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### Major issues in transport

## Regional transport infrastructure connectivity

### Note by the secretariat

#### *Summary*

The Asian Highway network, the Trans-Asian Railway network and the network of dry ports of international importance have laid the foundations for creating international integrated intermodal transport and logistics systems. However, the unrestricted flow of goods and people that the region needs for continued economic growth and enhanced social inclusion will require wider connectivity between members and associate members. Existing infrastructure networks too often serve a limited group of countries and seldom extend beyond a single subregion. The result is a lack of integration between networks, missing links, operational bottlenecks, technical incompatibilities and different levels of awareness and use of modern technologies.

In the present document, the substantial progress that has been achieved in the transport sector in recent years is recalled and proposals are highlighted to place its future development within a framework of integrated intermodal transport corridors that could coherently incorporate roads, railways, waterways and ports into a transport system operating on harmonized technical standards and benefiting from wider deployment of new technologies.

## I. Introduction

1. The Economic and Social Commission for Asia and the Pacific (ESCAP) has played a major role in bringing about a new approach by member States to include an international dimension in the planning of their transport infrastructure. This joint effort has led to the successful definition and formalization of the Asian Highway and Trans-Asian Railway networks, as well as the identification of a set of dry ports of international importance to facilitate the operationalization of the two networks and their integration with other modes.

\* E/ESCAP/MCT(3)/L.1.

2. The initiatives implemented under these programmes have enabled the region to accommodate increasing volumes of international trade on mostly existing infrastructure and have constituted a first effort towards aggregating disparate infrastructure systems into a common regional network that is best able to serve the region's economic integration, strengthen its future economic growth and facilitate the exchange of goods and services.

3. Acknowledging that attainment of these objectives is vital for the sustained economic development of the region, the Ministerial Conference on Transport held in Busan, Republic of Korea, in November 2006 adopted the Busan Declaration on Transport Development in Asia and the Pacific (E/ESCAP/63/13, chap. V), which articulated the vision of an international integrated intermodal transport and logistics system. This vision was later reiterated in the Bangkok Declaration on Transport Development in Asia adopted at the Forum of Asian Ministers of Transport, held in Bangkok in December 2009 (E/ESCAP/66/11, chap. IV), and reaffirmed in the Ministerial Declaration on Transport Development in Asia and the Pacific adopted at the Ministerial Conference on Transport, held in Bangkok in March 2012 (E/ESCAP/MCT.2/13). The latter also recognized that growth in intraregional trade could be further supported if regional transport corridors were expanded and bottlenecks removed.

4. Since the above declarations were adopted, the international community has launched a number of global programmes and initiatives which are influencing the scope and implementation of transport-related activities. Most notable among these initiatives is the adoption by the General Assembly in September 2015 of resolution 70/1 entitled "Transforming our world: the 2030 Agenda for Sustainable Development", containing the Sustainable Development Goals.

5. The implementation of the 2030 Agenda may pose a greater challenge to the transport sector than to any other industry. Indeed, while the transport sector has been a key driver of economic development and is a provider of employment, it remains a leading contributor to greenhouse gas emissions and a major consumer of fossil fuels. This challenge is even more formidable for a region that enjoys a high birth rate and an expanding middle class with growing affluence and purchasing power that fuel an increased demand for consumer goods, in particular private vehicles.

6. At this early stage in the realization of the 2030 Agenda, there appears to be a broad consensus that the provision of seamless and sustainable connectivity in support of market integration and economic dynamism may offer a way forward to align the pursuit of economic growth with a wider distribution of prosperity and greater environmental protection.

7. While countries of the region are still experiencing much higher rates of economic growth than the rest of the world, the weak post-2008 global recovery has had a negative impact on the exports of developing economies of the region, which are still reliant on external demand. Thus, according to the Asian Development Bank, average growth of gross domestic product in developing Asia fell from an average of 8.3 per cent during 2006-2010 to 5.9 per cent in 2015, and is projected to fall further to 5.7 per cent in both 2016 and 2017.<sup>1</sup>

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<sup>1</sup> Asian Development Bank, "Asian Development Outlook 2016: Asia's Potential Growth – highlights" (Manila, 2016). Available from [www.adb.org/publications/asian-development-outlook-2016-highlights](http://www.adb.org/publications/asian-development-outlook-2016-highlights).

8. Sustaining such high rates of growth, let alone returning to the higher ones experienced during the previous decade, will necessitate a new push by member countries to better exploit the potential of the region's vast internal market. This implies a renewed thrust to (a) expand and operationalize cross-border physical connectivity through enhanced regional infrastructure, (b) harmonize technical standards and (c) harmonize the legal environment of transport.

9. The Asian Highway and Trans-Asian Railway have already played a pivotal role in assisting member countries in improving intercountry and interregional transport links, in particular in addressing the specific transport challenges facing landlocked and transit developing countries in line with 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 (2003-2013) and the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014-2024.

