Towards an efficient and resilient transport and logistics network and mobility

Note by the secretariat

Summary

One of the key purposes of transport and logistics networks and mobility is to support the efficiency and resilience of supply chains. Even with considerable recent progress, the shortfalls in transport and logistics networks and mobility in Asia and the Pacific result in significant occurrences of high costs and delays in the movement of goods, disproportionally affecting countries with special needs. The present document serves to highlight the effects of these shortfalls. An outline is given of the current regional situation of land and maritime transport and logistics networks, the potential for further regional actions in transport infrastructure and operational connectivity, and possible gains from the digitalization of freight services.

The Fourth Ministerial Conference on Transport may wish to consider the policy directions and activities described in the present document in the light of the regional action programme for sustainable transport development in Asia and the Pacific (2022–2026), in particular its thematic areas of regional land transport connectivity and logistics, maritime and interregional transport connectivity, and digitalization of transport. The Ministerial Conference may also wish to share updates and selected highlights with regard to national, bilateral and multilateral policies and initiatives aimed at achieving a more efficient and resilient transport and logistics network and mobility.
I. Introduction

1. One of the key development purposes of transport and logistics networks and mobility is to support the decentralized value-adding processes of international supply chains. Supply chain performance depends on the relationship between economic efficiency and resilience. Leaner supply chains, while often more cost-effective, tend to have fewer buffers against external disruptions. The trade-offs between efficiency and resilience in supply chains can be mitigated by optimizing the performance of transport and logistics networks, in particular by improving infrastructure, promoting intermodality, efficiently regulating cross-border freight and, as illustrated by the ongoing coronavirus disease (COVID-19) pandemic, preserving essential transport services during crises.

2. Progressing towards an efficient and resilient transport and logistics network and mobility in Asia and the Pacific remains a top priority for the region. However, notwithstanding considerable progress over the past decades, transport connectivity in the region remains uneven, with significant occurrences of high costs and delays in the movement of goods, which disproportionately affect countries with special needs, such as landlocked developing countries and small island developing States.¹

3. The persistent connectivity challenges were amplified by the COVID-19 pandemic, which has shown the close interdependence between transport connectivity and efficient and resilient supply chains, as well as the need to go beyond restoring the pre-pandemic connectivity level in pursuit of greater incisiveness and resilience to future disruptions. Additional cross-border controls and checks introduced to deal with the pandemic have exacerbated the connectivity challenges of landlocked developing countries in Asia.² Likewise, the economic impact of the pandemic has further weakened shipping company services available to the small island developing States in the Pacific.³

4. To ensure the continuous flow of cross-border trade, member States have implemented various transport facilitation measures, balancing the need to contain the pandemic against the need to keep borders open, in particular for the movement of essential goods. The Asian Highway network member countries have kept all or a significant part of their land borders open for freight, and two thirds of them have implemented special transport facilitation measures. Freight transport has proceeded with limited interruptions along the Trans-Asian Railway network, making rail transport an even more vital link in international trade, in particular for the movement of essential goods and medical supplies. Likewise, ports have remained operational for freight, supporting the bulk of global trade and preventing the total dismantling of global supply chains.⁴

5. The pandemic has created great momentum for digitalization, and a wide range of policy and technical solutions for seamless and smart connectivity have reduced reliance on physical contact (i.e. contactless solutions) and exposure to

¹ Review of Sustainable Transport Connectivity in Asia and the Pacific 2019: Addressing the Challenges for Freight Transport (United Nations publication, 2019).
⁴ ESCAP and Asian Development Bank, “Regional cooperation for trade and transport connectivity in the age of pandemics in Asia and the Pacific” (n.p., 2020).
risks, interruptions and costs of documentary and other checks (i.e. seamless solutions). The past two years have also shown that there is high potential for a more balanced and sustainable modal split of freight transport, as the use of rail has grown to compensate for the interruptions in road transport operations.5

6. At the same time, the policy responses immediately following the outbreak were fragmented and characterized by lack of clarity and coordination, which adversely impacted supply chain connectivity. According to an analysis by ESCAP, existing legal instruments governing the international carriage of goods do not include sufficient provisions for cooperation to respond to critical situations that disrupt international supply and logistics chains.6 The adoption by the Association of Southeast Asian Nations (ASEAN) of the COVID-19 Recovery Guidelines for Resilient and Sustainable International Road Freight Transport Connectivity in ASEAN shows that there is great scope for action at the subregional level to establish a crisis response mechanism or guidelines that would help to coordinate and streamline the exchange of information during crises.7

7. The present document contains a summary of the current situation of regional transport connectivity (section II) and a discussion of the potential for further regional actions to progress towards a more efficient and resilient transport and logistics network, highlighting the possible gains from the digitalization of freight services (section III).

