup>

Toll revenue collection has progressively increased in India as more and more sections of the national highways have been brought under toll operation. The estimated toll collection on national highways in fiscal year 2004-2005 was Rs 4.34 billion. Government policy is for tolls to eventually be levied on all sections of national highways which are scheduled to be upgraded under the national highway development programme.

The administrative arrangement and management of toll revenues vary from country to country. In Nepal and Pakistan, for example, toll revenues are deposited in a dedicated road fund/account for off-budget financing of road sector projects, particularly for maintenance. In India, Indonesia, Thailand and other countries, toll revenues are used to compensate the private concessionaire of toll roads and highways. Tolls collected on highways that were built with public funds may either go to the general fund of the Government or be earmarked for the financing of road projects. In other countries, such as Bangladesh, toll revenues go to the general fund of the Government.

Despite the progress made in direct charging of users through tolls, the political economy issues associated with toll pricing makes direct charging a difficult system to implement.

## (iv) Indirect beneficiary payments

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<sup>42</sup> Tetsuo Miyairi. Country paper on Japan presented at the Expert Group Meeting on the Development of the Asian Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety, Bangkok, 8-10 May 2006.

<sup>43</sup> See information available at <<http://www.indonesiainfrastructure.com/>> (17 July 2006).

Systems for collecting payment from the indirect beneficiaries of transport projects constitute a major source of funding in some countries in the region. Such systems, which include a capital gains tax in the form of certain land-related taxes and fees imposed on property owners and developers, are used, for example, in China; Hong Kong, China; and Japan as well as the United States of America to capture a part of the development gains generated by new transport projects.<sup>44</sup> However, in most countries of the region, such payment systems either do not exist or have very limited applications. Japan and the Republic of Korea have also used the land readjustment tool for the financing of urban infrastructure projects.

(b) *Debt financing*

(i) Loans from domestic and foreign banks and financial institutions and development banks

Debt financing has become an important source of financing for transport projects. However, it is difficult to ascertain its exact share in the financing of these projects, particularly the share from international financing institutions. Many important transport projects and programmes in the region are at least partially debt financed from domestic and international financing institutions.

In China, revenues from road-related fees and charges are leveraged to borrow funds from domestic banks. Approximately 40 per cent of the total investment in China's road sector comes from domestic financial institutions and another 2 per cent from international financing institutions and foreign countries.<sup>45</sup> Available funding from international agencies for road sector investments in Indonesia was US\$ 253 million (approximately 34 per cent of the total) in 2005 and is US\$ 187 million (approximately 23 per cent of the total) in 2006. In Sri Lanka, foreign funds, excluding grants, provide 50 per cent of the total road development budget amounting to SRs 361 billion for 2006.

The Asian Development Bank, Japan Bank for International Cooperation (JBIC) and the World Bank have financed transport projects in many countries of the region, including Bangladesh, China, India, Indonesia, the Lao People's Democratic Republic, Nepal, Pakistan, the Philippines and Viet Nam. Loans from JBIC have been used to finance the underground mass transit system and the new airport system in Bangkok.

(ii) Bonds

Bonds are a relatively new financing modality in Asia that have been used by a limited number of countries for the financing of transport projects. In India, bonds have been used as an important source of financing for its large investment programmes in the road sector. A part of the fuel cess levied in India is allocated for the development of its national highways. These funds have been leveraged to borrow additional funds from the domestic capital market through the issuance of

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<sup>44</sup> Discussion on various forms of indirect beneficiary payment systems in China, Japan and the United States can be found in Y. Hayashi, Zhongzhen Yang and Omar Osman, "The effects of economic restructuring on China's system for financing transport infrastructure", *Transport Research A*, vol. 32 (1998), pp. 183-195.

bonds that were exempted from the capital gains tax. The National Highway Authority of India have floated bonds/debentures and has raised Rs 85 billion (US\$ 1.89 billion) from the domestic capital market. India has planned borrowings of about US\$ 5.5 billion through government guaranteed tax-free bonds for the first five years of the rural road development programme. India has also gained experience in issuing municipal bonds for financing urban infrastructure projects, but primarily in the water sector.<sup>46</sup>

In China, the first revenue bond financing in 1996 raised US\$ 200 million for the Zhuhai Highway Company Limited in Guangdong Province. The China Development Bank (CDB) is the second largest issuer of debt after the Government. CDB bonds are not formally guaranteed by the Government but are considered semi-official debt.

### (iii) Securitization

Securitization of existing assets is another relatively new mechanism in Asia which has been undertaken in China. Securitization is undertaken once the project is operating, after certain project risks such as construction delays, cost overruns and initial traffic levels have been mitigated. Share listing on the stock exchange in Hong Kong, China and on the Shenzhen and Shanghai exchanges have been used to raise funds through initial public offerings. The main advantage of this financing option is its low cost. The greatest disadvantage of this modality is the time required to complete the regulatory formalities. For example, companies must have three profitable years of operation before they can be listed on the Shenzhen and Shanghai exchanges. Because of these issues, this modality has been considered more appropriate as a refinancing instrument. Since 1995, 15 Chinese expressway companies and infrastructure developers have been listed on the above-mentioned three stock exchanges.<sup>47</sup> Securitization of some existing transport projects in Bangladesh is also under consideration by the Government.

## 4. New initiatives for financing infrastructure projects

### (a) *Private investment promotion fund in Bangladesh*

The Government of Bangladesh has recently launched a fund called the *Investment Promotion Financing Facility* (IPFF) for financing private sector initiatives in infrastructure development. The International Development Association (IDA) gave US\$ 50 million in assistance to this initiative. The Government's share of the fund comes from an ongoing financial institution development project of Bangladesh Bank, the country's central bank. Small-scale infrastructure projects are expected to benefit from the initiative. Banks and non-banking financial institutions will channel their loans to the private sector under the scheme. Entrepreneurs and the financial institution(s) concerned will be

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<sup>45</sup> Country paper on China at the Expert Group Meeting on the Development of the Asian Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety, Bangkok, 8-10 May 2006.

<sup>46</sup> A large number of Indian cities have issued tax-free as well as taxable municipal bonds. See Chetan Vaidya for further details at < <http://www.ficci.com/media-room/speeches-presentations/2006/apr/2>> (25 July 2006).

<sup>47</sup> Makoto Ojio, "Private sector participation in the road sector in China", *Transport and Communications Bulletin for Asia and the Pacific*, No. 73 (United Nations publication, Sales No. E.03.II.F.43), pp. 1-26.



required to share at least 30 and 20 per cent of the total project costs, respectively. The rest will be covered by IPFF. Investments from the facility are subject to approval of the Government and IDA. The Infrastructure Investment Facility Centre (IIFC), a special public-private partnership facilitation agency of the Government, reviews the eligibility of a project under the Government's private sector infrastructure guidelines of 2004.

*(b) Special infrastructure-financing institutions in India*

India has established special institutions that mobilize funds from domestic and international capital markets for the financing of infrastructure projects. The Infrastructure Development Finance Corporation (IDFC) established in 1997 with the participation of the Government of India, the World Bank, KfW IPEX-Bank and several commercial banks in India, provides long-term loans and guarantees for public and private sector infrastructure projects. IDFC provided a total of US\$ 1.3 billion in loans in 2005.

In a separate initiative, in January 2006 the Government of India established a wholly Government-owned company called the India Infrastructure Finance Company Limited (IIFCL). It has authorized capital of Rs 10 billion. In addition to this capital, IIFCL will be funded through long-term debt from the open market. The Government plans to extend guarantees for repayment of the principal and interest of this debt. One of the expected roles of IIFCL is the refinancing of those private sector projects initially financed by banks, which find long-term financing for infrastructure projects difficult. Public-private partnership projects awarded to private companies for development, financing and construction will receive overriding priority for financing from IIFCL.<sup>48</sup>

*(c) Infrastructure investment fund in the Russian Federation*

The authorities in the Russian Federation are considering the establishment of an investment fund with Rub 40-50 billion in 2005, which is expected to amount to approximately Rub 70 billion in 2006. The purpose of this initiative is to fund infrastructure projects, including those in the field of transportation. Investors can request funding for a part of their investment needs from the Fund. The remaining portion must come from the investor's own resources.<sup>49</sup>

*(d) Pooled finance fund*

Large local government bodies may have the capacity to access domestic capital markets to fund infrastructure projects. However, it is difficult for small and medium-sized local bodies to have access to the capital market. Pooled finance is an innovative mechanism, pioneered in the United States, which has been used for the financing of infrastructure projects. The Government provides grants or "seed money" to establish a fund to capitalize on other loan funds and resources. Total assets in a pooled finance fund can become significant over time through government contributions,

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<sup>48</sup> India, *Economic Survey, 2005-2006*.

<sup>49</sup> RZD-Partner, No. 9(85), 2005. p. 6 ([www.rzd.partner.ru](http://www.rzd.partner.ru)) (in Russian).

state match, leveraging, loan repayments and interest earnings.<sup>50</sup> The money in the fund, in turn, is made available to local bodies for the financing of their projects. Various financial innovations, such as refinancing, government loans and long repayment periods, are used to reduce the cost of financing compared with conventional sources. The State of Tamil Nadu in India has established such a fund, called the Tamil Nadu Urban Development Fund.

(e) *Financing of large programmes*

No single financing method is sufficient to meet the investment needs of some large-scale infrastructure development programmes. For this reason, funding may have to come from a number of sources. The massive ongoing programme to build rural roads in China is an example of such a financing arrangement. In addition, programmes on rural road development need to be integrated with complimentary programmes to have their desired effects. Funds for all such complementary programmes need to be pooled together in order to envision an integrated approach to development in rural areas. However, financing is not the only major issue associated with an approach to development; an institutional framework is also necessary for the integration of all such complementary programmes. The Pradhan Mantri Gram Sadak Yojana (PMGSY) programme in India is a notable example from the region (see Box 5 for details).

**Box 5: Financing of a large programme: the Pradhan Mantri Gram Sadak Yojana Programme in India**

The Pradhan Mantri Gram Sadak Yojana (PMGSY) Programme was launched by the Government of India in December 2000. The goal of this programme is to provide connectivity to unconnected rural habitations as part of a poverty reduction strategy. The Government ensures that the programme's technical and management aspects maintain high standards and uniformity. In addition, the Government facilitates policy development and planning at the state level. In the first phase of the programme, settlements with a population exceeding 1,000 (500 in the case of Hill States, tribal and desert areas) will be covered. In the second phase, settlements with a population of 500 (250 in the case of Hill States, tribal and desert areas) will be covered. About 368,000 km of new road construction and 370,000 km of upgraded or renewed roads are expected to be completed at a cost of about US\$ 26 billion. Planned resource mobilization for the first five years are as follows: budgetary allocations of Rs 176 billion, diesel cess of Rs 176 billion, tax-free bonds of Rs 250 billion and external and internal borrowings of Rs 150 billion (about US\$ 17 billion in total).

Source: [www.pmgysy.org/](http://www.pmgysy.org/)

<sup>50</sup> For example, the Clean Water State Revolving Fund (CWSRF) in the United States has grown to over US\$ 42 billion. For each federal dollar invested, this programme is making US\$ 1.90 available for important water quality projects each year. (See United States Department of State website at <<http://www.state.gov/g/oes/rls/fs/2003/18949.htm>> (19 July 2006).

## C. Private Sector Participation

### 1. Introduction

Governments worldwide have increasingly turned to the private sector for additional resources, increased efficiency and sustainable development in many fields, including that of transport infrastructure and services. Following trends in other fields, private sector involvement in the transport sector has now become common in many countries of the region. More recently, as in other sectors of the economy, the paradigm shift towards a market economy has also led to a growing interest in public-private partnerships in the transport sector.

To facilitate private involvement, reforms have been initiated and Governments are also considering various other steps. As a result, highways, rail systems and new port and airport facilities are increasingly being built following various models of public-private partnerships.

### 2. Recent trends

Globally, private sector participation in infrastructure development grew dramatically between 1990 and 1997. This participation gradually declined from its peak level owing to the 1997 Asian financial crisis. After sluggish private sector participation for several years there has been an apparent resurgence since 2005. Most of the new projects were, however, concentrated in four countries: China, India, Indonesia and Turkey.

Data from the Private Participation in Infrastructure (PPI) Database of the World Bank shows that, in the developing countries of the region between 1990 and 2005 the private sector made investments in 362 transport sector projects (see Table 6). The total value of these projects exceeded US\$ 60 billion. In terms of the number of projects and value of investment, the road sector was at the top, followed by the ports sector.

**Table 6: Total investment and number of projects by subsector, 1990-2005**

Sector	Total investment (Billions of US\$)	Share of investment in the sector	Number of projects
Airports	7.9	13.5	36
Railways	9.3	15.3	16
Ports	15.8	25.9	100
Roads	27.7	45.6	210
<b>Total</b>	<b>60.7</b>	<b>100.0</b>	<b>362</b>

Source: PPI Database, World Bank (available online at <http://ppi.worldbank.org>).

The total value of such projects, however, is only a part of the total investment made in the transport sector during that period. In more recent years, ports and airports have drawn more investments than in the past and, as a result, their relative shares have increased considerably.

(a) *Ports*

Private participation in port projects is under way in 12 Asian countries. In addition to China, major port sector investments are being made in India, Indonesia and Malaysia. Port facilities with more limited private participation have been built in Myanmar, Pakistan, the Philippines, the Russian Federation, Sri Lanka, Thailand, Turkey and Viet Nam. In 2005, five projects in China with a total investment value of US\$ 2.156 billion and one project in Turkey with a value of US\$ 825 million were undertaken.

Private sector participation in port facilities and services has gathered momentum in India and is expected to be further spurred by institutional reforms in the coming years. A total of 13 private and captive port projects with an investment of about Rs 26.62 billion have been completed and 24 others with investments amounting to Rs 79.10 billion are at various stages of evaluation and implementation.<sup>51</sup> Private sector participation in the management and operation of many ports in India has resulted in efficiency levels comparable to other ports in the region.<sup>52</sup> Considering the impressive success of private operation at Jawaharlal Nehru Port, similar contracts are now under negotiation or are being implemented at many ports across the country. These contracts include the development of a third container terminal at Jawaharlal Nehru Port and a contract for development, management and operation of the container transshipment terminal at Cochin. Many of the major ports in the region are managed and operated by the private sector although they may be owned by the public sector.

The establishment of inland container depots and dry ports is a relatively new development in the ports sector. Inland container depots serve as inland extensions of seaport facilities and have been established to improve logistics efficiency and provide value added services. Although inland container depots with customs clearance facilities have proliferated in other regions, only 103 such facilities exist in the ESCAP region, compared with an estimated 207 in Europe and 373 major ones in the United States. It is significant that many of these facilities have been established with private sector participation. Privately owned and operated inland container depots exist in China, India, Myanmar, Pakistan, the Republic of Korea and the Russian Federation (see the example in Box 6), although many of them do not have customs clearance facilities.

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<sup>51</sup> India, *India Economic Survey, 2005-2006*.

<sup>52</sup> 3iNetwork, *India Infrastructure Report 2003: Public expenditure allocation and accountability* (New Delhi, Oxford University Press, 2003), p. 72.

**Box 6: Kyungin inland container depot in the Republic of Korea: a project with private sector participation**

The Kyungin inland container depot at Uiwang was established in 1992 with the objective of reducing logistics costs. A 75 per cent stake of the inland container depot is held by 16 private sector transportation companies and the remaining 25 per cent stake is held by the Government through the Korean National Railroad. With a paid-in capital of US\$ 5.263 million, the total cost of the project was US\$ 32.2 million. Located close to Seoul, the inland container depot is well connected by road and rail networks with major ports at Busan and Gwangyang. It has an annual cargo handling capacity of 1.37 million twenty-foot equivalent units and provides such facilities and services as rail transportation, inland transportation to and from shippers, and inland customs clearance.

The inland container depot serves as an inland port and has all necessary physical facilities found at a seaport, such as a container yard, a container freight station, and office space for agencies and companies involved in its operations. By serving as a container freight station, Kyungin has brought relief to Busan from the accumulation of cargo. It has also helped to reduce inland traffic congestion by allowing large volumes of cargo to be transported by rail at reduced cost and time.

*(b) Road*

Road projects comprised about half of the total investments with private participation in the transport sector in the region. These projects were limited to seven major countries and were concentrated in China, India, the Republic of Korea and Malaysia. The three other countries with private participation in road projects were Indonesia, the Philippines and Thailand. China was clearly the lead country in terms of both the number of projects and their value. Lately, there has been a marked increase in private participation in the road sector in India and Indonesia. Both the countries are now undertaking a large number of road projects with private sector participation.

India has explored a variety of contractual arrangements for public-private partnerships in highway development. A total of 54 contracts involving 3,100 km of highway and investment of about Rs 190 billion have been awarded. Another 25 smaller build-operate-transfer (BOT) projects at a cost of Rs 14 billion have been taken up for the construction of bridges, flyovers and bypasses. The expected total investment by the private sector for the first three phases of the national highway development programme is about US\$ 6.42 billion. Most of the highway development programmes in the future are expected to be undertaken through public-private partnerships.

The provision of viability gap funding<sup>53</sup> and other incentive measures, investor-friendly contract agreements and transparent administrative procedures are behind the recent success of the public-private partnership programme in India. The Government allocated Rs 14 billion in the fiscal

<sup>53</sup> Viability gap funding is a scheme of the Government of India for providing financial support to public-private partnerships in infrastructure. A grant, one-time or deferred, is provided under this scheme with the objective of making projects commercially viable. Viability gap funding can take various forms including capital grants, subordinated loans, operation and maintenance support grants, and interest subsidies. A mix of capital and revenue support may also be considered.

year 2005-2006 for meeting the viability gap funding of public-private partnership projects.<sup>54</sup> The World Bank and the Asian Development Bank (ADB) are known to have expressed their interest in financing the viability gap of road projects. Box 7 provides a list of important incentives for the private sector.

(c) *Railways*

There are few railway projects with private sector participation and they are located in just seven countries, namely, Australia, China, India, Malaysia, the Republic of Korea, the Philippines and Thailand. Many of these initiatives are urban rail projects and mark the re-emergence of private railway operation in Asian developing countries after a long period of nationalization and public sector management. New urban rail projects in Bangkok, Kuala Lumpur, Beijing and Manila have inspired other countries in the region to consider similar projects for their major cities. Information from the BOT Center in the Philippines shows that, as of June 2006, five urban rail projects for the Manila transit system were under different stages of processing for implementation.

An urban railway project with an estimated cost of Rs 23 billion has been initiated in Mumbai, India, under a 35-year BOT concession agreement. State funding will cover about 28 per cent of the project cost. A similar public-private partnership project is also being undertaken in Hyderabad, which may receive state funding of up to 30 per cent of the cost.

In Australia, a 1,420 km line between Alice Springs and Darwin has been constructed to create a freight landbridge to Asia. Of the estimated total cost of \$A 1.3 billion, the project received government funding of \$A 559.2 million; the rest was mobilized by the private sector. A high-speed train link between Seoul and Busan has been implemented in the Republic of Korea at a cost of about US\$ 17 billion. The project received substantial government grants and loans to make it commercially viable. The Government provided 45 per cent of the cost (35 per cent as grants and 10 per cent as loans); the remaining 55 per cent was mobilized mainly through debt financing.<sup>55</sup> Two public-private partnership intermodal rail projects linking ports in Gujarat have been implemented. These projects, the Pipav Rail Corporation and the Kutch Railway Company, have a total value of over US\$ 198 million.

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<sup>54</sup> India, *Economic Survey 2005-2006*, p. 189, available at <<http://indiabudlet.nic.in/es200506/esmain.htm>> (14 July 2006).

<sup>55</sup> Information available at <<http://www.webmag.transport.alstom.com/eMag/externe/international/korea/ktx/mar2004/1/224.asp>>

**Box 7: Incentives for private sector participation in the road sector in India**

The Government of India has taken a number of administrative, legal and fiscal measures to promote public-private partnerships in the road sector. The model concession agreement has been made investor friendly through more equitable allocation of risks and provision of incentives in the form of grants and other measures. The main incentives include:

- Government bears expenses for land acquisition and pre-construction activities;
- Foreign direct investment up to 100 per cent;
- Capital subsidy up to 40 per cent to meet the viability of a project;
- Government equity up to 30 per cent;
- 100 per cent tax exemption in any consecutive 10 years;
- Duty-free import of road construction equipment;
- Bond exempted from capital gains tax;
- Tax benefits for property development activities;
- Transparent and well defined procurement procedure;
- Equitable dispute resolution mechanism.

*Source:* A.P. Bahadur, "Financing national highways in India", paper presented at the Expert Group Meeting on the Development of the Asian Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety, Bangkok, 8-10 May 2006.

*(d) Airports*

Airport projects with private sector participation have been implemented in nine countries of the region. The majority of the projects are located in China, India, the Russian Federation and Turkey. Cambodia, the Lao People's Democratic Republic, Malaysia, the Philippines, Thailand and Viet Nam have also implemented airport projects with private sector participation. Last year, two major airport deals were made in Turkey (for the Ankara airport) with a total investment of US\$ 2,848 million.

Recently, India has been able to draw huge private investments for its airport sector. The Cochin airport was the first greenfield airport constructed with private participation, at a cost of about US\$ 68.5 million. Greenfield airports are under construction at Bangalore and Hyderabad at a cost of US\$ 324 million and 399 million, respectively. In both cases the private sector shares 74 per cent of the estimated cost. Several other similar projects are also under consideration by the Government. The Delhi and Mumbai airports have been handed over to private consortia, led by domestic firms, under operation management development-agreements with a concession period of 30 years. The Government will hold a 26 per cent stake in both joint venture companies that will manage these airports. The capital investment for the Delhi and Mumbai airports over the next five years would be about Rs 28 billion and Rs 26 billion, respectively.<sup>56</sup>

<sup>56</sup> The *Economic Times*, available at <<http://economictimes.indiatimes.com/articleshow/1477941.cms>> (July 2006).

### 3. Institutional arrangements for public-private partnerships

Many Governments in the Asian and Pacific region have spelled out their policy and regulatory frameworks. Some Governments have gone beyond their usual roles of formulating policy, streamlining administrative processes and creating a supportive legal environment. They have established specialized units and devised suitable legal instruments to provide active support for private sector activities in infrastructure development. For a list of special units in Governments of selected ESCAP members, see Box 8; for a list of legal instruments in the region, see Box 9.

#### **Box 8: Some of the special PPP units in governments and programmes in the region**

- Private Infrastructure Investment Management Centre (PIMAC), Republic of Korea
- BOT Center, Philippines
- National Committee for the Acceleration of Infrastructure Provision Policy (KKPPI), Indonesia
- Infrastructure Investment Facilitation Centre (IIFC), Bangladesh
- Bureau of Infrastructure Investment (BII), Board of Investment, Sri Lanka
- Partnership Victoria, Victoria, Australia
- Gujarat Infrastructure Development Board (GIDB), Gujarat, India

#### **Box 9: Special instruments in support of private participation in infrastructure development**

- Private Finance Initiative Promotion Law (PFIPA Law), Japan
  - Private Provision of Infrastructure Act (PPI Act), Republic of Korea
  - Land Transport Management Act, New Zealand
  - Build Operate Transfer Law, Philippines
  - Board of Investment Law, Sri Lanka
  - Build Operate Transfer Law, Turkey
  - Gujarat Infrastructure Development Act, Gujarat, India
  - Sectoral laws in many countries (such as India and Indonesia) with the provision of public-private partnerships/private sector participation in infrastructure development
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#### 4. Observations and lessons learned

Private sector participation in the transport sector has increased considerably in the last two years. In the face of continuing government budget constraints and inefficiencies, it is expected that private participation in the sector will continue to grow in order to meet the growing demand.

Until recently, the Asian focus has been on new capital-intensive BOT projects. These projects are very complex to administer, however, particularly in view of the institutional weaknesses and capacity constraints of the public sector. Recognizing the complexities of BOT contracts, attention has been placed on more practical forms of participation aimed at increasing the efficiency of existing assets through improved operation and modernization. The success in the road and airport sectors in India shows that an appropriate risk sharing framework and more diversified contractual arrangements could result in greater participation by the private sector.

The growth of local currency financing, as evidenced in China, India, Malaysia, the Republic of Korea and Thailand, is an encouraging sign for public-private partnerships.<sup>57</sup> However, given the current limited level of debt financing in the region, further innovations in project financing and financing structures are required.

A special public-private partnership unit or programme within a Government can be very effective in promoting public-private partnerships. The experiences of countries with such units and programmes have been positive. These units and programmes have served as catalysts for the promotion and implementation of private projects.

In many countries, legal provisions and procedures related to private sector participation are complex, numerous, scattered over many different instruments and have no fixed time frame for completion. To address these problems, many countries have developed special legal and regulatory instruments, which have helped to reduce the level of uncertainty surrounding public-private partnership project deals and have increased investor confidence.

Experience from both within and outside the region suggests that Governments need to pay special attention to institutional development and capacity-building in the public sector, without which there will not likely be much progress despite the fact that the growing demand requires additional investment by the private sector.

#### D. Major findings and policy issues

The demand for transport infrastructure facilities will continue to increase owing to the growth of external and domestic trade and production, as well as rising incomes and ongoing urbanization. However, without larger government budget allocations, public provision alone will not be sufficient to meet the growing demand.

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<sup>57</sup> Makoto Ojira, *op.cit.*, discusses this development in China.

Current funding levels from all available sources fall far short of the total investment requirement. While the actual amount of future investment needs may still be debated and estimates refined, there is a great need to increase the availability of funding for transport infrastructure development from all possible sources.

An analysis of the current trends shows that off-budget financing of transport infrastructure is becoming increasingly more common in the region. In the future, funds from off-budget sources are likely to meet a larger share of investment needs. Although some countries are already using more off-budget sources, most countries are still relying heavily on their limited budgetary resources. Greater reliance on off-budget sources requires that countries explore options such as direct user charging and use innovative financing tools for borrowing from the market and also use equity participation by the private sector.

Few countries in the region have used financial tools and innovative instruments for borrowing money from the market or from long-term funds. Capital markets in most countries are not fully developed. Legal and regulatory bottlenecks, particularly at the sub-sovereign levels, remain a major constraint to debt financing. The growth of public-private partnerships is also dependent on the availability of debt finance in a country.

Indirect beneficiary payment systems through development gains taxation and other fees are almost absent with the exception of a few countries, such as China, Japan and the Republic of Korea. Indirect beneficiary payment systems could be a major source of finance, particularly for urban transport infrastructure.

Domestic financing is likely to remain more dominant than foreign investment. As such, domestic financing constraints need to be addressed. Suitable financing/refinancing tools, such as bonds and securitization of assets, need to be considered. The lessons learned from countries that have established special infrastructure-financing institutions and mechanisms need to be evaluated.

Governments have progressively pursued different types of partnerships with the private sector as a means of gaining access to additional resources, as well as to capitalize on the private sector's efficiency and ability to innovate. However, progress has been slower than expected owing to a range of issues. The knowledge and the necessary skills that are required to develop and implement public-private partnership projects are often lacking in the public sector. Consequently, despite the large number of potential projects, in many countries few deals for such projects were made.

Effectively engaging the private sector requires policymakers to develop an appreciation for its abilities while remaining aware of the limitations on the role it can play. Experience from various countries suggests that the formulation of an appropriate legal and regulatory framework, a suitable risk-sharing mechanism, transparent procurement processes and streamlined administrative processes as well as the provision of incentives, are also vital for the promotion of public-private partnerships.

## **E. Conclusions**

Most countries of the region are facing shortages of transport infrastructure and services. Available funding from the traditional sources falls far short of the investment needs, resulting in a huge gap in investment. There is a need to increase available funding from all possible sources, with greater reliance on non-traditional sources, including direct beneficiary payment systems and public-private partnerships.

Many Governments are diversifying their funding sources, with increasing emphasis on off-budget sources, and are also encouraging the participation of the private sector. An analysis of regional experiences shows that there is much room for further development in these areas. Off-budget financing still has a very limited role in most countries and private sector participation has also remained limited to a few countries. Considering the potential of these sources, it is important for countries to make concerted efforts at the national level.

### **1. Country level**

Governments that do not have them may wish to consider the establishment of transport funds/accounts. This will make additional funding available for investment in the transport sector. Experience of countries both from within and outside the region suggests that establishment of independent authorities would be ideal for efficient management of resources deposited in such funds. In countries where transport funds/accounts already exist, additional sources of resources may be explored for an increased level of funding from them.

Contributions from direct charging of road users are still fairly limited in most countries. This option needs to be explored further in order to mobilize additional funds for road development and maintenance of facilities.

With the exception of a few countries, the potential of the private sector has largely remained unutilized. Considering the recent positive experience of some countries, Governments may wish to explore alternative collaboration models of public-private partnerships with appropriate risk-sharing frameworks and administrative arrangements supported by necessary legal and regulatory provisions.

Countries may wish to consider their current legislative and administrative frameworks as well as administrative procedures with a view to creating a conducive environment for public-private partnerships. Actions in this respect may include suitable changes in legal and regulatory regimes to induce greater confidence in the private sector, streamlining of administrative procedures that place time limits on approval processes and the establishment of one-stop shops.

A special public-private partnership unit or programme in the Government can address the capacity problem of the public sector effectively and promote private participation in a planned and coordinated manner that takes into account the overall sectoral needs and cross-cutting issues. Such an administrative arrangement in Government can also help to enhance the social acceptability and transparency of private projects by institutionalizing the project identification and approval processes.

In view of the merits of special units and programmes, Governments that do not have them may wish to consider establishing them.

## **2. Regional level**

The secretariat has recently commenced an interregional project on public-private partnerships under the United Nations Development Account. Future activities are expected to continue to build on available expertise, resources, institutions and networks within the regional commissions and other United Nations entities along with agencies that have an interest in financing mechanisms and building capacity for public-private partnerships.

## IV. TRANSPORT AND THE MILLENNIUM DEVELOPMENT GOALS

The present chapter explores the relationships between transport and poverty and the role of transport development in achieving each of the eight Millennium Development Goals. In recognition of the important role of the transport sector in achieving the Goals, the chapter raises the need to consider specific development targets in the sector. It proposes a set of targets that can be used as planning tools and for monitoring progress in transport development.<sup>58</sup>

### A. Introduction

The Millennium Development Goals are an agenda of the United Nations agreed upon by world leaders at the Millennium Summit in September 2000 in order to reduce poverty and improve lives. With a central focus on poverty reduction and defined targets to be achieved in a specified time frame, the main thrust of the Goals is to make economic development more inclusive than it has been in the past and to bring all people to a readily feasible set of basic standards of health and education.

With the adoption of the Millennium Development Goals, there has been a necessity for new approaches in analysing and targeting the needs of the poor as well as monitoring the progress in achieving the Goals. The eight Goals range from eradicating extreme poverty and hunger to ensuring environmental sustainability, reducing child mortality and improving maternal health, promoting gender equality and developing a global partnership for development.

There is ample empirical evidence from both within and outside the Asian and Pacific region that transport has an important role in poverty reduction and improving the general welfare of the people.<sup>59</sup> Improvements in transport infrastructure and services can provide people with access to a broad range of socio-economic opportunities and services and strengthen their capability to work and increase productivity, which are keys to poverty reduction.

The present chapter explores the relationships between transport and poverty and, in particular, the role of transport development in achieving the eight Millennium Development Goals and the need for consideration of specific development targets in the sector.

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<sup>58</sup> This chapter draws on ESCAP document E/ESCAP/MCT/SGO/7, Busan, 6-8 November 2006.

<sup>59</sup> For example, see Selim Jahan and Robert McCleery, *Making Infrastructure Work for the Poor: Synthesis Report of Four Country Studies Bangladesh, Senegal, Thailand and Zambia* (New York, United Nations Development Programme, 2005); and R. Sengupta, D. Coondoo and B. Rout, "Socio-economic impact of national highway on rural population living in its proximity", *The Asian Journal*, vol. 12, No. 1, (New Delhi, Asian Institute of Transport Development, 2005), pp. 43-64.

## **B. Incidence of poverty in the region<sup>60</sup>**

The Asian and Pacific region is home to about 60 per cent of the world's population. However, 679 million people in Asia are still living on a less than a dollar per day, which accounts for more than two thirds of the world's poor.

Notable achievement has been made in reducing the number of poor, owing to rapid economic growth and affirmative actions in the form of various programmes and projects. Between 1990 and 2001 the absolute number of poor people fell from 931 million to 679 million. Despite this progress, with the exception of a few countries, poverty continues to be endemic in the region. In terms of absolute numbers, China and India are still home to a very large number of poor people. Setbacks in eradicating hunger nearly outweigh progress in some other areas. Between 1990 and 2002, the number of people suffering hunger has increased considerably in many countries of the region. About half of children in Afghanistan, Bangladesh, India and Nepal are undernourished. Asia also still accounts for over two thirds of all people living in rural areas without access to clean water and sanitation, of underweight children and of tuberculosis cases in the world.

A recent assessment by ESCAP of the poverty situation in the region finds that "...not all the developing countries in Asia and the Pacific are making sufficient progress; indeed none are currently on track to meet all Goals by 2015".<sup>61</sup> A large number of countries are off track for reducing the infant mortality rate, maternal mortality rate, proportion of children not enrolled in primary school and HIV prevalence.

Without going into any further details of the poverty situation, it can be said that further efforts are required by most countries in the region if they are to achieve the Millennium Development Goal targets within the specified time frame.

The great majority of the Asian poor in both urban and rural areas face a basic access problem owing to deficiencies in transport. In this respect, the links between poverty reduction and the transport infrastructure and services need to be assessed. It is necessary to assess how greatly the deficiencies in this sector are affecting progress in achieving the Millennium Development Goal targets and how these deficiencies may be tackled.

## **C. Contribution of the transport sector to achieving the Millennium Development Goals**

In recent years, ample empirical evidence of the positive impact of transport (rural roads, in particular) on poverty reduction has emerged from studies conducted by the Asian Development Bank, the Department for International Development of the United Kingdom of Great Britain and

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<sup>60</sup> This section draws heavily from the recent ESCAP report *Achieving the MDGs in Asia: a case for more aid?* (available at <<http://www.unescap.org/publications/detail.asp?id=1152>>); and United Nations, *The Millennium Development Goals Report 2005*, (New York, United Nations, 2005). The purpose of this section is not to lead to any further discussion on the subject but to reiterate that poverty is still a development issue of major concern in the region.