10. However, while both networks need to be further expanded and upgraded, the region's continued economic growth are calling for countries to go beyond the mere development of transport infrastructure on a unimodal basis. Effective integration of the Asian Highway and Trans-Asian Railway, with connections to inland waterways, seaports, river ports, airports and dry ports, can offer seamless transport solutions to the region's vibrant industry. Coupled with efficient maritime connections, it can also facilitate the inclusion of archipelagic and Pacific Island countries into the region's mainstream economic success.

11. The present document contains a review of the progress achieved in the region regarding the Asian Highway and Trans-Asian Railway. It also contains a discussion of key issues involved in using the two networks as the building blocks for the realization of the vision of an international integrated intermodal transport and logistics system through the development of a regional network of dry ports and international intermodal corridors.

## **II. Recent progress in the development of regional transport networks**

### **A. Status and challenges of the Asian Highway and Trans-Asian Railway networks**

12. The Asian Highway and Trans-Asian Railway networks play a pivotal role in fostering the coordinated development of regional road and rail networks. This collaborative work of ESCAP culminated in the formalization of the two networks through the Intergovernmental Agreement on the Asian Highway Network<sup>2</sup> and the Intergovernmental Agreement on the Trans-Asian Railway Network,<sup>3</sup> which entered into force in July 2005 and June 2009 respectively. There are now 29 parties to the Intergovernmental Agreement on the Asian Highway Network and 18 parties to the Intergovernmental Agreement on the Trans-Asian Railway Network.

13. In accordance with the terms of the Agreements, two working groups, for the Asian Highway and for the Trans-Asian Railway, were established as important forums to facilitate the implementation of the Agreements and

<sup>2</sup> United Nations, *Treaty Series*, vol. 2323, No. 41607.

<sup>3</sup> United Nations, *Treaty Series*, vol. 2596, No. 46171.

discuss issues and exchange information relating to the future development, upgrading and operational efficiency of transport in the region.

14. The 6th Meeting of the Working Group on the Asian Highway (Seoul, 3 and 4 November 2015) adopted amendments to annex I of the Intergovernmental Agreement that had been proposed by Azerbaijan and Bangladesh. These amendments (a) clarified the denomination of segments of routes numbers AH5, AH81 and AH83 in Azerbaijan and (b) formalized a new alignment for route number AH41 through the territory of Bangladesh to take into consideration the inclusion of a section bypassing Dhaka.<sup>4</sup>

15. The 4th Meeting of the Working Group on the Trans-Asian Railway Network (Bangkok, 23 and 24 November 2015) adopted amendments to annex I of the Intergovernmental Agreement that had been proposed by Bangladesh, the Islamic Republic of Iran, Mongolia, the Russian Federation and Thailand. The adopted amendments reflect the designation of new routes, either existing or planned to be built in future, to develop cross-border rail movements with neighbouring countries.<sup>5</sup>

16. The Asian Highway and Trans-Asian Railway are evolutionary by nature. Indeed, as per the terms of their respective Agreements, the formalized networks have been adopted as two coordinated plans for the development of highway routes and railway lines of international importance within Asia and between Asia and neighbouring regions to facilitate regional economic integration. The Asian Highway and Trans-Asian Railway currently comprise 143,000 km of highways in 32 countries and 117,500 km of railway lines in 27 countries respectively.

17. The development of the networks has been incorporated into national plans or strategies in a number of countries.

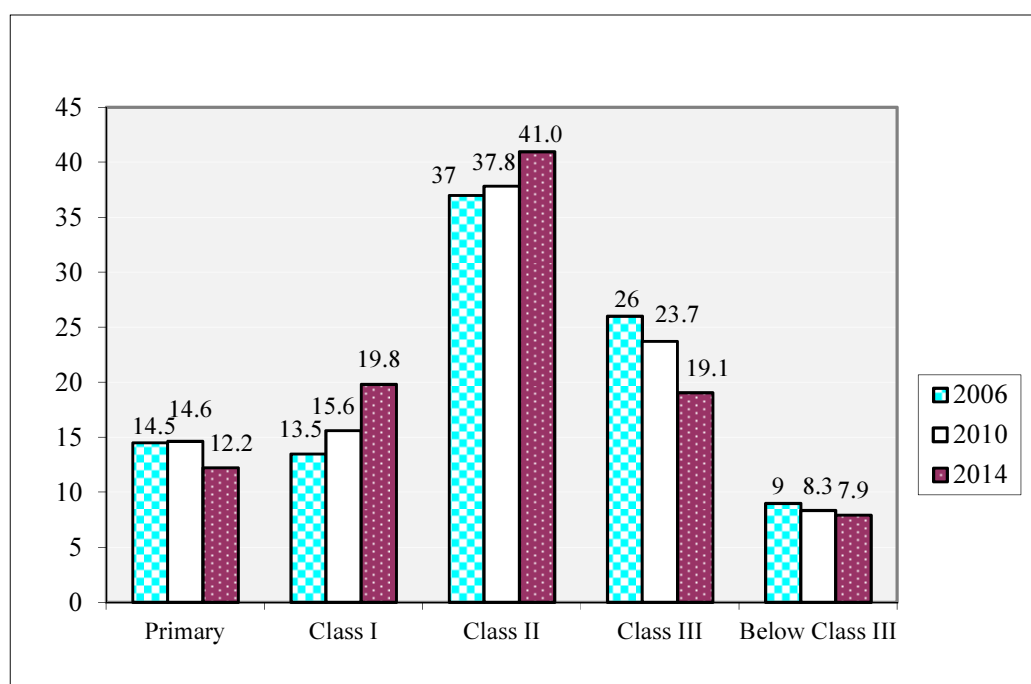
18. As regards the Asian Highway network, the 2015 update of the Asian Highway Database showed that to date about 10,147 km, representing 7.85 per cent of the network, do not yet meet the minimum desirable standards. In addition, while member countries have made undeniable progress in upgrading Asian Highway routes during the period 2010-2014 (see figure), in too many instances a single Asian Highway route falls into different groups of standard on two sides of a common border between neighbouring countries. This hampers the development of international cross-border road movements as road operators perceive poor infrastructure as posing a risk of injuries to drivers and damage to vehicles.

