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Policies and issues related to the development and operationalization of the Trans-Asian Railway network

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Note by the secretariat

Summary

The present document includes a stock-taking of the recent developments along the Trans-Asian Railway network, highlighting remaining challenges and emerging opportunities in the context of the coronavirus disease pandemic. It includes details on specific measures for further enhancing the competitiveness and sustainability of railway transport along the network.

The secretariat's work on strengthening international railway transport has been consolidated, described and linked to the Sustainable Development Goals to strengthen the positioning of railway transport for their achievement. The Working Group on the Trans-Asian Railway Network may wish to further discuss ways and means to strengthen the network and enhance its operational readiness to efficiently meet the growing demand for railway freight in the Asia-Pacific region and beyond, including in the focus areas described in the document.

The Working Group may also wish to share further information on perspectives and challenges in developing and operationalizing the network based on national experiences and offer further guidance to the secretariat on its future work in this area.

I. Introduction

1. Nearly three months after the 6th meeting of the Working Group on the Trans-Asian Railway Network, held in December 2019, transport connectivity faced a massive shock when the coronavirus disease (COVID-19) pandemic caused Governments to restrict their border operations and impose lockdowns, disrupting supply chains as never before. As the world and the Asia-Pacific region continue to feel the impact of the pandemic, the resilience of railway transport, particularly in the movement of freight, has emerged as a redeeming feature. Both at the national and international levels, railway transport has played a crucial role in preserving transport connectivity and ensuring the supply of essential items. Accordingly, promoting railway transport has

* ESCAP/TARN/WG/2021/L.1.

become a part of the COVID-19 response at the national level and in the dedicated capacity-building programmes of development organizations, including the Economic and Social Commission for Asia and the Pacific (ESCAP).

2. Moreover, the pandemic provided further momentum to the trend of increasing railway freight transport between Asia and Europe along various routes of the Trans-Asian Railway network. It also clearly underscored the network's role in not only ensuring but also expanding railway transport linkages during the crisis, which was critical in the face of the operational restrictions imposed on other modes of transport during the pandemic.

3. The network is one of three critical pillars that form the foundation of the region's integrated, international and intermodal transport system, together with the Asian Highway network and the network of dry ports of international importance. Together, these networks have been formalized by member States through the Intergovernmental Agreements on the Trans-Asian Railway Network, the Asian Highway Network and Dry Ports, facilitated by ESCAP, and now serve as building blocks for the realization of sustainable transport connectivity in the region as articulated in the Ministerial Declaration on Sustainable Transport Connectivity in Asia and the Pacific (E/ESCAP/73/15/Add.1) and adopted by the Commission in its resolution 73/4 on the implementation of the Ministerial Declaration on Sustainable Transport Connectivity in Asia and the Pacific (E/ESCAP/RES/73/4).

4. Sustainable transport connectivity in the region is inherently linked to the efficient operationalization of an integrated, international and intermodal transport system, and although progress has been made, the region still has a long way to go. Achieving such a system requires structural shifts in policies and approaches towards more-sustainable modes of transport leading to the optimal utilization of the transport infrastructure, based on the comparative advantages of each mode of transport. In this regard, there is considerable potential and opportunity in the region to further step up measures to increase the role of railways both for freight and passenger transport.

5. Railway transport is environmentally friendly, energy efficient and less prone to accidents and can help member States to deal with many of the negative externalities of transport. To harness the full benefits of railway transport, many member States are now investing in and expanding their railway networks. Development organizations need to support these initiatives by raising awareness among railway policymakers of the region about common challenges they are likely to encounter in expanding the railway networks in order to ensure synergies among various investments and the ability of national railway networks to connect with one another with minimal friction.

6. The Trans-Asian Railway network has played and can continue to play a crucial role by bringing the railways of the region to a common platform to meet the rising demands of transport sustainably. The network was formalized in 2006 through the Intergovernmental Agreement on the Trans-Asian Railway Network, which entered into force in 2009, and the number of parties to the Agreement has increased steadily since that time, rising to 21 when Myanmar became a party in December 2020. The network spans 28 countries with approximately 118,000 km of railway lines of five different gauges. It plays a pivotal role in fostering intraregional and interregional transport connectivity, benefiting the landlocked developing countries of the region in particular.