Northern Ireland, the International Food Policy Research Institute, the World Bank, the United Nations and other donor organizations in a number of countries in the region, including Bangladesh, China, India, Indonesia, the Philippines, Sri Lanka, Thailand and Viet Nam. A recent report entitled *Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction* provides a literature review synopsis of many of these studies.<sup>62</sup>

Findings from these studies show that investment in rural roads/access improvement can have a positive impact in five major areas: increases in total factor productivity in agriculture,<sup>63</sup> shifts from subsistence farming to higher earning commercial farming, increases in rural wages, growth of non-agricultural employment and better social impacts through improved access to basic services. Studies carried out in China, India and Viet Nam by the International Food Policy Research Institute found that transport infrastructure investment often yields high economic returns in less developed areas. Investment in transport infrastructure in less developed areas are often yields higher returns than investment in other sectors (highest in India, second highest in Viet Nam and third highest in China).<sup>64</sup>

This section highlights the potential direct and indirect transformative roles of transport in fostering human development through the achievement of each of the eight Millennium Development Goals.<sup>65</sup> Table 7 presents a summary of these transformative roles, as discussed hereafter.

### **Goal 1. Eradicate extreme poverty and hunger**

Improvement of transport infrastructure and services can have a large impact on poverty reduction, as well as a significant impact on productivity and economic growth.<sup>66</sup> Improved market access through better transport conditions can lead to increased surpluses due to higher producer prices, lower production and transport costs and reduced spoilage in the marketing chain, higher value crop substitution and better market information. On the other hand, deficiencies in transport can have significant adverse impacts on the rural agrarian economy and on the rural poor. Owing to deficiencies in transport and other logistics in most developing countries, a significant part of the agricultural output, including fruits and vegetables and dairy products, is lost on the journey from farms to consumers.

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<sup>61</sup> ESCAP, United Nations Development Programme and Asian Development Bank, *A Future within Reach: Reshaping Institutions in a Region of Disparities to Meet the Millennium Development Goals in Asia and the Pacific* (ST/ESCAP/2376) (United Nations publication, Sales No. E.05.II.F.27), p. 1.

<sup>62</sup> Asian Development Bank, United Kingdom Department for International Development (DFID), Japan Bank for International Cooperation and World Bank, 2005, available at <<http://www.adb.org/Documents/Reports/Assessing-Transport-Energy/default.asp>>.

<sup>63</sup> Total factor productivity relates to any effects on total output not caused by changes in inputs: land, labour and capital. Such effects could be due to changes in technology, institutional change and other factors.

<sup>64</sup> Shenggen Fan and Xiaobo Zhang, "Infrastructure and pro-poor growth", presentation made at the World Bank Transport Forum 2006, Washington D.C., 29 March 2006.

<sup>65</sup> The details of the Millennium Development Goals and their targets are well documented in many United Nations publications. Also available at <<http://www.un.org/millenniumgoals/index.html>>.

<sup>66</sup> Shenggen Fan, Peter Hazell and Sukhadeo Thorat, *Linkages between Government Spending, Growth and Poverty and in Rural India*, International Food Policy Research Institute Research Report No. 110 (Washington D.C., International Food Policy Research Institute, 1999).

**Table 7: Contribution of transport to the Millennium Development Goals and related targets**

<b>Millennium Development Goal</b>	<b>Target</b>	<b>Contribution of transport</b>
Goal 1. Eradicate extreme poverty and hunger	Target 1. Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day  Target 2. Halve, between 1990 and 2015, the proportion of people who suffer from hunger	<ul style="list-style-type: none"> <li>• Stimulates economic growth, raises agricultural and urban productivity, generates surpluses, facilitates diffusion of new technology and spread of new ideas and innovations</li> <li>• Facilitates access to employment and product market</li> <li>• Generates employment</li> <li>• Facilitates growth of secondary and tertiary sectors</li> <li>• Promotes tourism along major transport corridors</li> <li>• Improves food security by increasing food production and distribution through increased efficiency of the supply and marketing chain</li> </ul>
Goal 2. Achieve universal primary education	Target 3. Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling	<ul style="list-style-type: none"> <li>• Facilitates access to school for rural children</li> <li>• Facilitates delivery of school supplies</li> <li>• Prevents isolation of rural communities, attracts teachers and helps to ensure their regular attendance</li> </ul>
Goal 3. Promote gender equality and empower women	Target 4. Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015	<ul style="list-style-type: none"> <li>• Facilitates access to school and regular attendance, particularly for girls</li> <li>• Provides gender specific transport needs (time of travel, security, safety, free of sexual and other forms of harassment)</li> <li>• Reduces time-burden of women in carrying out their essential tasks and frees more time for personal welfare</li> <li>• Promotes women's mobility and reduces their constraints for social networking</li> </ul>



Millennium Development Goal	Target	Contribution of transport
Goal 4. Reduce child mortality	Target 5. Reduce by two thirds, between 1990 and 2015, the under-five mortality rate	<ul style="list-style-type: none"> <li>• Facilitates access to health facilities and services</li> <li>• Assists in combating major preventable diseases</li> <li>• Attracts health service personnel to rural areas</li> <li>• Increases road accident-related deaths and injuries (negative effect)</li> </ul>
Goal 5. Improve maternal health	Target 6. Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio	<ul style="list-style-type: none"> <li>• Provides access to health facilities and services, and medicines and supplies</li> <li>• Facilitates child delivery at a health facility</li> </ul>
Goal 6. Combat HIV/AIDS, malaria and other diseases	<p>Target 7. Have halted by 2015 and begun to reverse the spread of HIV/AIDS</p> <p>Target 8. Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases</p>	<ul style="list-style-type: none"> <li>• Encourages access to sustained health services</li> <li>• Facilitates implementation of programmes to eradicate major diseases</li> <li>• Aggravates spread of HIV/AIDS (negative effect)</li> </ul>
Goal 7. Ensure environmental sustainability	<p>Target 9. Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environment resources</p> <p>Target 10. Halve by 2015 the proportion of people without sustainable access to safe drinking water</p> <p>Target 11. Have achieved a significant improvement in the lives of at least 100 million slum dwellers by 2020</p>	<ul style="list-style-type: none"> <li>• Assists in promoting resource efficiency by providing services for waste recycling</li> <li>• Facilitates access to natural resources, such as forests and mineral resources (can be a negative effect)</li> <li>• Generates negative externalities due to pollution, congestion, depletion of natural resources, accidents and other effects (negative effect)</li> <li>• Supports disaster management, preparedness and post-rehabilitation activities</li> </ul>

<b>Millennium Development Goal</b>	<b>Target</b>	<b>Contribution of transport</b>
<p>Goal 8. Develop a global partnership for development</p>	<p>Target 12. Develop further an open, rule-based, predictable, non-discriminatory trading and financial system</p> <p>Target 13. Address the special needs of the least developed countries</p> <p>Target 14. Address to the special needs of landlocked countries and small island developing States</p> <p>Target 15. Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term</p> <p>Target 16. In cooperation with developing countries, develop and implement strategies for decent and productive work for youth</p> <p>Target 17. In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries</p> <p>Target 18. In cooperation with the private sector, make available the benefits of new technologies, especially information and communications</p>	<ul style="list-style-type: none"> <li>• Facilitates access to and from landlocked countries and regions</li> <li>• Facilitates internal and external trade, improves the efficiency of supply chains</li> <li>• Promotes the integration of isolated economies with regional and global flows of trade and investment</li> <li>• Reduces burden on public exchequer through implementation of public-private initiatives</li> <li>• Facilitates access to decent and productive work for youth</li> <li>• Facilitates access to health services</li> <li>• Facilitates the establishment of information and communication technology networks (along the transport infrastructure right of way)</li> </ul>

The majority of the region's population live in rural areas and vast rural areas are experiencing a basic access problem. Deficiencies in access result in high transport and production costs, low profits, little social interaction, slow spread of new ideas and innovations, problems in networking and diffusion of new technology, difficulties in getting social services, rural-urban disparity and high outmigration.

The transport sector is a major source of employment for the poor, particularly in the informal sector involving low or intermediate technology. Labour-intensive public works on transport infrastructure can be used as safety nets for the rural poor, especially in slack seasons and in post-disaster rehabilitation phases. Employment in labour-intensive rural road works can generate additional benefits through the multiplier effect, estimated to be between 1.5 and 2.8,<sup>67</sup> of expenditures in the rural economy.

Transport has an important role in eradicating hunger by improving food security in terms of access to and availability of food, and by improving resource distribution to produce food through increased efficiency of the supply and marketing chain. Transport is needed at all stages through which people may acquire food, produced either by themselves outrightly or by others for them.

## **Goal 2. Achieve universal primary education**

Improvement of roads and transport services has major implications for children's school enrolment, particularly that of girls. Many studies from Asia and Africa have shown that school enrolment increased significantly after transport facilities in rural areas were improved. The combined cost of education and transportation (including the time cost) can be a major reason for children dropping out of school. The time constraint of poor households can be a major factor in school enrolment when elder children are needed to assist their parents in productive and household tasks, including the care of younger children. Adequate transport decreases time and money costs and helps lower the dropout rates in the early years of schooling.

In addition, lowering transport costs can have a beneficial effect on other school services, for example, by enabling more teaching materials to be purchased and more meals to be provided. The quality of education can be affected where isolation of rural communities fails to attract teachers, and lack of adequate transport services can cause their attendance to be irregular.

## **Goal 3. Promote gender equality and empower women**

The travel and transport needs of women and men are different and they face different constraints. As such, access to transport technologies and services is gendered. Very often, the available transport services in developing countries are highly congested, insecure and unsafe. It is difficult for women to compete with men for a modest space on board. In the absence of adequate

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<sup>67</sup> Asian Development Bank, United Kingdom Department for International Development, Japan Bank for International Cooperation and World Bank, *Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction*, 2005, available at <<http://www.adb.org/Documents/Reports/Assessing-Transport-Energy/default.asp>>.

transport, many women are forced to rely on more expensive modes of transport, spend more time walking or simply abandon the idea of making a trip. They may also risk sexual and other forms of harassment. These adverse conditions can seriously limit women's labour force participation and access to facilities and services, which affects their personal attainment and welfare.

The economic and social benefits of improving women's access to travel and transport could be very high. Improvement in transport infrastructure and gendered facilities and services can significantly increase girls' school enrolment, help to reduce gender inequality, facilitate women's access to labour markets and paid employment and other economic and social opportunities.

Improvement of transport infrastructure and services can also play an important role in empowering the poor, particularly women. The participation of women in the wider social and political processes and local decision-making processes is necessary for their empowerment in society. The provision of gendered transport services can greatly assist in their participation by increasing their mobility and enhancing their opportunities for networking. This is crucial for the diffusion of ideas to improve their personal and family's welfare and to educate them about their rights and obligations.

#### **Goal 4. Reduce child mortality**

There is a clear link between levels of infant and child mortality and accessibility to health services/centres. When transport costs are high or health centres are difficult to reach, poor people fail to seek health-care services altogether. Transport has an important role to play in combating major preventable diseases, such as tuberculosis and measles. The success of national immunization programmes, for which repeat visits are often required, depends on the availability of affordable transport services to the poor. National immunization programmes require timely delivery of vaccines to health facilities in a cold-chain supply environment for which a dependable transport service is necessary.

Faster access to health services is critical to children's health. Transport is crucial for children's survival in medical emergencies, such as accidents (not only road accidents but other types, such as snake bites which may be common cause of death in many countries), and for effective response to outbreaks of communicable diseases (diarrhoeal diseases such as dysentery).

#### **Goal 5. Improve maternal health**

The link between levels of maternal mortality and accessibility to health services/centres is very clear. Improved transport facilities and services make it possible to increase the use of (reproductive) health-care facilities, antenatal care and professional child birth attendants. These services can reduce maternal mortality, which remains a major concern in achieving the relevant Millennium Development Goal targets in many countries of the Asian and Pacific region, particularly in South Asia. Research in the Lao People's Democratic Republic has shown that health and

education attainment are directly related to access.<sup>68</sup> Similar conclusions have been drawn from many other recent studies. When disaggregated by gender, this relationship has been found to be much stronger for women. Lack of access to appropriate transport services is one of the main reasons for the poor reproductive health of rural women in many countries. Low-cost transport interventions can help to reduce maternal mortality rates by improving access to health centres and facilitating child delivery at a health facility.

#### **Goal 6. Combat HIV/AIDS, malaria and other diseases**

The increased mobility of individuals and transport sector workers is often blamed for the aggravation or spread of HIV/AIDS and other sexually transmitted diseases. Although transport may have contributed to the spread of these diseases, interventions in the transport sector can also be instrumental in combating HIV/AIDS and other diseases. Often, responses have focused on educating and counselling transport workers and taking preventive measures such as issuing condoms to them, particularly at major terminals and transport infrastructure construction sites. Long distance transport modes, such as intercity trains and buses, have also been used as focus points in HIV/AIDS prevention communication programmes.

Persons infected with HIV/AIDS or other sexually transmitted diseases require repeat visits to health facilities for treatment and access to antiretroviral drugs. The success of treatment programmes for these diseases often depends on the availability of affordable transport services to the poor. HIV/AIDS-infected persons also require assistance in order to be rehabilitated in their communities. For this purpose and for regular monitoring of their treatment follow-ups, they require regular visits by social and health workers. The availability of adequate transport services to social and health-care workers can greatly facilitate these vital visits and make them more cost-effective.

#### **Goal 7. Ensure environmental sustainability**

The transport sector generates externalities that can have serious welfare implications for the poor. Major transport developments may have a substantial negative impact on the environment through pollution and congestion, health, safety and other related aspects. Transport infrastructure that opens up mineral deposits and forest frontiers destroys the natural habitat, and reduced forests contribute to the degradation of the environment.<sup>69</sup> Exhaust emissions from transport operations are among the major sources of pollution. Very often the poor take a heavier burden of the negative externalities of the transport sector. While it may not be possible to avoid such externalities altogether, it is possible to decrease their current level of production and reduce their negative effects through new technologies and other intervention/mitigation measures in the sector. For example, the burden of accident costs on the poor can be reduced significantly by improving road safety standards and achieving the related targets.

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<sup>68</sup> Cited in David Booth, Lucia Hanmer and Elizabeth Lovell, *Poverty and Transport: A report prepared for the World Bank in collaboration with DFID* (London, Overseas Development Institute, 2000), p. 39.

## **Goal 8. Develop a global partnership for development**

There are many landlocked countries and areas in the Asian and Pacific region. Trade and transport transaction costs in these countries and areas are significantly higher than in countries with coastal access. Consequently, integration of landlocked economies and areas with the global production and supply chain remains a major challenge. Transport has a crucial role in addressing the particular needs of these landlocked countries and areas. By providing essential links, transport can transform these landlocked countries into “land-linked” countries and help to integrate them with the global production and supply chain. In the same way, improving transport can help the small island developing States in the region.

Allocating limited budgetary resources to competing sectors could be a major problem in many developing countries. The private sector has shown considerable interest in making major new investments in the transport sector. Promoting public-private partnerships in transport can help reduce the burden on the public exchequer significantly as well as accelerate the pace of national and local development.

### **D. The need for transport sector targets related to the Millennium Development Goals**

#### **1. Deficiencies in past practices**

In the 1950s and 1960s, infrastructure development, particularly of rural roads, was taken as the starting point of economic development. Public works programmes for employment generation were introduced, for example, when Asia faced food shortages. In recent times, programmes to extend basic infrastructure, such as roads, irrigation and water supply, soil conservation and social facilities, in remote and poverty-stricken areas employing landless or agricultural labour have been introduced when no other work was available. Bangladesh, India, Malaysia, Nepal, Pakistan, the Philippines, Sri Lanka and Thailand have all introduced such programmes. Reviews on many of these programmes can be found elsewhere.<sup>70</sup>

Many of these programmes have had a beneficial effect on poverty reduction and social development in general. However, a major weakness of most of these programmes was that the processes did not involve people, particularly the poor, in their planning or implementation. As a result, the real needs of the target beneficiaries could not always be assessed and the distribution of benefits to the poor and other disadvantaged groups in society, women in particular, could not be ensured. Consequently, many of these programmes lacked local ownership and failed to achieve long-term goals. Despite the fact that many interventions were undertaken through integrated rural development programmes, budget and human resource allocations were considered on a sectoral and

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<sup>69</sup> The transport sector may not be entirely to blame for these negative effects, however. In most cases, they are due to failures in environmental policies and poor enforcement and/or absence of relevant laws.

<sup>70</sup> For example, see ESCAP, *Transport and Communication Interventions in the Alleviation of Poverty* (ST/ESCAP/1867), 1997.

ad hoc basis. No overall comprehensive development objectives or targets and policy framework, such as that provided by the Millennium Development Goals, guided any coordination of the activities undertaken by the multiple ministries and government agencies involved in the implementation process. This had negative effects on the quality of the outputs and the benefits of many of the programmes and on their sustainability.

As observed in a recent United Nations Development Programme report, the success of an infrastructure development programme for poverty reduction depends on packaging the programme with all the necessary complementary inputs in order to achieve multiple development targets. Without clear development targets or such a packaging approach and supporting factors, the ability of poor people to capitalize on the opportunities provided by the infrastructure projects could be very limited.<sup>71</sup> In realization of this necessity and other objectives, the importance of an integrated evaluation framework for the assessment of infrastructure development programmes and projects at national, subnational and local levels is the subject of the next chapter.

## **2. Some recent initiatives**

Because there is a link between transport and poverty reduction, there has been rising interest in broad performance targets. Some countries in the region have considered national standards for the development of their road infrastructure. China worked to achieve road accessibility for 95 per cent of its towns and 93 per cent of its villages by 2005. In the first phase of India's rural road development programme, settlements with a population of 1,000 (500 in the case of hill states and tribal and desert areas) or more will be connected by all-weather roads. This first phase is near completion. In the second phase, such infrastructure will extend to settlements with a population of 500 (250 in the case of hill states and tribal and desert areas) or more. Viet Nam's target for improving the local infrastructure was to have basic road access for 80 per cent of poor communities by 2005, and 100 per cent by 2010. These road development targets are being pursued as part of much broader development objectives, which are an approach in the right direction to addressing the past deficiencies discussed above.

## **3. The need for sector-wide development targets and their link to broad development targets**

The use of broad development targets remains un-common, however, in the transport sector, partly because of the great variety and specificity of services offered.<sup>72</sup> The United Nations Millennium Project team has recognized the importance of adequate transport while developing Millennium Development Goal needs-assessment methodologies. The team could not find suitable data, however, for most areas of the transport sector. Transport proposals included in poverty reduction strategy papers (PRSPs) and country plans did not prove to be particularly helpful for this

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<sup>71</sup> Selim Jahan and Robert McCleery, *Making Infrastructure Work for the Poor: Synthesis Report of Four Country Studies Bangladesh, Senegal, Thailand and Zambia* (New York, United Nations Development Programme, 2005).

<sup>72</sup> Some of the exceptions have been road traffic fatalities, on-time arrival rates of aeroplanes and trains, and ship turnaround times.

purpose. The team therefore resorted to an aggregate analysis involving the relationship between the per capita density of paved roads and a range of macroeconomic statistics for a large number of countries. On the basis of this analysis, the team concluded that countries needed to meet a minimum road density of 0.5 kilometres per 1,000 persons in order to meet the Goals, and used this target for investment needs assessments.<sup>73</sup>

The Millennium Project team proposed that a better method for future work might be to define levels of access to transport infrastructure and services compatible with the Millennium Development Goals for individual households or communities. The team proposed that, once a country had chosen an appropriate standard for its particular circumstances, attention could then be turned to assessing the increase in the share of the population enjoying this level of access.

Following this proposal, the African Union and the Economic Commission for Africa, in collaboration with the African Development Bank, the World Bank and the European Union, developed a set of transport targets and indicators related to the Millennium Development Goals. The development of a similar set of transport-related targets for the Asian and Pacific region may assist countries in monitoring their progress in transport development over time and would help to ensure the supply of transport as a necessary input for achieving multiple Goals.

Table 8 provides a set of proposed transport-related targets considered generally suitable for the developing countries of the region. These targets should assist the countries in attaining the Millennium Development Goals. Possible indicators that countries may use to measure and guide their progress are contained in the annex to this chapter (Table 9).

**Table 8: Proposed transport targets related to the Millennium Development Goals**

Millennium Development Goal	Target
Goal 1. Eradicate extreme poverty and hunger	<p>Rural settlements with a population of 1,000 or more are connected by an all-weather road, and those with a population of between 500 and 999 are not beyond 2 kilometres of an all-weather road</p> <p>The proportion of the urban poor for whom mobility problems severely restrict access to employment and essential services is halved</p> <p>The average transport and logistics cost as a proportion of the total cost is comparable to that of more developed countries in the region and ultimately to that of the member countries of the Organisation for Economic Cooperation and Development</p>
Goals 2 and 3. Achieve universal primary education, and promote gender equality and empower women	<p>Rural access and urban mobility are improved in order to reduce travel costs and the time burden on children in order to facilitate safe access to schools, regular attendance, particularly for girls, and effective education</p> <p>The mobility of women is improved through the provision and the promotion of transport services to meet their particular travel needs</p>

<sup>73</sup> Millennium Project, "Millennium Development Goals needs assessments country case studies of Bangladesh, Cambodia, Ghana, Tanzania and Uganda", working paper, 17 January 2004.



Goals 4 and 5. Reduce child mortality and improve maternal health	Rural access and urban mobility are improved in order to reduce travel costs and time to reach health facilities
	Transport services/mobile health services are improved to provide isolated and poor communities with outreach health services and to ensure reliable delivery of medical supplies  Emergency response to medical crises in rural communities is improved by linking telecom facilities to transport services
Goal 6. Combat HIV/AIDS, malaria and other diseases	The transport sector ceases to be an agent for spreading HIV/AIDS and sexually transmitted diseases
Goal 7. Ensure environmental sustainability	The rate of serious road injuries is reduced by 20 per cent  The pedestrian death rate is reduced by one third  The coverage of emergency assistance systems for road accident victims is increased  The negative effects generated by the transport sector on the environment are reduced
	The proportion of solid waste recycled is increased
Goal 8. Develop a global partnership for development	The transport costs for landlocked countries are reduced and their access to global markets is improved
	All links in the Asian Highway and in the Trans-Asian Railway are completed  All non-physical barriers that increase travel time and related transport costs, such as customs clearance, border delays and other impediments to the flow of goods and services, are dismantled or reduced
	Axle load limits, vehicle and road dimensions, and technical standards are harmonized
	The participation of the private sector in providing and operating transport infrastructure services is increased
	Information and communication technology networks along the transport infrastructure right of way, particularly along cross-border routes, are established

These targets can be applied not only for monitoring purposes but, perhaps more importantly, as a significant tool in planning and designing transport infrastructure services at all levels: local, subnational and national. The International Labour Organization has developed a tool called accessibility planning, which is based on simple measures defining the subsistence and economic and social access needs of rural households in relation to the need for basic supplies, services and facilities.<sup>74</sup> It is a simple planning tool designed to assist local-level planners in identifying the access

<sup>74</sup> Chris Donnges, "Rural transport and local government units – How to improve rural transport for the rural poor", in *Transport and Communications Bulletin for Asia and the Pacific*, No. 71 (ST/ESCAP/SER.E/71) (United Nations publication, Sales No. E.02.II.F.33), pp. 27-38.

needs of the local communities and in defining a set of priority interventions to improve access through a bottom-up planning process. Developing transport-related national targets and standards can greatly assist in such an initiative.

This is not to suggest, however, that these targets would be universally valid across the region. Many of the targets may be of trivial significance to some countries, and yet other countries may require a somewhat different set of targets in the light of their own local realities and priorities. Therefore, each country may need to develop its own set of targets using the targets proposed in the present document as initial guides. While developing such national targets, it would be necessary to consider the relative population density, the location and distribution of centres of economic activity, the topography, the wealth of the target population, the relationships with neighbouring countries and many other social, economic and geographic factors.

There is no generally accepted methodology for the development of national targets or standards for improving the transport sector. Developing such a methodology could greatly assist countries in creating national standards. Once developed, these standards would also provide a basis for assessing appropriate and effective intervention points for transport-related poverty reduction strategies, policies, plans, programmes and projects.

## **E. Conclusion**

Poverty remains a development issue of major concern in the region, with large sections of the population experiencing a basic access problem in both rural and urban areas. Transport development that improves access and enhances the inclusion of the poor in the overall development process can be an entry point in poverty alleviation. Consideration of ways in which transport interventions can contribute to poverty reduction at the policy formulation and programming stages may significantly reduce the costs of such transport interventions.

However, the lack of a clear understanding about the complementary relationships between interventions in the transport sector and other sectors, and how that affects total factor productivity and the welfare of the poor and other disadvantaged groups often result in narrowly focused transport programmes that fail to achieve the desired outcomes. The Millennium Development Goals provide a unique opportunity to consider transport development within a wider framework of intersectoral collaboration to address poverty reduction and economic and social development.

Many developing countries in the region have prepared PRSPs. These national documents contain intersectoral strategies and plans for poverty reduction. However, in many PRSPs, transport issues have not received due attention and/or the focus has been primarily on building road infrastructure. The papers have been prepared without much consideration for other areas of transport or cross-cutting issues in transport development, such as gender and the environment. These deficiencies in the PRSPs need to be rectified where appropriate. In this respect, developing national targets similar to those proposed in Table 8 and their inclusion in the PRSPs and other national plans

may greatly assist in ensuring the provision of transport as a necessary input for achieving the Millennium Development Goals.

In order to have a better understanding about the links between transport and social development and poverty alleviation, countries may wish to undertake studies and ex-post evaluation of projects involving transport interventions for poverty alleviation. In addition, they may wish to review the availability of relevant data in order to enable a comparative analysis of the activities of the transport sector and those of other sectors. Findings from these studies would assist in the necessary adjustment of policies in the PRSPs from time to time.

The economic justification for transport investments has been traditionally based on some form of cost-benefit analysis. However, these traditional planning tools are subject to methodological limitations in the absence of a clear understanding about how and under what conditions the poor can actually benefit from transport projects. It is therefore necessary to consider new broad-based evaluation methodologies, at both the programme and project levels, involving all complementary elements to make transport infrastructure interventions work, and with explicit reference to achieving the Millennium Development Goal targets.

Participatory approaches to planning and decision-making can help in addressing various issues of a cross-cutting nature and in pursuing sustainable development; ensuring the welfare of the poor and other disadvantaged groups; and resolving conflicts of interest. However, institutional mechanisms to ensure wide participation of all social groups are still largely absent. Where appropriate, countries may wish to consider the steps necessary to incorporate a fundamental change in the local transport planning process in order to promote the participation of all social groups in the process. The needs of all groups in society should be considered and reflected in project formulation, service delivery and other actions. In this respect, they may wish to consider such a methodology developed by ESCAP through a pilot project.<sup>75</sup>

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<sup>75</sup> The process followed is documented in ESCAP, *ESCAP-UNDP Guidelines for Participatory Planning of Rural Infrastructure* (ST/ESCAP/2029), 1999.

**Table 9: Proposed transport targets and their possible indicators (Annex to chapter 5)**

Millennium Development Goal	Target	Indicator to monitor progress <sup>a</sup>
<p>Goal 1. Eradicate extreme poverty and hunger</p>	<p>Rural settlements with a population of 1,000 or more are connected by an all-weather road, and settlements with a population of between 500 and 999 are not beyond 2 kilometres of an all-weather road.</p> <p>The proportion of the urban poor for whom mobility problems severely restrict access to employment and essential services is halved</p> <p>The average transport and logistics cost as a proportion of the total cost is comparable to that of more developed countries in the region and ultimately to that of the member countries of the Organisation for Economic Cooperation and Development</p>	<ul style="list-style-type: none"> <li>• An increase in the proportion of the rural population within 2 kilometres of an all-weather road</li> <li>• A road density of 5 kilometres/1,000 persons with 25 per cent of all roads paved<sup>b</sup></li> <li>• An increase in the accessibility of markets (considering the time and the cost to transport goods)</li> <li>• The reduction of travel time and costs (for women in particular)</li> <li>• An increase in agricultural productivity and economic activities</li> <li>• An increase in employment opportunities (including those in local tourism-related activities) and income generation from transport-related activities</li> <li>• An increase in the use of intermediate means of transport</li> <li>• A reduction in the proportion of the urban poor facing severe travel-related constraints</li> <li>• A reduction in unit transport costs (per ton-kilometre)</li> <li>• An increase in the proportion of roads in good and fair condition</li> <li>• A reduction in freight transport time</li> <li>• A reduction in port handling costs</li> </ul>

<p>Goals 2 and 3. Achieve universal primary education, and promote gender equality and empower women</p>	<p>Rural access and urban mobility are improved in order to reduce travel costs and the time burden on children in order to facilitate safe access to schools, regular attendance, particularly for girls, and effective education</p>	<ul style="list-style-type: none"> <li>• An increase in the proportion of schools have reliable/safe access from their service areas</li> <li>• A reduction in the proportion of households reporting constraints to children's education due to travel time and costs and safety concerns (for women in particular)</li> <li>• A reduction in the proportion of teachers reporting transport constraints to working at a rural school</li> <li>• A reduction in the number of schools reporting transport-related problems in the delivery of school supplies</li> </ul>
	<p>The mobility of women is improved through the provision and the promotion of transport services to meet their particular travel needs</p>	<ul style="list-style-type: none"> <li>• A reduction in the proportion of women reporting that available services do not meet their particular travel needs (travel time, safety, security, sexual harassment)</li> <li>• A reduction in women's travel time and costs (for personal needs and household tasks)</li> <li>• An increase in the mobility of women (trips per capita)</li> </ul>
<p>Goals 4 and 5. Reduce child mortality and improve maternal health</p>	<p>Rural access and urban mobility are improved in order to reduce travel costs and time to reach health facilities</p> <p>Transport services/mobile health services are improved to provide isolated and poor communities with outreach health services and to ensure reliable delivery of medical supplies<sup>c</sup></p> <p>Emergency response to medical crises in rural communities is improved by linking telecom facilities to transport services<sup>c</sup></p>	<ul style="list-style-type: none"> <li>• An increase in the proportion of health facilities with reliable access from their service areas</li> <li>• A reduction in the proportion of children under 5 years of age who can regularly visit health facilities with their parents without facing transport-related constraints</li> <li>• A reduction in the proportion of households reporting constraints to health facility access because of distance, cost or difficulty of travel</li> <li>• A reduction in the average cost and time required to reach health facilities; or, alternatively, improvement in accessibility<sup>d</sup></li> <li>• An increase in the proportion of the rural population within 30 minutes of the nearest health facility</li> <li>• A reduction in the proportion of emergency patients unable to reach health facilities in time for treatment</li> <li>• An increase in the number of expectant or post-natal mothers who do not face travel-related constraints in reaching health facilities</li> <li>• An increase in the number of child births at health facilities</li> </ul>

<p>Goal 6. Combat HIV/AIDS, malaria and other diseases</p>	<p>The transport sector ceases to be an agent for spreading HIV/AIDS and sexually transmitted diseases<sup>c</sup>.</p>	<ul style="list-style-type: none"> <li>• A reduction in the HIV/AIDS and sexually transmitted disease prevalence rate among transport sector workers</li> <li>• HIV/AIDS-related counselling and services available to the transport workers, and through facilities at transport terminals</li> <li>• A reduction in the HIV/AIDS and sexually transmitted disease prevalence rate in communities located along transport corridors</li> <li>• A reduction in the proportion of infected persons reporting difficulties in making repeat visits to health facilities owing to transport-related difficulties</li> <li>• A reduction in the proportion of health workers reporting transport-related difficulties in visiting HIV/AIDS patients</li> <li>• An increase in intercountry coordination of action in AIDS-related transport</li> </ul>
<p>Goal 7. Ensure environmental sustainability</p>	<p>The rate of serious road injuries is reduced by 20 per cent.</p> <p>The pedestrian death rate is reduced by one third.</p> <p>The coverage of emergency assistance systems for road accident victims is increased.</p> <p>The negative effects generated by the transport sector on the environment are reduced.</p> <p>The proportion of solid waste recycled is increased.</p>	<ul style="list-style-type: none"> <li>• A reduction in the number of road fatalities (and fatality rates per 10,000 vehicles, per 100 million vehicle-kilometre)</li> <li>• A reduction in the number of pedestrian deaths per 100 million people and per 10,000 vehicles</li> <li>• An increase in the number of kilometres of road on which emergency services are provided</li> <li>• National plan/programmes for compliance with progressive and higher emission standards (to regulate emissions of oxides of nitrogen, particulate matter, carbon monoxide and volatile organic compounds such as those provided in Euro 0 to Euro V standards)</li> <li>• All available petrol is 100 per cent unleaded</li> <li>• An increase in the number of vehicles using “green” fuels</li> <li>• A modal shift from road transport to rail and water transport</li> <li>• An increase in the availability of transport services for waste recycling</li> </ul>

Goal 8. Develop a global partnership for development	The transport costs for landlocked countries are reduced and their access to global markets is improved  All links in the Asian Highway and in the Trans-Asian Railway are completed	<ul style="list-style-type: none"> <li>• A reduction in transport costs for landlocked countries</li> <li>• An increase in the volume of international trade (by quantity and value)</li> <li>• Completed sections of the Asian Highway network</li> <li>• Completed sections of the Trans-Asian Railway network</li> <li>• An increase in the proportion of the Asian Highway under higher classification (according to ESCAP classification)</li> </ul>
	All non-physical barriers that increase travel time and related transport costs, such as customs clearance, border delays and other impediments to the flow of goods and services, are dismantled or reduced	<ul style="list-style-type: none"> <li>• A reduction in the number of checkpoints along trade/transit corridors</li> <li>• A reduction in the time taken to complete border-crossing procedures</li> <li>• A reduction in the time taken at ports to obtain required clearance for passage of shipments</li> </ul>
	Axle load limits, vehicle and road dimensions, and technical standards are harmonized	<ul style="list-style-type: none"> <li>• The formulation of regional/subregional standards and national programmes for compliance with those standards</li> <li>• The accession to relevant international conventionse</li> </ul>
	The participation of the private sector in providing and operating transport infrastructure services is increased	<ul style="list-style-type: none"> <li>• An increase in the number and value of public-private partnership projects in the transport sector</li> </ul>
	Information and communication technology networks along the transport infrastructure right of way, particularly along cross-border routes, are established	<ul style="list-style-type: none"> <li>• A reduction of the cost and the availability of reliable services for voice and data communication among neighbouring countries and at border crossings</li> </ul>

*Notes:*

<sup>a</sup> The actual indicator values would be developed in the context of a country.