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<sup>4</sup> Economic and Social Commission for Asia and the Pacific, "Report of the Working Group on the Asian Highway on its 6th meeting", paras. 7 and 8. Available from [www.unescap.org/sites/default/files/pre-ods/E-ESCAP-AHWG%286%29-4-English.pdf](http://www.unescap.org/sites/default/files/pre-ods/E-ESCAP-AHWG%286%29-4-English.pdf).

<sup>5</sup> Economic and Social Commission for Asia and the Pacific, "Report of the Working Group on the Trans-Asian Railway Network on its 4th meeting", paras. 5 to 9. Available from [www.unescap.org/sites/default/files/pre-ods/E\\_ESCAP\\_TARN\\_WG\(4\)\\_4\\_E.pdf](http://www.unescap.org/sites/default/files/pre-ods/E_ESCAP_TARN_WG(4)_4_E.pdf).

**Asian Highway routes by classification, 2006, 2010 and 2014**  
(Percentage)



*Source:* Economic and Social Commission for Asia and the Pacific, Asian Highway Database (accessed 15 September 2016).

19. The Asian Highway Database is a long-standing joint effort by the secretariat and member countries to monitor the development of the Asian Highway network. The Database includes comprehensive and detailed data and information on Asian Highway routes in member countries and benchmarks their development status against the Asian Highway design standards stipulated in annex II to the Intergovernmental Agreement on the Asian Highway Network. Member countries are requested to update information related to Asian Highway routes passing through the territory of their countries on a biennial basis. An updated database is an important tool for policymakers to define their national road development policies in line with international trends and gives transport planners and operators access to reliable data to promote international traffic.

20. As regards the Trans-Asian Railway network, the four corridors that were studied to identify the network present sharp contrast in their operational readiness. The Northern Corridor presents a high level of operational readiness owing to the existence of continuous rail infrastructure, adequate interoperability between railway organizations of neighbouring countries, even when a break-of-gauge exists at the border, and a high level of operational and technical competence.<sup>6</sup> Since the completion of the Trans-Siberian main line, this corridor has traditionally been used for cross-border rail movements, and in recent years the introduction of more market-oriented economic policies in China and the Russian Federation has intensified its use with an increasing number of new international container-block train services being launched along the corridor every year.

<sup>6</sup> The countries concerned are China, the Democratic People's Republic of Korea, Kazakhstan, Mongolia, the Republic of Korea and the Russian Federation.

21. Meanwhile, in the other corridors, operational readiness is hampered by one or more of the following issues: poor rail infrastructure in some of the countries traversed, rolling-stock assets in insufficient number, lack of rolling-stock interoperability across borders and low operational capabilities of railway organizations in some of the countries concerned. Most importantly, the absence of continuous rail infrastructure across borders remains an obvious obstacle to the development of international services in some parts of the region.

22. The Trans-Asian Railway network comprises 117,500 km of existing or planned railway tracks that have been selected by member countries for their current or future potential to carry international trade. Of this total, 11,500 km are missing, representing 9.8 per cent of the network. This is the sum of cross-border line sections which, if constructed, would provide intercountry rail connectivity. The total investment required to put in place these missing links is estimated at 69.5 billion dollars. The lack of rail intercountry connectivity is particularly acute in South-East Asia, including its links to other subregions, which accounts for 42 per cent of the missing sections in the Trans-Asian Railway network. Beyond the financing issue, a critical challenge that needs to be addressed is for all of the countries concerned by each of the missing links to afford them the same level of priority in their respective development plans and coordinate their construction schedule.