II. Efficiency and resilience challenges in connecting Asia and the Pacific to regional and global supply chains

8. The level of transport connectivity in the region is determined by the current state of the regional land transport network, including the Asian Highway network, Trans-Asian Railway network and dry ports. It is also influenced by the situation of the regional maritime network. Obstacles for land and maritime transport connectivity in the region, which range from limited availability and low quality of transport infrastructure to persistent operational connectivity challenges, undermine supply chain efficiency at the national, subregional and regional levels. The present section provides a general overview of the regional transport and logistics network in the region.

A. Asian Highway network

9. The Asian Highway network has been formalized through the Intergovernmental Agreement on the Asian Highway Network, which entered into force in July 2005. Currently, 30 member States are parties to the Agreement.

10. The network now comprises more than 145,000 km of roads connecting all ESCAP subregions in Asia, namely East and North-East Asia, North and Central Asia, South-East Asia, and South and South-West Asia. There are currently 9 Asian Highway routes indicated by a single-digit number (routes 1–9), which link more than one subregion, and 50 routes indicated by a two-digit number, which include routes contained within individual subregions and those

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7 ASEAN, Jakarta, 2021.
11. Road infrastructure development along the Asian Highway network remains active. In South-East Asia, the Government of Viet Nam has an ambitious road development project along Asian Highway route 1, the 2,100 km North-South expressway, which runs from the northern mountains of Lang Son Province, bordering China, to the southernmost province of Ca Mau, traversing Hanoi in the north and Ho Chi Minh City, the largest commercial hub, in the south. In Cambodia and Viet Nam, a project to construct an expressway that would link Phnom Penh to Ho Chi Minh City could halve the travelling time along the Greater Mekong subregion southern corridor. In South-West Asia, the Government of Turkey embarked on large-scale development of the road infrastructure network with the North Marmara motorway, connecting numerous industrial zones and economic centres and supporting seamless transport and logistics connectivity between Asia and Europe. The world’s longest sea-crossing bridge, the 55 km Hong Kong-Zhuhai-Macao bridge in China, is set to cut the journey time between Zhuhai and Hong Kong from three and a half hours to 45 minutes, allowing for seamless and speedy logistics connectivity and supporting supply chain networks in the area. The Government of the Russian Federation is constructing new high quality road networks, such as the Kazan-Yekaterinburg highway, the Moscow-Kazan highway and the 2,000 km Meridian highway, which will extend from the border of Kazakhstan to the border of Belarus.

12. The quality of road infrastructure in Asia and the Pacific remains an area of pressing concern. In order to ensure the quality of Asian Highway infrastructure, parties to the Agreement are required to conform to the technical design standards and road classifications as stipulated in annex II to the Agreement. Four classes of routes are envisaged in the annex: primary, class I, class II and class III. However, there are still routes that do not rise to the standard of class III. According to current estimates, 37 per cent of the Asian Highway network routes are primary and class I, 38 per cent are class II, and one quarter are class III or below (see figure I). Route quality also varies substantially by subregion. In North-East Asia and South-West Asia, 60 per cent of the network consists of primary and class I roads. In North and Central Asia, 55 per cent of the network consists of class II roads, while primary and class I roads account for less than 20 per cent. In South Asia, more than one third of the network consists of class III roads.

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Figure I
Distribution of Asian Highway routes by road classification
(Percentage)

![Figure showing distribution of Asian Highway routes by road classification](image)


13. In addition to facing infrastructure challenges, cross-border and transit road transport in Asia and the Pacific face considerable operational challenges due to various non-physical barriers, such as restrictions on traffic rights, lack of harmonized standards for freight vehicles, insufficient use of new technologies and a low level of digitalization.

14. With regard to traffic rights, the cross-border road connectivity arrangements among network member countries, usually stipulated under bilateral or multilateral agreements, can be categorized as follows: arrangements whereby no traffic rights are granted to foreign vehicles; arrangements whereby traffic rights are granted subject to a quota; and arrangements with non_quota restrictions. The most common arrangements among member countries are those whereby traffic rights are granted subject to a quota through bilateral and/or multilateral agreements. For example, multilateral permit arrangements among countries of the Greater Mekong subregion allow a fixed number of transport permits to be issued to foreign road freight vehicles. Similar arrangements exist among member countries of the Black Sea Economic Cooperation Organization.

15. Furthermore, differences in national standards in the design and construction of road infrastructure as well as permissible vehicle weights, dimensions and emissions pose various challenges in international road transport. For example, overloaded or oversized foreign vehicles can cause serious damage to roads, bridges and other transport infrastructure abroad, as the foreign vehicles may not be compatible with the design of the road network of host countries (e.g. tunnel height and width and road curve radii). Differences in emissions standards, border crossing procedures and administrative requirements add another layer of complexity that prevents the achievement of seamless international road connectivity in the region. At the same time, given the current situation and the variety of implementation capacities of the Asian Highway network member countries, addressing the harmonization of standards
on vehicle weights, dimensions and emissions requires that a gradual approach be taken, possibly at the corridor level, accompanied by a set of complementary measures.\(^{14}\)

16. Lastly, existing and emerging smart transport and digitalization solutions remain underused in many network member countries. In many cases, transport documentation is processed manually: carriers issue documents in paper form only, and documentation is subject to physical and manual controls. The implementation of the electronic systems of pre-declaration verification and remote approval of the accompanying transport documentation is still at a relatively early stage. The use of new technologies at road checkpoints is very limited: systems of remote registration, issuance and control of the use of permits in digital format are only partially implemented; there is limited use of electronic navigation seals indicating geographical coordinates and time as a control tool to register unauthorized access to the transported goods; and the use of associated sensors that record the modes and condition of the transported goods is also limited.