<sup>b</sup> The suggested road density of 5 km /10,000 persons (of which 25 per cent are paved) was a target originally considered by Food and Agriculture Organization of the United Nations in calculating investment needs for an anti-hunger programme. In estimating road investment needs, the Millennium Project team considered a minimum provision of 0.5 km /10,000 persons.

<sup>c</sup> Road safety-related targets are taken from E/ESCAP/MCT/SGO/9.

<sup>d</sup> Accessibility may be defined as the ease (or difficulty) of reaching or using a facility or service. Improvement in accessibility may be based on consideration of mobility and proximity combined in a manner such as that applied in the integrated rural accessibility planning concept developed by the International Labour Organization. The concept has been applied in a number of countries in the region. See reference cited in footnote 18 for more details on the concept.

<sup>e</sup> In its resolution 48/11 of 23 April 1992 on road and rail transport modes in relation to facilitation measures, the Commission recommended that countries in the region should consider acceding to the following seven international conventions: Convention on Road Traffic of 1968, Convention on Road Signs and Signals of 1968, Customs Convention on the International Transport of Goods under Cover of TIR Carnets (TIR Convention) of 1975, Customs Convention on the Temporary Importation of Commercial Road Vehicles of 1956, Customs Convention on Containers of 1972, International Convention on the Harmonization of Frontier Control of Goods of 1982, and Convention on the Contract for the International Carriage of Goods by Road (CMR) of 1956.

## V. INTEGRATED POLICY AND ASSESSMENT IN SUSTAINABLE TRANSPORT DEVELOPMENT

The overall objective of this chapter is to highlight the importance of sustainable transport and to illustrate elements of desirable future paths and the policy tools available. In particular, it explains the emerging hierarchy of integrated assessment tools, processes and participation that can be employed at the local and national levels, as well as in a cross-border context. Such approaches may help to identify a policy mix that maximizes the contribution of transport to sustainable development and achievement of the Millennium Development Goals.

The “vision” of an Asian integrated transport network implicitly incorporates elements of sustainable transport. In fact, managing an integrated transport network also requires integrated policy approaches across transport modes, economic, environmental and health, social and poverty objectives, and across levels of intervention from projects, programmes and plans to policies.

Thus, the approaches outlined in this chapter may contribute to the realization of sustainable transport in general and the “vision” in particular.<sup>76</sup>

### A. Introduction

#### 1. Context

By definition, sustainable development is a necessary objective for humanity in order to sustain improvements in living standards in the future. The Millennium Development Goals<sup>77</sup> consist of a wide set of targets or milestones for measuring progress towards achieving sustainable development by 2015. Consequently, the suggested transport targets for the ESCAP region contained in the previous chapter (“Transport and the Millennium Development Goals”) measure an important set of milestones towards sustainable transport development in the ESCAP region. Although the two sets of goals and targets are important milestones, they do not cover the whole spectrum of sustainable development that needs to be taken into account in decision-making.

Arguably, the participation of countries in international production networks, supported by transport and communications, has helped to lift more people out of poverty in Asia in the last 30 years than ever before in the history of humankind. Consequently, the “vision” envisages specific transport interventions to support the extension of international production networks to Asian hinterlands and landlocked countries. Thus, the vision describes one element of a sustainable transport system in the ESCAP region.

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<sup>76</sup> This chapter draws on ESCAP document E/ESCAP/MCT/SGO/8, Busan, 6-8 November 2006.

<sup>77</sup> [www.un.org/millenniumgoals/](http://www.un.org/millenniumgoals/)



In order to turn the vision into a sustainable reality and to maximize the contribution of transport to sustainable development, all elements of sustainable transport need to be considered in transport-related decision-making.

## **2. Objective**

The overall objective of the present chapter is to highlight the importance of sustainable transport and to illustrate elements of desirable future paths and the policy tools available. In particular, the chapter explains the emerging hierarchy of integrated assessment tools, processes and participation that can be employed both at the national level and in a cross-border context. Such approaches may help to identify a policy mix that maximizes the contribution of transport to sustainable development and achievement of the Millennium Development Goals.

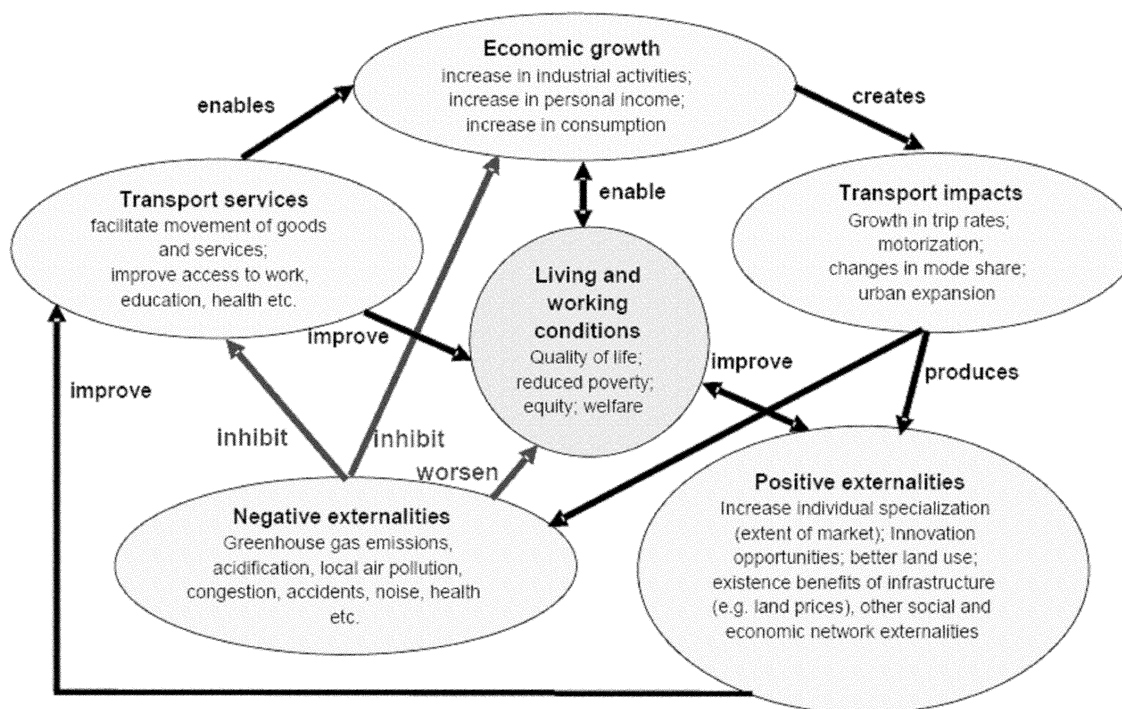
## **3. Rationale**

Transport is both a prerequisite for and a major driver of economic and social development. However, appropriate measures need to be taken in order to ensure that transport makes the maximum contribution to improving living and working conditions. This requires the management of the positive and negative externalities of transport, for example, pollution, safety, congestion, poverty impacts and increased specialization, in order to achieve sustainable transport.

Significant economic growth in the ESCAP region, rapid motorization and increasing freight flows have been the cause and effect of massive investments in transport infrastructure construction and maintenance (equivalent to between 1 and 6 per cent of gross domestic product). In fact, in many ESCAP member countries, more roads, railways, ports and airports are being built in this decade than ever before. Once built, these infrastructure assets will predetermine future development options for decades to come, owing to the longevity of transport assets and their impact. In essence, the next 20 years or so may be a “once in a lifetime” opportunity for decision makers to make transport systems more sustainable, thus avoiding being locked into undesirable future transport systems.

Sustainable transport can greatly enhance economic development and improve living and working conditions. Figure 3 provides a glimpse of the complexity of relationships. Essentially a feedback loop system determines how sustainable transport can contribute to improved or worsened living and working conditions.

**Figure 3: Schematic illustration of transport and economic development**



As elaborated in the present chapter, current transport systems in the region are unsustainable in several aspects. Even in cases where the negative externalities of transport have not yet inhibited transport services, growth and living conditions to a significant extent, it should be noted that negative change can happen surprisingly quickly owing to the nature of ecosystems and socio-economic networks that often exhibit “tipping point” behaviour.<sup>78</sup>

The “vision” of an Asian integrated transport network implicitly incorporates elements of sustainable transport. In fact, its realization has the potential to sustain rapid economic growth in the region, balancing growth with the distributive aspects, as well as lead to improved logistics efficiency, reliability, energy savings and better land-use planning. Further, it will provide opportunities to systematically choose desirable paths towards a future ESCAP transport system that is sustainable. For example, an efficient network of dry ports may provide new opportunities for a modal shift from road to rail (where desirable). In this sense, the policy tools and processes described in the present document may prove useful for realizing the “vision” in particular and sustainable transport in general. In this context, it should be noted that the secretariat recently produced a monograph that outlined the scope of the proposed Asian integrated transport network and possible paths towards its realization.<sup>79</sup>

Serious consideration of integrated tools and processes in designing transport policies and programmes may lead to a more positive approach in which environmental, social and poverty issues are not seen as a mere “add-on” to economic and transport policies but as an integral part of their

<sup>78</sup> M. Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference* (Little, Brown and Company, March 2000).

<sup>79</sup> ESCAP, *Toward an Asian Integrated Transport Network*, Monograph Series on Managing Globalization, No.1 (ST/ESCAP/2399) (<http://www.unescap.org/publications/detail.asp?id=1137>).

objectives. In principle, such an approach is possible at low, and sometimes even negative, cost, as there are many “win-win” solutions available.

## **B. Sustainable transport**

### **1. Concept and definition**

The concept of “sustainable transport” derives from the general term “sustainable development”, which takes into account all sectors of human activity. This terminology was popularized in the 1987 report of the World Commission on Environment and Development, which defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.<sup>80</sup> This definition implies that the movement of people and goods should occur in ways that are environmentally, socially and economically sustainable.

The definition proposed by the Organisation for Economic Cooperation and Development (OECD) contains four elements. A sustainable transport system<sup>81</sup> is one that:

- (1) Provides for safe, economically viable and socially acceptable access to people, places, goods and services;
- (2) Meets generally accepted objectives for health and environmental quality, for example, those set by the World Health Organization (WHO) for air pollutants and noise;
- (3) Protects ecosystems by avoiding exceeding critical loads and levels for ecosystem integrity, for example, those defined by the Economic Commission for Europe (ECE) for acidification, eutrophication and ground-level ozone;
- (4) Does not aggravate adverse global phenomena, such as climate change and stratospheric ozone depletion.

While the OECD definition is widely used, it is strongly focused on environmental objectives. Policymakers in developing and transition economies in the ESCAP region are addressing additional sustainable transport objectives that are considered crucial in the region. Therefore, for the ESCAP region, a working definition of sustainable transport is suggested that includes another six aspects, in addition to those contained in the OECD definition. Thus, a sustainable transport system is one that:

- (5) Is designed to contribute to reducing poverty in all its dimensions, including the elements contained in the Millennium Declaration;
- (6) Provides increasing levels of transport services that are affordable, reliable, efficient and rapid;

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<sup>80</sup> *Our Common Future* (Oxford University Press, 1987), chap. 2, “Towards sustainable development”.

<sup>81</sup> See the synthesis report on the OECD project on environmentally sustainable transport (<http://www.oecd.org/env/ccst/est/curract/vienna2000/EST-Synthesis-Report-Part1.pdf>).

- (7) Minimizes resource use to sustainable levels in terms of energy, land and materials use;
- (8) Limits the public debt burden to sustainable levels (taking into account changes in public capital and operating expenditure);
- (9) Maximizes long-term economic growth that is geared to benefit all parts of the country, including the hinterlands and border regions;
- (10) Facilitates the smooth flow of goods and people across national borders, including for transit, thereby supporting regional economic integration and contributing to peace, stability and “good-neighbourly relations” among countries.

This suggested working definition for the ESCAP region is also in line with that proposed by the World Business Council for Sustainable Development which defines sustainable mobility as “the ability to meet society’s need to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values today and in the future.”<sup>82</sup>

## **2. Sustainability of the transport system in the ESCAP region, current trends and desirable targets**

In a report on energy and transport submitted to the Commission on Sustainable Development in 2001 as part of the preparatory process for the World Summit on Sustainable Development, the Secretary-General stated that “consumption patterns in [the transport] sector are widely acknowledged to be unsustainable”.<sup>83</sup>

The extent to which the transport system can be considered sustainable depends on assumptions about future developments. The consistent and plausible (but not necessarily most likely) sets of such assumptions about the future are often called scenarios or “futures”. A typical reference scenario is the “dynamics-as-usual-scenario”, which assumes that present trends continue in terms of the key underlying dynamics of change. A dynamics-as-usual scenario differs from a “business-as-usual-scenario” in that the latter assumes that no changes in policies and attitudes occur in the future. In contrast, a “sustainable transport scenario” assumes that special efforts are made to achieve the objectives listed in the working definition of sustainable transport.

Table 10 contrasts the implications of a dynamics-as-usual scenario of the transport system in the ESCAP region with what could be achieved in a sustainable transport scenario. The scenarios are characterized using the 10 elements of the working definition of sustainable transport. The comparison illustrates the significant potential benefits of efforts to make the transport system more sustainable in the coming decades. It should be noted that Table 10 is a summary of research findings

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<sup>82</sup> World Business Council for Sustainable Development, *Mobility 2030: Meeting the Challenges to Sustainability: The Sustainable Mobility Project*, World Business Council for Sustainable Development (2004).

<sup>83</sup> E/CN.17/2001/PC/20, para. 24.

of recent reports published by the World Business Council for Sustainable Development, the Intergovernmental Panel on Climate Change, the World Bank and ESCAP.

**Table 10: Implications of a “dynamics-as-usual” scenario versus a sustainable transport scenario for the ESCAP region, for the period 2006-2030\***

No.	Implications of “dynamics-as-usual” scenario	Sustainable transport scenario
1a	Congestion may worsen in urban areas and on major freight corridors in both the developed and developing countries.	Congestion levels are actively managed and mitigated through a combination of measures, including market instruments and encouraging modal shifts.
1b	There could be around 610,000 road fatalities in the region by 2020.	By 2030, the region’s road fatality rate per motor vehicle is reduced to the current world average rate.
2a	Local air pollution will remain a major health concern in Asian urban clusters.	Local air pollution is reduced significantly in developing countries by 2015.
2b	Noise pollution will not decrease.	Noise pollution, particularly along busy roads, rail corridors and airports, is decreased.
3	Critical loads for certain ecosystems will be exceeded in the coming decades.	Exceeding critical loads is avoided in most parts of the region.
4a	Absolute amounts of nitrogen oxides (NO <sub>x</sub> ) emissions and carbon monoxide (CO) emissions from transport will remain roughly constant, or decrease slightly, by 2030.	NO <sub>x</sub> and CO emissions from transport are drastically reduced by 2010 to between one third and one half of current levels.
4b	Carbon dioxide (CO <sub>2</sub> ) emissions from transport will continue to increase more rapidly than those of most other sectors.	The increase in CO <sub>2</sub> emissions from transport is decelerating, but its share in total CO <sub>2</sub> emissions continues to increase until 2030.
5	The contribution of transport to poverty reduction will primarily be limited to the “trickle-down” effect, with 40 per cent of all poor people living in urban areas by 2025.	By 2015, at least 66 per cent of all villages in the ESCAP region are connected by all-weather roads and all villages are connected by 2030.
6a	Transport efficiency (especially ports and airports and their land linkages) and reliability will continue to increase and freight costs will continue to decline.	Better integration of transport modes, as well as improvements in “domestic logistics”, lead to even higher efficiency and reliability.
6b	By 2030, the region’s personal mobility levels will reach 270 motor vehicles per 1,000 persons, while railways both in urban areas and on inter-city routes will lose ground in most countries of the ESCAP region.	By 2030, high mobility levels are reached, through not only vehicle ownership but also near-universal access to urban mass transit, new high-speed rail freight corridors and high-speed passenger railways.
7a	Road construction alone will consume 3 million to 6 million hectares of land from 2005 to 2015.	Land consumption by roads is reduced to 2.5 million hectares or less from 2005 to 2015, owing to the re-emergence of railways and other measures.
7b	Transport-related energy use will remain almost entirely in gasoline and increase by another 400 million tons of oil equivalent per year in the region by 2020.	While transport-related energy use increases, the fuel mix changes towards a higher renewable content (e.g. biofuels, flex fuel).
7c	The use of virgin materials will continue to increase, despite higher recycling rates. Natural rubber prices will increase rapidly due to road freight.	Special efforts are made to increase recycling rates even further and to limit the need for additional amounts of natural rubber.
8	The public debt burden will increase substantially in many developing countries over the next 30 years.	The public debt burden is limited through innovative ways of financing, including environmental co-financing and viability funding arrangements.
9	Participation in international production networks will continue to be concentrated in maritime regions around major ports and a select group of countries.	All ESCAP member countries, including landlocked countries and hinterlands, participate to a varying extent in international production networks by 2030.
10a	Overall overland cross-border transport flows will	Infrastructure and cross-border transport facilitation

	continue to increase slowly in Asia but, with few exceptions, will remain small compared with Europe or North America; cross-border facilitation issues, and especially transit issues, will continue to constrain traffic.	are improved, so that by 2015 significant cross-border overland traffic (including for transit) emerges as a veritable alternative to maritime and air transport between neighbouring countries and certain long-distance routes, including the Euro-Asian land route.
10b	Whereas the integration or “melding” of physical transport and communication networks will continue as a business trend (“logistics”), Governments will continue to regulate them in isolation from each other. Melding with relevant non-physical networks will occur only in rare cases.	Public sector policies facilitate the integration or “melding” of physical and non-physical networks, including transport networks (e.g. road, rail, inland waterways and shipping), communication networks, and non-physical networks (e.g. freight forwarders, multimodal transport operators, banking, customs, health, security etc).
10c	An increasingly complex “hub and spoke” system of international agreements on transport will emerge in the region. It will be difficult to manage. There will be concerns that this system is too closed and inequitable, and that commitments under some of the agreements are incompatible.	A coherent system of agreements is developed that is equitable, open to accession by any United Nations member, non-discriminatory and allows for a phased process for participation by ESCAP members, as they become ready for the various commitments.

*Sources:* World Business Council for Sustainable Development, *Mobility 2030: Meeting the Challenges to Sustainability: The Sustainable Mobility Project* (2004); Intergovernmental Panel on Climate Change, *Climate Change 2001: Third Assessment Report* (2001); World Bank, *Cities on the Move – A World Bank Urban Transport Review* (Washington, DC, 2002); ESCAP, *Enhancing Regional Cooperation in Infrastructure Development, including that Related to Disaster Management* (ST/ESCAP/2408) (United Nations publication, Sales No. E.06.II.F.13), chap. III, “Transport infrastructure” and *Toward an Asian Integrated Transport Network*, Monograph Series on Managing Globalization, No. 1 (ST/ESCAP/2399).

\* Numbers in the left column correspond to the 10 elements of the working definition of sustainable transport (section I.A). Item 9 corresponds to the “vision” in document E/ESCAP/MCT/SGO/2.

### 3. Policy analysis with sustainable transport scenarios

What policies are needed in order to move from the current unsustainable trends towards the more sustainable transport system scenarios in the ESCAP region in the coming decades? Clearly, different paths are possible, making use of different policy mixes with varying emphasis on information, regulation, planning or economic instruments. The emphasis will vary according to the national and local conditions and the implied rate of time preference of decision makers.

While a large number of policy tools<sup>84</sup> are available to address the many interconnected issues, the challenge lies not so much in selecting the “right” policy tool as in choosing an optimal combination of the various policy tools to make the best use of synergies. A strategic process, such as integrated assessment (see the following section), can help to identify this policy mix.

The most basic approach for systematic analysis of policy options, and one usually incorporated in integrated assessments, is to carry out a scenario analysis, an approach that in the past was mainly used by the military but today is also used by businesses and civilian governments. In scenario analysis, potential policy mixes are tested against possible, but not necessarily likely, alternative future developments.

<sup>84</sup> Policy tools can be either market instruments (e.g. rebates, vehicle tax reform, full budgetary cost pricing, charges to account for external costs), command-and-control measures (e.g. corporate average fuel economy standards and controls on emission levels of vehicles) or voluntary self-regulation. They may be based on transport infrastructure, vehicles or users. For an overview, see, for example, document E/ESCAP/SGO/MCI(2)/8, submitted to the Meeting of Governmental Officials in preparation for the Ministerial Conference on Infrastructure, held in Seoul in 2001.

(a) *Lessons learned from the OECD scenario analysis*

OECD recently carried out a project on scenario analysis and backcasting techniques in the transport sector.<sup>85</sup> Experts from the OECD secretariat and its member countries, including some ESCAP members, used these techniques in order to determine the consistent policy mixes (paths) required for achieving sustainable transport systems in their respective countries by 2015.<sup>86</sup> The project showed that the external costs of transport in OECD countries could be reduced by 39 per cent over the period 1990-2015, compared with an expected increase by 30 per cent over this time frame in a business-as-usual scenario.

(b) *Scenario analysis in the ESCAP region*

The OECD project and guidelines provide useful directions for sustainable transport development programmes, including those in developing and transition economies of the ESCAP region. In line with the expanded working definition of sustainable transport, additional aspects would probably be featured in the case of most ESCAP members.

A scenario analysis of national and regional transport plans and policies similar to that carried out by OECD might prove useful for Asia and the Pacific. In particular, it would allow Governments to assess their current and planned transport policies in terms of their sustainability impacts and regional consistency.

### **C. Integrated policy, assessment and legal instruments**

Scenario analysis is but one of several methodologies that can be used in the systematic assessment of policies, plans, programmes and even projects, in support of decision-making at various levels. This section outlines the concepts, national experiences, relevant international mandates and specific issues that arise in the cross-border context, including international legal instruments.

#### **1. National experiences**

It is important to note that the different assessment tools and processes at the project, programme, plan and policy levels are mutually supportive but answer different, though interrelated, questions. For example, while an environmental assessment of a road construction project linking two cities can help to ensure that the route is appropriately chosen and that the road is constructed in an environmentally friendly way, the question of whether a road or rather a railway line should be built needs to be decided beforehand through an assessment of transport plans and programmes.

Similarly, the question whether a construction permit should be issued will be decided at a different level from that of whether public funds are to be used to construct a transport link between the two cities. The issuance of a construction permit will largely be an outcome of an assessment at

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<sup>85</sup> The Environmentally Sustainable Transport Programme.

<sup>86</sup> Organisation for Economic Cooperation and Development, *Policy Instruments for Achieving Environmentally Sustainable Transport* (OECD, Paris, 2002); and *OECD Guidelines towards Environmentally Sustainable Transport* (OECD, Paris, 2002).

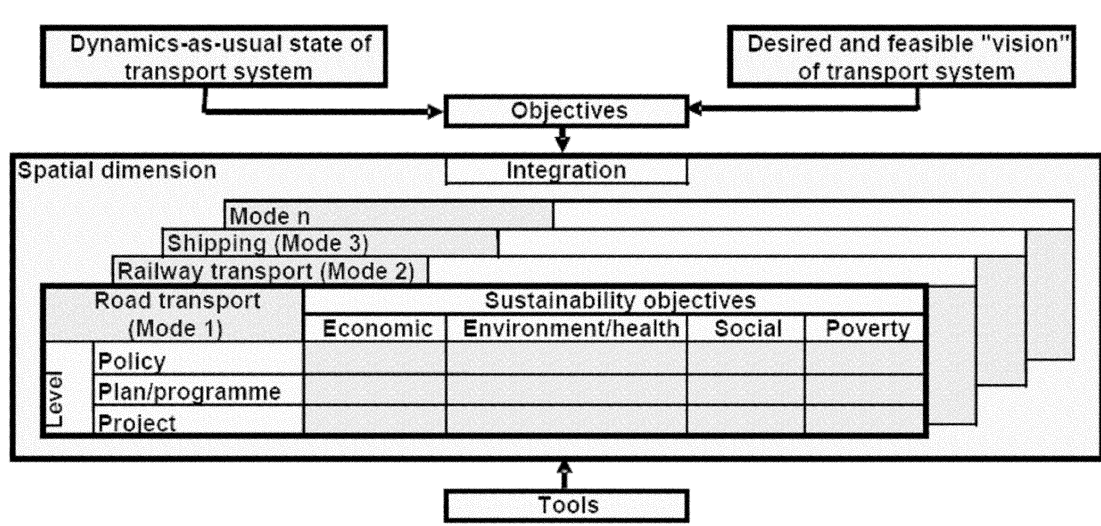
the local project level. The decision on the source of funds will typically be an outcome of assessments of national or regional transport policies. As a result, the emerging assessment hierarchy supports the implementation of national policies as well as specific projects designed to achieve the objectives of the policies, thereby having the added advantage of improving the effectiveness of overall governance.

(a) *Integrated intermodal transport requires integrated decision-making*

The creation of a truly integrated and intermodal transport system is increasingly seen as a way of not only improving economic efficiency but also making the local, national and regional transport systems sustainable in the long run.

However, such an approach requires decision-making that is integrated in terms of transport modes (including roads, railways, shipping/ports, airports and dry ports), the type of sustainability (economic, environmental and health, social, poverty), the level of intervention (policy, plan, programme and project) and the spatial dimensions (for example, municipality, province, state, country, subregion, region, global) (see Figure 4).

**Figure 4: From project and mode-specific to integrated approaches**



In other words, a logical consequence of trying to achieve sustainable transport through the creation of an international integrated intermodal transport network is that an integrated decision-making approach is needed which allows for the assessment of transport policies, plans and programmes across various transport modes, in addition to the predominant project-specific assessments.

(b) *Assessment approaches for transport policies, plans, programmes and projects*

The need for more integrated approaches has been reflected in the hierarchy of assessment tools and processes that have emerged over several decades, in order to help decision makers in the transport sectors make balanced and consistent choices at the local, national and cross-boundary levels.



An increasingly wide range of assessment tools has been adopted since the 1950s. In the 1950s and 1960s, economic cost-benefit analysis was applied to large-scale infrastructure projects, in addition to simple financial analysis. During the 1970s and 1980s, many countries also established environmental impact assessment requirements, mainly at the project level. Beginning in the late 1970s and early 1980s, various other assessment tools emerged, including social impact assessment, health assessment, technology assessment, poverty assessment and risk assessment. From the mid to the late 1980s, at the policy level, the environmental, social and economic effects were integrated and the cumulative effects considered. Since the early 1990s, attention has increasingly been given to integrated assessment and sustainability assessment in planning and decision-making in support of sustainable development in a growing number of countries.

However, until recently, most of the broader approaches were mainly promoted, and implemented, by environment ministries rather than by transport-related ministries or economic planning agencies. While environment ministries typically promoted integrated assessment at the broadest level, economic and transport planners adopted a narrower approach to assessment. More recently, transport planners have started using strategic approaches, including integrated assessment, and consideration of comprehensive options across transport modes, sectors and locations, taking into account all elements of sustainable transport.

Table 11 provides a conceptual overview of key assessment tools, along the lines of economic, environmental/health, social,<sup>87</sup> and poverty-related sustainability objectives, from the project to the policy level. The classification applies equally to national or local governments as well as in the international context. Essentially, assessment tools have gradually been used for higher-level decisions, thus ensuring consistency from policy to project level and vice versa (“top-down” versus “bottom-up”).

**Table 11: Classification of assessment tools for transport-related decision-making**

Timeline of adoption (1950s to 1990s) ↑	Transport	Economic		Social	Poverty	Top-down ↑ ↓ Bottom-up	
	Policies (Primarily intermodal)	Integrated assessment (IA)					
		Sustainability assessment (SA)					
	Plans and programmes (intermodal or mode-specific)	Traditional policy analysis	SEA				
Integrated assessment (IA)							
Sustainability assessment (SA)							
Projects (usually mode-specific)		SEA			PIA		
	Economic CBA	ESIA					
	Financial Analysis	EIA	SIA or HIA	PIA			

CBA – cost-benefit analysis

EIA – environmental impact assessment

ESIA – environmental and social impact analysis

HIA – health impact assessment

PIA – poverty impact assessment

SEA – strategic environmental assessment

SIA – social impact analysis

<sup>87</sup> For the purpose of this chapter, “social elements” include issues such as gender, HIV/AIDS, gains and losses of livelihoods (e.g. due to resettlement), access to social opportunities (health, education and social networking) etc.

(i) Project level

When complemented with strategic tools at the sector or network level, the environmental, social and health impact assessments of transport-related projects have proved to be useful preventive tools. Environmental impact assessment and environmental and social impact analysis are the most widely practised and standardized. These tools for transport planners help to take into account issues of major concern in the project design, their principal objective being to mitigate or prevent the negative environmental and social impacts of projects.

A number of countries in the region have taken such measures, including Bangladesh, China, India, Indonesia, the Islamic Republic of Iran, Kazakhstan, Malaysia, Nepal, the Philippines, the Republic of Korea, Thailand, Turkey, Uzbekistan and Viet Nam. In fact, at the project level, most Asian countries have established environmental impact assessment processes and some now have considerable experience with such assessment. Environmental impact assessment and/or environmental and social impact analysis have also become requirements of the development banks and international financial institutions and other donors, particularly for projects of regional importance, such as in the context of the Asian Highway and the Trans-Asian Railway networks.

(ii) Plan and programme level

Strategic environmental assessment refers to “a range of analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the interlinkages with economic and social considerations”.<sup>88</sup> Strategic environmental assessment can complement environmental impact assessment and other project-level assessment tools. It is applied at the earliest stages of decision-making and needs to be adapted to the specific context. Various forms of the assessment have been developed over the past 15 years. It can be used to evaluate impacts which may result from major developments, to help in project selection and to assess cumulative and large-scale impacts.

In practice, a continuum of strategic environmental assessment tools exists that involves increasing degrees of integration all the way to integrated assessment, which aims to fully integrate environmental, social, poverty and economic factors. Integrated assessment in its various forms is clearly the broadest and most adaptable assessment tool for strategic purposes. Transport planners can benefit from the body of experience built up in the past 30 years by scientists and policy analysts in the area of global environmental issues.

Comparative assessment of development options is a particular variant of integrated assessment which compares development programmes according to their respective contributions to

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<sup>88</sup> OECD, “Good practice guidance on applying strategic environmental assessment (SEA) in development cooperation” (DCD/DAC(2006)37), 6 July 2006.

poverty reduction, economic goals and environmental sustainability, taking into account various sectoral choices and locations.

It should also be noted that strategic environmental assessment, integrated assessment and comparative assessment of development options usually include both quantitative and qualitative features, in contrast to cost-benefit analysis, which largely focuses on those dimensions to which monetary values can be assigned.

The ESCAP Ministerial Conference on Infrastructure, held in Seoul in 2001, discussed and encouraged the use of strategic assessment tools such as strategic environmental assessment and integrated assessment for infrastructure-related plans, programmes and policies.<sup>89</sup> Since then, many countries have made progress in adopting or implementing such processes, particularly at the level of transport plans and programmes. In the last five years, a framework of national and international legislation on environmental impact assessment and strategic environmental assessment has emerged in which both developed and developing countries increasingly participate (see <http://www.iied.org/Gov/spa/docs.html>).

Related assessment processes for plans and programmes are the so-called poverty reduction strategies papers and poverty and social impact analysis<sup>90</sup> which were introduced by the World Bank and the International Monetary Fund. In a similar manner to environmental and social impact analysis, these two processes only consider alternative designs of a given reform and do not evaluate alternative reforms.

#### *Experience outside the region*

Integrated assessment, strategic environmental assessment and related institutional mechanisms to formalize a systematic process for ensuring consistency in decision-making have been used in Europe and Canada for quite a few years. In the European Union, strategic environmental assessment was mandated in 2001 and a directive entered into force in 2004. The European Commission has established its own comprehensive system for integrated assessment/strategic assessment of internal and external policy documents. Over the past decade, it has also made strategic environmental assessment analyses on individual transport corridors<sup>91</sup> of the Trans-European Network. Notably in Belgium, Denmark, Finland and the Netherlands, transport strategic environmental assessments deal with all transport modes together, along with infrastructure and non-infrastructure measures and linkages with other sectors. At the level of the United Nations Economic

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<sup>89</sup> See note 8 above.

<sup>90</sup> Defined as “the analysis of positive and negative distributional and poverty impact of policy change on the well-being of different groups in society, with a focus on the poor and vulnerable.”

<sup>91</sup> Five corridors in Sweden, the United Kingdom of Great Britain and Northern Ireland, Austria, Italy, France and Belgium.

Commission for Europe (ECE), a legally binding international instrument, the Protocol on Strategic Environmental Assessment to the Espoo Convention, was adopted in 2003 (see Box 11).<sup>92</sup>

Among developing countries, interesting applications of integrated assessment as well as strategic environmental assessment in the transport sector are being reported in South America, such as the integrated assessment of the “Trans-Amazonia” in Brazil. The World Bank has carried out strategic environmental assessment-type regional and transport sector environmental assessments since the early 1990s.

#### *Legal requirements in the ESCAP region*

While most ESCAP members have legal assessment requirements at the project level, contained in environmental impact assessment laws or transport sector laws, an increasing number have introduced legislation requiring assessment of transport plans and programmes.<sup>93</sup>

Environmental impact assessment-type frameworks that include elements of strategic environmental assessment are in place in almost all ESCAP members in Central Asia and the Caucasus. This is due to the introduction of a combination of state environmental reviews and assessment of environmental impact procedures in the former Union of Soviet Socialist Republics during the mid-1980s. Whereas that system appears to have remained in place almost unchanged in Azerbaijan, Kyrgyzstan, Tajikistan and Uzbekistan, Western-style assessment elements have been added in Armenia, Georgia, Kazakhstan, the Russian Federation and Turkmenistan. In Armenia, the Law on Environmental Impact Assessment of 1995 requires environmental impact assessment not only of projects but also of concepts, which include proposals, programmes, complex designs and master plans and documentation on regional planning.