23. Despite the above, member countries have made substantial investment in upgrading their rail infrastructure and are continuing to launch new national, bilateral or multilateral projects to improve rail connectivity as a way to provide more sustainable and balanced transport development for the region, in particular in providing access to and from landlocked countries and remote hinterland areas.

## **B. Providing seamless regional connectivity**

24. Recognizing that intraregional and interregional connectivity remained an unfinished agenda, the Commission at its seventy-first session (May 2015) adopted resolution 71/8 on strengthening intraregional and interregional connectivity in Asia and the Pacific, requesting the secretariat to accord priority to developing comprehensive and seamless connectivity in the region. The Commission further reinforced this mandate at its seventy-second session (May 2016) when it adopted resolution 72/5 on strengthening regional cooperation on transport connectivity for sustainable development in Asia and the Pacific.

25. The concept of seamless connectivity conjures up the vision of an integrated transport system that allows goods and people to travel efficiently across modes and national borders. It requires policies to be coordinated, infrastructure gaps to be filled, technical standards to be harmonized, operational procedures to be synchronized, information and communication systems to be developed and deployed and cross-border legislation to be aligned.

26. In this respect, as regards infrastructure developments, recent initiatives in developing the Asian Highway and Trans-Asian Railway networks are being implemented with an increasing awareness of their continuation through the territories of neighbouring countries. However, notwithstanding different financing capabilities, planning the upgrading of Asian Highway routes or the construction of the missing sections in the Trans-Asian Railway network are made difficult by the fact that they do not have the same level of priority among the countries concerned.

27. While infrastructure gaps have been mentioned and the need for the harmonization of operational procedures and cross-border legislation are addressed in separate documents, the present document puts some stress on technical standards requirements for the Trans-Asian Railway and Asian Highway networks.

28. Under the terms of the Intergovernmental Agreement on the Asian Highway Network and the Intergovernmental Agreement on the Trans-Asian Railway Network, two related working groups have been established as legislative platforms for policymakers of the region to discuss issues and coordinate policies supporting the development of the networks. Greater use may be made of the working groups to align national priorities with regional needs, including the planning of infrastructure and demonstration of innovative technological and operational solutions for traffic management and interoperability. They may also be used to further the expansion of the networks, in particular to rural areas, discuss future directions of work towards the harmonization of technical standards and identify new solutions for freight terminal operations, connection to seaports and hinterland, and “first- and last-mile” haulage.

29. As regards the Trans-Asian Railway, the efficiency of international train operations in the network will in large part depend upon there being reasonable consistency in the technical design and operating practices of neighbouring railway systems. While this principle applies throughout the network, it is particularly crucial in situations where continuity of track gauge already exists. However, in a number of cases where this happens, there is no consistency in the length of trains operated either side of the border. This results in transit delay and cost penalties arising from the necessity to remarshal or adjust loading at the border.

30. Also critical is the compatibility of rolling stock, whether track-gauge continuity exists or not. Where there is continuity of track-gauge, the design of braking systems prevents the exchange of rolling stock between neighbouring railways. Meanwhile, when there is no continuity of track gauge, imbalances between the loading capacity of wagons either side of the break-of-gauge point imposes similar constraints.

31. As regards road transport in general and the Asian Highway in particular, the compatibility of standards has been a dormant issue for many years because vehicles on roads, as opposed to railways, are neither captive of their ground-based infrastructure nor as strongly dependent on a particular type of roadside infrastructure. Another factor is that road movements were for a long time relatively limited. A consequence of these factors was that there was never felt to be any need for an international organization that set norms and standards.

32. Yet, several factors now call for greater standardization to be brought into the realm of road transport. Such factors include the expansion of the region’s internal market, the increase in short-distance cross-border trade between neighbouring countries, improved road infrastructure and growing affluence resulting in an unprecedented rise in the number of privately-owned vehicles. In addition, the region is also witnessing an emerging form of tourism by road with either increased personal cross-border travel by car for tourism purposes, such as can be seen between China and Thailand, or a rise in the number of international tourists renting vehicles in their destination countries, both of which raise the question of standards relating to driving practices and road-safety facilities.

33. In this regard, while the harmonization of road construction standards continues to be important, the secretariat has recognized that attention should also be given to “above-the-ground” installations, in particular those linked to road safety such as acceleration and deceleration lanes, warning signs, regulatory signs, speed-reduction devices and roadside safety features. Easing drivers’ vehicle operation and providing a safe driving environment require a “predictability of events” during road trips. Given that increased connectivity will gradually lead to enhanced cross-border road movements, it is highly desirable that this “predictability of events” be uniform along the region’s road infrastructure and that standards be established to that effect. Since 2015, the secretariat has been collaborating with the Korea Expressway Corporation on a three-year programme to provide related guiding standards to the member countries of the Asian Highway network.