17. The Regional Strategic Framework for the Facilitation of International Road Transport, adopted in 2012, and the subsequent facilitation models developed by the secretariat provide comprehensive guidance to member States in further facilitating international road transport in the region.

B. Trans-Asian Railway network

18. The Trans-Asian Railway network was formalized through the Intergovernmental Agreement on the Trans-Asian Railway Network, which entered into force in June 2009. The number of parties to the Agreement has steadily increased since that time, reaching 21 in 2020.

19. The entry into force of the Agreement heralded the arrival of container freight trains on the Trans-Asian Railway network. Figure II, which provides annual data on the number of China-Europe freight train journeys, reveals exceptional growth in the network’s freight operations. The number of such journeys rose from a mere 17 in 2011 to 12,406 in 2020, a 730-fold increase over approximately a decade. Even during the pandemic, the number of freight train journeys along the network continued to increase year on year, which demonstrates the resilience of the network and rail transport. The increase in the number of journeys over the past decade shows that transcontinental freight trains provide a competitive alternative to maritime and air transport for shipments between Asia and Europe and that railways can therefore be an important and reliable component of sustainable transport connectivity between the two regions.

\(^{14}\) ESCAP, *Strengthening the Capacity of ESCAP Member States to Harmonize Standards on Weights, Dimensions and Emissions of Road Vehicles for Facilitation of Transport along the Asian Highway Network* (Bangkok, 2020).
Figure II
Exponential growth of China-Europe freight train journeys since 2011

Source: Annual data from Shanghai Tianheng International Logistics Company Limited website (Chinese only).

20. Notwithstanding the rapid increase in the number of freight train journeys in recent years, including during the pandemic, seamless rail connectivity along the network continues to be challenged by numerous physical and non-physical barriers that have become more pronounced as rail traffic over the network has increased.

21. The network consists of nearly 118,000 km of railway lines, 12,400 km of which have yet to be constructed. These missing links in the network are an obvious challenge to its physical connectivity. The Governments of member countries where these missing links are located have been making efforts to construct them, but progress has been slow owing to the huge financing requirements involved.

22. In addition to the missing links, there are five different gauges of track along the network, the most predominant of which are 1,520 mm, 1,435 mm and 1,676 mm. The presence of different gauges requires a break of gauge at many railway border crossings. The need for a break of gauge is not itself a particularly serious challenge to seamless rail connectivity, as trains must stop at border crossings in any case for the completion of regulatory formalities and operational requirements. There are many efficient ways to address the break of gauge, and as long as it can be done in parallel to mandatory border crossing activities, then the delays can be kept to a minimum.
23. The greater challenge to rail connectivity in the region, however, stems from the lack of efficient operational or institutional connectivity. This includes divergence among the countries in operational requirements of railways and regulatory formalities of border agencies, such as customs. These issues were first highlighted in the Regional Cooperation Framework for the Facilitation of International Railway Transport, adopted by the Commission in its resolution 71/7. The Framework served to identify 4 basic issues and 11 areas of cooperation among the member States for the facilitation of international railway transport.

24. The issues related to the facilitation of international rail transport have received increasing attention since then and gained further traction when the Working Group on the Trans-Asian Railway Network, at its 5th meeting, recognized that the operational readiness of the network required concurrent facilitation measures, such as harmonized customs formalities and efficient electronic information exchange among the stakeholders.15

25. At its 6th meeting, held in 2019, the Working Group further recognized the importance of electronic information exchange among railways and proposed the harmonization of such initiatives in the region through a possible multilateral arrangement, including an annex or protocol to the Intergovernmental Agreement in that area.16 At its 7th meeting, in 2021, the Working Group took the matter even further, agreeing to consider introducing a new annex on guiding principles on the harmonization of electronic information exchange among railways and between railway and control agencies.17

C. Dry ports and intermodal transport corridors

26. Dry ports help to improve transport efficiency and meet supply chain requirements by grouping access to highways and railways together with customs processing, warehousing, consolidation and distribution, and manufacturing functions, and by clustering economic activities along domestic and international transport and economic corridors.

27. The Intergovernmental Agreement on Dry Ports, which entered into force in April 2016, is a fundamental pillar for the development of dry ports in the region. It provides a uniform definition of a dry port of international importance, identifies the network of existing and potential dry ports in Asia and the Pacific and proposes guiding principles for their development and operation. The number of parties to the Agreement continued to grow throughout the period 2017–2021 and currently stands at 16.