In China, regional environmental assessments have been mandated for large construction projects since 1998. The new Environmental Impact Assessment Law, in force since 2003, requires a strategic environmental assessment-type approach to be applied to long-term strategic plans at the national, provincial and sector levels and to short-term project plans at the local level. Indonesia follows the Canadian environmental assessment review process and requires an environmental impact assessment to be carried out for every plan which is considered likely to have a significant impact on the environment.

In Samoa, the Planning and Urban Management Act of 2003 promotes environmental planning, including environmental impact assessment, strategic planning and infrastructure coordination, and provides for strategic environmental assessment of area-wide plans.

#### *Selected examples from the transport sector of ESCAP members*

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<sup>92</sup> ECE and WHO, “Overview of instruments relevant to transport, environment and health and recommendations for further steps – synthesis report” (ECE/AC.21/2001/1).

<sup>93</sup> ECE has conducted an informal review of legislation in ECE countries, including information on nine ESCAP member countries, “EIA and SEA legislation across South-Eastern and Eastern Europe, Caucasus and Central Asia”; see [www.unecce.org/env/eia/legislation.htm](http://www.unecce.org/env/eia/legislation.htm).

While strategic environmental assessments as well as broader assessment processes have become common in most OECD countries, they have been applied in a systematic way in the transport sector in only a few developing countries of the ESCAP region. This is not primarily due to limited capacity, as most countries in Asia and the Pacific have the infrastructure in place to make strategic environmental assessment work.

Table 12 lists selected, publicly documented, examples of the application of strategic environmental assessment, integrated assessment and related tools for the assessment of transport plans, programmes and policies in ESCAP members. Particularly noteworthy examples include strategic environmental assessments that have been carried out in China since 1995, and the application of the comparative assessment of development options in Papua Province of Indonesia.

**Table 12: Selected examples of the application of strategic environmental assessment, integrated assessment, comparative assessment of development options and related tools for the assessment of transport-related plans, programmes and policies in the ESCAP region**

Location	Type	Date	Description
Papua Province of Indonesia	Comparative assessment of development options	2003	At the request of the provincial government, four development scenarios were considered: (a) do nothing (“business-as-usual”), (b) Trans-Papua Highway, (c) mega hydropower development programme, and (d) urban development plan in two cities
China	Strategic environmental assessment	Since the early 1990s	Great Western Development Strategy (2002); Pudong Economic Development Zone in Shanghai (1993); Automobile Industry Development Policy (1997)
Hong Kong, China	Strategic environmental assessment	Since 1989	Port and airport development strategy (1989); railway development strategy (1993), freight transport study (1994), third comprehensive transport study (1999), second railway development study (2000); future strategic growth areas (1999)
Armenia	Strategic environmental assessment	2005	Master Plan of Yerevan City
Australia and New Zealand	Integrated assessment	2005	ICLEI-Local Governments for Sustainability works with its 105 local governments to develop a “triple-bottom-line” (financial, environmental and social/labour accounts) and carry out sustainability assessment and reporting
India	Strategic environmental assessment	2000	Gujarat State Highway Programme (financed by the World Bank)
Russian Federation	Strategic environmental assessment	1997-1999	Moscow City Master Plan for the Period to 2020

(iii) Policy level

Existing legislation in ESCAP member countries typically does not require strategic environmental assessment or broader integrated assessment of transport policies or development options to be undertaken. However, in practice, a number of members and associate members have recently started to carry out such assessments. For example, in Hong Kong, China, all major transport-related policies and plans have been subject to strategic environmental assessment since 1998.

In practice, certain institutional barriers need to be overcome by Governments, in order to achieve policy integration that adequately reflects the increasing importance of integrated transport and the multitude of government objectives that are linked to transport policy decisions. An overview of issues and possible institutional arrangements to enhance integrated assessment at the policy level and policy integration in general has recently been put together by the WHO/ECE pan-European programme project (see [http://www.thepep.org/en/workplan/ia4pi/ia4pi\\_docs.htm](http://www.thepep.org/en/workplan/ia4pi/ia4pi_docs.htm)).

(c) *Participation and information*

Good transport-related decision-making needs to be based on access to information for stakeholders and their participation in the evaluation and decision-making process.

All the assessment processes institute various levels of participation of stakeholders, improving access to information and transparency, preventing conflicts and improving governance in general. A notable example of participation in urban transport-related decision-making is an ESCAP pilot project in the Rattanakosin area of Bangkok.<sup>94</sup>

The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, the so-called “Aarhus Convention” (see Box 10), is open for accession by any United Nations Member States.

**Box 10: Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters and its Protocol on Pollutant Release and Transfer Registers**

The so-called “Aarhus Convention” was adopted in 1998 and entered into force in October 2001. The Convention grants public rights and imposes on Parties and public authorities obligations regarding access to information, public participation and access to justice. As at August 2006, 10 ESCAP members were Parties to the Convention: Armenia, Azerbaijan, France, Georgia, Kazakhstan, Kyrgyzstan, the Netherlands, Tajikistan, Turkmenistan and the United Kingdom of Great Britain and Northern Ireland. The Convention is open for accession by any United Nations Member States, but approval is required by the Meeting of the Parties (article 19, para. 3). On several occasions, including at the Second Meeting of the Parties in May 2005, accession by non-ECE member States was encouraged.

All “public authorities”, including transport-related ministries and agencies, are covered by the Convention. All Parties have to follow minimum standards in terms of information and participation in the case of transport-related projects with potential significant adverse environmental impact (article 6), including railway lines, airports, motorways, inland waterways, ports and dry ports (annex I to the Convention). There are also minimum provisions for decision-making on transport-related plans, programmes and policies (article 7). While the requirements for public participation in preparation of plans and programmes prescribe procedural requirements (article 6), the legal standard for transport-related policies in article 7 is much weaker: “To the extent appropriate, each Party shall endeavour to provide opportunities for public participation in the preparation of policies relating to the environment”.

The Protocol on Pollutant Release and Transfer Registers was adopted in Kiev in 2003 and signed by 36 States and the European Community and is expected to come into force shortly. It includes provisions regarding information on releases from diffuse sources such as transport.

For further information, see ECE, *Summary of Convention contents and principles* (<http://www.unece.org/env/pp/welcome.htm> and <http://www.unece.org/env/pp/contentofaarhus.htm>); *Implementation guide* (<http://www.unece.org/env/pp/acig.pdf>); and *Clearinghouse* (<http://aarhusclearinghouse.unece.org/resources>).

<sup>94</sup> ESCAP, *Traffic and Transportation for Sustainable Environment, Mobility and Access: Application of a Comprehensive and Integrated Approach to Policy Development in the Rattanakosin Area of Bangkok* (ST/ESCAP/2171) (United Nations publication, Sales No. E.02.II.F.27).

Well-documented examples of applying the Aarhus Convention in transitional economies include the Convention's Compliance Committee report on decision-making regarding motorways in Hungary, and the adoption of the Act on Access to Information on the Environment and Public Participation in Environmental Decision-making in Poland in 2000 (in the light of the ratification of the Convention by Poland), which introduced mandatory public participation in decision-making on transport policies, strategies, plans and programmes.

## **2. International policy agenda and sharing of experiences**

### *(a) International policy agenda*

In recent years, the need for integrated policy, assessment and decision-making has been featured prominently on the international transport policy agenda.

The United Nations Millennium Declaration<sup>95</sup> reaffirmed support for the principles of sustainable development and Goal 7 calls for the integration of the principles of sustainable development into country policies and programmes. In the discussions at the World Summit on Sustainable Development, held in Johannesburg in 2002, the importance of "strategic approaches and balanced decision-making" was stressed and reference made to the importance of taking a holistic and intersectoral approach.

In 2004, the OECD Council strongly emphasized the importance of integrated decision-making and adopted a recommendation on assessment and decision-making for integrated transport and environment policy. The Council recommended that systematic evaluation of economic, social and environmental effects should underpin all transport plans and programmes and all major transport sector investments, agreed that integrated assessment and decision-making procedures should be designed to facilitate effective and transparent decisions and their implementation, and adopted guidelines for good assessment and decision-making support, drawing on earlier work by the European Conference of Ministers of Transport.

The Paris Declaration on Aid Effectiveness of 2005<sup>96</sup> also calls upon donors to develop and apply common approaches for strategic environmental assessment at the sector and national levels.

### *(b) Capacity-building and international sharing of experiences*

A number of national and international organizations have recently produced background documents and training materials and have started carrying out capacity-building activities on integrated assessment.

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<sup>95</sup> See General Assembly resolution 55/2 of 8 September 2000.

<sup>96</sup> Adopted at the Senior Level Forum on Development Effectiveness in Fragile States, held in London in January 2005.

### 3. Cross-border issues and experiences

Issues similar to those in the national context also arise in the cross-border context, in terms of integrated policy and planning, assessment processes and participation. However, additional issues need to be taken into account when a transport policy, plan/programme or project is cross-border in nature, for example, a bridge across a river that demarcates a national border, or when it has major impacts across national borders, for example, plans and programmes for the long-term development of the Asian Highway or Trans-Asian Railway, airports or ports that affect areas in neighbouring countries, including landlocked countries.

To date, most examples of assessment in a cross-border context have taken place in Europe; however, the number of potential applications in the ESCAP region is large and increasing in line with cross-border traffic.

#### (a) *Project level*

The types of issues in cross-border project environmental impact assessment are illustrated by the example of a bridge construction project over the Danube River between Bulgaria and Romania (costing €230 million). Whereas Bulgaria had a one-step assessment procedure at the beginning of the project design process, Romania had an assessment procedure in the framework of the approval process, that is, before obtaining the construction permit. To resolve this difference, and to provide a stronger overall environmental impact assessment, the cross-border assessment took place in two stages, that is, a preliminary assessment according to Bulgarian legislation covering both countries, and a final assessment according to Romanian legislation, also covering both countries.

Similar issues arise in the ESCAP region, even though systematic cross-border assessments are carried out only rarely. For example, in the Greater Mekong Subregion, Cambodia, the Lao People's Democratic Republic, Thailand and Viet Nam all have standard environmental impact assessment procedures and legislation in place, but so far none have procedures to deal with transboundary impacts.

In the ECE region, the Convention on Environmental Impact Assessment in a Transboundary Context, the Espoo Convention, which entered into force in 1997, provides a solution to such cross-border issues. In essence, it specifies minimum standards for environmental impact assessment processes, including information and participation requirements, to be carried out for transport infrastructure projects, and other activities, that are either cross-border or have a significant cross-border impact (see Box 11). As at August 2006, seven ESCAP members, Armenia, Azerbaijan, France, Kazakhstan, Kyrgyzstan, the Netherlands and the United Kingdom, were Parties to the Convention. An amendment has been passed, and is expected to come into force in 2007, according to which all States Members of the United Nations can become Parties to the Convention.

The Espoo Convention covers all major economic sectors, with the transport sector being one of the most important sectors in practice. In fact, a review of implementation of the Espoo



Convention, published by ECE in 2004, showed that the majority of reported projects (8 of 15) to which the Convention was applied were in the transport sector.

**Box 11: Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) and its Kiev Protocol**

The Espoo Convention was adopted in February 1991 and entered into force in September 1997. As at August 2006, there were 41 Parties to the Convention, including the following ESCAP members: Armenia, Azerbaijan, France, Kazakhstan, Kyrgyzstan, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland. A number of non-ECE member countries have expressed interest in becoming a Party. At their second meeting, the Parties adopted an amendment to the Convention allowing non-ECE member States to become Parties. This amendment is expected to come into force in 2007.

The Espoo Convention is intended to promote international cooperation in assessing and mitigating the likely impact of a proposed activity, such as transport infrastructure development, on the environment. It applies, in particular, to activities that could have an adverse impact on the environment in other countries. The Convention ensures that explicit consideration is given to environmental factors well before the final decision is taken. It also ensures that the people living in areas likely to be affected by an adverse impact are informed of the proposed activity, provided with an opportunity to make comments or raise objections, and enabled to participate in relevant environmental impact assessment procedures.

The Protocol on Strategic Environmental Assessment, also known as the Kiev Protocol, or SEA Protocol, was adopted in May 2003. The Protocol was adopted by 37 signatories, including the following ESCAP members: Armenia, France, Georgia, the Netherlands and the United Kingdom. It requires its Parties to evaluate the environmental consequences of their official draft plans and programmes and recommends a similar process for draft policies. Strategic environmental assessment is undertaken much earlier in the decision-making process than environmental impact analysis. The Protocol also provides for appropriate public participation in government decision-making, including in all the major transport subsectors.

For further details, see the ECE website [www.unece.org/env/eia/](http://www.unece.org/env/eia/), in particular: (a) ECE, *Guidance on the Practical Application of the Espoo Convention* (ECE/MP.EIA/8), 2006; (b) *Resource Manual to Support Application of the UNECE Protocol on Strategic Environmental Assessment*, July 2006; and (c) *Report of the Third Meeting of the Parties* (ECE/MP.EIA/6).

*(b) Plan and programme level*

The Protocol on Strategic Environmental Assessment, the Kiev Protocol, or SEA Protocol, to the Espoo Convention, requires its Parties to evaluate the environmental consequences of their official draft plans and programmes and recommends a similar process for draft policies. It also provides for appropriate public participation in government decision-making, including all major transport subsectors. It is expected that the Protocol will lead to a global strategic environmental assessment standard, as it will be open to all United Nations Member States.

The need for such an international instrument for the ESCAP region is evident. It should be noted that the Asian Development Bank has recently started preparatory work for possible strategic environmental assessment and integrated assessment to be carried out for the Greater Mekong Subregion. In this context, it may be noted that the World Wildlife Fund has published an overview paper<sup>97</sup> which provides a range of arguments to show why a comparative assessment of development options-style integrated assessment should be carried out for all Greater Mekong Subregion

<sup>97</sup> World Wildlife Fund, *Economic Corridors: Transport and Energy Infrastructure Transforming the Greater Mekong Subregion (GMS)* (2005).

infrastructure plans.<sup>98</sup> Similarly, integrated assessment of other regional transport plans, programmes or agreements, for example, the Asian Highway and Trans-Asian Railway networks, could highlight the regional overall costs and benefits of various large-scale development options.

(c) *Policy level*

It is more likely that national transport-related policies rather than projects will have cross-border impacts. Furthermore, regional organizations, programmes and agreements have de facto introduced an international layer of policy-relevant aspects which might be assessed in a similar way. For example, ESCAP members and associate members might be interested in collaboratively assessing various paths towards realizing the aforementioned “vision”, in order to test their planned future transport policies. Similarly, a scenario analysis of the development of the Asian Highway and Trans-Asian Railway might be beneficial.

It should be noted that the Kiev Protocol to the Espoo Convention recommends, although it does not require, strategic environmental assessment for the assessment of all transport policies with cross-border impacts.

#### **D. Conclusion**

Transport has a significant impact on the environment, health and safety as well as on economic and social systems in the ESCAP member countries. This chapter outlined the need to formulate strategies that incorporate all dimensions of a sustainable transport system using an appropriate mix of policy tools. Governments may use integrated assessment and futures-based policy analysis to determine a transport policy mix that “optimally” reflects their special objectives.

Governments may wish to consider:

- (a) Promoting close coordination and cooperation in terms of planning, assessment and operations among all transport-related ministries and with other relevant sectoral ministries, including those relating to the environment, energy and trade;
- (b) Implementing processes and activities as contained in the recommendation of the OECD Council on assessment and decision-making for integrated transport and environment policy adopted on 21 April 2004;
- (c) Gradually building capacity for and implementing a hierarchy of assessment tools and processes, ranging from project-level environmental and social impact analysis, to strategic environmental assessment, to comprehensive integrated assessment at the programme, plan and policy levels; and to make full use of these assessments by exploring environmental co-financing mechanisms such as the Clean Development Mechanism of the United Nations Framework

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<sup>98</sup> It should be noted, as a first step in this direction, that a strategic environmental framework is being developed by the Asian Development Bank for the Greater Mekong Subregion Programme which, however, appears to focus mainly on data collection.

Convention on Climate Change and the Global Environment Facility, as well as making use of innovative transport infrastructure solutions;<sup>99</sup>

(d) Exploring the use of futures-based policy analysis for analysing the sustainability of national transport systems and comparing the simulated performance of alternative transport policies.

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<sup>99</sup> Promising examples include dedicated road corridors both in the urban (e.g. bus rapid transit) and the inter-city context (dedicated lanes for trucks and longer-combination vehicles, as well as hybrid buses).

## VI. ROAD SAFETY IN ASIA AND THE PACIFIC

Much progress has been made in the development of the Asian Highway Network. Last year alone around \$170 billion was invested on Asian roads, with more than US\$ 20 billion being committed to the Asian Highway Network. Unfortunately, the Asia now has the worst road safety record in the world. Last year more than half a million people were killed and 20-30 million injured in road crashes, at an economic cost of some \$100 billion. While most segments of the 140,000 kilometres of the Asian Highway are safer than other roads in the region, some segments show worrying safety records. Last year, more than 19,000 persons died in over 125,000 road crashes on the Asian Highway Network.

Decision makers of the region have recognized the urgent need to improve road safety. Parties to the Intergovernmental Agreement on the Asian Highway Network have made a formal commitment to “give full consideration to issues of road safety” and the ESCAP Ministerial Declaration on Improving Road Safety in Asia and the Pacific includes the goal to “save 600,000 lives and prevent a commensurate number of serious injuries on the roads of Asia and the Pacific over the period 2007 to 2015” and invites ESCAP members to “develop the Asian Highway as a model of road safety”.

The objectives of the present chapter are to describe and analyse (a) the status of road safety in the ESCAP region and (b) national and regional efforts to improve the situation. The chapter provides an overview of the global and regional road safety situation and the relevant mandates for international collaborative action. It illustrates selected issues, experiences and lessons learned from national activities designed to improve road safety in the ESCAP region, including information pertaining specifically to the Asian Highway and the important role of road safety targets. It also reviews global, regional and subregional cooperation for improving road safety in the ESCAP region.<sup>100</sup>

### A. Background

Section A provides an overview of the global and regional road safety situation and relevant mandates for international collaborative action. Section B discusses key road safety issues. Section C reviews country experiences. Section D provides an overview of road safety on the Asian Highway. Section E reviews selected best practises. Section F reviews global, regional and subregional cooperation for improving road safety in the ESCAP region.

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<sup>100</sup> This chapter draws on ESCAP document E/ESCAP/MCT/SGO/9, Busan, 6-8 November 2006; as well as on ESCAP document E/ESCAP/CMG(4/I)/7, Bangkok, 12-14 Sept. 2007.

## 1. Global road safety crisis and the General Assembly

Globally, road traffic accidents kill an estimated 1.2 million people and injure or disable up to 50 million people per year, leading to annual costs of more than US\$ 500 billion. Currently, road traffic accidents rank as the eleventh leading cause of death, similar to malaria, and road traffic injuries are predicted to become the third largest contributor to the global burden of disease by 2020, ahead of HIV or tuberculosis. Today, road traffic injuries are the second most important cause of death for people between 5 and 29 years of age.<sup>101</sup> In this age group, young men, whether they are pedestrians, cyclists, motorcyclists, novice drivers or passengers, are nearly three times more likely to be killed or injured on the road than young women.

Since the 1990s, global concern has mounted over the rapid increase in the number of road deaths, as many developing countries, including populous China and India and other ESCAP member countries, have entered the phase of rapid motorization.<sup>102</sup> Today, more than 90 per cent of road traffic deaths occur in low- and middle-income countries. It has been recognized that many road accidents could have been avoided and that road safety is a development issue for many countries.

The General Assembly has adopted a series of resolutions in which it called on member countries, the World Health Organization (WHO) and the regional commissions to address what it called a global road safety crisis. In fact, four such resolutions on road safety have been adopted since 2003: they are resolutions 57/309 of 22 May 2003, 58/9 of 5 November 2003, 58/289 of 14 April 2004 and 60/5 of 26 October 2005. The General Assembly, in its resolution 58/289 of 14 April 2004 on improving global road safety, underlined the need for the further strengthening of international cooperation, taking into account the needs of developing countries, to deal with issues of road safety.

In adopting the resolution, the General Assembly noted the recommendation contained in the report of the Secretary-General on the global road safety crisis<sup>103</sup> that the regional commissions be called on to add to their respective work programmes activities that would, inter alia, develop short- and medium-term strategies to address road safety priorities.

The most recent resolution adopted by the General Assembly, resolution 60/5 of 26 October 2005 on improving global road safety, was sponsored by 85 Member States, among which were 27 ESCAP members.<sup>104</sup> The Assembly highlighted a number of specific measures that Member States were invited to take. These included implementing the recommendations contained in the report of

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<sup>101</sup> M. Peden, et al, (eds.), *World Report on Road Traffic Injury Prevention* (Geneva, WHO, 2004).

<sup>102</sup> It should be noted, though, that road safety is hardly a new issue: "At the height of the horse era, riding horses may have caused as many as 25,000 traffic fatalities per year. Today's death toll from motor vehicle accidents in the United States of America is about 50,000 per year for at least ten times as many road vehicles." This is despite the fact that cars have been roughly ten times as safe as horses per kilometre travelled. Source: A. Gruebler, *Technology and Global Change* (London, Cambridge University Press, 1998).

<sup>103</sup> A/58/228.

<sup>104</sup> Those members are: Afghanistan Armenia, Australia, Azerbaijan, Bangladesh, Brunei Darussalam, Cambodia, China, France, India, Indonesia, Fiji, Iran (Islamic Republic of), Kazakhstan, Malaysia, Nepal, New Zealand, Pakistan, Philippines, Russian Federation, Singapore, Thailand, Timor-Leste, Turkey, Turkmenistan, United Kingdom of Great Britain and Northern Ireland and Viet Nam.

WHO on the global road safety crisis related to the use of safety belts and child restraints, the use of helmets, drinking and driving, inappropriate and excessive speed, and the lack of appropriate infrastructure. It also invited Member States to establish a lead agency, on a national level, on road safety and to develop a national action plan to reduce road traffic injuries, by passing and enforcing legislation, conducting necessary awareness-raising campaigns and putting in place appropriate methods to monitor and evaluate interventions that are implemented.

## 2. Overview of road safety in Asia and the Pacific

The ESCAP secretariat estimates that 440,000 people were killed<sup>105</sup> and at least 2 million injured<sup>106</sup> in accidents on the roads of the ESCAP region in 2005. Higher estimates, of up to 20 to 30 million injuries in the region, are implied by recent reports.<sup>107</sup> Despite some serious data issues, it is safe to say that more than half of the world's traffic fatalities occur in the ESCAP region, even though only one in five of the world's motor vehicles are registered in the region. It should also be noted that roughly half of all road fatalities in the ESCAP region occurred in China and India.

In recent decades, the number of road users killed in accidents has increased rapidly in Asia, mainly due to the rapid rate of motorization. The increase in the fatality rate has continued despite the fact that vehicles have become safer. The ESCAP secretariat estimates that, by 2020, about two thirds of the world's road deaths (or 610,000 road deaths) could occur in the ESCAP region (Figure 5).<sup>108</sup>

Figure 6 illustrates that the increase in the number of deaths on Asia's roads has been almost entirely due to rapid motorization. The overall number of road traffic fatalities (adjusted for underreporting and excluding two- and three-wheeled vehicles) per 10,000 motor vehicles<sup>109</sup> in the ESCAP region has remained stable at around 20 or twice the world average since the early 1990s.<sup>110</sup>

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<sup>105</sup> Only rough estimates exist of the number of road deaths and particularly of road accidents in the ESCAP region. This is due to non-comprehensive coverage of accident reporting systems and underreporting by police. The estimate of 440,000 road deaths has already been adjusted for underreporting. It is based on police-reported data and the methodology described in E. Kopits, M. Cropper, "Traffic fatalities and economic growth", (Washington DC, World Bank, 2003), Policy Research Working Paper No. 3035. This was used on page 38 of M. Peden, et al, (eds.), *The World Report on Road Traffic Injury Prevention* (Geneva, WHO, 2004). Note that the sum of police-reported road traffic deaths in the ESCAP region (data available for 26 countries only) was 299,446 in 2005. Still, the estimate of 440,000 is rather conservative compared to estimates highlighted in the latter report (which reports 1.2 million road deaths worldwide of which 650,000 have occurred in the ESCAP region).

<sup>106</sup> This number is based on accidents reported.

<sup>107</sup> The number of roughly 20 million injuries is implied by the global estimates published in the 2004 WHO report (footnote 1). The number of 30 million injuries in 2005 is derived by assuming the ratio of the number of injuries to fatalities in the ESCAP region is the same as in the ASEAN region. A. Ross, C. Melhuish, "Road Safety in ASEAN: Introducing a regional approach", *Transport and Communications Bulletin for Asia and the Pacific*, No. 74 (Road Safety), Bangkok, ESCAP, 2005), p. 1-15.

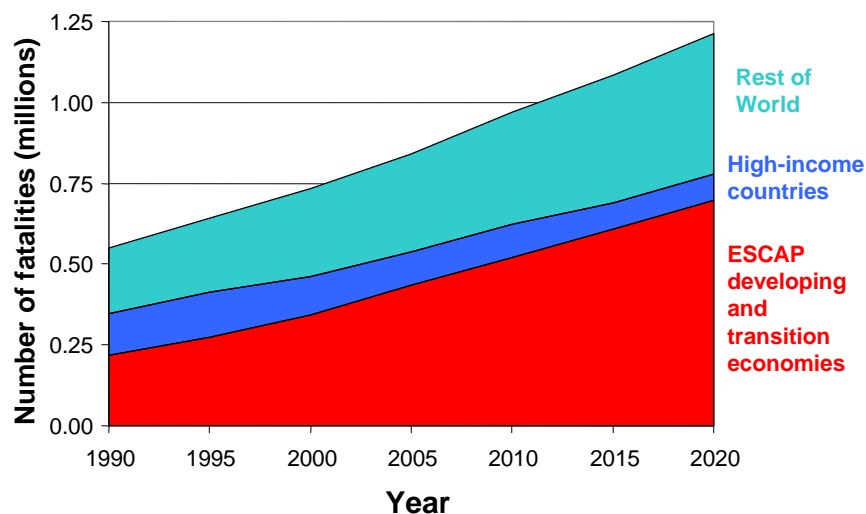
<sup>108</sup> The calculations use the same assumptions and methodology as the dynamics-as-usual scenario published in Kopits and Cropper, op. cit. (see footnote 105).

<sup>109</sup> The official United Nations Statistics Division's definition of motor vehicle is used here: "Motor cars and buses, passenger motor vehicles for unusual terrain such as snow mobiles and golf carts, motor vehicles for goods transport, special purpose trucks such as fire engines and mobile clinics." Thus, this definition does not include two- or three-wheelers, which are numerous in ESCAP developing countries. In practice, however, various differing definitions are used by statistical offices in ESCAP countries. For more information see [http://unstats.un.org/unsd/cdb/cdb\\_dict\\_xrxx.asp?def\\_code=98](http://unstats.un.org/unsd/cdb/cdb_dict_xrxx.asp?def_code=98)

<sup>110</sup> Fatality rates quoted by ESCAP developing countries are often smaller than those of figure 2. This is because (a) these countries might include large numbers of two- and three-wheelers in their definitions of "motor vehicle" in

Further details of key road safety related indicators for selected ESCAP member countries are contained in the table at the end of this chapter.

**Figure 5: Number of road traffic fatalities from 1990 to 2020**

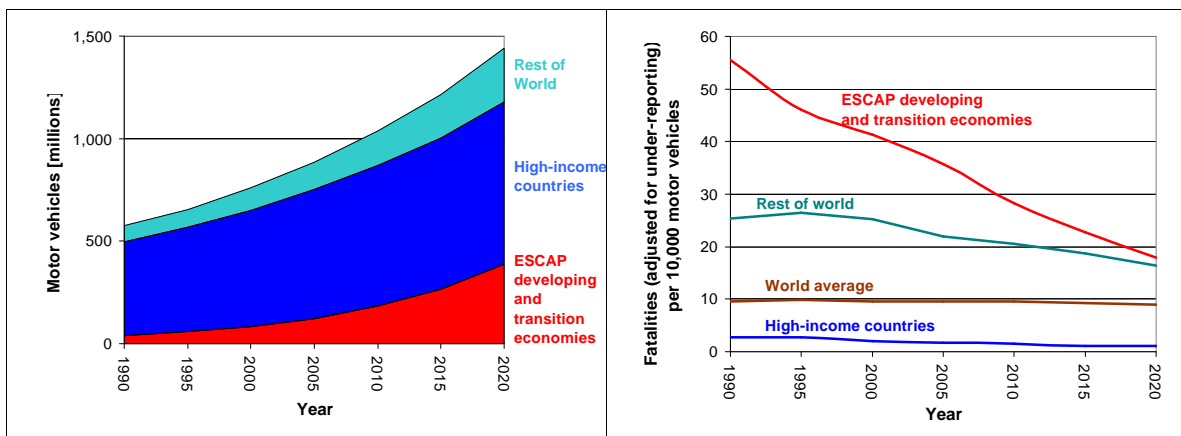


Source: ESCAP secretariat.

<sup>a</sup> The number of fatalities after 2005 are expected under a dynamic-as-usual scenario, adjusted for underreporting and following the methodology, and GDP projects, of E. Kopits, M. Croppers, “Traffic fatalities and economic growth”, World Bank Policy Research Working Paper No. 3035 (Washington DC, World Bank, 2005).

<sup>b</sup> A high-income country having an annual gross national product (GNP) per capita equivalent to \$9,206 or greater in 2003. There are currently about 29 high-income countries in the world with populations of one million people or more. Their combined population is about 0.9 billion, less than one-sixth of the world’s population.

**Figure 6: Number of motor vehicles and number of road traffic fatalities**



Source: ESCAP (Asia-Pacific road safety database <http://www.unescap.org/ttdw/data/aprad.aspx>), ESCAP secretariat estimates; M. Peden, et al (eds.) *World Report on Road Traffic Injury Prevention* (Geneva, WHO, 2004).

\* Adjusted for underreporting.

<sup>a</sup> The official United Nations Statistics Division’s definition of motor vehicle is used here: “Motor cars and buses, passenger motor vehicles for unusual terrain such as snow mobiles and golf carts, motor vehicles for goods transport, special purpose trucks such as fire engines and mobile clinics.” Thus, this definition does not include two- or three-wheelers, which are numerous in ESCAP developing countries. In practice, however, various differing definitions are used by statistical offices in ESCAP countries. For more information see [http://unstats.un.org/unsd/cdb/cdb\\_dict\\_xrxx.asp?def\\_code=98](http://unstats.un.org/unsd/cdb/cdb_dict_xrxx.asp?def_code=98)

contrast to the United Nations definition, and (b) these countries might use police-reported data (which are incomplete).

The per capita number of road users killed in accidents has been particularly high in middle-income and newly industrialized economies. Higher fatality rates per unit of population are also linked to higher vehicle densities (measured in vehicles per kilometre of road), regardless of the level of motorization. This shows the important link between road safety and infrastructure development in general.

The nature of road safety issues in the developing countries of the ESCAP region differs significantly from that in developed countries. In Asia, most of those killed or injured in road accidents are vulnerable road users, such as pedestrians and motorcyclists. In South Asian countries, typically more than 50 per cent of all road fatalities are pedestrians. In East and South-East Asian countries, more than two thirds of the victims are motorcyclists. In contrast, casualty rates in North and Central Asian countries are typically similar to those of the member countries of the Organization for Economic Cooperation and Development (OECD). Yet, all the developing countries of the ESCAP region have higher fatality rates than the member countries of OECD.

Motorization rates range widely in the ESCAP region, with the number of private cars per thousand people ranging from 11 to 684.<sup>111</sup> Two- and three-wheelers constitute more than two thirds of all motorized vehicles in Cambodia, Bangladesh, Nepal, Sri Lanka, Indonesia, the Lao People's Democratic Republic, Myanmar, Thailand, Viet Nam, and other developing ESCAP member countries. However, the comparatively larger impact of road accidents on vulnerable groups in the developing countries of the ESCAP region is not merely due to a different vehicle mix; it appears to be a systemic issue in which accidents disproportionately impact lower income groups and younger people.

The economic cost of road accidents ranges from 1 to 3 per cent of the GDP of each ESCAP member country, indicating the potential for substantial returns on investments in road safety interventions.<sup>112</sup> The secretariat estimates the economic costs at US\$ 106 billion or equivalent to 2.3 per cent of the GDP of the developing and transition economies in the ESCAP region.

## **B. Road safety issues: government policy, technology, and safer road users, vehicles and roads**

This section illustrates selected issues, experiences and lessons learned from national activities to improve road safety in the ESCAP region, including information pertaining specifically to the Asian Highway.<sup>113</sup> It shows the important progress made in improving road safety in many

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<sup>111</sup> For the 22 Asian Highway countries for which data was reported to the ESCAP secretariat for an expert group meeting held from 8 to 10 May 2006, see [http://www.unescap.org/ttdw/common/tis/ah/egm\\_may06.asp](http://www.unescap.org/ttdw/common/tis/ah/egm_may06.asp).

<sup>112</sup> Economic costs of road accidents when expressed as a percentage of GDP roughly appears to follow the following relationship: Losses [% of GDP] = 0.0297 \* EXP(-8\*10<sup>-5</sup>) \* (GDP per capita). In other words, losses are roughly 3 per cent in poorer developing countries and become less than 1 per cent for developed economies.

<sup>113</sup> Information refers primarily to a sample from Fiji and 22 Asian Highway network countries for which such information was available to the secretariat. This sample is representative of the whole ESCAP region, covering the vast majority of the population (roughly 3.3 of 3.8 billion) of the region.



ESCAP member countries. Yet, it is important to note that, in most cases, this progress is merely mitigating the rapid increase in the number of fatalities and injuries due to rapid motorization.

## 1. Government policy, road safety targets and resources

### (a) *Policies, programmes and plans*

Against the background of urgency described above, most ESCAP member countries have recognized the importance of a political commitment to improving road safety. In fact, many have made impressive progress in recent years. Yet, great potential for further improvement remains.

Road safety is an important issue on the Governments' agendas, as indicated by the fact that most ESCAP member countries appear to have a road safety strategy and/or policy, programme and action plan.<sup>114</sup> Historically, OECD member countries and some ESCAP developing member countries have initiated road safety policies when the number of private passenger cars started to increase rapidly.<sup>115</sup> However, several developing countries in the ESCAP region have not followed this pattern. These countries developed road safety plans relatively earlier, in the 1990s or later, when the number of motorcycles started to increase rapidly.