34. Under the same three-year programme, the secretariat is also looking at how the region could benefit from the introduction of new technologies such as intelligent transport systems. These systems are a combination of technologies based on the new capabilities offered by modern information and communications technology. Deployment of intelligent transport systems allows improved traffic management, more fluid traffic flows and higher levels of safety and security. They include telematics and all types of communications within vehicles, between vehicles and between vehicles and infrastructure. Typically, intelligent transport systems can address traffic congestion, reduce traffic accidents and mitigate environmental externalities generated by road transport.<sup>7</sup> The secretariat has been reviewing deployment of intelligent transport systems in China, the Republic of Korea, the Russian Federation and Turkey, and has already started to share best practices among member States. Intelligent transport systems lay the foundation for creating benefits such as increased competitiveness of transport logistics, ensuring effective use of relevant resources, realizing low-carbon green transport and promoting new drivers of growth.<sup>8</sup>

35. In addition to the above initiatives, standardization in road transport also needs to be institutionalized at a higher level, as is the case for other modes of transport which are supported by their respective intergovernmental bodies. Thus, the International Maritime Organization is the global standard-setting authority for the safety, security and environmental performance of international shipping; the International Civil Aviation Organization works on standards and recommended practices and policies in support of a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector; and the Organisation for Co-operation between Railways and the Intergovernmental Organisation for International Carriage by Rail look after the technical standards and legal aspects of international rail transport.

36. So far as road transport is concerned, while the existing related non-governmental organizations play a significant role in promoting international cooperation on issues pertaining to roads and road transport, none has the authority to function as an intergovernmental body with the responsibility to create a regulatory framework for the design of roads and vehicles, and ensure that their management and operation conform to global norms.

<sup>7</sup> Intelligent Transport Systems Asia-Pacific, “ITS guideline for sustainable transport in the Asia-Pacific region”, 13 October 2013. Available from [www.its-jp.org/english/its\\_asia/1153/](http://www.its-jp.org/english/its_asia/1153/).

<sup>8</sup> Hwang Sang-kyu and Kim Gunyoung, eds., “Chapter 6: Transport Technology”, in *50 Praxes for Better Transport in Korea* (Goyang, Republic of Korea, Korea Transport Institute, 2012), p. 247.



Given the discussed evolution in road transport, an international road organization would be able to promote the coordinated and sustainable development of road transport through intergovernmental cooperation aiming at enhanced traffic management, better road safety and improved environmental impact. The establishment of such an organization is timely in the context of the newly adopted 2030 Agenda and the current Decade of Action for Road Safety (2011-2020).

### **III. Developing international intermodal transport corridors**

#### **A. Benefits of international intermodal transport corridors**

37. The Busan Declaration on Transport Development in Asia and the Pacific adopted at the Ministerial Conference on Transport held in Busan, Republic of Korea, in November 2006 enunciated the vision of an international integrated intermodal transport system. Pursuant to General Assembly resolution 70/197 of 22 December 2015 entitled “Towards comprehensive cooperation among all modes of transport for promoting sustainable multimodal transit corridors”, the Commission at its seventy-second session adopted resolution 72/5 on strengthening regional cooperation on transport connectivity for sustainable development in Asia and the Pacific, in which it recognized the importance of international intermodal transport corridors for safe, efficient, reliable and affordable movement of goods and people for supporting sustainable economic growth, improving the social welfare and enhancing international cooperation and trade among member States.

38. As Governments strive to enhance the region’s economic vitality, address its mobility requirements for people and goods and bring its hinterland areas into mainstream economic development, the planning and operationalization of international intermodal transport corridors appear to offer a new approach to the delivery of regional transport projects that can minimize the environmental impact of the transport sector.

39. These corridors incorporate different modes of transport, consider the development of adjacent land, connect industry clusters, synchronize supply chains and, most importantly, serve the lives of communities, small or large, along the way. In a regional context, corridors encourage the joint planning of initiatives based on a shared vision of development. They focus on the entire transportation needs along a wide strip of land and permit greater rationalization of investment. International intermodal corridors also create “network effects” that allow countries with more limited funding capabilities to implement projects that they could not envisage on their own. In the process, these countries also gain access to technologies and technical know-how.

40. The corridor approach for the integration and coordination of different transport modes is essential to the region’s economic integration, in particular for landlocked countries and remote hinterland areas. It allows countries to identify projects of common interest, thereby aligning national initiatives with regional priorities. It also facilitates a phased harmonization of design standards and operating principles and serves as a catalyst for the introduction of new technologies such as intelligent transport systems.

41. Experiences in the region show that the concept of international intermodal transport corridors is now well accepted across the region and related projects are being implemented or studied. One of the most inclusive frameworks for such corridors to be developed is the One Belt, One Road initiative put in place by the Government of China to instil new forces in realizing economic integration through enhanced intercountry connectivity.