28. As of 12 September 2021, 269 dry ports, comprising 181 existing and 88 potential dry ports, are listed in the Agreement. The interconnection of dry ports to form a network, as envisaged in the Agreement, requires a certain degree of consistency with regard to the services that dry ports provide, their proximity to trade-generating industry and their transport connections. To account for the fact that the facilities that member countries identified as dry ports under the Agreement correspond to a wide range of types, infrastructure links and service functions, guiding principles were further developed in the Regional Framework.
29. As recognized in the Regional Framework, further dry port development in the region requires addressing both hard aspects (i.e. infrastructure) and soft aspects (i.e. operations) of dry ports. Addressing infrastructure includes the following: reaching compliance with basic requirements in accordance with annex II to the Agreement; finding a suitable location; ensuring transport infrastructure linkages both within a dry port and connecting dry ports to other locations; and meeting technical standards for dry ports, container yard capacity and equipment, and the design of other major facilities of dry ports. With regard to addressing operations, priority areas include the following: introducing information technology systems to manage dry port workflows; applying the United Nations Code for Trade and Transport Locations for the identification of dry ports of international importance; incorporating dry ports into international transport documents; establishing arrangements for customs clearance at dry ports; implementing policy measures, legislation and solutions for planning dry port development; and identifying practical options for financing the development and operation of dry ports.

30. At the present time, the lack of institutional capacity imposes serious limitations on the development of dry ports in the region. In particular, the choice of proper locations for dry ports remains a frequent challenge for their subsequent successful operation. In some cases, de facto competition between dry ports and seaports for flows of transported cargoes hinders the efficiency of dry ports and contravenes their intended role of complementing and decongesting seaports.

31. The financing of dry port development remains an imminent challenge to their development. There is always a high level of risk associated with dry port investments, owing to the uncertain level and stability of demand, in particular in some inland areas, and the uncertain level of competition in some cases. Wider exploration of public-private partnerships can offer an opportunity for Governments to reduce the burden on national budgets by attracting private investments in expensive infrastructure projects while introducing private sector expertise into project management and operations.

32. Lastly, as recognized by the Working Group on Dry Ports at its 3rd meeting, in November 2019, the region needs to develop a more comprehensive approach to the development of dry ports as components of intermodal transport corridors. Governments engaged in this work need to bear in mind the broader context of international intermodal transport and economic corridors in scaling up the catalytic role of dry ports in the shift to sustainable freight operations and in expanding the scope of the economic and social benefits of transport connectivity. There is also an acknowledged demand for continued efforts to enhance the efficiency of transport corridors involving dry ports and to prioritize concrete measures, such as identifying practical and viable options concerning the harmonization of legal frameworks for multimodal transport operations in the region.

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18 Commission resolution 74/2, annex II.
19 ESCAP/DP/WG/2019/5, para. 27.
D. Maritime connectivity

33. Asia and the Pacific currently accounts for two thirds of global seaborne trade and is home to more than half of the busiest seaports worldwide, yet maritime connectivity, including sustainable port development, remains a significant challenge. Asia is home to the top 10 container ports and 15 out of the top 20 ocean container carriers and shipping companies in the world. In addition, out of the top 10 global terminal operators, 7 are based in Asia. Although COVID-19 has weighed down shipping demand and port traffic, maritime transport has continued to play a key role in the global supply chain and the transport of all goods, including essential goods, quarantine supplies, daily necessities and industrial products.

34. The degree of maritime transport connectivity ultimately depends on the choice of shipping line as determined by the carrier’s port calling strategy and feeder network, which, in turn, are influenced by the location and capacity of the port and the volume of traffic. As a result, cargo is more concentrated along the major trunk routes and at the regional hub ports and gateway ports of each country. In addition, areas far from the main routes have relatively unstable connections and have no alternative to expensive services. In other words, maritime connectivity in the region shows a kind of polarization.

35. This polarization is well illustrated by the Liner Shipping Connectivity Index of the United Nations Conference on Trade and Development, which shows how well countries are connected to the global shipping network. China, Singapore, the Republic of Korea, Malaysia and Hong Kong, China, are the highest ranked according to the Index, and their scores have shown high growth rates over the past 10 years compared to countries in other regions, such as Europe and North America. Meanwhile, Pacific island countries have shown very low connectivity, well below the world median value, indicating that integration with the global logistics chain remains challenging.