In Japan, a succession of five-year fundamental traffic safety programmes and targets, the first of which began in 1971, has reduced the number of road traffic fatalities from 16,765 in 1970 to 6,871 in 2005. In the Republic of Korea, national road safety campaigns have reduced the number of road traffic fatalities from 13,429 in 1991 to 6,563 in 2004. In Nepal, the first road safety strategy was prepared in 1994. In Viet Nam, the national road code recognizes all citizens as stakeholders, ensuring the timely flow of traffic safety information from local stakeholders to decision makers by employing specific incentives for participation. This has resulted in the number of accidents decreasing dramatically since 2002.

Recent recommendations by OECD on road safety action plans are also relevant for the ESCAP region:<sup>116</sup> action plans need to be comprehensive but focused, and should be developed jointly with all relevant stakeholders. It is preferable for overall political and technical responsibility for traffic safety policy to be at the national level. Long-term planning would be preferred and should focus on reducing risks and exposure. Possible road safety measures need to be ranked/prioritized with the help of social cost-benefit analysis. This requires efforts to obtain quality data.

WHO stresses the importance of political will, and the sharing of information, goals and budgets, in order to successfully implement road safety plans. Due to the multi-sectoral nature of road safety, challenges remain, particularly in implementing new measures and maintaining a balanced focus. In particular, designating a lead agency or setting up a coordination mechanism remains a

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<sup>114</sup> For more information see the following link to the Expert Group Meeting on the Development of the Asian Highway Network [http://www.unescap.org/ttdw/common/tis/ah/egm\\_may06.asp](http://www.unescap.org/ttdw/common/tis/ah/egm_may06.asp)

<sup>115</sup> For example, this level was reached by Japan in 1971 and the Republic of Korea in 1992, when both countries had a PPP of 9,000 US\$, measured in (1990) International Geary-Khamis dollars. The Australian Road Safety Council was established in 1947.

challenge in many ESCAP member countries. In fact, in some countries, road, health and police related organizational units appear to compete with each other rather than work together. It should also be noted that sometimes a more complex setup at various levels of political responsibilities rather than the designation of a lead agency has proven successful. Examples of this include India, Viet Nam, and Japan. In India, high-level institutional structure and policy guidance is provided by the National Road Safety Council, whose membership comprises representatives from both central and state governments.<sup>117</sup>

*(b) National road safety visions and targets*

In some countries or areas, long-term road safety visions have been developed, inter alia, in order to ensure that road safety issues gain a prominent place in transport policy. For example, the Governments of Canada and Japan have adopted the vision of having the “safest roads in the world”, Sweden has adopted the initiative “vision zero”, and the Netherlands envisions “sustainable safety”. The Government of Mongolia proposed that 2004 be “a year without any accidents”, and Hong Kong, China, works towards “zero deaths on the road”.

A study by OECD<sup>118</sup> have illustrated the value of quantitative road safety targets: “It appears that targets have proven to be a valuable tool in the development of effective road safety programmes. Whether developed through a “top-down” or “bottom-up” process, a measurable, clear and ambitious target can motivate all the actors involved in road safety, and greatly increases the likelihood of effective programme development and improved road safety at the national, regional and local levels”. In fact, most OECD countries have ambitious quantitative targets, with planned annualized absolute reductions in the number of fatalities by 1.5 to 13.9 per cent per year.

Similarly, ESCAP member countries that have adopted qualitative and/or quantitative road safety targets have tended to be more successful in terms of actual improvements than those without targets. Particularly successful examples include Japan, the Republic of Korea, Viet Nam, and Nepal. Table is a sample of national road safety targets of ESCAP members (as of 2006). For example, the Japanese road safety target contained in the current five-year plan foresees road traffic fatalities falling to below 5,500 by 2010. In the Republic of Korea, the national goal is to reduce road fatalities by 50 per cent by 2010. In Singapore, the Road Safety Action Plan specifies a goal of reducing the number of fatalities by 100 over a 5-year period (2004-2008). The Malaysian road safety targets foresee a reduction to below 2 deaths per 10,000 registered vehicles, 10 deaths per 100,000 people and 10 deaths for a billion kilometres traveled by 2010. Adding up the targets of ASEAN countries implies a target of reducing the fatality rate by 12 per cent in 5 years, or an annualized average of 2.3 per cent. Some Asian countries have even more ambitious targets. If achieved, these targets imply substantial savings in terms of lives and costs.

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<sup>116</sup> OECD, *Safety on Roads: What's the Vision?* (Paris, OECD, 2002).

<sup>117</sup> The establishment of a permanent national expert body at the working level might complement this structure in the future.

Table 13: Current national road safety targets of ESCAP member countries

ESCAP members and associate members	Overall target	Annualized reductions [% of total number of fatalities]
Armenia	Decrease the number of accidents.	
Australia	2001 - 2010: "The target of the strategy is to reduce the annual number of road fatalities per 100,000 population by 40%, from 9.3 in 1999 to no more than 5.6 in 2010."	-4.6% in absolute terms
Bhutan	Focus on education, awareness, habits and enforcement.	
Brunei Darussalam	Save more than 56 lives in 5 year period of action plan (for 2008) [Reduction of 45 lives and 2028 injuries (2005-2010)].	
Cambodia	"Eliminate number of road fatality by educating peoples through illustrating posters, TV spots and radio broadcasting on road safety program"; ADB-ASEAN target of saving 1,800 lives and prevent 36,000 injuries during 2005-2010.	
France	Halve the number of road fatalities from 1997 to 2002	-13.9% in absolute terms
India	Various targets of state Governments.	
Indonesia	For 2005-2010: save 20,411 lives, 3.4% deaths per 10,000 vehicles, increase seat-belt and helmet use to 90%; ADB-ASEAN target of saving 12,000 lives and preventing 996,000 injuries during 2005-2010.	
Japan	2006-2010: a) "Safest roads in the world" (<5500 deaths); b) Less than 1 million injuries and deaths.	
Kazakhstan	Reduce the number and severity of accidents.	
Lao People's Democratic Republic	Save 917 lives and 21,000 injuries by the year 2010 by halving the anticipated increase in deaths and injuries; increase helmet wearing to 90%.	-9.9% of projected deaths
Malaysia	By 2010, reduce the fatality rate to 2 per 10,000 vehicles, 10 per 100,000 people and 10 per billion vehicle-km; ADB-ASEAN target of saving 3,000 lives and preventing 21,900 injuries during 2005-2010.	
Myanmar	ADB-ASEAN target of saving 940 lives and preventing 32,900 injuries during 2005-2010.	
Nepal	Halve the number of road casualties in ten years.	-6.9% in absolute terms
Netherlands	Reduce the number of road deaths by 25 per cent during 1985-2000 and by 50 per cent during 1986-2010.	-1.5% and -2.9% in absolute terms
New Zealand	Reduce the road toll to no more than 300 deaths and fewer than 4,500 hospitalisations per year by 2010 (from 404 fatalities in 6,670 hospitalisations in 2002).	-3.7% and -4.9% in absolute terms
Philippines	ADB-ASEAN target of saving 3,000 lives and prevent 258,000 injuries during 2005-2010.	
Republic of Korea	"Prevent road accidents and advance transport culture"; reduction of 62% between 2000 and 2006.	-8.0% in absolute terms
Russian Federation	Local target in Krasnoyarsk region "to decrease the accident rate by 10-15% and the number of victims of road accidents by 10-12% every year".	
Singapore	Reduce fatalities by 100 between 2004 and 2008. ADB-ASEAN target of saving 100 lives and prevent 4,300 injuries during 2005-2010.	
Thailand	ADB-ASEAN target of saving 13,000 lives and prevent 1,508,000 injuries during 2005-2010.	
Turkey	Reduce fatalities and injuries on highways by 40% within 5 years.	-6.7% in absolute terms
United Kingdom	Reduce the number of road deaths and serious injuries by 40 percent during 1998-2010.	-2.8% in absolute terms
United States of America	Reduce the number of all road deaths by 20 per cent during 1996-2008, and to reduce the number of road deaths involving large trucks by 50 per cent during 1998-2010.	-1.5% and -3.4% in absolute terms
Viet Nam	ADB-ASEAN target of saving 7,000 lives and prevent 16,100 injuries during 2005-2010.	
<i>Others</i>		
European Union	Reduce road deaths by 15 per cent during 1995-2000 and by 40 percent during 1995-2010.	-2.8% and -3.4% in absolute terms
African Union	Rate of road accident fatalities reduced by half during 2005-2015 (in terms of fatalities per vehicle-kilometres).	-6.9% of fatalities per vehicle-km
ASEAN	Reduce the number of projected road deaths and injuries by 12 percent during 2005-2010.	-2.3% of projected deaths

Sources:

<sup>a</sup> Information refers primarily to a sample from Fiji and 22 Asian Highway network countries for which such information was available to the secretariat. This sample is representative of the whole ESCAP region, covering the vast majority of the population (roughly 3.3 of 3.8 billion) of the region.

<sup>b</sup> For more information see the following link to the Expert Group Meeting on the Development of the Asian Highway Network [http://www.unescap.org/ttdw/common/tis/ah/egm\\_may06.asp](http://www.unescap.org/ttdw/common/tis/ah/egm_may06.asp)

<sup>c</sup> OECD, *Safety on Roads: What's the Vision?* (Paris, OECD, 2002).

<sup>118</sup> OECD, *Safety on Roads: What's the Vision?* (Paris, OECD, 2002).

The ESCAP secretariat estimates that extending the existing ASEAN target<sup>119</sup> to the whole ESCAP region and to the year 2015<sup>120</sup> could reduce the fatality rate (per vehicle) by 20 per cent, saving 600,000 lives and almost US\$ 100 billion.

It should be noted, however, that most of the road safety targets of ESCAP developing countries are reductions relative to projected or expected increases in road fatalities, implying an increase in absolute numbers of road fatalities due to continued motorization in the years to come.

(c) *Financial and human resources*

Financial and human resources specifically dedicated to improving road safety are limited in many ESCAP member countries. In fact, such resources are derived almost exclusively from public budgets and only rarely from special funds,<sup>121</sup> levies or other sources. In addition, some funding for maintenance and construction of roads is not considered road safety spending for budgetary purposes. Such non-dedicated road safety funding increases safety, since road engineers generally aim to build “easy, safe and comfortable” roads. It should be noted that the Commission for Global Road Safety, also known as the Lord Robertson Commission, has recommended that “all donor-supported road projects in developing countries should include a minimum 10 per cent road safety component”.<sup>122</sup> As no clear definition of road safety component exists, it is difficult to ascertain the current share of road projects that is actually motivated by or has been added due to road safety concerns.

Several cases of generous funding for road safety are noteworthy in the ESCAP region. For example, in China a large-scale black spot programme at a cost of US\$ 820 million was carried out. Viet Nam opted for dedicated resources for road safety that were provided through a US\$ 36 million World Bank loan project and a project funded by the Japanese Bank for International Cooperation (JBIC). Similarly, the Islamic Republic of Iran implemented dedicated road safety projects with support from the World Bank at a cost of US\$ 104 million. Nepal has reduced the number of accidents at 10 road intersections by 80 per cent with assistance from Japan, showing a social rate of return on investment of 1,000 per cent for the first year.

## 2. Safer road users

In most ESCAP member countries, road user behaviour is the most important cause of accidents. Countries have addressed this issue through a combination of road safety campaigns and legislative actions. Focus areas are the use of helmets and seat belts, motorcycle daytime running

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<sup>119</sup> The ASEAN target is equivalent to an annualized reduction in the number of projected road deaths by 2.3 per cent.

<sup>120</sup> This is equivalent to a reduction of the ESCAP fatality rate per vehicle by 20 per cent from 2007-2015.

<sup>121</sup> Exceptions include Japan and the Republic of Korea. In 2005, the Republic of Korea invested US\$ 1.6 billion in road safety, funded also from a special traffic account.

<sup>122</sup> Kate McMahon and David Ward, *Make Roads Safe: A New Priority for Sustainable Development* (London, Commission for Global Road Safety, 2006).

lights, drinking and driving, pedestrian safety, and the introduction of road safety elements into the school curriculum.

In order to make road safety campaigns sustainable, it is important to encourage leadership and road safety “champions”. Of course, the means of raising awareness have ranged widely, from staging local neighbourhood dramas depicting road accident scenes to mass media campaigns. The methods are chosen to match local conditions, including literacy rates, network accessibility and local customs. China, the Islamic Republic of Iran, and the Republic of Korea have reported major mass media campaigns in recent years.

While the use of helmets and seat belts is mandated by law in almost all ESCAP member countries, actual compliance and enforcement varies from only a small percentage to almost 90 per cent. In 1972, Australia became the first country in the region to introduce compulsory seat belts in passenger. This resulted in a 40 to 60 per cent reduction in the risk of injury or death. Due to the success of Australia’s seat belt policy, since the 1990s most ESCAP member countries have followed this example. For example, the Republic of Korea introduced compulsory seat belt use in 1990, supported by a mass media campaign in 1992. In India, noteworthy initiatives include motorcycle manufacturers organizing training camps and the Government requiring motorcycle vendors to sell minimum standard helmets with every sale of a motorcycle.

Several ESCAP member countries have experienced significant reductions in motorcycle accidents following the introduction of laws that mandate motorcycle headlights to be on whenever the engine is running. More than half of Malaysia’s motorized vehicles are motorcycles. For this reason, Malaysia pioneered a “daytime running headlights” campaign in 1992 which reduced conspicuity related motorcycle accidents by almost 30 per cent.<sup>123</sup> After an initial two-month multimedia campaign on running headlights, compliance of more than 82 per cent was achieved. As of May 2006, “always-on” motorcycle front-lights were mandatory in a number of ESCAP member countries, including Armenia, Kazakhstan, Malaysia, Sri Lanka, Singapore, Thailand and the Republic of Korea. In Brunei Darussalam, it is practised but not mandatory.

To date, the use of child restraints is mandated almost exclusively in developed countries.<sup>124</sup> Yet, the importance of child restraints is being increasingly recognized throughout the ESCAP region. For example, Armenia introduced a child restraint requirement in 2006. Child restraints are also mandatory in Brunei Darussalam and the Republic of Korea. In India, the introduction of such a requirement by 2008 is being discussed. Even where child restraints are mandatory, compliance varies widely and depends on the example provided by parents. According to the presentation on reporting on national road safety in the Republic of Korea given at the ESCAP Expert Group Meeting on the

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<sup>123</sup> R.U.R. Sohadi, “The value of daytime running headlight initiatives on motorcycle crashes in Malaysia”, in: *Transport and Communications Bulletin for Asia and the Pacific*, No. 74, p. 17-31 (United Nations publication, Sales No. E.05.11.F.17).

<sup>124</sup> As a result, for example, four times as many children under five are killed on roads in Thailand as in Japan, which has a population twice the size and highly motorized.

Development of the Asian Highway Network, held in Bangkok from 8 to 10 May 2006, in the Republic of Korea, “when adults are buckled up, 87 per cent of children are buckled up, but when adults are not buckled up, only 24 per cent of children are buckled up”.

In the majority of ESCAP member countries, at least some safety elements are included in the school curriculum, especially at the primary level, and in some cases, such as India and Sri Lanka, also at the secondary level. The importance of continuous road safety education programmes can hardly be overestimated. For example, it is reported that accident rates in some parts of Nepal were reduced by as much as 75 per cent due to such programmes, despite a literacy rate of only 54 per cent. Driver training and testing is also being introduced and improved in China, India and elsewhere. India, for example, has established model driver training schools and created incentives for refresher training. Within the scheme, 43,000 heavy vehicle drivers were recently trained by local institutions and non-governmental organizations.

The prevalence of “drinking and driving” or driving while intoxicated from alcohol or drugs depends, *inter alia*, on social, cultural and religious factors. In some ESCAP member countries, alcohol has been a negligible cause of accidents; in others, it was involved in half of all road accidents. Above all, in many ESCAP member countries, driving while intoxicated is accompanied by weak enforcement. In fact, police in most ESCAP member countries have neither the necessary resources nor the equipment, such as breathalysers, for the effective enforcement of existing laws on driving while intoxicated. On the other hand, in Japan, enforcement measures halved alcohol-related traffic fatalities between 1994 and 2004, and significantly reduced “drinking and driving” in Armenia. In Singapore, drivers can be convicted, even if their blood alcohol content is below the legal limit.

Pedestrians are at particular risk, especially in South and South-East Asian countries, where pedestrian fatalities typically account for one quarter to more than half of all road fatalities. For example, in Bangladesh, 70 per cent of road accident victims are pedestrians. In part, this problem is due to the fact that scarce road space is often illegally “encroached” upon, especially by the poor, who face the highest risk.

Speeding has become a significant cause of accidents, especially in countries that have experienced rapid growth and improvements in their road infrastructure. For example, in Thailand, more than two thirds of all accidents occurred on straight road sections and were often due to speeding. In addition, most accidents occurred in Bangkok and other urban areas.

### **3. Safer roads**

Particularly in developing countries, the condition of roads tends to be an area of major concern. For example, the condition of roads is a cause for road casualties in roughly 27 per cent of all accidents in Thailand, despite the country’s relatively well-developed road network. Securing the resources for the necessary safety-enhancing engineering interventions is a challenge, especially for poorer countries.

Black spot programmes have been put in place or are being tested in most ESCAP member countries, especially since the early 1990s. The size and impact of these programmes ranges widely, and some are constrained by limited resources. In China, a very large-scale black spot treatment programme has been undertaken, in which 210,000 black spots have been removed, resulting in an estimated reduction of 80,000 accidents and 5,000 deaths over one year. In Bangladesh, social returns, in the form of accident savings, on investments to improve black spots along the Dhaka-Aricha highway between 1995-2002 range between 9 and 252 per cent for the first year.<sup>125</sup>

In addition, formal road safety audits are carried out before, during or after road construction in at least 11 ESCAP member countries. For example, in India, regular road safety audits and other interventions have led to relatively high safety standards for the 65,000 kilometres of roads under the National Highway Authority of India. This achievement has yet to be duplicated on the more than 3 million remaining kilometres of road for which the state governments are responsible. In Nepal, road safety audits were introduced as early as 1995. In Thailand, road safety audits are expected to be conducted from 2007 onward.

Many ESCAP member countries have tried to reduce accident risks with the provision of separate road space for pedestrians and cyclists in urban areas. However, many challenges remain, such as resource constraints, illegal encroachment and problems with land acquisition.<sup>126</sup> Interestingly, Malaysia has pioneered the creation of 150 kilometres of exclusive separate motorcycle lanes for inter-city traffic, in recognition of the fact that two thirds of all casualties involve motorcycles. The result has been a 39 per cent reduction in fatal accidents involving motorcyclists.

Engineering interventions that reduce the severity of accidents when they occur, known as “forgiving roads” programmes, are starting to be used in ESCAP member countries such as Armenia, Japan and Malaysia. For example, the installation of safety guardrails or the removal of roadside obstacles through large-scale programmes rather than on an ad hoc basis can cut costs.

#### 4. Safer vehicles

Various levels of technical safety requirements exist in the ESCAP region, and de facto most imported vehicles follow international standards. In addition, many ESCAP member countries have made progress in terms of domestic standards. For example, India has implemented 76 of the 124 relevant Economic Commission for Europe regulations related to vehicle safety.

Periodic inspection of all commercial motorized vehicles is mandatory in all ESCAP countries. These inspections must be conducted every six months to after fifteen years. However, the major challenge is the enforcement of inspection and maintenance.

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<sup>125</sup> Muniruzzuman Hoque and Ahmed (2005). “Performance evaluation of road safety measures: a case study of the Dhaka-Aricha highway in Bangladesh”, in: *Transport and Communications Bulletin for Asia and the Pacific*, No. 74 (Special issue on road safety) (Bangkok, ESCAP, 2005), p. 33-56, ST/ESCAP/SER.E/74.

<sup>126</sup> Japan and other developed countries have also reduced accident risks through improvement of sidewalks, bicycle lanes, road lighting, etc.

Overloading is a major road safety issue in many developing countries. According to some reports, until recently most accidents in China were caused by overloading, which triggered government measures, such as stricter regulations, enforcement and support programmes, and the creation of new weigh-stations. Together, these measures have resulted in a reduction in the occurrence of overloading to about 10 per cent.

## **5. Technology, safer systems and cooperation**

Institutional and technical systems are key success factors for road safety programmes. Good qualitative and quantitative data is required for targeted policymaking and decisions regarding road safety interventions. In fact, a direct link between policy measures and data collection is needed in order to measure impacts and to decide on priorities. Yet, as indicated earlier, in many ESCAP developing countries, lack of and insufficient quality of data are serious constraints for decision-making. For example, the Asian Development Bank (ADB) and the Association of Southeast Asian Nations (ASEAN) estimate that “underreporting” in the ASEAN region was in the order of 70 per cent for road deaths and 25-fold for road accidents in 2003. In addition, it should be noted that providing public access to road safety data is very important in the decision-making process.

Various types of computerized and manual databases exist in ESCAP member countries. While only roughly half of them provide locational information, some countries have rather sophisticated data recording and analysis systems. For example, Armenia, Fiji and Nepal are using the GPS based microcomputer accident analysis package system, and Singapore and Japan are running systems that highly integrate data recording, impact and analysis functions. Initiatives in India to improve the national road accident reporting system include a pilot implementation of compatible road accident reporting systems in the southern states of India. Finally, it should also be noted that it is useful to complement police data with data from injury surveillance.

Coverage of emergency response assistance in ESCAP member countries ranges widely, from “only available in cities” to “comprehensive national coverage”. Some developing countries have recently made special efforts to improve this situation. For example, India is working to establish “traffic aid centres” at intervals of 30 to 50 kilometres.

The use of new technologies promises major road safety benefits and provides interesting leapfrogging possibilities for poorer countries. China has recently established a dedicated laboratory on road safety, and it reports major advances in its research. Japan and the Republic of Korea have worked on advanced management systems based on information and communication technology. Intelligent roads and ubiquitous transport, which integrate transport and wireless communications, can help reduce the number of road accidents. In particular, risks related to the transport of dangerous goods can be reduced using GPS-based systems that employ radio-frequency identification for tracking purposes.

However, new technologies can be used innovatively without requiring high-tech capacities. For example, it is possible to make use of collaborative tools that are freely available on the World



Wide Web. For analytic purposes, the location and nature of accidents can be easily mapped with online systems<sup>127</sup> drawing on Geographic Information Systems (GIS), satellite or aerial photography.<sup>128</sup> More generally, mobile GIS has become an efficient method for making inventory management maps. Other interesting examples of technology applications include a photo accusation system, known as caparazzi, tested in the Republic of Korea during 2001 and 2002 and the Internet based ASEAN Road Safety Network (ASNet) linking academic communities (see [www.asnet.org](http://www.asnet.org)).

## **6. Safer Asian Highway**

At the Expert Group Meeting on the Development of the Asian Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety, held in Bangkok, from 8 to 10 May 2006, measures taken to improve road safety at the national level and along the Asian Highway were considered. Some of the measures reported that specifically related to the Asian Highway are outlined below.

### *(a) Government actions*

At the expert group meeting, seven countries<sup>129</sup> reported road safety actions specifically targeting the Asian Highway as well as national trunk roads. For example, in Bhutan, additional safety features are being implemented on segments of the Asian Highway network which are being widened, in a process called double-laning, to meet the Asian Highway standard by 2010. In fact, in 2005, the majority of road accidents in Bhutan occurred along the Asian Highway. This is largely due to traffic volumes exceeding 850 vehicles per day on certain segments with a design capacity of only 100 vehicles per day. In Japan, road safety measures were implemented along the Asian Highway, including road widening in the congested areas, maintenance, and the provision of traffic information. In Nepal, special efforts have been made to provide safety barriers along the Asian Highway routes, following the recommendations of a road safety audit, and leading to a “substantial reduction in fatalities”. In Pakistan, the creation of a National Highways and Motorway Police, the National Highway Safety Ordinance of 2000, and the provision of adequate maintenance funds for highways have improved safety on the Asian Highway. In Thailand, a recent annual road safety budget covered a range of safety-enhancing engineering interventions and US\$ 50 million has been dedicated to national highways alone. In Turkey, a strategic plan and policy for improving safety on the national highways and the Asian Highway foresees measures to reduce by 40 per cent the number of casualties that have occurred due to road faults (see [www.kgm.gov.tr](http://www.kgm.gov.tr)).

### *(b) Financing road safety along the Asian Highway*

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<sup>127</sup> Examples of such systems include Google Earth, PointAsia, Geoportail and others.

<sup>128</sup> An example is the Ohio State Highway Patrol in the United States, which has begun innovative fatal crash mapping through Google Earth satellite imaging (see [www.statepatrol.ohio.gov/media/2006/06-097.htm](http://www.statepatrol.ohio.gov/media/2006/06-097.htm)).

<sup>129</sup> Bhutan, Bangladesh, India, Japan, Pakistan, Republic of Korea, Sri Lanka, Thailand and Turkey.

In terms of financing road safety along the Asian Highway, it should be noted that there have been only a few direct grants and loans from international sources in connection with road safety. For example, Nepal was a recipient of grant support from the Department for International Development of the United Kingdom of Great Britain and Northern Ireland from 1994 to 2000. Bangladesh reported having received grants/loans from international sources. Turkey has yet to receive international financial resources for road safety, but it may apply for them within the framework of the European Union Participation Partnership. While India has not received separate dedicated road safety grants from international or bilateral organizations, studies on road safety audits and policies have made up part of the loan assistance for the development of the national highways which include the Asian Highway. Most funding for road safety from international sources is covered indirectly as part of road construction, rebuilding and maintenance projects.<sup>130</sup> Against this background, the establishment of a US\$ 300 million road safety facility administered by development banks, as proposed by the Global Commission on Road Safety, may make a difference.

(c) *Asian Highway maps of traffic safety risks*

The European Road Assessment Programme (EuroRAP), an initiative of automobile associations in Europe, regularly tracks the road safety performance of national trunk roads in European countries (see [www.eurorap.org](http://www.eurorap.org)). The number of fatalities per billion vehicle-kilometres on each road segment (approximately 50 kilometres long) are shown in the form of colour-coded maps. EuroRAP also performs on-site inspection and safety ratings of the routes based on physical characteristics, in order to monitor the actual impact of making roads more forgiving. EuroRAP activities have been prominent at the highest political level in several European countries.<sup>131</sup>

In order to show the feasibility of the EuroRAP approach for the Asian Highway, the ESCAP secretariat produced similar color-coded maps for the Expert Group Meeting held in May 2006 showing the number of fatalities per billion vehicle-kilometres on segments of the Asian Highway.<sup>132, 133</sup> The data was drawn from the Asian Highway database, which includes sufficient data for 16 countries. Better and more comprehensive data and regular updates of sectional Asian Highway data would make it possible for the secretariat to regularly produce updated maps and to track progress. For example, it would allow tracking risk rates within and across countries for similar types of roads with similar levels of traffic.

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<sup>31</sup> See, for example, the current World Bank portfolio of road projects at <http://www.worldbank.org/projects>.

<sup>131</sup> For example, French President Jacques Chirac supported the publication of the EuroRAP risk rate map for France and declared that “we owe the French people the truth about where accidents occur” (see <http://217.174.251.13/library/pdfs/conferences/151003.pdf>).

<sup>132</sup> The Asian Highway database includes data on the number of accidents as well as the number of fatalities for each segment. It should also be noted that the length of segments specified in the Asian Highway Agreement is not that different, on average, from the average length of route segments in EuroRAP (roughly 50 kilometres).

<sup>133</sup> The performance maps are directly comparable with the maps produced by EuroRAP, since the same scale was used: Low (0-15), Low-Medium (15-61.6), Medium (61.6-106) Medium-High (106-180), High (>180), in term of fatalities per billion vehicle-kilometres.

## 7. Safety benefits of modal shifts

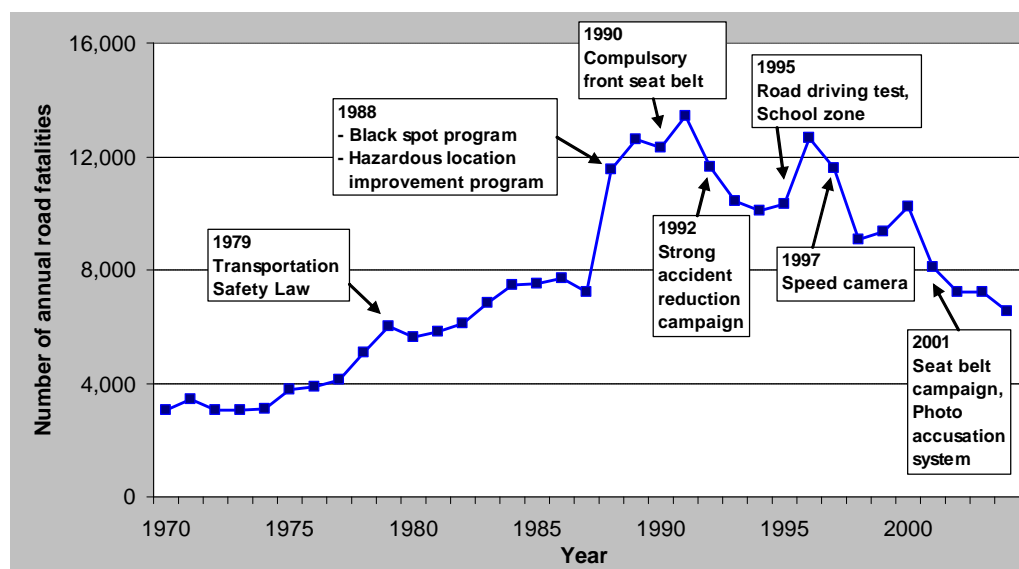
Significant benefits in terms of improving road safety may also be achieved by encouraging a modal shift from road to rail. For example, according to Swiss estimates, for an average tonne kilometre moved, the average cost of accidents is roughly six times higher for road freight than for to rail freight.<sup>134</sup> A non-governmental organization in the United Kingdom has estimated that one is nine times more likely to be killed travelling by private car and 2.5 times more likely by air, than travelling by railway.<sup>135</sup> These ratios depend on the country-specific situation and are likely to be higher in developing countries than in developed countries. This is increasingly being recognized by Governments in the region which are strengthening public passenger transport and increasing the share of railway freight.

## 8. Multisectoral approach

In practice, each country will need to address a combination of all the intervention areas listed above, and priorities will change over time. The examples of Australia, Japan, the Republic of Korea, Singapore and Malaysia illustrate that long-term success in improving road safety relies on prioritizing interventions based on good monitoring of changing developments on the roads.

For example, in the Republic of Korea, a succession of targeted interventions following rapid motorization included programmes on black spots, improvement of hazardous locations, compulsory seat belt use, national road safety campaigns, speed cameras and a photo accusation system, has resulted in respective reductions in the number of road deaths (see Figure 7).

**Figure 7: Number of road fatalities and counter-measures in the Republic of Korea, 1970-2000**



Source: Republic of Korea, Ministry of Construction and Transportation "Report about Korea national road safety", presentation given at the ESCAP Expert Group Meeting on the Development of the Asian Highway Network, held in Bangkok from 8 to 10 May 2006.

<sup>134</sup> M. Maibaich, C. Schreyer, M. Lebkuechner, S. Mauch, *Zukunftsgüterbahn* (Bern, 1998).

<sup>135</sup> Friends of the Earth, "Why travelling by rail is better for the environment" (fact sheet), 2002 (available at [www.foe.co.uk](http://www.foe.co.uk)).

Similarly, Japan has implemented a succession of five-year fundamental traffic safety programmes since 1971. The programmes included many interesting government initiatives, such as improvement of sidewalks, bicycle lanes, road lighting, along with child seat requirements, and severe punishment for drunk driving. Together these have led to an impressive road safety record.

Singapore's comprehensive road safety action plan, 2004-2008, covers 14 sectors. It includes a computerized traffic accident analysis system, black spot programmes, accident investigation, road safety audits, and road safety consultations. By 2005 the plan had achieved a low fatality rate of 2.3 people per 10,000 registered vehicles.

In Viet Nam, the number of people killed or injured in road accidents increased rapidly until 2002. Thereafter, despite a high rate of motorization, roughly 10 to 12 per cent per year, the number of road accidents and injuries has declined dramatically. This was due to a number of decisive and comprehensive measures taken by the Government of Viet Nam that were geared to mobilize a large number of citizens in road safety efforts.

### **C. Country experiences**

National updates and more specific information pertaining to the Asian Highway Network were reported by participants of the EGM on improving road safety on the Asian Highway (21-22 June 2007). These are briefly summarized in this Section.

#### **1. Afghanistan**

Major road safety issues in the Islamic Republic of Afghanistan include sub-standard road infrastructure, lack of funds, insufficient capacity and resources for the road traffic police and the Ministry of Health, as well as enforcement issues. Last year the number road crashes increased by less than one percent, basically in line with the increased number of road vehicles. Support is required from donors to improve road safety, in particular through safety engineering measures along the Asian Highway Network, as well through support to the traffic police (e.g., training of officers and provision of equipment).

#### **2. Armenia**

Major road safety issues in the Republic of Armenia are insufficient allocation of funds for improving road safety and the recent increase in the number of accidents by 12 percent per year from 2004 to 2006. Several critical safety measures have been successfully initiated or undertaken, including (a) the accident data collection and analysis system, (b) the MAAP-5 computerised program for black spot analysis, (c) procurement of breathalyzers for enforcement purposes, (d) the establishment of the Road Safety Secretariat in 2001, (e) carrying out of road safety audits, and (f) the planned joint IRAP (International Road Assessment Programme) assessment of 1,000 kilometres of the Asian Highway, including AH81, AH82, and AH83.

### **3. Azerbaijan**

In 2005, the Department of Transport set up a division for road safety which is comprised of two sections, one for organization of traffic and the other for environment and safety. These authorities together with local officials and the operational departments monitor road safety measures. Most recently, road shoulders were reinforced, curb beams and balustrades installed, as well as road signs improved. Costs of accidents are calculated monthly and the causes are investigated by traffic police and the road maintenance authority.

### **4. Bangladesh**

While the number of road fatalities per 10,000 vehicles has declined from 137 in 1998 to 98 in 2005, the absolute number of fatalities remained at a very high level. The government's vision is to halve the number of fatal road accidents in fifteen years. While a basic accident reporting system provides accident data by type of accident, a better data system would improve the allocation of scarce funds for improving road safety. Recently, a special Highway Police force was established, as well as the creation of advanced driver training institutes and the Accident Research Center at the Bangladesh University of Engineering and Technology.