In recent years, in collaboration with a range of international partners including train operators and logistics companies, the railways of China have launched a number of new intermodal services to demonstrate the potential of such corridors.

42. Since 2010, a weekly service has been carrying automotive parts for BMW from the manufacturer's Leipzig site in Germany to its assembly plant in Shenyang, China. In 2014 and 2015, other ventures were tested with the launch of services between Chongqing (China) and Duisburg (Germany), Zhengzhou (China) and Hamburg (Germany), Suzhou (China) and Warsaw, Yiwu (China) and Madrid, Kunming (China) and Rotterdam (Netherlands). Most recently, in early 2016, a first container train travelled from Zhejiang province in China to Tehran through Kazakhstan and Turkmenistan. Other services have also been put in place between Central Asia and ports in the Islamic Republic of Iran as well as between the Islamic Republic of Iran, Pakistan and Turkey.

43. In general, with transit times that are much shorter than those offered by maritime shipping and transport costs that are well below those of air freight, these services are popular with industries shipping time-sensitive, expensive cargo such as automotive parts or information technology products. However, challenges remain in a number of operational and commercial areas. Interfaces between transport operators can be further improved, as can communication between partners and achievement of agreed targets.

44. To be successful in their planning, design and operationalization, corridors require substantial coordination. Given the multilateral nature of international intermodal corridors, this coordination can be driven mainly at the governmental level as no other entities could realistically muster the necessary power of negotiation. It is therefore suggested that this coordination be established through a special framework that could take the form of an intergovernmental agreement on the development and operation of intermodal transport corridors.

45. An agreement would facilitate the articulation of a clear vision with clearly stated goals and objectives through dialogue and consensus. It would also guarantee that projects move forward at a similar pace in all the countries concerned. Once a corridor is operationalized, an agreement would also make it easier to refine and improve its management, especially in times of changing trade flows.

## **B. Role of dry ports**

46. International intermodal corridors are characterized by a high number of interfaces. Ensuring that these corridors deliver a high level of performance requires that these interfaces be managed efficiently at strategically located sites that serve as crossover points where freight can switch modes without delays or damage, regulations and procedures can be speedily and efficiently processed, and associated services can be delivered. Intermodal facilities such as dry ports are designed to fulfil these functions.

47. Indeed, developing dry ports may create economic stimuli by attracting manufacturing, agricultural processing and associated activities. Transport and related services, such as freight forwarding, logistics, customs and sanitary services, would be available at these facilities. Other value added services would include storage, warehousing, packing, grading, labelling and distribution. In addition, dry ports could grow into special economic zones with a much broader industrial and service base. Similar growth potential has

existed around seaports that have brought prosperity to coastal areas by clustering economic activity and services, which in turn have attracted further economic factors of production in a self-perpetuating process, such as a constant pool of mobile and well-trained labour.

48. Dry ports are an essential part of an inland trade distribution system, and although related facilities bear different names across the region, they all share the common characteristic that their main functions are to complete customs and other border-crossing formalities for traded cargo and to transfer this cargo between the different modes used for transportation between a port origin and an ultimate inland destination, or vice versa. In this respect, in acting as a conduit for international trade between trade origins and points of destinations or seaports, dry ports – in particular, rail-connected dry ports – are essential for landlocked countries.

49. In addition, dry ports can play an important role in rebalancing the transport task of land transport modes. Well-managed dry ports, particularly those located at a significant distance from a seaport, help reduce transportation costs and total transit time. Experiences from outside the region show that successful dry ports have increased logistics efficiency and allowed a modal shift from roads onto rail or inland waterways, thereby supporting policies aiming to reduce carbon emissions within the logistics chain. When distances between dry ports and seaports are relatively short, such as in South-East Asia, it is proving more difficult to sustain rail transport, although some countries still build dry ports for the purpose of reducing traffic congestion and pollution in and around seaports.

50. In recognition of these issues, the Busan Declaration on Transport Development in Asia and the Pacific adopted at the Ministerial Conference on Transport held in Busan, Republic of Korea, in November 2006 recognized the important role of dry ports in extending the reach of the Asian Highway and Trans-Asian Railway networks, and their potential to become centres for economic development, particularly in landlocked countries and wider domestic hinterlands. This mandate received renewed support in December 2009 in the Bangkok Declaration on Transport Development in Asia adopted at the Forum of Asian Ministers of Transport at its first session. The Bangkok Declaration also went one step further by requesting the secretariat to provide connectivity and integration of the Asian Highway network, the Trans-Asian Railway network and other transport modes by working towards the development of an intergovernmental agreement on dry ports.

51. The Intergovernmental Agreement on Dry Ports entered into force in April 2016. To date, 17 member States have signed the Agreement and 11 have become parties to it. As the Agreement will in the long term offer the benefit that trade consignments will be directly transported and customs cleared between an inland port in one country and another inland port in another country, all member States need to become parties to the Agreement as early as possible to realize this objective and serve the future development of international intermodal corridors.