36. Current shipping rates show the direct impact of maritime connectivity on the efficiency and resilience of supply chains. The composite index of spot sea freight rates between major East-West trade routes increased by 300 per cent between September 2020 and September 2021, creating a serious burden for many shippers and other supply chain participants. There are several reasons for the surge in shipping rates. In particular, owing to the long recession that preceded the pandemic, the shipping industry had not been placing shipbuilding orders, and when demand for cargo from China rapidly increased following a temporary contraction due to the pandemic, the supply of ships could not keep up. This reasoning is supported by the fact that most of the shipping rate increases occurred on routes originating in China. Furthermore, in a kind of domino effect, frequent outbreaks caused delays at logistics sites and ports and in inland transportation. As empty containers could not be retrieved, freight rates increased. The current situation is likely to persist until 2022, when recently ordered ships will enter the market. These difficulties illustrate the need for a more resilient, integrated, intermodal transport network that has the capacity to quickly adjust and respond to disruptions.

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37. The development of Asia-Pacific ports is a necessary response to continuous economic growth and the concentration of maritime transport networks. Asian container ports have grown rapidly with the progress of containerization, and container port traffic in the Asia-Pacific region accounted for 62 per cent of global container port volume in 2019. The deployment of large container ships by shipping companies to respond to economies of scale and eco-friendly regulations has led to investment in new terminals as well as the expansion of existing port facilities.

38. Despite those signs of rapid growth, most of the countries in the region have low-capacity and outdated port infrastructure, which results in increased logistics costs, reduced competitive edge in international trade and diminished opportunities to benefit from backward and forward linkages in port investments. Increasingly, large container ships operating in association with a strategic shipping alliance can place an enormous financial burden on port authorities or terminal operators, who must install new container equipment, upgrade technology and, where necessary, dredge the port to improve access. In addition, the need to accommodate large ships has weakened the negotiating power of port authorities in relation to the shipping lines. In turn, small and medium-sized ports have few alternatives but to become feeder ports to key hub ports, owing to their inability to accommodate large mother vessels, prices and the carriers’ change of policy with regard to the deployment of their liner fleets.

39. Faced with the constantly growing volume of seaborne trade, most ports need to keep enhancing their performance and productivity to remain a competitive gateway to the global economy. Doing so entails addressing a wide set of institutional, financial, technological, environmental and legal challenges, which are present in one way or another at most ports in the region.

E. Challenges of countries with special needs

40. Connecting countries with special needs to regional and global markets remains one of the most challenging tasks for Asia and the Pacific.

41. The landlocked developing countries continue to suffer from high transport costs and delays due to their geographical situation, which are amplified by infrastructure shortages, road-centric transport systems, low levels of digitalization and limited facilitation of cross-border transport operations. These challenges were exacerbated by additional cross-border controls and checks introduced to deal with COVID-19 in landlocked developing countries and in the countries that constitute their main trading and transit partners.

42. Likewise, the pandemic impacted the Pacific small island developing States. In the Pacific, the export of primary goods decreased in response to reduced demand from major importing countries, and the economic downturn in Pacific island countries decreased the subregion’s demand for imports, further weakening the shipping company services available to those countries. The

23 ESCAP, Facilitating Sustainable and Resilient Port Development to Support Sustainable Maritime Connectivity in Asia and the Pacific.


25 ESCAP, “Freight transport and COVID-19 in North and Central Asia: changing the connectivity paradigm”.

setback in the maritime connectivity of small island developing States was further amplified by adverse climatic events that coincided with the pandemic.  

III. Exploring opportunities for more efficient and resilient transport connectivity in Asia and the Pacific

43. Building on the considerations in the previous sections and the guidance offered by the Committee on Transport at its sixth session, the present section serves to elaborate on the existing opportunities to achieve a more efficient and resilient transport connectivity and mobility in Asia and the Pacific. The wide range of possible regional actions aimed at enhancing the efficiency and resilience of supply chains through improved transport connectivity can be clustered into two major areas: regional land transport connectivity and logistics; and maritime and interregional transport connectivity.

A. Strengthening regional land transport connectivity and logistics

44. Strengthening land transport connectivity and logistics in Asia and the Pacific requires a comprehensive approach, addressing both infrastructure and operational connectivity along the regional intermodal land transport and logistics systems. The proposed activities in this area are provided in the following paragraphs.

1. Encouraging the upgrading and extension of the Asian Highway and Trans-Asian Railway networks, as well as dry ports of international importance

45. Facilitating coordinated infrastructure development in line with the agreed regional infrastructure parameters remains one of the highest regional priorities, as member States continuously expand and improve regional infrastructure by introducing new routes along the Asian Highway network and the Trans-Asian Railway network and developing new dry ports to support intermodal operations.

46. In this regard, the Working Group on the Asian Highway, the Working Group on the Trans-Asian Railway Network and the Working Group on Dry Ports retain the utmost importance in steering regional infrastructure development. As reflected in their consistent practice over the years, the Working Groups have provided an important institutional platform for the advancement of regional connectivity, covering emerging and topical operationalization issues that maximize the efficiency and value added of the infrastructure defined in the relevant Intergovernmental Agreements.