### **5. Cambodia**

In 2004, a National Road Safety Action Plan was approved by the Prime Minister. It includes 15 action points which are fully in line with the priority areas indicated in the ESCAP Ministerial Declaration on Improving Road Safety in Asia and the Pacific. The action points have a strong focus on budgeting issues and building of partnerships, in particular with Handicap International Belgium and the Japanese International Cooperation Agency. The government of Cambodia is working on improving the road safety data system in order to better monitor progress including for Cambodia's ASEAN target of reducing the number of fatalities to 7 per 10,000 vehicles by 2010 and 2 per 10,000 vehicles by 2020, compared to 18 fatalities per 10,000 vehicles (or 1,157 fatalities) in 2006.

### **6. China**

The People's Republic of China has a road network of 3.5 million kilometers, and 145 million road vehicles. The four key road safety issues are reported to be safety consciousness, vehicle safety, hidden dangers on highways, and effective traffic safety management. Recently, major progress has been made in: (a) reducing the safety hazard of overloading, (b) road improvement through the National Highway Safety Enhancement Project (which will run until 2010), (c) provision of road safety education, and (d) the development of road safety audit processes. The goal of these measures is to continue reducing the number of road fatalities after a peak in 2004.

### **7. Democratic People's Republic of Korea**

Significant efforts are reported in terms of promoting road safety, such as through (a) a legal framework and enforcement rules for traffic offences, (b) public awareness campaigns through mass

media, (c) black spot treatment and road engineering measures for highways (in design and construction stages). However, remaining challenges include law enforcement issues, insufficient resources for road safety, and improving existing road safety strategies. There are plans to improve in these areas by engaging in international collaboration, by developing a road safety strategy compliant with international goals, by enhancing road safety related IT infrastructure, and by further improving the Asian Highway Network to become a model of road safety in line with the ESCAP Ministerial Declaration.

## **8. India**

While the road fatality rate per 10,000 vehicles has decreased, the absolute number of accidents, injuries and fatalities continues to increase. In 2005, 94,968 road fatalities were reported. However, many successful road safety activities are being reported in the areas of infrastructure, education, enforcement and vehicle safety. In February 2007, the Committee on Road Safety and Traffic Management recommended the establishment of a road safety body at the federal level (“National Road Safety & Traffic Management Board”) which will provide advisory services to the government and serve as regulator setting standards for vehicles and national highway safety. It also recommended an enabling provision for creation of similar State level bodies and recommended that 1 percent of the total proceeds of the cess on diesel and petrol to be available to the Road Safety Fund.

## **9. Indonesia**

Following the Presidential Direction and Instruction provided on the occasion of the National Road Transport Safety Week in Indonesia in April 2007, a number of important road safety measures have been initiated. These include: (a) establishment of a designated lead agency, the Road Transport Safety Board, and Accident Investigation Units; (b) formulation of a road safety blueprint; (c) exploring road safety financing through increased third party insurance premiums; (d) creation of an inter-agency safety information system; (e) early safety education (through a “Helmet for Kids” campaign, “ZoSS”-zones for secure road crossing at schools, and preparation of road safety school curricula); (f) national road safety awareness campaigns. The Road Transport Safety Strategy 2012 includes targets to reduce the number of fatalities per 100,000 people to 11 and the number of serious injuries per 100,000 citizens to 187.

## **10. Islamic Republic of Iran**

Road safety actions are taken within the context of the five-year development plan which aims to halve the number of black spots. A major achievement of the “Statewide Roadway Safety Commission” has been to halt the increase in the number of road fatalities through a combination of engineering, enforcement, education, emergency and evaluation (“5E-approach”). Measures also focus on speed management, roadway immunisation (includes black spot reduction), awareness-raising radio programmes, and rescue equipment for hospitals. The performance of measures is regularly evaluated. Support for a road safety programme is received from the World Bank.

## **11. Japan**

While the number of accidents reached a peak of 950,000 in 2004, the number of fatalities has decreased continuously since 1992 to 6,352 in 2006. Since 1971, a series of so-called “fundamental five-year programmes” have successfully achieved increasingly ambitious road safety targets. Some measures aim to shift traffic from general roads to access controlled expressways, as the fatality rate on the latter is less than one third of that on other roads. Other measures include road improvement, a black spot programme, junction improvements, traffic calming in residential areas, the use of the ITS technology, an advanced data collection and analysis system, and the establishment of the Institute for Traffic Accident Research and Data Analysis in 1992. Japan continues to be one of the world’s most important sources of ODA for improving road safety.

## **12. Lao People’s Democratic Republic**

While the number of road fatalities per 10,000 vehicles has been declining, the absolute number of road fatalities continues to increase. In 2005, some 4,619 accidents were reported, of which 84 percent involved motorcycles. In April 2005, a national road safety strategy and an action plan were approved by the Prime Minister. The road safety strategy includes targets to reduce the number of fatalities per 10,000 vehicles to 8 by the year 2010, to 5 by 2015 and to 2 by 2020. The comprehensive action plan, which was developed with support from ADB and SIDA, contains actions to be implemented in 15 areas.

## **13. Malaysia**

While the number of road fatalities has remained roughly constant for the last four years, a considerable increase in fatalities is expected in the coming years, despite significant road safety measures. The National Road Safety Target (which was reviewed in 2005) aims to halve the current fatality rates of 3.98 per 10,000 vehicles and 23.6 per 100,000 people by 2010. A series of measures are being carried out in the areas of education, engineering, enforcement and environment (“4E concept”), and targets road users, roads, vehicles, and systems management. Under a special programme initiated in 2000, fifteen exclusive motorcycle lanes outside urban areas have been constructed. A pilot project to assess 3,000 kilometres of road with support from the International Road Assessment Programme has also attracted much attention internationally.

## **14. Mongolia**

Nearly two thirds of the all road crashes in Mongolia occur in and around Ulaanbaatar, where the majority of the population and road vehicles are concentrated, as indicated by a recent traffic and road accident study. In contrast to the countryside, in Ulaanbaatar the traffic density, capacity and traffic related air pollution already exceed acceptable levels. Despite the growing vehicle fleet, it has been possible to reduce the number of road crashes and registered traffic offences since 2000. The leading cause of road crashes in Ulaanbaatar is irresponsible road user behaviour, including

encroachment on road space and illegal parking. Thus, special efforts are being made to improve road safety education and promote stricter enforcement.

### **15. Nepal**

Nepal has one of the highest road fatality rates in the world which is due to a number of factors including the mountainous terrain. The number of reported road fatalities has decreased since 2003. Most of the road fatalities are pedestrians and motorcyclists, particularly in Kathmandu valley. However, on the highways outside Kathmandu most accidents and fatalities involve buses and trucks. In 1993, the first traffic safety legislation was adopted which was followed by the development of a road safety strategy. Road safety audits have been carried out and safety awareness campaigns and education initiatives have been undertaken. The strategy to improve road safety aims for safer people, safer vehicles, safer roads, and safety management.

### **16. Pakistan**

Key road safety challenges include lack of awareness, institutional capacity, inadequately trained staff and limited financial resources. Recently, a national road safety secretariat was established which is developing the first national road safety plan. Also, a draft transportation policy and a driver's education plan were developed. Institutional capacity building, safety of vulnerable road users, road safety audits and the establishment of a road safety fund are current priorities.

### **17. Republic of Korea**

With a series of targeted road safety measures based on comprehensive data collection and analysis for the past two decades a decreasing road fatality rate was achieved despite continuing rapid motorization. Measures included significant increases in the road safety budget, black spot programmes and road improvement, better enforcement, zoning, awareness and education campaigns, as well as experiments with a photo accusation system ("caparazzi"=camera + paparazzi).

### **18. Singapore**

While the number of road crashes and pedestrian fatalities have declined, the high share of motorcyclist fatalities remains a concern. The Land Transport Authority, Traffic Police and the National Safety Council are responsible for the implementation of the national road safety strategy and the five-year road safety action plan which includes measures in the areas of encouragement, engineering, education, enforcement and emergency preparedness. A major event was organized on occasion of the 1st United Nations Global Road Safety Week in April 2007, and a programme by the traffic police to provide road safety advice to motorcyclists rather than to fine them has received positive feedback.

### **19. Sri Lanka**

There are more than 2 million road vehicles with a motorcycle share of roughly 50 per cent in Sri Lanka. In 2005, 43,171 road crashes were reported of which 2,141 were fatal. The 5 per cent share



of fatal crashes indicates a relatively good data reporting system compared to many developing countries. Road safety measures are detailed in the Cabinet approved Action Plan for Road Safety that follows the 4E approach and includes, inter alia, a black spot programme, driver training, children education, vehicle inspection, public awareness creation and law enforcement. Notable activities were reported on the occasion of the 1st United Nations Global Road Safety Week in April 2007. Financing through a road safety fund is being explored which would draw on a share from insurance premiums.

## **20. Tajikistan**

From 2005 to 2006, the number of road crashes, injuries and fatalities in the Republic of Tajikistan has decreased by 13, 15, and 10 percent, respectively. This is attributed to various road safety measures, including (a) public awareness campaigns through mass media (TV, print media and others) including some aimed at the kindergarten-level; (b) decrees on mandatory vehicle check-ups; (c) a decree on the creation of a Public Board on Road Safety for coordination purposes which is headed by the First Deputy Minister of Transport; and (d) comparatively high level of investments in road safety projects. To date, Tajikistan has implemented four such projects amounting to US\$ 86 million and is currently preparing several projects at the additional cost of US\$ 468 million.

## **21. Turkey**

The major share of passenger and freight transport in Turkey is by road and most of these roads are single carriageway. Over the past 15 years, the number of motorized vehicles has more than doubled and the total number of road casualties has increased accordingly. Around 80 percent of the road crashes occur in urban areas, whereas two thirds of the road fatalities occur in rural areas. Existing road safety targets for the period 2007-2013 focus on infrastructure design. For example, the Government is constructing dual-carriageway roads, undertakes a black-spot programme and engages in cooperation for safe road design.

### **D. Status of road safety on the Asian Highway Network**

The Asian Highway Project was initiated in 1959 by ECAFE (which was later renamed ESCAP). It now comprises more than 140,000 kilometres of trunk roads passing through 32 ESCAP member states. On 4 July 2005, the Intergovernmental Agreement on the Asian Highway network entered into force. The Agreement established a Working Group. The ESCAP Secretariat acts as secretariat for the agreement and also maintains an Asian Highway database.<sup>136</sup> The main obligations of the contracting parties to the Agreement<sup>137</sup> are to: (a) adopt the Asian Highway network as a coordinated plan for the development of highway routes of international importance; (b) bring the network in conformity with the Asian Highway classification and design standards; and (c) place Asian Highway routes signs along the network. Parties to the Agreement have also made a formal commitment to “*give full consideration to issues of road safety*”.

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<sup>136</sup> <http://www.unescap.org/ttdw/common/tis/ah/Database.asp>

<sup>137</sup> <http://www.unescap.org/ttdw/common/tis/AH/AH-Agreement-E.pdf>

Much progress has been made in the development of the Asian Highway Network. The ESCAP Secretariat estimates that last year alone around \$170 billion was invested on Asian roads, with more than US\$ 20 billion being committed to the Asian Highway Network.<sup>138</sup>

In line with the prevailing export and growth-focused development paradigms that are being pursued by many governments in the ESCAP region, they have invested particularly in trunk roads including the Asian Highway Network. While roads have been upgraded and built safer, traffic levels have increased rapidly, too, and the continent now has the worst road safety record in the world. Last year more than half a million people were killed and 20-30 million injured in road crashes in Asia and the Pacific, at an economic cost of some \$100 billion (including indirect costs).

The *Ministerial Declaration on Improving Road Safety in Asia and the Pacific*, inter alia, invites ESCAP members to “develop the Asian Highway as a model of road safety”. As a first step, the secretariat recently conducted an analysis of the road safety data contained in the latest version (May 2006 update) of the Asian Highway database, the results of which are reported here.

In terms of data coverage, fatality and accident data are available and appeared to be of “reasonable” quality for 31 percent of the Asian Highway length, including 521 road segments (or 39 percent of all segments) covering 43,432 km in 20 countries (Table 14).

For the latest available years respectively, a total of 5,970 fatalities and 38,812 accidents were reported on the Asian Highway, i.e., approximately one fatality per seven reported accidents. Consequently, the Secretariat estimates that at least 19,000 fatalities and 125,000 accidents occurred on the more than 140,000 kilometres of Asian Highway Network in 2006<sup>139</sup>. This implied an average rate of 37 fatalities per billion vehicle-km, as well as a rate of 14 fatalities per 100 km.

While the number of fatalities per 100 km was larger for the Asian Highway compared to the roughly 4 fatalities per 100 km for all roads in ESCAP region, the Asian Highway appears safer than the average road when the number of fatalities per traffic volume is considered. In fact, most segments of the Asian Highway are safer than other roads in the region.

However, some segments of the Asian Highway show worrying safety records (Table 1, two columns on the right), including roughly 10 percent of the length of the Asian Highway where more than 100 fatalities per billion vehicle-kilometres were registered.<sup>140</sup> Improving these segments would go along way in improving overall safety records and saving many lives every year.

There is evidence that the average safety record of the Asian Highway has slightly improved from 2005 to 2006.<sup>141</sup> Improved Asian Highway safety in many countries has been linked to

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<sup>138</sup> This number is not an *annual* number, but spread over the whole life-time of projects.

<sup>139</sup> This considers potential fatalities and accidents on the segments for which no data were included in the database, but does *not* make adjustments to account for general underreporting of accidents.

<sup>140</sup> The 10 percent refers to a share of segments for which safety data are available, i.e., 4,643 km.

<sup>141</sup> Improved data are needed to firmly establish this statement. Compared to the 2005 version, the 2006 database included new safety data for 9 countries, had a better data coverage, and better data quality.

upgrading of roads, particularly when it involved the construction of separating barriers (for different direction of traffic and for separating different types of vehicles) and improvement of road shoulders.

**Table 14: Road safety data for the Asian Highway Network. Source: Asian Highway Database, July 2007.**

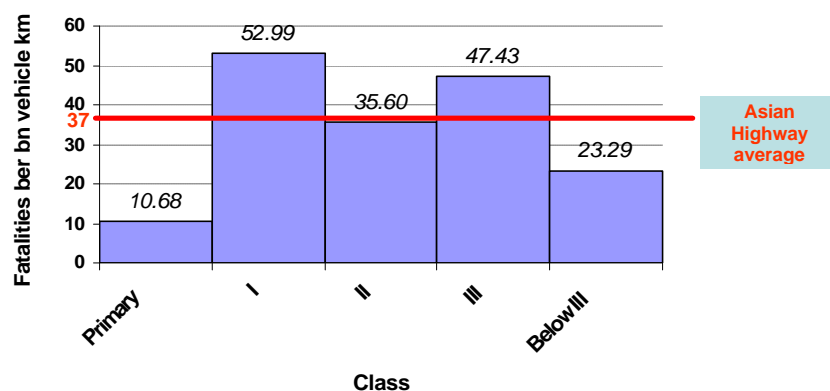
Country	Asian Highway segments		Data availability		Absolute safety data for the AH		Safety rates for the Asian Highway		Segments with worst safety record	
	Average length of Asian Highway segments [km]	Total length of Asian Highway [km]	Length of network for which fatality data available [km]	Proportion of Asian Highway network length for which fatality data available [%]	Number of fatalities per year	Number of accidents per year	Reported number of fatalities per billion vehicle-km per year	Reported number of fatalities per 100 km per year	Highest number of fatalities per billion vehicle-km	Proportion of segments with more than 100 fatalities per billion vehicle-km
Afghanistan	137	4,246	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Armenia	39	966	966	100%	96	259	66.3	9.9	421	28%
Azerbaijan	54	1,462	1,105	76%	148	374	38.0	13.4	220	7%
Bangladesh	43	1,760	1,066	61%	425	284	133.3	39.9	414	34%
Bhutan	21	167	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Cambodia	61	1,332	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
China	158	26,181	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Democratic People's Republic of Korea	162	1,462	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Georgia	44	1,101	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
India	89	11,650	1,851	16%	2450	2465	146.6	132.4	811	5%
Indonesia	46	3,936	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Islamic Republic of Iran	123	11,153	11,006	99%	655	6062	18.2	6.0	170	2%
Japan	51	1,111	1,111	100%	68	9176	3.3	6.1	11	0%
Kazakhstan	138	12,856	7,508	58%	213	560	29.4	2.8	219	3%
Kyrgyzstan	65	1,695	1,100	65%	32	130	43.0	2.9	989	19%
Lao People's Democratic Republic	85	2,306	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Malaysia	42	1,595	821	51%	234	8149	27.4	28.5	92	0%
Mongolia	102	4,286	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Myanmar	91	3,003	386	13%	16	118	140.1	4.1	199	9%
Nepal	82	1,314	1,236	94%	365	1612	335.1	29.5	713	75%
Pakistan	91	5,377	358	7%	20	162	34.9	5.6	51	0%
Philippines	73	3,367	1,646	49%	73	242	36.5	4.4	170	2%
Republic of Korea	45	907	483	53%	38	760	10.9	7.9	70	0%
Russian Federation	254	17,046	2,510	15%	0	689	0.0	0.0	0	0%
Singapore	10	19	19	100%	7	197	11.7	36.8	14	0%
Sri Lanka	33	650	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Tajikistan	101	1,924	1,137	59%	36	106	22.2	3.2	133	5%
Thailand	48	5,108	4,377	86%	365	2593	9.7	8.3	107	1%
Turkey	66	5,245	4,076	78%	485	4269	45.6	11.9	1,002	11%
Turkmenistan	110	2,204	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
Uzbekistan	78	2,966	670	23%	244	605	79.2	36.4	1,925	5%
Viet Nam	64	2,631	0	0%	n.a.	n.a.	n.a.	n.a.	n.a.	0%
<b>All Asian Highway countries</b>	<b>96</b>	<b>141,026</b>	<b>43,432</b>	<b>31%</b>	<b>5,970</b>	<b>38,812</b>	<b>36.8</b>	<b>13.7</b>	<b>1,925</b>	<b>10%</b>

Figure 8 summarizes the average number of fatalities per billion vehicle kilometre for each of the Asian Highway classes (Table 15). Roads of class I, II and III with rapidly increasing mixed traffic and with high motorcycle shares show the worst safety record. In fact, the lower average fatality rate for class II is due to a selection bias, as for most countries where class II segments of the Asian Highway exist and safety data is available, roads of class II tend to show a worse safety record than roads of other classes in the country. Most importantly, there remain large spreads across countries and within countries, even for roads of the same class and same traffic levels (Table 14).

**Table 15: Asian Highway classification. See the text of the Agreement for design standards.** <sup>142</sup>

Classification	Description	Pavement type
Primary	Access-controlled highways	Asphalt or cement concrete
Class I	4 or more lanes	Asphalt or cement concrete
Class II	2 lanes	Asphalt or cement concrete
Class III	2 lanes	Double bituminous treatment

**Figure 8: Average fatality rates for each Asian Highway class. Source: Asian Highway database.**



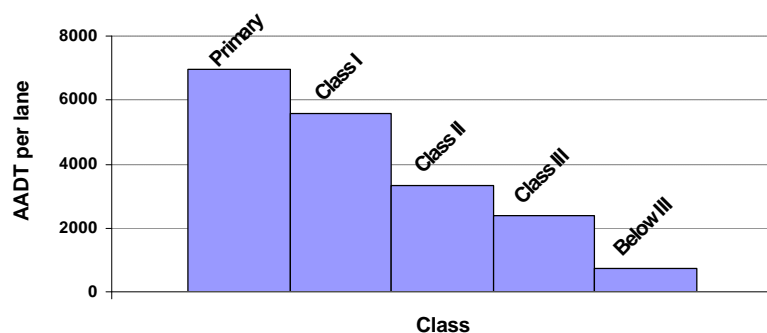
However, class I and primary roads also support higher speed and larger volumes of traffic per lane (Figure 9). Even when these higher volumes of traffic are taken into account and particularly when looking at specific country examples, upgrading of Asian Highway segments to class I and particularly (access-controlled) primary roads has significant safety benefits.

In contrast to what Figure 8 might suggest, upgrading Asian Highway segments of class III and below III does not necessarily lead to worse safety records. If road safety is fully taken into account in the process of upgrading these roads, there is indicative evidence that the overall safety record can be improved significantly and in a sustainable manner. Unfortunately, in the past safety elements were among the first components of the road projects to be scrapped due to very limited resources and despite the large social returns on safety investments and the marginally increased funding requirements. Against this background, since early this year the ESCAP Secretariat has started to promote the inclusion of road safety components into the road projects on the list of 159 “priority” Asian Highway projects<sup>143</sup> (many of which are class III or below III), through joint missions with IDI-Japan to Myanmar, Nepal, Armenia and Bangladesh. Hopefully, this work will be continued with IDI and other partners in the future.

<sup>142</sup> <http://www.unescap.org/ttdw/common/tis/AH/AH-Agreement-E.pdf>

<sup>143</sup> ESCAP (2006).

**Figure 9: Average annual daily traffic (AADT) per lane for each Asian Highway Class. Source: Asian Highway database.**



In view of the large spread of fatality rates within countries, even for roads in the same class and with similar traffic levels, simple road assessment can be a useful instrument for prioritizing safety investments, even where national safety data reporting systems are of low quality. In line with ESCAP Resolution 63/9 on the “Implementation of the Busan Declaration on Transport Development in Asia and the Pacific and the Regional Action Programme for Transport Development in Asia and the Pacific, phase I (2007-2011)” which requests the Secretariat to explore the use of colour-coded maps that illustrate the safety risk on each Asian Highway segment, similar to the practise of the International Road Assessment Programme, the secretariat created an initial set of such maps.<sup>144</sup> However, special efforts will be needed to collect better quality Asian Highway road safety data.

#### **E. Best practises: From regional goals to national plans, financing or road safety, and road assessment**

This Section reviews the regional ESCAP goals, targets and indicators and discusses possible ways of financing national road safety initiatives, as well as methodologies that can help in the optimal allocation of scarce resources in this respect. The following essentially reports on the deliberations of the *Expert group meeting on improving road safety on the Asian Highway* held in Bangkok from 21 to 22 June 2007.

##### **1. ESCAP road safety goals, targets and indicators (2007-2015)**

While the eight ESCAP goals were already included in the Ministerial Declaration, the Expert Group Meeting (EGM) recommended a modified set of targets and indicators which is reproduced in Table 16.

<sup>144</sup> [http://www.unescap.org/ttdw/common/tis/ah/egm\\_may06.asp](http://www.unescap.org/ttdw/common/tis/ah/egm_may06.asp)

Table 16: Set of ESCAP road safety goals, targets and indicators for 2007-2015.

UNESCAP Road Safety Goals of Asia and the Pacific, 2007-2015	
Goals and Targets	Indicators for monitoring achievements
<b>Overall Objective: Saving 600,000 lives and preventing a commensurate number of serious injuries on the roads of Asia and the Pacific over the period 2007 to 2015</b>	
a) Reduce the fatality rates by twenty percent from 2007 to 2015 (or reduce it to less than 10 per 10,000 motor vehicles by 2015).	1) Number of road fatalities (and fatality rates per 10,000 motor vehicles, per motor vehicle-km and per passenger-km). 2) Number of anticipated road fatalities (baseline). 3) Number of road crashes. 4) "Fleet safety records" of public or private organizations (e.g., deaths per 100,000 km).
b) Reduce the rates of serious road injuries by twenty percent from 2007 to 2015.	5) Number of anticipated serious injuries on roads (baseline). 6) Number of serious road injuries (and injury rate per 10,000 motor vehicles, and per motor vehicle-km).
<b>Goal 1: Making road safety a policy priority</b>	
a) Create a road safety policy/strategy, designate a lead agency and implement a plan of action, by 2010.	7) Documents of road safety policy, strategy, and plan of action etc. Information on their actual implementation. 8) Name of designated lead agency. Description of responsibilities of local, regional and national government organizations. 9) National road safety reports or impact evaluation reports of government programmes.
b) Allocate sufficient financial and human resources to improving road safety.	10) Amount of public financial and human resources allocated to road safety. 11) Amount of private sector contributions, as well as special funds, from donors, or relevant financial institutions. 12) Road safety programmes and activities conducted. At least one major national road safety campaign.
<b>Goal 2: Making roads safer for vulnerable road users, including children, senior citizens, pedestrians, non-motorized vehicle users, motorcyclists, and persons with disabilities</b>	
a) Reduce by one third the pedestrian death rate in road crashes (or reduce it to less than 1 per 10,000 motor vehicles).	13) Pedestrian deaths per head of population and per 10,000 motor vehicles.
b) Increase the number of safe crossings for pedestrians (e.g., with subway, overhead crossings or traffic signals).	14) Number of safe crossings, or information on programmes for constructing or improving crossings.
c) Make the wearing of helmets the norm and ensure minimum helmet quality, in order to reduce the motorcyclist death rate by one third (or reduce it to below the average motorcyclist death rate of the ESCAP)	15) Motorcyclist deaths and motorcyclist death rate. 16) Law or administrative rule (Yes/No). (Survey) information on helmet use (percentage) and minimum helmet quality standards.
d) Ensure minimum child safety measures, in order to reduce the child death rate by one third (or reduce it to less than 0.01 per 10,000 motor vehicles).	17) Death rate of children less than 5 years in road crashes. 18) (Survey) information on the following of child safety norms (e.g., child restraints) (percentage). 19) Existing measures for child safety in cars and on motorcycles (qualitative indicator).
e) Equip all school children with basic road safety knowledge.	20) Road safety education part of the school curriculum (Yes/No). 21) Existing education programs on road safety (qualitative indicator).
<b>Goal 3: Making roads safer and reducing the severity of road crashes (building "forgiving roads")</b>	
a) Integrate road safety audit in all stages of road development starting at the design stage, carry out necessary improvement works, and improve hazardous locations.	22) Road safety audit programme (Yes/No); Blackspot programme (Yes/No) 23) Extent to which road safety audits are carried out for new road construction and major improvements (estimated share of all cases). 24) Programmes to make roads "forgiving" by removing or cushioning roadside obstacles.
b) Increase separate/secure road space for pedestrians and cyclists in urban and peri-urban areas (where space permits)	25) National or local programmes. Existing length of pedestrian and bicycle tracks in kilometres per 100,000 people (along highways and city roads).
<b>Goal 4: Making vehicles safer and encourage responsible vehicle advertising</b>	
a) Make regular inspection of road vehicles mandatory and ensure enforcement of inspection (starting in urban areas).	26) Law or administrative rule (document). Information on vehicle inspection facilities and organizations (qualitative).
b) Ensure safety requirements for new vehicles to be in line with international standards.	27) Documents specifying laws and regulations and implementation.
<b>Goal 5: Improving national and regional road safety systems, management and enforcement</b>	
a) Implement a national (computerized) database that provides information on the location of road crashes.	28) Yes/No indicator. If yes, which database system and responsible organizations (qualitative indicator). 29) Country coverage of the regional APRAD database.
b) Significantly increase "compliance", e.g., with mandatory helmet, seat-belt wearing and speed limits.	30) Information on rules and "compliance" on helmet wearing levels (percentage from surveys). 31) Information on rules and "compliance" on seat-belt wearing levels (percentage from surveys). 32) Information on rules and "compliance" related to "drinking and driving" (information from surveys not prosecutions).
c) Allow alcohol tests for prosecution (either breathalyzer and/or behavioural tests).	33) Yes/No. If yes, description of existing rules, types of tests and alcohol limits used and allowed for prosecution.
d) Make it the norm to keep motorbike front-lights on at all times.	34) Law or administrative rule (document). Description of existing practises (from survey) or technical measures.
e) Increase coverage of emergency assistance systems for road victims, to cover at least all urban areas and trunk roads.	35) Kilometres of road (by type) on which emergency services are provided. 36) Average response time. 37) Number of emergency service centres per length of highways (except city roads).

<b>Goal 6: Improving cooperation and fostering partnerships</b>	
a) Encourage and recognize private-sector sponsored initiatives.	<b>38)</b> Number of major private sector initiatives. (Financial) volume of commitments.
	<b>39)</b> Number of major public-private partnerships in the area of road safety. (Financial) volume.
b) Create new and deepen existing partnerships with NGOs.	<b>40)</b> Number of major private sector initiatives. (Financial) volume of commitments.
<b>Goal 7: Developing the Asian Highway as a model of road safety</b>	
a) Reduce the total number of fatalities and road crashes on the Asian Highway.	<b>41)</b> Total number road fatalities and road crashes on the Asian Highway in each country per year.
b) Reduce the number of fatalities on <i>all</i> Asian Highway segments to below 1,000 per 100 million vehicle-kilometres.	<b>42)</b> Number of fatalities per 100 million vehicle-kilometres for each Asian Highway segment per year.
c) Increase resource allocation for road safety-related measures along the Asian Highway.	<b>43)</b> (Financial and human) resources allocated for safety-related works for Asian Highway segments.
	<b>44)</b> Amount of safety-related grants and loans for Asian Highway segments from international sources.
d) Improve Asian Highway road segments to be forgiving to road users if a crash occurs. Demonstrate best practise.	<b>45)</b> Develop a road safety rating program.
<b>Goal 8: Providing effective education on road safety awareness to the public, young people and drivers</b>	
a) Carry out targeted awareness campaigns and training programs	<b>46)</b> Information on awareness campaigns and training programs carried out

In this context, it should be noted that the set contained in Table 16 is consistent and supported by the existing national and subregional road safety goals and targets that have emerged recently. The set includes the recommendations of the 2004 WHO report on road safety, in line with the recommendations contained in UN General Assembly Resolution 63/5. The set also extends key elements of the ASEAN road safety framework including national and regional goals for 2005-2010 as agreed in the ASEAN Phnom Penh Ministerial Declaration of 2004. Furthermore, at least 25 ESCAP members have quantitative and qualitative road safety targets that are compatible with the ESCAP set contained in Table 16. These include Armenia, Australia, Bhutan, Brunei Darussalam, Cambodia, France, India, Indonesia, Japan, Kazakhstan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, Netherlands, New Zealand, Philippines, Russian Federation, Singapore, Thailand, Turkey, United Kingdom, United States of America, Viet Nam (see Table 13). The targets aim for reductions in absolute, relative or projected terms, the extent of which appears to depend more on the level political commitment than other factors.

In response to the ESCAP Ministerial Declaration, some ESCAP governments are reportedly considering national road safety targets specific to Asian Highway segments in their country. For example, the road safety plan of the Republic of Korea includes a 30 percent reduction in the number of people killed and the number of crashes on the Asian Highway.

The Expert Group Meeting (21-22 June 2007) provided support for the further “formalization” of the set of goals, targets and indicators through the Commission. It also emphasized the need for continued support to ESCAP members for the implementation of the declaration, as well as for collection and analysis of better road safety data for the Asian Highway.

## **2. Financing safer road infrastructure**

The most basic and prevailing constraint for many ESCAP members in achieving the ESCAP and national goals is the insufficient amount of resources available.

(a) *Developing road safety plans*

The case of the development of a road safety strategy including resources issues for New South Wales, Australia was discussed at the EGM.<sup>145</sup> The strategy was formulated and a target defined to save 2,000 lives by 2010. By treating roads as “products” to be delivered to the citizens, staff in charge of road safety took on their role as “road managers”, being aware of complementing as well as conflicting objectives (e.g., between road safety and maintenance). The strategy also noted that Inter-ministerial, inter-organisational and private-public partnerships proved essential, including the promotion of financial links between the road safety lead agency and other organizations, for example, joint actions with educational institutions. The Australian Road Research Board (ARRB) recommends financing of road safety at a level of roughly three to ten per cent of the overall budget for roads. It also proposes additional sources such as (a) a one to two per cent levy on compulsory 3rd party accident insurance which could be appropriated to prevention and rehabilitation funds; (b) sponsorships, especially for campaigns and community projects; (c) community activities financed by other institutions.

(b) *Global Road Safety Facility and other external donors*

Support from bilateral and multilateral donors has been of great importance to some ESCAP developing and least developed countries. While such resources dedicated to road safety have been rather limited in the past, the recent creation of the Global Road Safety Facility has created considerable hope for an improvement in this situation.

The Global Road Safety Facility (GRSF), administered by the World Bank, provides funds for road safety actions with a basic focus on capacity building and management<sup>146</sup>. Founding donors were the FIA Foundation for the Automobile and Society; the Government of the Netherlands; the Swedish International Development Cooperation Agency (Sida); and the World Bank Development Grant Facility. The goals of the facility for low and middle-income countries are: (a) to strengthen global, regional and country capacity to support sustainable reductions in road deaths and injuries; (b) to increase road safety investment; (c) to accelerate safety knowledge transfer; (d) to promote innovative infrastructure solutions to improve the safety of mixed traffic environments. National agencies, as well as global and regional partners can apply on a continuous basis. It should be noted, though, that the fund has not reached its original target of attracting donor funds amounting to some US\$ 300 million. Special donor efforts will be required to achieve this target.

Even if the target were met, its amount would be small compared to the approximately US\$ 10 billion per year that would be required for improving road safety in the ESCAP region, according to estimates by the Secretariat. This compares to annual costs of road crashes in the region of roughly US\$ 100 billion, which illustrates the economic case for preventive action. In fact, most current

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<sup>145</sup> The case was reported by a participant from the Australian Road Research Board (ARRB) which “advances safety and efficiency in transport through knowledge”, <http://www.arrb.com.au/>

<sup>146</sup> <http://go.worldbank.org/9QZJ0GF1E0>



funding for road safety is in the form of safety components included in road projects, particularly in projects by development banks such as the Asian Development Bank and the World Bank. Only a few loans have been taken for *dedicated* road safety projects, such as in the case of Viet Nam and the Islamic Republic of Iran.