52. To assist Governments and policymakers in approaching the development of dry ports, the secretariat, with funding support from the Government of the Russian Federation, recently carried out an assessment of dry port development projects in five countries of the region, namely Australia, China, India, the Republic of Korea and Thailand, which were considered to have achieved some measure of success in the establishment and operation of dry ports. It is expected that the progress achieved in these five countries could benefit countries with more limited experience in

applying best practice planning techniques and policy formulation to the development of dry ports.<sup>9</sup>

#### IV. Connecting maritime transport infrastructure

53. While the development of land transport infrastructure networks has topped the transport agenda of policymakers of the region, connectivity-related activities to link these networks with archipelagic and Pacific island countries have been afforded similar priority. Developing these links is essential to confer on land transport networks their full operational function through which they can provide broader benefits to all the countries in the region.

54. One example is maritime transport with onward land movements through the Asian Highway and Trans-Asian Railway between Japan and mainland Asia. Goods collected anywhere in Japan are routinely loaded into containers at the ports of Tokyo, Nagoya, Osaka or Hakata and taken to Shanghai, China, by sea where they are transferred to rail or road for further carriage to inland places of China or Central Asia.

55. This shows that the use of efficient international land transport linkages such as those offered by the Asian Highway and Trans-Asian Railway networks need not be limited to continental Asia but can be extended to archipelagic and island countries. However, for this to happen, efficient port infrastructure and maritime services must be developed.

56. Recognizing that maritime connectivity is vital to the achievement of the Sustainable Development Goals and acknowledging a need for better linkages between land-based transport networks and the main seaports of the region, the Commission at its seventy-first session (May 2015) adopted resolution 71/6 on maritime transport connectivity for sustainable development, requesting the secretariat to strengthen cooperation in building intermodal transport, in particular maritime transport.

57. Currently, insufficient maritime connectivity limits the ability of producers in archipelagic and island countries to take advantage of opportunities in domestic and foreign markets. For Pacific island countries, the problem is further exacerbated by the fact that there is no alternative to sea transport to achieve those benefits. Yet, the sea still largely remains for Pacific island countries the cause of their isolation and many studies have already highlighted the correlation between isolation and poverty. Not surprisingly, a number of Pacific island countries are among the least developed countries in the region.

58. Since 2004, the United Nations Conference on Trade and Development has been capturing individual countries' level of access to overseas markets through the line shipping network by using a liner shipping connectivity index. The latest 2015 figures for this index show that Pacific island countries have some of the lowest values in the world, with 8.6 for Fiji, 2.9 for Kiribati, 8.6 for New Caledonia, 5.2 for Samoa, 7.6 for Papua New Guinea, 6.6 for the Solomon Islands, 2.9 for Tonga and 6.2 for Vanuatu. While archipelagic

<sup>9</sup> Economic and Social Commission for Asia and the Pacific, "Planning, development and operation of dry ports of international importance: report on trends in the development of inland ports and policies underlying their development in selected countries of the UNESCAP region" (Bangkok, 2015). Available from [www.unescap.org/resources/study-planning-development-and-operation-dry-ports-international-importance](http://www.unescap.org/resources/study-planning-development-and-operation-dry-ports-international-importance).

countries that have larger economies and are located closer to the mainland are faring better, with index values of 27 for Indonesia and 18.3 for the Philippines, they are still far below countries with active international maritime ports such as China, Japan or the Republic of Korea, which have index values of 167.1, 68.8 and 113.2 respectively.

59. This lack of connectivity also has an impact on transport costs and therefore on the competitiveness of the economies concerned. A 2008 study on the Caribbean concluded the following:

The number of liner shipping companies providing direct services between pairs of countries appears to have a stronger impact on the freight rate than does distance. For routes where there is no company providing direct service, that is, where all containerised maritime trade involves at least one transshipment in a third country's port, freight rates in our sample range from 1,170 to 3,290 USD, with an average of 2,056 USD. For routes with one to four carriers providing direct services the reported freight rates range from 650 USD to 2,250 USD with an average of 1,449 USD. If five or more competing carriers provide direct services, the freight rate ranges from 650 USD to 1,730 USD, averaging 973 USD. Statistically, the number of carriers explains around two fifths of the variance of the freight rate.<sup>10</sup>

60. Other similar studies have found similar correlations between liner shipping connectivity and trade costs, in particular transport costs. A 2011 ESCAP study found that 25 per cent of the changes in non-tariff policy-related trade costs could be explained by the liner shipping connectivity index, that is by access to effective maritime services and related port infrastructure.<sup>11</sup>

61. Furthermore, as happens with any other mode of transport when the availability and quality of infrastructure is insufficient, services become more limited in scope. Indeed, a company's decision to provide services from/to a country's ports using its largest ships is closely related to the country's available transport infrastructure. The current trend for larger vessels, especially container ships, will therefore have a worldwide impact on the number of direct services and ports of call between origins and destinations.