47. The three Working Groups must continue their work on coordinating infrastructure requirements in line with their mandates. They could, however, upon request from the contracting parties, discuss further issues of interest, including the potential for harmonization of the regulatory formalities, as appropriate, and the operational requirements in international transport along the respective networks. For example, the Working Groups discussed the issue of enhancing sustainability in freight transport at their most recent meetings and supported a regional approach to sustainable freight transport for the region. Furthermore, it will be crucial to leverage the networks for greater integrated intermodal transport in the region, taking a holistic view of the supply chain from

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26 ESCAP, “COVID-19 and its impact on shipping and port sector in Asia and the Pacific”.
the perspective of a variety of stakeholders, such as end users, shippers, freight forwarders and third-party logistics providers.

48. Moreover, pursuant to Commission resolution 77/1 on building back better from crises through regional cooperation in Asia and the Pacific, actions must be taken to further regional cooperation on connectivity, including through the cooperation mechanisms, frameworks and agreements of the Commission. Possible steps in this area include the insertion of harmonized crisis response-related provisions into existing transport agreements, exploring ways of strengthening the resilience of land transport, and supporting collective actions during future disruptions.

49. Lastly, there is a pressing need to support evidence-based approaches to ensure better planning, development and upgrading of the regional transport system. This entails a greater use of data and related analytical and modelling tools in the decision-making processes pertaining to the regional transport infrastructure and operational connectivity initiatives, as well as an increase in the capacity of countries, in line with their specific needs, for the development of transport and logistics information systems to support better planning and analytical tools. Strengthening the mechanisms for cooperation and the exchange of knowledge among institutes involved in transport research, education and training in Asia and the Pacific would be instrumental in these efforts to promote evidence-based and scenario-based approaches in transport policies.

2. Increasing the efficiency and resilience of land and intermodal transport corridors

50. As evidenced by the latest discussions of the Working Group on Dry Ports, the absence of a clear institutional and regulatory framework covering door-to-door intermodal and multimodal transport operations hinders efforts to realize the full potential of intermodal transport corridors, for instance through the use of more environmentally friendly modes of transport, including railway and inland waterway transport.

51. There is a need to develop the conceptual framework for the harmonization of rules and practices pertaining to the relationship between the carriers of different modes of transport involved in multimodal transport chains. The drafting of regional guidelines for harmonized national legislation on multimodal transport would constitute an optimal immediate output in this area.27

3. Enhancing the accessibility of the regional transport network with particular attention to countries with special needs

52. The provision of regular advisory services and capacity-building programmes to facilitate the access of landlocked developing countries to regional supply chains remains an imperative if the region is ever going to bridge existing transport connectivity gaps.

53. Great benefits and reduced connectivity gaps would result from greater use of transport facilitation tools and digital technologies that ensure transparency and information exchange with regard to relevant procedures and requirements in order to secure the seamless movement of goods, and from enhanced sharing of trade- and transit-related information among countries.

27 ESCAP/DP/WG/2021/4, para. 16.
54. Landlocked countries in the region need a reliable, secure and efficient transit transport system to access regional and global markets. More coordinated and harmonized interaction between national border agencies, both in landlocked developing and transit countries, is essential to simplifying, facilitating and accelerating the clearance of freight. Digital solutions, such as the electronic exchange of information and tracking of goods and vehicles, will also help to ensure the seamless movement of freight and limit physical contacts in transit and at borders. For example, landlocked developing countries could operationalize electronic cargo tracking systems using new technologies to further reduce transit transport costs and simplify related formalities. The secretariat, through its extensive work in this area, could render technical assistance to interested member States.

55. In addition, Governments of landlocked developing countries need to take concrete measures to strengthen international railway transport as rail, in particular, is suited to enabling access among these countries and seaports. To support landlocked developing countries in this regard, the secretariat is now working on recommendations to enhance their port-hinterland connectivity.

4. **Improving the quality and inclusiveness of logistics services and the overall competitiveness and competence of logistics in the region**

56. Human capacities in the logistics and transport sectors play an increasingly significant role in defining the prevailing nature of transport operations, and the maturity of the logistics sector has now been recognized as an integral part of the overall performance of the supply chain.

57. Over the past decade, ESCAP has established close collaboration with logistics and transport providers and developed several tools and training programmes to increase logistical competence in the region. Improving the quality, inclusiveness and overall competitiveness of logistics services could be encouraged by continuing to provide capacity-building activities for logistics services professionals, holding regular regional meetings of logistics service providers and their national associations, and increasing the use of logistics information systems.