(c) *Domestic financing of road safety*

Clearly, in all countries most of funds for road safety will need to be raised domestically. In 2006, the German GTZ published a manual on financing road safety, entitled “the Road Safety Cent”<sup>147</sup>. The publication identifies the issue of insufficient funding for road safety as the most difficult problem to overcome, without which the other key issues of lacking awareness and lacking institutional capacity cannot be solved. It draws on the experience in New Zealand and many other countries, and suggests seven specific “lessons-learned”:

a. Road users and other stakeholders need to be persuaded that only a fraction of the amounts presently being spent on road accidents can save a lot of money and pain for road users and the society.

b. Road safety funds or road safety councils can be effective and efficient institutions as long as they have a sound legal basis, strong oversight by a public-private board, sound financial management, funding based on direct user charges, and regular technical and financial audits.

c. Financing can be secured through an existing road fund. If this is not an option, road safety charges could be raised through a surcharge on motor fuels or vehicle insurance premiums supplemented by contributions from public and private sectors.

d. For road safety engineering measures, the same financing mechanism that is used for road construction and maintenance could be used, requiring roughly 10-15 percent of road construction improvement, rehabilitation and maintenance budgets.

e. Financing of other road safety programmes would need approximately US 1cent per litre of motor fuel or 5-10 percent of vehicle insurance premiums.

f. To enforce traffic rules and regulations, a special road safety police force financed and supervised by a road safety fund might prove effective.

g. International and bilateral donors can play an important role in assisting developing countries in reforming financing and management of road safety. All road projects financed by the donor community should have a road safety component, both on project and sector levels.

The recent ESCAP EGM on improving road safety on the Asian Highway endorsed the GTZ recommendations and encouraged ESCAP members to explore a full range of financing possibilities.

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<sup>147</sup> <http://www.gtz.de/de/dokumente/en-Road-Safety-Cent-2006.pdf>

Table 17 lists the total amount of road safety fees that would have been collected by selected ESCAP member countries in 2003, if a surcharge of US 1 cent per litre had been applied to each litre of gasoline and diesel used by road vehicles. Though not necessarily sufficient in all cases, these amounts would constitute a significant increase in available resources for improving road safety. Table 18 lists typical advantages and disadvantages of different sources of financing of road safety in developing countries which may, of course, vary from country to country

**Table 17: Total amount of road safety fees that would have been collected by selected ESCAP member countries in 2003, if a surcharge of US 1 cent per litre had been applied to each litre of gasoline and diesel used by road vehicles. Source: GTZ (2005) “The Road safety cent”.**

Country	Road safety surcharges in million US\$ in 2003
China	846
India	361
Indonesia	210
Kazakhstan	34
Malaysia	17
Pakistan	34

**Table 18: Typical advantages and disadvantages of different sources of financing of road safety in developing countries. Source: GTZ (2005) “The Road safety cent”.**

Sources of funding	Advantages	Disadvantages
Surcharges on motor fuel	Low level of evasion, low collection fee	Difficulty to raise fuel prices
Surcharges on weight-distance charges	Accepted as user charge	High level of evasion
Surcharges on compulsory vehicle insurance	Best related to road safety	High level of evasion
Surcharges on vehicle license fees	Low collection fee	High level of evasion
Surcharges on road tolls	Low level of evasion, accepted as user charges	Toll roads form only a small part of the road network
Contribution by private sector	Can complement road safety financing and can make use of private sector management and efficiency	Can only provide limited amounts and may not be sustainable
Development loans and grants	Can initiate effective road safety programs and financing schemes	Not sustainable

It should also be noted that the GTZ recommendations are essentially an extension of a direct follow-up to ESCAP’s earlier promotion of dedicated road funds for road maintenance. From 1996 to 2001 the Secretariat, in collaboration with ADB and World Bank, carried out a regional workshop and 5 country-level workshops in 10 countries. Today dedicated road funds exist in India, Japan, Kazakhstan, Lao People’s Democratic Republic, Mongolia, Nepal, New Zealand, Pakistan, Papua

New Guinea, as well as the Indian states of Kerala, Madhya Pradesh, Karnataka, Uttar Pradesh.<sup>148</sup> In view of the serious road safety situation in many ESCAP member countries an extension of the earlier ESCAP recommendation to include road safety could be considered.

### 3. International Road Assessment Programme and the Swedish Vision Zero

In view of the scarce financial and human resources available for improving road safety, the issue of prioritization and optimal allocation is also an important challenge for many developing countries which often lack a comprehensive data collection and reporting system. In this respect, two examples were discussed at the *EGM on Improving Road Safety on the Asian Highway*: the International Road Assessment Programme and the Swedish Vision Zero.

#### (a) International Road Assessment Programme

In view of the success of the EuroRAP, AusRAP, and usRAP in Europe, Australia and the USA, respectively, an International Road Assessment Programme (IRAP) was recently launched to assist interested developing countries and economies in transition to benefit from a similar standardized and internationally comparable road assessment.<sup>149</sup> The RAP programmes were created to provide similar systematic and independent safety assessments of roads, as have been provided for road vehicles under the New Car Assessment Programmes (NCAP)<sup>150</sup>, in order to raise the overall safety standard of roads.

In assessing roads, IRAP takes into account driver behaviour and vehicle safety. The assessments are carried out by collecting relevant road features (lane marking, roadside condition, pedestrian facilities, etc.) via video capture and drive-through inspections, which are then further analyzed to finally provide safety risk maps, star ratings, charts, tables and engineering toolkits. These outputs can help in prioritizing road improvement measures such as separate lanes of opposing traffic to reduce head-on crashes, roundabouts to ease the severity of side impacts at junctions or guardrails to prevent run-off crashes.

The first IRAP pilot project in Asia is currently being carried out in Malaysia, where 3,000 kilometres of trunk roads including the Asian Highway segments in the country, have been inspected with support from AusRAP and the Malaysian automobile association. Similar pilot projects are under discussion/preparation for Asian Highway segments in Armenia and Georgia, as well Viet Nam. It should also be noted that the ESCAP Secretariat is currently exploring increased collaboration with IRAP in order to promote safety assessments of the Asian Highway Network. Also, the EGM on improving road safety on the Asian Highway suggested exploring the use of IRAP assessments for national trunk roads and to work together to similarly assess the Asian Highway Network.

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<sup>148</sup> See also: ESCAP Transport and Communications Bulletin, No. 75 (2005) on Road Maintenance Funds, ST/ESCAP/SER.E/75, <http://www.unescap.org/ttdw/PubsDetail.asp?IDNO=181>

<sup>149</sup> <http://www.irap.net>

<sup>150</sup> See, for example, <http://www.euroncap.com>

(b) *The Swedish Vision Zero*

“Vision Zero” became the official Swedish Traffic Safety Policy in 1997. It established the long term goal that “*no-one shall be killed or seriously injured within the Swedish road transport system*”. Vision Zero is based on a systems view that combines “more of the same” in order to ensure continuity with innovative and more radical measures. It promotes an approach of shared responsibility of road designers and road users.

In contrast to conventional approaches that put much of the blame on the road user, the Swedish approach assigns much more responsibility to the road designers. For example, as “kinetic energy” kills and the average human being is incapable of adequately estimating the potential impacts of a collision, management of kinetic energy is best left to “professionals”. Similarly, unlike in most other countries, traffic safety education does not focus on educating children but rather on educating their parents about their responsibilities. Measures focus on educating traffic engineers, provision of a safe environment (e.g., bicycle lanes) and safety equipment (e.g., helmets, seat belts).

The Swedish approach is based on “Integration and Separation” which are translated into simple guidelines tailored to different groups of road users, for example, “Vulnerable road users should not be exposed to motorized vehicles at speeds exceeding 30km/h”. Where these targets cannot be achieved, recommendations for improvement are provided such as “separate lanes or reduce vehicle speed to 30km/h”.

As a result of the Swedish systems view, the transport system is made more error-tolerant and to reduce the severity of accidents when they occur (“forgiving roads”). The approach has proven very successful in Sweden, where now less than 10 children are killed in road crashes per year.<sup>151</sup>

The EGM suggested that ESCAP members could learn from the Swedish best practise and explore the use of special road engineering measures (“forgiving roads), such “2+1 roads” with cable barriers, separated lanes for different vehicles (e.g., motorcycles, bicycles, buses), and the systematic use of roundabouts.

## **F. International cooperation for improving road safety**

International cooperation has proven instrumental in sharing experiences and resources and in supporting national activities in the area of road safety. Various types of cooperation exist at the global, regional and subregional levels.

### **1. Global cooperation**

In response to General Assembly resolution 58/289 of 14 April 2004 on improving global road safety, WHO and the regional commissions have set up the United Nations Road Safety Collaboration (see [www.who.int/roadsafety.en](http://www.who.int/roadsafety/en)), which comprises 42 organizations, 11 of which are United Nations organizations. This coordinating group has met four times since October 2004, and its

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<sup>151</sup> This rate is equivalent to less than one child (age from 0 to 14) per 100,000 children per year.

Asia-Pacific group is led by ESCAP. Governmental and non-governmental organizations are involved and represent sectoral expertise in health, transport, and safety. Most recently, the ESCAP secretariat organized the 4th United Nations road safety collaboration meeting (10-11 May 2006) and the global organizing committee for United Nations Road Safety Week 2007 (10 May 2006).

The Collaboration has initiated work on (a) the development of a series of manuals on good practices; (b) the creation of a web-based database on road safety legislation; (c) the completion and updating of a series of ECE resolutions on road traffic signs and signals; (d) the coordination of the first United Nations Global Road Safety Week (23-27 April 2007), targeted towards young road users; and (e) the establishment of the World Day of Remembrance for Road Traffic Victims (third Sunday in November of every year).

The Global Road Safety Partnership (GRSP), of which ESCAP is a founding member, was established in 1999 (see [www.grsproadsafety.org](http://www.grsproadsafety.org)). It is a global partnership between business, civil society and governmental organizations collaborating to improve road safety conditions in low and middle income countries, and it is now active in over 10 countries. Major car and tyre manufacturers, aid agencies and non-governmental organizations are among its members. The International Federation of Red Cross and Red Crescent Societies hosts the GRSP secretariat. GRSP is one of four Business Partners for Development (BPD) programmes initiated by the World Bank.

The International Road Transport Union and other NGOs have been active on the global level through a number of activities to improve road safety. For example, it has developed materials and carried out programmes, including a bus and coach safety programme, and developed a road safety charter which is open for signature by private sector entities (see [www.iru.org](http://www.iru.org)).

## **2. Regional cooperation**

In addition, a regional approach to improving road safety in Asia and the Pacific is promising because (a) most of the anticipated increase in the global number of road deaths is expected to occur in Asia; (b) there are region-specific conditions, such as high rates of death among two- and three-wheelers in Asia, that warrant special consideration; (c) high-level international mandates call on ESCAP and other regional commissions to take the lead in regional cooperation; and (d) there is potential for international synergies and leverage from regional cooperation. There is a clear need for more support to be extended to developing member States in this area.

### *(a) Asian Highway and ESCAP activities*

The Intergovernmental Agreement on the Asian Highway Network<sup>152</sup> entered into force in 2005. Connecting 32 countries, the Agreement includes a provision that reads: “While developing the Asian Highway network, parties shall give full consideration to issues of road safety”. Thus, road safety is one of the areas under the mandate of the Working Group on the Asian Highway. Most recently, the ESCAP secretariat organized an Expert Group Meeting on the Development of the Asian

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<sup>152</sup> See Commission resolution 60/4 of 28 April 2004.

Highway Network: Regional Experiences and Lessons in Financing Highway Infrastructure and Improving Road Safety (8-10 May 2006) in which 55 experts from 29 ESCAP member States participated. In the meeting, the secretariat presented preliminary maps of the Asian Highway that indicated road accident risks for each of its sections.

ESCAP has worked on road safety issues since 1992. Activities included regional studies and reviews, development of the Asia-Pacific Road Safety Database (APRAD), expert group meetings, workshops and publications, including most recently a special issue of the *ESCAP Transport and Communications Bulletin*<sup>153</sup> on road safety, as well as a technical cooperation project on road accident reporting, monitoring, planning and database development. The Seoul Declaration on Infrastructure Development in Asia and the Pacific of 2001 and the attached Regional Action Programme Phase II (2002-2006) noted that “economic losses caused by road accidents are more than double the total development assistance to the ESCAP region from all sources”.

Through inter-agency collaboration, the ESCAP secretariat has supported raising awareness and changing attitudes, analytical work, sharing best practices, monitoring of change, expert group meetings and workshops. ESCAP has worked with a wide range of partners including ADB, GRSP, IRU, the International Road Federation (IRF), the World Road Association (PIARC) and others. In 2004, ESCAP created the Asia-Pacific Network of Transport and Logistics Education and Research (ANTLER), a network of academic institutions that may also cover road safety issues in the future.

The organization of United Nations Road Safety Week from 23 to 27 April 2007 has been mandated by the General Assembly in its resolution 60/5 of 26 October 2005 on improving global road safety. An ESCAP contribution to Road Safety Week will be organized in Bangkok, in conjunction with possible national events in the ESCAP member countries. In fact, most ESCAP members already have an established road safety day, week or month.

*(b) Regional road safety declarations, goals and targets*

Analogous to the useful role of quantitative road safety targets at the national level, regional declarations, goals and targets have the potential to raise road safety awareness, created political commitment and leverage required human and financial resources.

The ESCAP secretariat recently explored the possibility of ESCAP members agreeing on goals and targets that might be included in or referred to in an ESCAP ministerial declaration.

Regional goals and targets have been used outside the ESCAP region. For example, the meeting of the African ministers responsible for transport on the Millennium Development Goals, which was held in Addis Ababa from 4 to 6 April 2005, adopted a ministerial declaration with multiple transport targets, including a road safety target expressed as follows, “rate of accident

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<sup>153</sup> *Transport and Communications Bulletin for Asia and the Pacific*, No. 74 (United Nations publication, Sales No. E.05.II.F.17).

fatalities arising from road and other means of transport reduced by half by 2015” (see [www.africa-union.org/infrastructure/transport/](http://www.africa-union.org/infrastructure/transport/)).

Similarly, the European Road Safety Action Programme of the European Union emphasizes the need for road safety targets. The European Union communication on halving the number of road accident victims in the European Union by 2010: a shared responsibility was announced in the white paper on European transport policy in 2001. Essentially, the programme sets out specific actions and reaffirms the overall objective of halving the number of road accident victims by 2010, which is equivalent to saving 20,000 lives.<sup>154</sup> To ensure that responsibilities are shared, it aims to encourage road users to improve their behaviour, to make vehicles safer, and to improve road infrastructure. It provides for the establishment of a European road safety observatory, and it proposes that all the parties concerned, whether public or private, should subscribe to a European Road Safety charter. The communication emphasizes that “it is widely accepted that targeted road safety programmes are more beneficial in terms of effectiveness of action, rational use of public resources and reducing the number of people killed and injured than non-targeted programmes”.

### **3. Subregional cooperation**

WHO, through its four subregional offices that cover ESCAP member countries, has focused on injury surveillance as well as road user behaviour issues related to motorcycles, helmets, seat belts, alcohol and speeding.

The ASEAN Regional Road Safety Strategy and Action Plan (2005-2010), an ASEAN project supported by ADB, appears to be the most comprehensive multi-country road safety programme in the ESCAP region. The project included an ASEAN road safety programme, together with the Phnom Penh Ministerial Declaration on ASEAN Road Safety, which was adopted on 23 November 2004 by ministers from all 10 ASEAN countries. The declaration includes a regional action plan as well as national action plans and targets for the period 2005 to 2010.

Within the ASEAN project, training activities and stakeholder consultations have already been held, analytical reports prepared, and the ASNet online platform for collaboration has been created. The summary report of the project, entitled *Arrive Alive*, indicated that, currently in ASEAN countries, 75,000 people die and over 4.7 million are disabled or injured every year, costing the region some US\$ 15 billion or 2.2% of GDP. Target reductions in terms of the number of road deaths and injuries were agreed during the preparation of national action plans. Potential casualty savings constitute around 12 per cent of projected total deaths and injuries in the ASEAN region, cumulatively equivalent to some US\$ 10.6 billion for 2005 to 2015. The next phase of the project will focus on strengthening institutional capacities.

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<sup>154</sup> Only the European Commission and the European Parliament have so far endorsed this objective; the Council has not taken a position.

The ESCAP expert group meeting on road safety from 8 to 10 May 2006 noted the effectiveness of the ADB-ASEAN Road Safety Programme and considered that such programmes could be beneficial for other ESCAP subregions, including those covered by the South Asian Association for Regional Cooperation (SAARC), the Shanghai Cooperation Organization (SCO), the Economic Cooperation Organization (ECO) and others.

#### **4. Findings**

International collaboration and action at the global, regional, subregional and national levels can improve road safety. Apart from the possibility of exchanging experiences in the form of good practices, and the sharing of resources and tools, it can provide endorsement at the highest political level, which has the potential to shift road safety to the top of the national policy agenda. The importance of the latter has been highlighted by the recent ministerial declarations on road safety adopted by ASEAN and the African Union in 2004 and 2005, respectively. These initiatives and others show that measurable targets at the regional level can improve road safety efforts in a similar way as national road safety programmes that used measurable national targets.

#### **G. Conclusion**

While important progress has been made in improving road safety, the overall number of road traffic fatalities and injuries continues to increase rapidly. Hence, there is a need to step up efforts at the local, national and regional levels in order to change the “tide” of road accidents throughout the ESCAP region. Every single road death and serious injury leads to human suffering and comes at a sizeable economic cost, while most road accidents are, in principle, preventable.

ESCAP road safety recommendations for governments include: (a) To sustain their high-level commitment to improving road safety on the Asian Highway network and other roads; (b) To include traffic safety as an integral part of sustainable transport policies, taking into account the safety benefits of modal shifts; (c) To adopt or strengthen existing national policies and action plans including the use of measurable national road safety targets; (d) To seriously consider and explore all options for domestic financing of road safety following the recommendations contained in the recent GTZ manual entitled “The Road Safety Cent” and the earlier ESCAP recommendations on road maintenance funds; (e) To include road safety components in all road projects, and to initiate dedicated road projects where appropriate; (f) To promote public-private partnerships for improving road safety; (g) To explore the usefulness of adopting a systems approach similar to the Vision Zero of the Swedish road administration; (h) To regularly perform road safety policy analysis and improve road safety data collection and reporting systems, in order to respond to changing priorities; (i) To use a multisectoral approach involving all relevant stakeholders and ministries, including transport and health ministries, local governments, and the police and, in accordance with General Assembly



resolution 60/5, to follow the recommendations<sup>155</sup> contained in the WHO global report on road safety 2004;<sup>156</sup> (j) To make innovative use of technologies to improve road safety, including information technology services and collaborative online tools, including those making use of satellite imagery, aerial photography and/or GIS; (k) To designate a lead agency or establish a national organizing committee for the events during United Nations Road Safety Week from 23 to 27 April 2007 and to consider recognizing the third Sunday in November every year as the World Day of Remembrance for Road Traffic Victims, in accordance with General Assembly resolution 60/5; (l) To systematically employ special engineering measures to make roads more “forgiving” (when a crash occurs), including, for example, roundabouts, “2+1 roads” with cable barriers, physically separate the road traffic of various vehicles (e.g., lanes for motorcycles, bicycles, buses); (m) To improve data collection and reporting systems, and each year to provide to the secretariat the basic safety data contained in the Asian Highway database as well as data for the indicators contained in Table 16.

At the subregional level, Governments are invited to consider introducing joint road safety programmes in areas covered by SAARC, SCO, ECO and in the ESCAP subregions, similar to the ADB-funded ASEAN Road Safety Programme. These programmes might be co-funded by bilateral and multilateral donors. Governments may also consider requesting priority funding for such subregional activities from the planned road safety facility to be administered by the World Bank.

In view of the importance of international endorsement at the highest political level, Governments are invited to follow the good experiences that other regions have had with ministerial declarations and regional programmes on road safety. Examples include ASEAN and the African Union. Governments may also consider the ESCAP road safety goals and targets for 2007-2015 as a means of developing more targeted activities in the region.

At the regional level, governments are encouraged: (a) to systematically share experiences on using a systems approach and especially on road engineering measures in line with the “forgiving roads” concept; (b) to support road safety assessments, including IRAP of the Asian Highway Network and to regionally share experiences and capacities; and (c) To encourage donors’ support for road safety initiatives in the region.

At the global level, Governments are invited to continue to put the issue of road safety on the agenda of the General Assembly Resolution, and to consider providing support for a potential Global Ministerial Conference on Road Safety to be organized under the auspices of the United Nations and in an inter-sectoral manner. In this context, it should be noted that 27 of the 85 UN members that supported the most recent General Assembly Resolution 60/5 on the global road safety crisis were ESCAP members.

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<sup>155</sup> These recommendations included to: (i) designate or create lead agency; (ii) assess situation; (iii) devise strategies and a plan of actions; (iv) provide adequate finance; (v) implement evidence-based interventions; (vi) engage in international cooperation.

<sup>156</sup> M. Peden, et al (eds), *The World Report on Road Traffic Injury Prevention* (Geneva, WHO, 2004).



## Annex I

## Key road safety related indicators for selected ESCAP member countries

	Year	Accidents (police- reported)	Deaths (police- reported)	Injuries (police- reported)	Pedestrian fatalities	Motor- cyclist deaths	Child fatalities (<5 years)	Fatalities per 10 000 vehicles	Pedestrian deaths [% of total]	Motorcyclist deaths [% of total]	Two and three- wheelers [% of all vehicles]
Armenia	2005	1 309	304	1 771	43	0	1	10.1	14%	n.a.	1%
Australia	2004		1 868								
Azerbaijan	2004		811								
Bangladesh	2004	3 566	3 150	3 026	1 609	n.a.	86	103	51%	n.a.	67%
Bhutan	2005	1 038	23	247	n.a.	n.a.	n.a.	7.7	n.a.	n.a.	24%
Brunei Darussalam	2005	2 771	38	528				43			3%
Cambodia	2005	3 957	904	7 018		906	5	16		89%	75%
China	2005	450 000	98 738	470 000							
Georgia	2004		637								
India	2003	406 726	85 998	435 122	8 799	13 570	1 128	12.8	10%	16%	71%
Indonesia	2005	20 623	11 610	22 217				5			75%
Japan	2004	952 191	8 492	72 777	2 250	1 313	72	1.0	26%	15%	15%
Kazakhstan	2005	14 517	3 374	17 422	1 084	n.a.	251	18.7	32%	n.a.	3%
Lao People's Democratic Republic	2003	5 177	426	6 699				17			80%
Malaysia	2005	328 264	6 200	47 012				4			48%
Myanmar	2003	5 375	1 308	9 299				27			68%
Nepal	2001	32 000	1 987	4 390	993	773	189	42.0	50%	39%	65%
New Zealand	2002		404								
Philippines	2003		995	6 793							38%
Republic of Korea	2004	220 755	6 563	346 987	2 543	618	108	3.6			10%
Russian Federation	2004		34 506								
Singapore	2005	6 705	173	87	41	95	3	0.6	24%	55%	19%
Sri Lanka	2005	43 171	2 306	23 165	747	406	39	9.1	32%	18%	60%
Thailand	2002	91 623	13 116	69 313	787		262	0.6	6%		71%
Turkey	2005	621 183	4 525	154 094	679	117	117	4.1	15%	3%	13%
Viet Nam	2005	14 000	11 000	11 760				7		63%	68%

Data sources: Transport and Tourism Division database, Asia-Pacific Road Accident database, Asian Development Bank and the Association of Southeast Asian Nations.

**PART TWO:**

**OUTCOMES OF THE BUSAN MINISTERIAL CONFERENCE ON  
TRANSPORT**



## VII. BUSAN DECLARATION AND COMMISSION RESOLUTION 63/9

The ESCAP Ministerial Conference on Transport was held in Busan, Republic of Korea, from 6-11 November 2006. The Conference adopted two Ministerial Declarations on 11 November 2006. One of them is known as the *Busan Declaration on Transport Development in Asia and the Pacific*. The Annex to the Declaration contains the Regional Action Programme for Transport Development in Asia and the Pacific, 2007-2011. The Busan Declaration and its Regional Action Programme was endorsed (with minor changes) by ESCAP Commission Resolution 63/9 in May 2007. It identifies high-priority actions and helps coordinating the work carried out by ESCAP members and associate members and international organization.

### A. Busan Declaration and ESCAP Commission Resolution 63/9

What follows is a verbatim quote of the resolution:

#### “Resolution 63/9

#### **Implementation of the Busan Declaration on Transport Development in Asia and the Pacific and the Regional Action Programme for Transport Development in Asia and the Pacific, phase I (2007-2011)**

*The Economic and Social Commission for Asia and the Pacific,*

*Welcoming* the successful outcome of the Ministerial Conference on Transport, held in Busan, Republic of Korea, on 10 and 11 November 2006, which adopted the Busan Declaration on Transport Development in Asia and the Pacific, including the Regional Action Programme for phase I (2007-2011), and the Ministerial Declaration on Improving Road Safety in Asia and the Pacific,<sup>157</sup>

*Recognizing* the increasing impact of globalization and the substantial growth in output, trade and investment being experienced by many countries in the Asian and Pacific region,

*Stressing* the crucial role of efficient, reliable and cost-effective transport services, including infrastructure, facilitation and logistics, in supporting continued growth through improved competitiveness of exports and reduced cost of imports,

*Convinced* that, in order to support the rapid changes in output, trade and investment, there is a need for the implementation of regional transport policy through more frequent dialogue between countries,

*Noting* the strong support expressed at the Ministerial Conference on Transport for the establishment of a forum of Asian ministers of transport as a formal regional mechanism to facilitate close collaboration and more frequent interaction in order to address emerging issues,

*Noting also* that growth has taken place mainly in coastal areas that have well-developed regional and interregional maritime transport linkages with international sourcing and production networks,

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<sup>157</sup> See E/ESCAP/63/13.

*Convinced* of the important role of “dry ports” in the development of an international integrated intermodal system and their potential to become centres for economic development, particularly in landlocked countries and wider domestic hinterlands,

*Welcoming* the successful regional cooperation that led to the formalization of the intergovernmental agreements on the Asian Highway<sup>158</sup> and Trans-Asian Railway<sup>159</sup> networks, which are the major building blocks in the development of an international integrated intermodal transport system, which the region needs in order to meet the growing challenges of globalization,

*Recognizing* that the full benefits of an international integrated intermodal transport system will not be realized unless the physical infrastructure issues, including road, rail, inland waterways, maritime transport, dry ports, airports, seaports and information and communication technology, as well as the non-physical issues, including multimodal transport operations, customs clearance, and banking and other commercial networks, are addressed comprehensively,

*Deeming* that an effective approach to the realization of an integrated transport system is through the operationalization of priority transport corridors and routes within the system,

*Noting* that the issues relating to the identification of any national shortfalls in the areas of transport security and the provision of assistance upon request to address them are being dealt with by the International Maritime Organization, the World Customs Organization and the International Civil Aviation Organization,

*Recognizing* the need to mobilize financial resources and improve organizational arrangements, as deemed appropriate by participating members and associate members, for the development of the necessary physical and non-physical infrastructure,

*Stressing* that a long-term regional transport development strategy can promote regional cooperation and development effectively, as demonstrated by the New Delhi Action Plan on Infrastructure Development in Asia and the Pacific, 1997-2006,<sup>160</sup>

*Recalling* the United Nations Millennium Declaration<sup>161</sup> and the 2005 World Summit Outcome,<sup>162</sup> in which Heads of State and Government reiterated their determination to ensure the timely and full realization of the development goals and objectives agreed at the major United Nations conferences and summits, including those agreed at the Millennium Summit, described as the Millennium Development Goals,

*Stressing* in this context the important contribution of transport infrastructure and services in achieving the Millennium Development Goals,

*Recalling* the Almaty Programme of Action: Addressing the Special Needs of Landlocked Developing Countries within a New Global Framework for Transit Transport Cooperation for Landlocked and Transit Developing Countries,<sup>163</sup>

*Encouraged* by the profound impact of the Seoul Declaration on Infrastructure Development in Asia and the Pacific,<sup>164</sup> which resulted in the active and constructive

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<sup>158</sup> See Commission resolution 60/4 of 28 April 2004.

<sup>159</sup> Commission resolution 62/4 of 12 April 2006, annex.

<sup>160</sup> Commission resolution 51/8 of 1 May 1995, annex.

<sup>161</sup> See General Assembly resolution 55/2 of 8 September 2000.

<sup>162</sup> See General Assembly resolution 60/1 of 16 September 2005.

<sup>163</sup> *Report of the International Ministerial Conference of Landlocked and Transit Developing Countries and Donor Countries and International Financial and Development Institutions on Transit Transport Cooperation, Almaty, Kazakhstan, 28 and 29 August 2003 (A/CONF.202/3), annex I.*

<sup>164</sup> E/ESCAP/1249, chap. IV.

participation of members and associate members of the Commission in promoting regional cooperation for the development of transport infrastructure and services,

*Concerned* about the human suffering, social implications and heavy burden on the poor of road accidents as well as their impact on national economic development, with the costs being estimated to be in the range of 1 to 3 per cent of a country's annual gross national product,

*Recognizing* that road safety is a public policy issue of major concern that requires a strong political commitment and effective interventions if road traffic fatalities, injuries and related human suffering are to be reduced significantly,

1. *Resolves* that, in order to meet the growing challenges of globalization effectively, respective government authorities will develop and implement transport policies at the national, subregional and regional levels in line with the following principles:

(a) Formulating integrated policies and decision-making frameworks based on strategic assessments of economic, environmental, social and poverty-related aspects;

(b) Developing an international integrated intermodal transport and logistics system that contributes to the long-term objective of regional cooperation in support of production and distribution networks and international trade;

(c) Giving priority to investment in the Asian Highway and Trans-Asian Railway networks, including intermodal interfaces to link them with water and air transport networks;

(d) Promoting the development of economic and logistic activities at intermodal interfaces, particularly at production and consumption centres, and around seaports and dry ports;

(e) Mobilizing financial resources for the development of the transport system, its maintenance and operation from all possible sources, including private-sector partnerships and other financial arrangements;

2. *Endorses* the Regional Action Programme for Transport Development in Asia and the Pacific, phase I (2007-2011), as contained in the annex to the present resolution;

3. *Reiterates* its support for the implementation of the Almaty Programme of Action<sup>71</sup> for the benefit of landlocked and transit developing countries;

4. *Encourages* members participating in the development of the Asian Highway network that have not already done so to accede to, ratify, accept or approve the Intergovernmental Agreement on the Asian Highway Network;<sup>66</sup>

5. *Encourages* 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;<sup>165</sup>

6. *Encourages* members participating in the development of the Trans-Asian Railway network that have not already done so to sign, accede to, ratify, accept or approve the Intergovernmental Agreement on the Trans-Asian Railway Network;<sup>67</sup>

7. *Encourages* members and associate members to place increasing attention on the operationalization of priority transport corridors and routes;

8. *Invites* international and regional financing institutions and multilateral and bilateral donors to consider providing further financial and technical support for the development and operationalization of the Trans-Asian Railway network and the Asian Highway network;

9. *Requests* the Executive Secretary:

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<sup>165</sup> E/ESCAP/63/13, chap. IV.



- (a) To assist regional members and associate members in realizing the long-term vision of an international integrated intermodal transport and logistics system, which is needed in order to meet the growing challenges of globalization;
- (b) To accord priority to the implementation of phase I (2007-2011) of the Regional Action Programme, including the mobilization and deployment of resources;
- (c) To undertake a detailed study on the establishment of a forum of Asian ministers of transport, including its organization and format, and submit the findings to the Committee on Managing Globalization at its fourth session and the Commission at its sixty-fourth session for their consideration;
- (d) To undertake a study which, based upon the Asian Highway and Trans-Asian Railway networks as well as major Euro-Asian and other interregional transport links, defines priority transport corridors, and good practices that could be implemented on the corridors and proposes specific measures, for example memorandums of understanding, that lead to the effective development of those corridors;
- (e) To ensure effective coordination with other United Nations and multilateral agencies as well as subregional organizations, including the Association of Southeast Asian Nations, the Economic Cooperation Organization, the Pacific Islands Forum Secretariat, the South Asian Association for Regional Cooperation and the Shanghai Cooperation Organization;
- (f) To collaborate effectively with international and regional financing institutions, multilateral and bilateral donors and international organizations and, if necessary, determine other possible innovative sources of financing for the implementation of the Regional Action Programme;
- (g) To assess and evaluate the implementation of the Regional Action Programme and submit reports with recommendations to the Commission at its sixty-fifth and sixty-eighth sessions;
- (h) To carry out in 2011 an evaluation of the implementation of phase I of the Regional Action Programme as an important and necessary step in the preparation of phase II (2012-2016).”

## **B. Regional Action Programme**

The Annex to the Busan Ministerial Declaration on Transport Development is identical with the Annex to ESCAP Commission Resolution 63/9. It contains the *Regional Action Programme for Transport Development in Asia and the Pacific, 2007-2011*. A verbatim quote follows:

### *Annex*

#### **Regional Action Programme for Transport Development in Asia and the Pacific, 2007-2011**

Over the past decade, ESCAP member countries have benefited substantially from the process of globalization. Many of these successes have been achieved through improved transportation.

The Asian Highway and Trans-Asian Railway networks, formalized through the related intergovernmental agreements,<sup>166,167</sup> are the major building blocks for the realization of an

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<sup>166</sup> See Commission resolution 60/4 of 28 April 2004.

international integrated intermodal transport and logistics system as a long-term vision for the development of the transport sector in order to meet the growing challenges of globalization.

In order to move forward, there is a need to comprehensively address the issues arising and meld together the physical and non-physical infrastructure issues, including road, rail, inland waterways, maritime transport, dry ports, airports, sea ports and information and communication technology, as well as the non-physical issues, including multimodal transport operations, customs clearance, banking and other commercial networks, thereby improving infrastructure and cross-border and transit facilitation measures and logistics systems, in the development of an international integrated intermodal transport system.

In the process of doing this, many of the challenges of globalization need to be addressed. Managing these challenges requires a collaborative effort among member countries and United Nations agencies, intergovernmental organizations, subregional organizations and professional associations involved in transport.

In the implementation of the Regional Action Programme (2002-2006) of the New Delhi Action Plan on Infrastructure Development in Asia and the Pacific,<sup>168</sup> the ESCAP secretariat has worked closely with: (a) several key United Nations agencies, including ECA, ECE, ECLAC, ESCWA, ICAO, ILO, IMO, ITU, UNAIDS, UNCTAD, UNDP, UPU and the World Bank; (b) intergovernmental organizations, including ADB, APT, EBRD, IDB and OSJD; (c) subregional organizations, such as ASEAN, ECO, IGC-TRACECA, the Pacific Islands Forum Secretariat, SAARC, SCO and TRADP; (d) non-governmental organizations, such as IRF, IRU and UIC; and (e) other collaborating institutions, including AITD, CPD, IDI, KMI and KOTI. Further cooperation and coordinated action between ESCAP and these organizations would greatly enhance the prospect of successful implementation of the Regional Action Programme for Transport Development, 2007-2011.