62. Finally, port infrastructure is too often designed and developed with the sole idea of accommodating maritime vessels. As gateways to land transport networks, ports should also be developed as an essential component of any policy that aims to enhance access to hinterland areas through intermodal corridors. In this respect, their future design should pay increased attention to interfaces with land transport modes, in particular railways.

63. At the moment, very few, if any, ports of the region have a layout that is compatible with the efficient operation of trains, in particular container trains. In this respect, two major impediments need to be addressed: rail loading and unloading tracks must be of sufficient length to accommodate

<sup>10</sup> Gordon Wilmsmeier and Jan Hoffmann, "Liner shipping connectivity and port infrastructure as determinants of freight rates in the Caribbean", *Maritime Economics & Logistics*, vol. 10, March 2008, pp. 130-151. Available from [www.researchgate.net/publication/5223519\\_Liner\\_Shipping\\_Connectivity\\_and\\_Port\\_Infrastructure\\_as\\_Determinants\\_of\\_Freight\\_Rates\\_in\\_the\\_Caribbean](http://www.researchgate.net/publication/5223519_Liner_Shipping_Connectivity_and_Port_Infrastructure_as_Determinants_of_Freight_Rates_in_the_Caribbean).

<sup>11</sup> Economic and Social Commission for Asia and the Pacific, "Trade facilitation in Asia and the Pacific: which policies and measures affect trade costs the most?", staff working paper prepared by the Trade and Investment Division, Bangkok, 22 February 2011, p. 22. Available from [www.unescap.org/sites/default/files/TIDwp01\\_11.pdf](http://www.unescap.org/sites/default/files/TIDwp01_11.pdf).

full-length trains, and they must be located close to berth-side container stacks to allow single-lift loading and unloading operations using port handling equipment, such as portal cranes or reach-stackers. In their current design, most ports, far from encouraging a modal shift from road to rail, actually reinforce the predominant use of road transport for inbound and outbound movements. This feature delays the emergence of fuel-efficient, environmentally friendly and cost-effective transport systems in support of the 2030 Agenda.

64. It is therefore important that policymakers of the region who are going through the planning of their country's future transport infrastructure, in particular port infrastructure, be aware of likely medium- and long-term developments that may have an impact on their level of connectivity to the main land and its markets.

## V. Issues for consideration

65. While the Intergovernmental Agreement on the Asian Highway Network, the Intergovernmental Agreement on the Trans-Asian Railway Network and the Intergovernmental Agreement on Dry Ports provide the foundation for regional connectivity, the quality and capacity of this infrastructure across the region is uneven and some links are still missing. It is believed that the development of international intermodal corridors would provide a framework for a coordinated approach to address development issues across all modes, including interoperability and technological innovations.

66. The Ministerial Conference may wish to provide further guidance on the following elements proposed for inclusion in the draft regional action programme for sustainable transport connectivity in Asia and the Pacific, phase I (2017-2021).

**Immediate objective.** Regional connectivity is to be enhanced through the continued development, upgrading and operationalization of the transport infrastructure networks, including through the introduction of new technologies and necessary regional standards.

### Outputs

1. Sessions of the Working Group on the Asian Highway, the Working Group on the Trans-Asian Railway Network and the Working Group on Dry Ports;
2. Study on a regional framework on infrastructure connectivity for integrated intermodal transport corridors with the inclusion of land and maritime transport;
3. Study on infrastructure integration of different modes of transport through further development of the Asian Highway network, the Trans-Asian Railway network, the network of dry ports and other regional transport infrastructure networks, including maritime infrastructure;
4. Study on harmonization of technical standards of transport infrastructure;
5. Study on the application of new technologies to promote sustainable transport through improved infrastructure facilities;

6. Report on regional progress in transport infrastructure connectivity in the region;
7. Workshop/seminar/meeting/advisory service on transport infrastructure connectivity.

**Indicators of achievement**

1. Continued use by member States of the meetings of the Working Group on the Asian Highway, the Working Group on the Trans-Asian Railway Network and the Working Group on Dry Ports to amend the corresponding Intergovernmental Agreements and debate issues relating to the development of the networks.
  2. An increased number of member States becoming parties to the Intergovernmental Agreement on the Asian Highway Network, Intergovernmental Agreement on the Trans-Asian Railway Network and Intergovernmental Agreement on Dry Ports.
  3. Adoption by member States of favourable frameworks for the development and operation of intermodal transport corridors.
  4. Measures taken by member States to upgrade and expand the Asian Highway and Trans-Asian Railway networks and internationally recognized dry ports in their territories, including measures to harmonize technical standards and introduce new traffic management technologies.
  5. Measures taken by member States to incorporate study recommendations for regional and interregional intermodal transport corridors.
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