5. **Deepening the sustainability of freight transport across the transport networks of the region in the decade of action for the Sustainable Development Goals**

58. The sustainability of freight transport has become a highly pressing issue owing to the escalating negative externalities of the freight transport sector and the need to mitigate them to implement the 2030 Agenda for Sustainable Development. The COVID-19 pandemic has further heightened awareness of the need for more-sustainable freight transport, which is an integral part of building back better from the crisis. In this regard, the secretariat has supported the member States in developing national strategies for sustainable freight transport with the overarching objective of strengthening the links between the implementation of freight transport policies and the achievement of the Sustainable Development Goals.
59. At their latest meetings, the Working Groups welcomed a regional approach to enhancing the sustainability of freight transport in Asia and the Pacific and further recommended the approach to be presented at the Fourth Ministerial Conference on Transport for further consideration.28

B. Maritime and interregional transport connectivity

60. The current position of the region in the global economy makes connecting to global supply chains through maritime routes and interregional transport corridors an integral part of the transport connectivity agenda. In that regard, reforms in maritime and overland connectivity are needed.

1. Promoting sustainable maritime connectivity

61. The diversity of the region is a driving force for regional development, but since the subregions and member States each face distinct problems and challenges, maritime transport policies should take into account the specific issues of subregions, the policy goals of individual countries, the realities of the maritime industry and the interests of stakeholders. Still, there are several common issues that member States should consider in establishing shipping policies, including issues that align with global agendas, such as implementing the 2030 Agenda, achieving the greenhouse gas reduction targets set by the International Maritime Organization, promoting technological innovation in the shipping and port industries and collaborating with the private sector to improve shipping performance.

62. Supporting the regular systematic exchange of best practices and experiences on sustainable maritime connectivity for Asia and the Pacific, as mandated by the Commission in resolution 76/1 on strengthening cooperation to promote the conservation and sustainable use of the oceans, seas and marine resources, would enable the consideration of best practices and possible collective actions that could contribute not only to greater transport connectivity but also to a more sustainable use of the region’s vital marine resources. The regional dialogue on sustainable maritime connectivity will also address the issues of small island developing States, promote regional cooperation to assist them in meeting their transport challenges, and strengthen their resilience to future shocks.

2. Enhancing interregional transport connectivity

63. The COVID-19 pandemic has demonstrated that Asia and Europe remain key trade partners. It also underscored a high demand for interregional trade and the transportation of goods between the regions. Further enhancing sustainable transport connectivity between Asia and Europe after the pandemic will be an important element in rebuilding a better-designed and crisis-resilient international trade and transport system covering the Eurasian continent.

64. Regional consultations were held on the basis of the secretariat’s analytical work on Eurasian transport connectivity. The results of the consultations suggest that given the rapidly evolving situation in the transport industry, the conditions of uncertainty and the obvious need to adapt approaches to ensure the sustainability and crisis-responsiveness of transport systems, convening periodic interregional forums on Eurasian sustainable transport

28 See ESCAP/AHWG/2021/4, para. 23; ESCAP/TARN/WG/2021/5, para. 21; and ESCAP/DP/WG/2021/4, para. 24.
connectivity is the optimal modality for cooperation and coordination of efforts for relevant policymakers and transport industry stakeholders in both regions.  

C. Leveraging digitalization in regional transport and logistics networks

65. The use of new technologies and digitalization in regional connectivity has enormous benefits in terms of increasing the efficiency and resilience of supply chains. At the same time, digital transformation can take a variety of forms, and solutions may diverge greatly; thus the networks in the region would strongly benefit from regionally coordinated efforts.

1. Towards smart Asian Highway routes

66. Smart transport solutions elicit significant interest among Asian Highway network member countries. Technological advancements have made it possible to collect, analyse and disseminate a large amount of traffic information more quickly than ever before. Technologies enable traffic detection, information, management, control, communication and user interface systems that monitor traffic and identify bottlenecks and other disruptions as they occur on the road. In combination with big data and artificial intelligence, such technologies create a smart transport system that improves the safety, efficiency and environmental friendliness of transport operations and makes road transport more sustainable and resilient.

67. Currently, the development of smart transport technologies in Asia and the Pacific has a national focus. To reap the full benefits and economies of scale from deploying smart transport solutions, however, would require that Governments in the region have the willingness and ability to jointly address issues, in particular those related to transport infrastructure and operational requirements, including border-crossing procedures. As a first step in that regard, there is ongoing work on a set of guidelines for the deployment of highly and fully automated vehicles in road traffic along the network, based on the analysis of existing technical differences and differences in standards as well as technology gaps among member countries.

68. Tangible progress in the digitalization of road transport along the Asian Highway network can also be achieved through continued development of logistics information systems, which are increasingly used at the national and international levels to improve logistics efficiency and performance quality and reduce logistics costs. The use of e-logistics speeds up logistics and supply chain service by automating the preparation of documentation, increasing the transparency and traceability of cargo and simplifying performance evaluation, and it may also reduce fraud and theft, especially within a long and complex supply chain. There is scope for further advisory and capacity-building actions in this area, based on the existing ESCAP Standard Model of Logistics Information Systems and its recommended best practices, and on a recently updated training manual to support member countries in the development of such a system.

69. Studies conducted by ESCAP show that national practices and strategies prior to – and in particular during – the pandemic, provided a wealth of good practices and lessons learned that can further support momentum for tangible progress towards seamless and smart connectivity along the network. Some of these solutions draw on technical progress in other areas (for example, telemedicine), while others represent an internal change in transport processes and organizations (such as intelligent transportation systems), but they still...