## **1. POLICY GUIDANCE AT THE MINISTERIAL LEVEL**

Policy direction at the ministerial level is paramount to the successful development of mutually beneficial regional transport policies and infrastructure in the Asian and Pacific region, to meet common economic and social interests. Given the rapid pace of change in the region and the need for timely policy direction to achieve progress in transport,<sup>169</sup> it may be time for ministers to establish a formal regional mechanism to facilitate close collaboration and more frequent interactions to address these issues.

Establishing a regular meeting or forum of Asian ministers of transport, as exists in Europe, where the Organisation for Economic Cooperation and Development and some member States act as the secretariat of the European Committee of Ministers of Transport, could further assist ESCAP members and associate members in their efforts to cooperate in improving transport in and across the region. The European Committee of Ministers of Transport could prove a useful template in this regard. A similar body, adapted to suit the Asian and Pacific region, could hold meetings every two or three years, possibly with ESCAP acting as its secretariat.

### **1.1 A forum of Asian ministers of transport**

Immediate objective: to promote regional cooperation and policy leadership at the ministerial level for the advancement of transport as a key to regional development

Outputs:

1. Regular scheduled meetings of Asian ministers of transport

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<sup>167</sup> Commission resolution 62/4 of 12 April 2006, annex.

<sup>168</sup> E/ESCAP/1249, chap. IV, annex I.

<sup>169</sup> ESCAP meetings of ministers of transport are held at intervals of at least five years.

2. Ministerial consideration and direction to transport policies in the region

Indicators of achievement:

1. High level of participation in meetings of Asian ministers of transport
2. Documented decisions by transport ministers leading to a greater degree of coordination and consistency between countries on issues of mutual benefit

## **2. TRANSPORT INFRASTRUCTURE DEVELOPMENT**

In order to realize new opportunities of economic and trade development brought by globalization, countries require efficient transport infrastructure and services to access regional and global markets. While much progress has been achieved in developing regional transport networks, increased coordination among different modes of transport will allow countries to link more efficiently to international production networks and to international markets.

### **2.1 Promotion and development/upgrading of the Asian Highway network**

Immediate objective: to promote the Asian Highway network through coordinated planning for development of national road infrastructure, including upgrading of the network

Outputs:

1. Meetings of the Working Group on the Asian Highway
2. Updated Asian Highway maps and database
3. Investment studies on Asian Highway sections and linkages undertaken in collaboration with member States and investment forums, with the participation of international and regional financing institutions, multilateral and bilateral donors, international organizations and the private sector, for the development and upgrading of the Asian Highway network

Indicators of achievement:

1. Expansion of the Asian Highway network through the addition of new sections and the upgrading of the network by participating countries and by additional countries ratifying/accepting/approving/ acceding to the agreement
2. National highway planning recognizing the Asian Highway network as a priority and providing inputs for the regional database
3. Increase in investment to develop and upgrade the Asian Highway network and in the length and capacity of the proportion of the network that meets Asian Highway minimum standards

### **2.2 Promotion, development and operationalization of Trans-Asian Railway network**

Immediate objective: to promote the Trans-Asian Railway network for the efficient and sustainable movement of goods and people

Outputs:

1. Meetings of the Working Group on the Trans-Asian Railway Network
2. Cooperation among railway organizations on the Trans-Asian Railway routes and operationalization of rail transport services
3. Updated Trans-Asian Railway maps and the establishment of a database
4. Investment studies on the Trans-Asian Railway sections and linkages, including “missing links”, undertaken in collaboration with member States and investment forums with the participation of international and regional financing institutions,

multilateral and bilateral donors, international organizations and the private sector for the development and upgrading of the Trans-Asian Railway network

Indicators of achievement:

1. Countries signing/ratifying/accepting/ approving/acceding to the Trans-Asian Railway Agreement and participating in the Working Group
2. Number of demonstration runs of container block-trains and international train services operating on Trans-Asian Railway routes
3. Number of countries providing inputs for the regional database
4. Increased investment to develop and upgrade routes of the Trans-Asian Railway network, including construction of missing links

### **2.3 Integrated intermodal approach to transport planning and infrastructure development**

Immediate objective: to promote an integrated approach to transport planning as an integral part of an international integrated intermodal transport system for Asia and a focus for economic and trade development

Outputs:

1. Intermodal studies and forecasts to provide a regional context for national transport planning and regional policy development
2. Policy guidelines for the development of inland container depots and dry ports and information and communication infrastructure for an integrated intermodal transport network
3. Investment forums to establish networks to improve the exchange of information on the business and investment environment, ideas and experiences
4. Joint meetings of the working groups on the Asian Highway and Trans-Asian Railway networks
5. Capacity-building through seminars, workshops and training activities

Indicators of achievement:

1. Countries participating in undertaking intermodal studies and guidelines
2. National plans reflecting proposals to develop intermodal transport infrastructure
3. Increased financing opportunities being explored by member States, international financing institutions and other stakeholders, including the private sector
4. Positive response from member countries participating in meetings, with documented exchange of experiences and best practices
5. Countries using outputs from seminars and workshops in the development of national integrated transport strategies and plans

### **2.4 Management and maintenance of transport infrastructure**

Immediate objective: to improve national capacities in the management and maintenance of transport infrastructure

Outputs:

1. Publication of guidelines, including examples of regional best practices on the management and maintenance of transport infrastructure
2. Capacity-building through seminars, workshops and training activities

Indicators of achievement:

1. Positive response from member countries and other readers to outputs and inclusion of proposals in national policy statements
2. Countries implementing ESCAP guidelines

### 3. TRANSPORT FACILITATION

The smooth and efficient movement of goods and people across borders in the region requires close collaboration between ministries and agencies and support from all stakeholders, including the private sector. Multilateral legal instruments relating to international transport can provide a mechanism for simplifying and harmonizing the documentation, formalities and procedures of border crossing. While progress is being made in these areas, much could be done to further reduce the delays and costs associated with border crossings in the region.

#### 3.1 Facilitation coordinating mechanisms

Immediate objective: to promote collaboration between all stakeholders involved in international transport from the public and private sectors for transport facilitation

Outputs:

1. Guidelines on establishing or strengthening national facilitation coordinating mechanisms refined and published
2. Workshops, seminars and advisory services for establishing or strengthening national facilitation coordinating mechanisms
3. Regional and subregional fora of national facilitation coordinating mechanisms

Indicators of achievement:

1. Countries applying the guidelines on national facilitation coordinating mechanisms
2. National facilitation coordinating bodies established or strengthened
3. Exchange of experiences and good practices between national facilitation coordinating bodies documented

#### 3.2 Legal frameworks for international transport

Immediate objective: to assist countries in putting in place suitable legal regimes to facilitate international land transport

Outputs:

1. Study on the implementation of Commission resolution 48/11 on road and rail transport modes in relation to facilitation measures and the possible inclusion of additional conventions
2. Workshops, seminars and advisory services on accession to, and implementation of, major international facilitation conventions
3. Guidelines on the formulation and implementation of agreements for international land transport
4. Meetings, training courses and studies on the formulation and implementation of subregional agreements on the facilitation of international land transport

Indicators of achievement:

1. Adoption of proposals for updating Commission resolution 48/11
2. Increase in the number of countries acceding to major international transport facilitation conventions

3. Countries applying the guidelines on the formulation and implementation of facilitation agreements
4. Countries signing or acceding to subregional facilitation instruments

### **3.3 Application of new technologies**

Immediate objective: to promote the simplification/harmonization of border-crossing procedures and documentation for international transport and the application of new technologies, including information and communication technology

Outputs:

1. Study on the impact of new technologies, including information and communication technology, on border controls and international transport
2. Workshops and seminars on the application of new technologies to border controls and international transport

Indicators of achievement:

1. Countries applying the findings of the study on the impact of new technologies
2. Countries applying new technologies to border controls and international transport

### **3.4 Tools for the identification of bottlenecks and the monitoring of the impact of facilitation measures**

Immediate objective: to assist countries in identifying, isolating and addressing the major bottlenecks impeding smooth and efficient international transport

Outputs:

1. Refinement of facilitation diagnostic and monitoring tools
2. Workshops, seminars and training courses on the application of facilitation diagnostic and monitoring tools

Indicators of achievement:

1. Countries employing the refined facilitation diagnostic and monitoring tools
2. Time and cost analysis of routes and border crossings for international transport undertaken by member countries

### **3.5 Transport operator skills upgrading**

Immediate objective: to assist countries in upgrading the capacity of professionals to undertake international land transport operations

Outputs:

1. Promotion and regional networking of national training centres for international land transport
2. Content of training courses and materials for international land transport recommended
3. Training of trainers courses on international land transport

Indicators of achievement:

1. Centres for international land transport participating in the network
2. Centres applying the recommended training course content and materials
3. Delivery of training courses by national and international centres

#### 4. TRANSPORT LOGISTICS

The logistics industry in some ESCAP member countries is still at a relatively early stage of development, and there are lessons to be learned from both successful and unsuccessful operations from both within and outside the region. These lessons include the practical implementation of logistics, integrated infrastructure and policy development, the removal of impediments, information and communication technology, maximizing the benefits of foreign investment and managing changes in the logistics industry.

The lack of common standards guiding the operation of freight forwarders, multimodal transport operators and logistics service providers impedes their development. It is therefore important that Governments and industry work together to effectively manage the changes that will facilitate improved performance. The development of an efficient national logistics system can be encouraged through the sharing of the knowledge and experiences of the private sector in national, regional and international forums. This, together with appropriate capacity-building programmes, would also lead to improved professionalism and skills within the industry. Research needs to be undertaken on how logistics services can be extended inland through corridors which would create the conditions for the formation of industrial clusters.

##### 4.1 Guidelines for the operation of logistics service providers

Immediate objective: to create common standards for the operation of logistics service providers and to harmonize the approaches of regional member countries with a view to raising the profile of freight forwarders, multimodal transport operators and logistics services providers within the transport industry

Outputs:

1. The publication of codes of conduct and minimum standards based on best practices and experience in registration requirements and liability regimes for the operations of freight forwarders, multimodal transport operators and logistics services providers

Indicators of achievement:

1. Countries incorporating aspects of the codes and standards in the rules of their national industry associations and national regulations and legislation

##### 4.2 Development of logistics service centres

Immediate objective: to promote the development of efficient logistics service centres and clusters throughout the region

Outputs:

1. The publication of research and study findings on corridor development and best practices for the operation of logistics service centres

Indicators of achievement:

1. Countries participating in research and contributing information on latest developments and best practices for the development of logistics service centres

##### 4.3 Promoting partnerships and exchange of experiences within the region

Immediate objective: to create local, subregional, regional and international networks to strengthen the capacity of the logistics services industry to create partnerships, to share experiences and to improve its competitiveness

Outputs:

1. Regional meetings of national freight forwarders, multimodal transport operators, logistics service providers and shipowner associations
2. The sharing of private sector experiences with Governments through meetings and publications
3. Subregional and regional seminars and workshops, including representatives of the public and private sectors to discuss research findings and to share opinions and experiences

Indicators of achievement:

1. Exchange of experience and best practices are documented, and partnerships are created
2. Issues of common interest are identified and brought to the attention of Governments for their consideration
3. Countries involving both public and private sector stakeholders when planning the operations of logistics service centres and clusters

#### **4.4 Capacity-building in logistics**

Immediate objective: to enhance national competencies and skills within the logistics industry through sustainable education programmes targeting freight forwarders, multimodal transport operators, logistics service providers and civil servants

Outputs:

1. Familiarization seminars on the role and development of the logistics industry for senior government officials
2. Training of trainers workshops and seminars, with training material developed by the secretariat of ESCAP, to develop national capacities and skills
3. Support provided to Governments for the establishment of national sustainable programmes in multimodal transport and logistics

Indicators of achievement:

1. Government policies reflect awareness of the need of the logistics industry to provide efficient services
2. Local trainers deliver and implement training programmes to enhance national competencies and skills in multimodal transport and logistics
3. Countries establish sustainable training programmes on multimodal transport and logistics

### **5. FINANCE AND PRIVATE SECTOR PARTICIPATION**

Most countries of the region are facing shortages of transport infrastructure and services. Available funding from traditional sources falls far short of the investment needs, resulting in a huge investment gap. There is a need to increase available funding from all possible sources, with greater reliance on non-traditional sources, including direct beneficiary payment systems and public-private partnerships.

Immediate objective: to enhance institutional capabilities for the mobilization of additional funding for investment in the transport sector from traditional and non-traditional sources, including public-private partnerships

Outputs:

1. Published guidelines on financing transport infrastructure and services based on good practices from the region



2. Capacity-building activities related to the establishing and strengthening of public-private partnerships and user charging systems, as well as the establishment and management of special funds in the transport sector
3. Regional meetings of national public-private partnership units and programmes and networking among them
4. Studies and reports assessing the public-private partnership-readiness of countries

Indicators of achievement:

1. Countries using the guidelines and an increase in financial and other resources for investment in the transport sector
2. Countries establishing and managing special funds and promoting public-private partnerships for transport infrastructure development and maintenance
3. Documented exchange of experience through networking among agencies and institutions responsible for public-private partnerships
4. ESCAP proposals to enhance public-private partnership-readiness, as reflected in policy statements and actions taken by countries

## 6. SUSTAINABLE TRANSPORT DEVELOPMENT

Transport is a driver of economic and social development. However, this requires that transport's positive and negative externalities be managed in order to achieve sustainable transport.

Participation of countries in international production networks, supported by transport and communications, has arguably helped to lift more people out of poverty in Asia in the last 30 years than ever before. However, for this process to be expanded to Asian hinterlands and landlocked countries, strategies are needed that incorporate all dimensions of a sustainable transport system using an appropriate mix of policy tools, including integrated assessment and futures-based policy analysis.

Consideration of integrated assessment tools and processes in designing transport policies and programmes can lead to a more positive and comprehensive approach where environmental, social and poverty issues are clearly seen as a constituent part of economic and transport policy objectives.

Immediate objective: to increase awareness and understanding of alternative policy options for sustainable transport by decision-makers

Outputs:

1. Inclusion of sustainable transport-related issues in the *Review of Developments in Transport in Asia and the Pacific*, the *Transport and Communications Bulletin for Asia and the Pacific* and ad hoc regional transport policy studies
2. Advisory services, meetings and networking of transport decision-makers and advisers on the application of integrated assessment, strategic environmental assessment and related approaches in transport plans, programmes and policies
3. Studies of alternative policy paths ("regional futures") towards sustainable transport

Indicators of achievement:

1. Positive evaluation of publications, analysis and outputs by countries and other concerned groups
2. Methodologies, policies and intervention measures promoted by ESCAP reflected in national or local policy documents

3. Participation of stakeholders, including research groups and national institutes

## 7. ROAD SAFETY

More than half of the world's traffic fatalities occur in the ESCAP region. In 2005, approximately 440,000 people were killed and as many as 30 million were injured in accidents on the roads of the ESCAP region. Due to rapid motorization, it is expected that by 2020, about two-thirds of the world's road deaths (amounting to 610,000 road deaths) will be in the ESCAP region. Against this background, the General Assembly has adopted a series of resolutions<sup>170</sup> calling on member countries, the World Health Organization and other United Nations regional commissions to address this global road safety crisis.

While some countries have made progress in improving road safety, the overall numbers of road traffic fatalities and injuries continue to increase rapidly in the ESCAP region. Hence, there is a need to step up efforts at the local, national and regional levels in order to stem the "tide" of road accidents.

Immediate objective: to foster better awareness and understanding of road safety issues and potential interventions, and improved international collaboration in Asia and the Pacific

Outputs:

1. Meetings to discuss and set regional road safety goals, targets and indicators as a follow-up to the Ministerial Declaration on Improving Road Safety in Asia and the Pacific
2. Coordination of activities of the United Nations road safety collaboration in the ESCAP region, in line with the relevant General Assembly resolutions
3. Collaborative website and meetings for sharing of road safety resources, good practices, data and accident risk maps of the Asian Highway

Indicators of achievement:

1. Regional goals, targets and indicators being applied by members and associate members
2. Regional member countries providing inputs and feedback regarding the material on the website, including the accident risk maps
3. User feedback

## 8. TRANSPORT AND THE MILLENNIUM DEVELOPMENT GOALS

Poverty is still a major development concern in the region, with large sections of the population, in both rural and urban areas, lacking access to economic and social opportunities. Transport development that improves access and enhances the inclusion of the poor in the overall development process can be an entry point in poverty alleviation. Consideration of the ways in which transport interventions can contribute to poverty reduction at the policy formulation and programming stages may significantly reduce the costs of pro-poor transport interventions. The Millennium Development Goals provide a unique opportunity to consider transport development within a wider framework of intersectoral collaboration to address poverty reduction and economic and social development.

Immediate objective: to foster a better understanding of the links among transport interventions, poverty reduction and the achievement of the Millennium Development

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<sup>170</sup> They are: resolutions 57/309 of 22 May 2003 and 58/9 of 5 November 2003 on the global road safety crisis and 58/289 of 14 April 2004 and 60/5 of 26 October 2005 on improving global road safety.

## Goals

### Outputs:

1. Seminars and workshops on transport interventions aimed at achieving the Millennium Development Goals, and informational material on regional good practices in Goal-responsive transport development
2. Reviews, analytical and quantitative studies on the links between transport and socio-economic development
3. Dissemination of information on best practices and interventions designed to improve transport connectivity and access

### Indicators of achievement:

1. Proposals for Millennium Development Goal-responsive transport interventions included in national policy documents
2. Use of ESCAP promoted methodologies and information/resource materials in support of pro-poor and inclusive transport development
3. Documented exchanges of experiences within the region and instances of technical cooperation between developing countries resulting from activities initiated by the secretariat

*Fifth plenary meeting  
23 May 2007*

## VIII. MINISTERIAL DECLARATION ON IMPROVING ROAD SAFETY IN ASIA AND THE PACIFIC

### A. High-level commitment to improving road safety

The Ministerial Conference on Transport was organized by the ESCAP secretariat and hosted by the Government of the Republic of Korea in Busan from 6 to 11 November 2006. It was attended by 264 representatives, including 39 ministerial-level officials from 40 member and associate members of ESCAP, and 16 representatives from relevant organizations within and outside the United Nations system, including the private sector. Road safety issues were featured high on the agenda, culminating in the adoption of the *Ministerial Declaration on Improving Road Safety in Asia and the Pacific* on 11 November 2006.

The Ministerial Declaration builds on the Asian Highway agreement and essentially extends key elements of the ASEAN road safety framework to the whole ESCAP region up to 2015. In particular, the Ministerial Declaration sets an overall goal to “*save 600,000 lives and prevent a commensurate number of serious injuries on the roads of Asia and the Pacific over the period 2007 to 2015*”. It invites the members and associate members of the Commission to address road safety in the following areas:

- a. “Making road safety a policy priority;
- b. Making roads safer for vulnerable road users, including children, senior citizens, pedestrians, non-motorized vehicle users, motorcyclists, and persons with disabilities;
- c. Making roads safer and reducing the severity of accidents (building “forgiving roads”);
- d. Making vehicles safer and encourage responsible vehicle advertising;
- e. Improving national and regional road safety systems, management and enforcement;
- f. Improving cooperation and fostering partnerships;
- g. Developing the Asian Highway as a model of road safety;
- h. Providing effective education on road safety awareness to the public, young people and drivers. “

The Ministerial Declaration requests the development of “*a set of goals, targets and indicators, to be achieved by 2015, in order to assess and evaluate road safety progress*”. The Senior Government officials meeting in preparation for the ESCAP Ministerial Conference on Transport agreed to a set of eight road safety goals (in line with priority areas), 24 targets and

45 indicators as a basis for future work. It should be noted that the set includes four measurable targets that specifically pertain to the 140,000 kilometres of Asian Highway, thus contributing to the road safety commitments under the Intergovernmental Agreement on the Asian Highway Network.

Subsequently, the Commission adopted *Resolution 63/9 on Implementation of the Busan Declaration on Transport Development in Asia and the Pacific and the Regional Action Programme for Transport Development in Asia and the Pacific, phase I (2007-2011)* in Almaty, Kazakhstan in May 2007. The Commission Resolution encourages “*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*”.

The United Nations General Assembly has adopted a series of resolutions in which it called on member countries, the World Health Organization (WHO) and the regional commissions including ESCAP to address the “*global road safety crisis*”. In fact, four such resolutions on road safety have been adopted since 2003, namely resolution 57/309 of 22 May 2003, 58/9 of 5 November 2003, 58/289 of 14 April 2004 and 60/5 of 26 October 2005, the most recent of which was sponsored by 85 Member States, among which were 27 ESCAP members.<sup>171</sup> Most recently, the second UN Global Stakeholders Forum was organized in Geneva on 26 April 2007 as a key event of the 1st UN Road Safety Week called for the organization of a Global Ministerial Conference on Road Safety to be convened under the auspices of the United Nations.

## **B. Ministerial Declaration**

The *Ministerial Declaration on Improving Road Safety in Asia and the Pacific* was adopted at the Ministerial Conference on Transport which was held in Busan, Republic of Korea, from 6-11 November 2006. A verbatim quote of the Declaration follows.

*We, the Ministers of transport of the members and associate members of the Economic and Social Commission for Asia and the Pacific attending the Ministerial Conference on Transport, held in Busan, Republic of Korea, from 6 to 11 November 2006,*

*Recalling General Assembly resolutions 57/309 of 22 May 2003 and 58/9 of 5 November 2003 on the global road safety crisis, and 58/289 of 14 April 2004 and 60/5 of 26 October 2005 on improving global road safety,*

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<sup>171</sup> Those members are: Afghanistan, Armenia, Australia, Azerbaijan, Bangladesh, Brunei Darussalam, Cambodia, China, France, India, Indonesia, Fiji, Iran (Islamic Republic of), Kazakhstan, Malaysia, Nepal, New Zealand, Pakistan, Philippines, Russian Federation, Singapore, Thailand, Timor-Leste, Turkey, Turkmenistan, United Kingdom of Great Britain and Northern Ireland and Viet Nam.

*Recalling* that the General Assembly, in its resolution 58/289, invited the World Health Organization, working in close cooperation with the United Nations regional commissions, to act as a coordinator on road safety issues within the United Nations system,

*Taking note* of the *World Report on Road Traffic Injury Prevention*, which estimated that 1.2 million people are killed in road accidents and as many as 50 million are injured worldwide annually,

*Also noting* that the Report projected that, without a new commitment to prevention, these figures could increase by about 65 per cent over the next 20 years, making road traffic injuries one of the top three causes of the global burden of disease,

*Concerned* that about half of all road traffic fatalities and injuries worldwide occur in the Asian and Pacific region, most of which are vulnerable road users, such as pedestrians, children and motorcyclists,

*Observing* the rapid growth of road transport infrastructure development and motorization in the region, which implies concomitant growth in road traffic fatalities and injuries,

*Deeply concerned* about the human suffering, social implications and heavy burden on the poor of road accidents as well as their impact on national economic development, with the costs being estimated to be in the range of 1 to 3 per cent of a country's annual gross national product,

*Cognizant* of the significant progress already achieved in this respect,

*Recognizing* that the Parties to the Intergovernmental Agreement on the Asian Highway Network shall give full consideration to the issues of road safety while developing the network,

*Also recognizing* that road safety is a public policy issue of major concern that requires a strong political commitment and effective interventions if road traffic fatalities, injuries and related human suffering are to be reduced significantly,

*Resolve* to save 600,000 lives and to prevent a commensurate number of serious injuries on the roads of Asia and the Pacific over the period 2007 to 2015,

*Invite* the members and associate members of the Commission, in this regard, to implement the recommendations contained in the *World Report on Road Traffic Injury Prevention*, in line with General Assembly resolution 60/5 of 26 October 2005 on improving global road safety,

*Also invite* the members and associate members of the Commission to address road safety in the following areas:

- a) Making road safety a policy priority;
- b) Making roads safer for vulnerable road users, including children, senior citizens, pedestrians, non-motorized vehicle users, motorcyclists, and persons with disabilities;
- c) Making roads safer and reducing the severity of accidents (building “forgiving roads”);
- d) Making vehicles safer and encourage responsible vehicle advertising;
- e) Improving national and regional road safety systems, management and enforcement;
- f) Improving cooperation and fostering partnerships;
- g) Developing the Asian Highway as a model of road safety;
- h) Providing effective education on road safety awareness to the public, young people and drivers.

*Request* the Executive Secretary:

- a) To accord priority to mobilizing resources from domestic and international sources for the implementation of the present Declaration;
- b) To strengthen existing road safety initiatives affirmed at the regional and international levels and to take new ones, in particular to improve road safety along the Asian Highway network;
- c) To work closely with the World Health Organization, the other regional commissions, and other relevant international and multilateral organizations in the implementation of the present Declaration and to continue to promote cooperation in a synergistic manner with the various intergovernmental, non-governmental and subregional organizations that are playing an increasingly important role in improving road safety and, in particular, the private sector;
- d) To develop, in consultation with the members and associate members of the Commission, a set of goals, targets and indicators, to be achieved by 2015, in order to assess and evaluate road safety progress;
- e) To promote networking among the national and subregional organizations that support the implementation of the present Declaration.

### C. Set of road safety goals, targets and indicators (2007-2015)

The *Ministerial Declaration on Improving Road Safety in Asia and the Pacific*, requested the Executive Secretary of ESCAP, “to develop, in consultation with the members and associate members of the Commission, a set of goals, targets and indicators, to be achieved by 2015, in order to assess and evaluate road safety progress”.

Such a set has been discussed and revised at various meetings since May 2006. Whereas the road safety goal were already finalized and contained in the Ministerial Declaration on Road Safety, various versions of targets and indicators have been discussed thereafter. Most recent revisions have been made by the ESCAP *Expert group meeting on improving road safety on the Asian Highway* which was held in Bangkok from 21 to 22 June 2007. In September 2007, the ESCAP Committee on Managing Globalization (part I) at its fourth session agreed on the set reproduced in Table 19.

**Table 19: Set of ESCAP road safety goals, targets and indicators for 2007-2015 (Final version: Sept. 2007).**

UNESCAP Road Safety Goals of Asia and the Pacific, 2007-2015	
Goals and Targets	Indicators for monitoring achievements
<b>Overall Objective: Saving 600,000 lives and preventing a commensurate number of serious injuries on the roads of Asia and the Pacific over the period 2007 to 2015</b>	
a) Reduce the fatality rates by twenty percent from 2007 to 2015 (or reduce it to less than 10 per 10,000 motor vehicles by 2015).	1) Number of road fatalities (and fatality rates per 10,000 motor vehicles, per motor vehicle-km and per passenger-km). 2) Number of anticipated road fatalities (baseline). 3) Number of road crashes. 4) "Fleet safety records" of public or private organizations (e.g., deaths per 100,000 km).
b) Reduce the rates of serious road injuries by twenty percent from 2007 to 2015.	5) Number of anticipated serious injuries on roads (baseline). 6) Number of serious road injuries (and injury rate per 10,000 motor vehicles, and per motor vehicle-km).
<b>Goal 1: Making road safety a policy priority</b>	
a) Create a road safety policy/strategy, designate a lead agency and implement a plan of action, by 2010.	7) Documents of road safety policy, strategy, and plan of action etc. Information on their actual implementation. 8) Name of designated lead agency. Description of responsibilities of local, regional and national government organizations. 9) National road safety reports or impact evaluation reports of government programmes.
b) Allocate sufficient financial and human resources to improving road safety.	10) Amount of public financial and human resources allocated to road safety. 11) Amount of private sector contributions, as well as special funds, from donors, or relevant financial institutions. 12) Road safety programmes and activities conducted. At least one major national road safety campaign.
<b>Goal 2: Making roads safer for vulnerable road users, including children, senior citizens, pedestrians, non-motorized vehicle users, motorcyclists, and persons with disabilities</b>	
a) Reduce by one third the pedestrian death rate in road crashes (or reduce it to less than 1 per 10,000 motor vehicles).	13) Pedestrian deaths per head of population and per 10,000 motor vehicles.
b) Increase the number of safe crossings for pedestrians (e.g., with subway, overhead crossings or traffic signals).	14) Number of safe crossings, or information on programmes for constructing or improving crossings.
c) Make the wearing of helmets the norm and ensure minimum helmet quality, in order to reduce the motorcyclist death rate by one third (or reduce it to below the average motorcyclist death rate of the ESCAP	15) Motorcyclist deaths and motorcyclist death rate. 16) Law or administrative rule (Yes/No). (Survey) information on helmet use (percentage) and minimum helmet quality standards.
d) Ensure minimum child safety measures, in order to reduce the child death rate by one third (or reduce it to less than 0.01 per 10,000 motor vehicles).	17) Death rate of children less than 5 years in road crashes. 18) (Survey) information on the following of child safety norms (e.g., child restraints) (percentage). 19) Existing measures for child safety in cars and on motorcycles (qualitative indicator).
e) Equip all school children with basic road safety knowledge.	20) Road safety education part of the school curriculum (Yes/No). 21) Existing education programs on road safety (qualitative indicator).



<b>Goal 3: Making roads safer and reducing the severity of road crashes (building “forgiving roads”)</b>	
a) Integrate road safety audit in all stages of road development starting at the design stage, carry out necessary improvement works, and improve hazardous locations.	22) Road safety audit programme (Yes/No); Blackspot programme (Yes/No) 23) Extent to which road safety audits are carried out for new road construction and major improvements (estimated share of all cases). 24) Programmes to make roads “forgiving” by removing or cushioning roadside obstacles.
b) Increase separate/secure road space for pedestrians and cyclists in urban and peri-urban areas (where space permits)	25) National or local programmes. Existing length of pedestrian and bicycle tracks in kilometres per 100,000 people (along highways and city roads).
<b>Goal 4: Making vehicles safer and encourage responsible vehicle advertising</b>	
a) Make regular inspection of road vehicles mandatory and ensure enforcement of inspection (starting in urban areas).	26) Law or administrative rule (document). Information on vehicle inspection facilities and organizations (qualitative).
b) Ensure safety requirements for new vehicles to be in line with international standards.	27) Documents specifying laws and regulations and implementation.
<b>Goal 5: Improving national and regional road safety systems, management and enforcement</b>	
a) Implement a national (computerized) database that provides information on the location of road crashes.	28) Yes/No indicator. If yes, which database system and responsible organizations (qualitative indicator). 29) Country coverage of the regional APRAD database.
b) Significantly increase “compliance”, e.g., with mandatory helmet, seat-belt wearing and speed limits.	30) Information on rules and “compliance” on helmet wearing levels (percentage from surveys). 31) Information on rules and “compliance” on seat-belt wearing levels (percentage from surveys). 32) Information on rules and “compliance” related to “drinking and driving” (information from surveys not prosecutions).
c) Allow alcohol tests for prosecution (either breathalyzer and/or behavioural tests).	33) Yes/No. If yes, description of existing rules, types of tests and alcohol limits used and allowed for prosecution.
d) Make it the norm to keep motorbike front-lights on at all times.	34) Law or administrative rule (document). Description of existing practises (from survey) or technical measures.
e) Increase coverage of emergency assistance systems for road victims, to cover at least all urban areas and trunk roads.	35) Kilometres of road (by type) on which emergency services are provided. 36) Average response time. 37) Number of emergency service centres per length of highways (except city roads).
<b>Goal 6: Improving cooperation and fostering partnerships</b>	
a) Encourage and recognize private-sector sponsored initiatives.	38) Number of major private sector initiatives. (Financial) volume of commitments. 39) Number of major public-private partnerships in the area of road safety. (Financial) volume.
b) Create new and deepen existing partnerships with NGOs.	40) Number of major private sector initiatives. (Financial) volume of commitments.
<b>Goal 7: Developing the Asian Highway as a model of road safety</b>	
a) Reduce the total number of fatalities and road crashes on the Asian Highway.	41) Total number road fatalities and road crashes on the Asian Highway in each country per year.
b) Reduce the number of fatalities on all Asian Highway segments to below 1,000 per 100 million vehicle-kilometres.	42) Number of fatalities per 100 million vehicle-kilometres for each Asian Highway segment per year.
c) Increase resource allocation for road safety-related measures along the Asian Highway.	43) (Financial and human) resources allocated for safety-related works for Asian Highway segments. 44) Amount of safety-related grants and loans for Asian Highway segments from international sources.
d) Improve Asian Highway road segments to be forgiving to road users if a crash occurs. Demonstrate best practise.	45) Develop a road safety rating program.
<b>Goal 8: Providing effective education on road safety awareness to the public, young people and drivers</b>	
a) Carry out targeted awareness campaigns and training programs	46) Information on awareness campaigns and training programs carried out

In this context, it should be noted that the set contained in Table 19 is consistent and supported by the existing national and subregional road safety goals and targets that have emerged recently. The set includes the recommendations of the 2004 WHO report on road safety, in line with the recommendations contained in UN General Assembly Resolution 63/5. The set also extends key elements of the ASEAN road safety framework including national and regional goals for 2005-2010 as agreed in the ASEAN Phnom Penh Ministerial Declaration of 2004.

Furthermore, at least 25 ESCAP members have quantitative and qualitative road safety targets that are compatible with the ESCAP set contained in Table 19. These include Armenia, Australia, Bhutan, Brunei Darussalam, Cambodia, France, India, Indonesia, Japan,

Kazakhstan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, Netherlands, New Zealand, Philippines, Russian Federation, Singapore, Thailand, Turkey, United Kingdom, United States of America, Viet Nam. The targets aim for reductions in absolute, relative or projected terms, the extent of which appears to depend more on the level political commitment than other factors.

In response to the ESCAP Ministerial Declaration, some ESCAP governments are reportedly considering national road safety targets specific to Asian Highway segments in their country. For example, the road safety plan of the Republic of Korea includes a 30 percent reduction in the number of people killed and the number of crashes on the Asian Highway.

The Expert Group Meeting (21-22 June 2007) provided support for the further “formalization” of the set of goals, targets and indicators through the Commission. It also emphasized the need for continued support to ESCAP members for the implementation of the declaration, as well as for collection and analysis of better road safety data for the Asian Highway.

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