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29 ESCAP/CTR/2020/6, recommendation 3.
require the buy-in and participation of other sectors and a wide range of governmental actors. This requirement makes awareness-raising and capacity-building activities key in supporting ongoing and potential reforms for smart and seamless connectivity along the Asian Highway routes.30

2. Accelerating the digital transformation of rail transport

Rail freight transport has faced major competition from road transport, which is expected to further intensify with the emergence of transformative transport technologies, such as autonomous vehicles, high-capacity trucks, vehicle platooning and on-demand mobility services. Transformative changes are also impacting rail freight, driven by emerging digital technologies such as fifth-generation (5G) wireless systems networks, big data, cloud computing, the Internet of things, automation, artificial intelligence and blockchain technology. The crisis caused by the COVID-19 pandemic has provided an opportunity for railways of the region to further increase their comparative advantages by strengthening rail digitalization.

Some of the areas where rail digitalization could be pursued include rolling stock and fixed-asset maintenance, railway operations and rail safety. Post-pandemic digitalization offers huge prospects for railway managers, owing to its numerous benefits in areas that include capacity utilization, traffic management, reliability, energy efficiency, customer experience and operating costs. Increasing rail digitalization in the region would present a formidable challenge, however, given the divergence among countries in the state of development of railway transport and the considerable disparity in financial investments in digital infrastructure, research and innovation, and digital skills.

Rail digitalization needs to be managed with a systematic and staggered approach and with considerable policy advocacy and high-level political support, including enhancing the capacity of railway officials to manage the digital transformation. In response to requests from member States, the secretariat is currently working on a suitable modality for accelerating rail digitalization in the region for consideration at its intergovernmental meetings.

3. Digitalization in dry ports and intermodal transport

The dry ports ecosystem has now evolved into intricate partner networks that include government authorities, terminals and shipping lines, transport and logistics companies, and off-dock storage providers. To remain effective, stakeholders should consider embracing shared platforms and services that make it easier to work together to promote the efficiency of the overall ecosystem. Shared platforms and services let individual partners expand their businesses without substantial new infrastructure or equipment and, in some cases, facilitate the creation of digital services that can generate new revenue sources.

In relationships among stakeholders in transport and logistical systems, integrated digital platforms that can manage transport and cargo flows, unite all stakeholders and provide a high degree of clarity and traceability in the supply chain are gradually displacing logistics operators as communication focal points. In the short-to-medium term, as digital technologies continue to develop rapidly, digital solutions at dry ports will be integrated into multipurpose digital management systems which, in turn, will be gradually connected with similar

systems of other logistics chain participants. Thus, the components of future digitalized transport corridors will be built.

75. Although there have been a number of major practical developments in the Asia-Pacific region in the area of digital transformation, more coordinated efforts are needed to promote innovative solutions and business models in intermodal and multimodal transport operations and to develop a regional strategic vision for digital transport corridors. Accordingly, the secretariat has focused its most recent capacity-development activities on the introduction and implementation of digital solutions for dry ports.

4. **Accelerating the transition to smart ports**

76. Even before the pandemic, port digitalization and the transition to smart ports was a policy pursued by most governments to enhance port productivity and other aspects of port operations. Smart port development is challenging, in practice, owing to inertia in the existing operating system, complex governance and limited investment resources, as well as the fact that the levels and performance of port digitalization vary by country and port. Therefore, it is necessary to identify the strengths, weaknesses and risks of the on-site implementation of smart port systems through pilot projects and through strengthened cooperation and partnerships with stakeholders.

77. Another important consideration in smart port development is that it does not entail port-oriented development but rather integrated and harmonized development with the hinterland network. Such development links ports to a broader objective of building a smart intermodal transport network that coordinates smart transport strategies and plans across all modes of transport to create synergy and connectivity while also promoting safety, mobility, efficiency and consideration of the environment.

78. Accelerating a transition to smart ports requires continued policy advising and capacity-building to deepen policymakers’ understanding of the benefits of smart ports, to help to mobilize sufficient political will to implement necessary reforms and to enhance the necessary technical skills. Given that some countries face resource constraints and lack the required experience and technical knowledge to establish a development plan and transition to a smart port, dedicated analytical materials and intensive capacity-building programmes remain necessary.

IV. **Issues for consideration**

79. The Ministerial Conference may wish to consider the policy directions and activities described in the present document in the light of the regional action programme for sustainable transport development in Asia and the Pacific (2022–2026), in particular its thematic areas of regional land transport connectivity and logistics, maritime and interregional transport connectivity, and digitalization of transport.

80. In this context, the Ministerial Conference may also wish to share updates and selected highlights on national, bilateral and multilateral policies and initiatives aimed at achieving a more efficient and resilient transport and logistics network and mobility.