7. With regard to operationalization, the network's considerable progress was particularly notable during the past decade, which saw the implementation

of a flurry of initiatives by member railways aimed at efficient operations along the network as well as an increase in freight trains between Asia and Europe. However, numerous challenges remain, and the region's railway policymakers need to come together to appropriately address them. Some of the challenges related to infrastructure include the construction of missing links, rehabilitation of weaker sections and modernization of rolling stock, all of which requires considerable investment. In addition, operational issues have become increasingly important as cross-border freight trains become more frequent.

8. Therefore, railway policymakers in the region are focusing increased attention on issues such as the electronic exchange of information among various stakeholders for completing operational and regulatory requirements; the use of tracking technologies for real-time location of goods; and the harmonization of customs formalities for international railway transport. As shown by the secretariat's work on monitoring the transport response to the COVID-19 pandemic, the crisis has provided an opportunity for railway policymakers to carry out deeper reforms and make railways more agile with a view to their efficient integration into national, regional and global transport networks.

9. Realizing an international intermodal transport system to enable sustainable transport connectivity remains a long-term endeavour for the region. Despite likely challenges, the enormous potential benefits make it an endeavour worth pursuing. Sustainable transport connectivity would expand economic opportunities but also inclusivity, improving access to rural areas and minimizing the negative externalities of transport including its environmental footprint. Efficient railway transport is a central pillar of sustainable transport connectivity in the region. In that regard, the present document contains information on policies and issues in need of coordinated action by the region's railways to further strengthen the network in all its dimensions and enable it to contribute more effectively to sustainable development in the decade of action for the Sustainable Development Goals.

II. Decisions and recommendations of the Commission and its subsidiary bodies

10. Issues related to the further development and operationalization of the network figured prominently in the deliberations at the sixth session of the Committee on Transport, held in November 2020. The Committee recognized the network as a key building block for sustainable transport infrastructure and operational connectivity in the region. Relevant excerpts from the report on the session are contained in the annex to the present document.

11. In addition, issues related to the operationalization of the network have received heightened attention from development partners and were discussed at various meetings and events since the 6th meeting of the Working Group, including the following: 24th meeting of the Greater Mekong Subregion Subregional Transport Forum,[1] held online on 21 January 2021; capacity-building webinar on smart road and rail solutions for transport connectivity in the COVID-19 context,[2] held online on 30 November and 1 December 2020; annual meeting of the Commission on Freight Traffic of the Organization for Cooperation between Railways, held online from 6 to 9 October 2020;

[1] www.greatermekong.org/24th-meeting-greater-mekong-subregion-subregional-transport-forum.

[2] www.unescap.org/events/capacity-building-webinar-smart-road-and-rail-solutions-transport-connectivity-covid-19.

3rd International Union of Railways Asia-Pacific International Partners Interaction Meeting, held online on 24 September 2020; and Joint ESCAP-Organization for Cooperation between Railways meeting of experts on challenges and opportunities for international railway transport along the network and beyond in the times of COVID-19,[3] held online on 7 and 8 July 2020.

III. Recent developments along the Trans-Asian Railway network

12. The railway linkages between Asia and Europe are becoming major established routes for international transport, offering a viable alternative to maritime transport of goods. Although transport by rail is currently more expensive than by sea, it is also faster, making it an attractive mode for transporting time-sensitive goods such as fashion goods, electronics, car parts and perishables including food. With the continuous increase in railway infrastructure, the number of Eurasian trains has increased exponentially, from 308 in 2014 to approximately 4,400 in 2018, while the volume of traffic has grown from 25,000 to 345,000 twenty-foot equivalent units, approximately.[4] The numbers have kept growing. Even during the pandemic, railway freight has grown year on year.

13. Rough estimates indicate the potential for container traffic between Asia and Europe to be in the range of 0.5 million to 4.8 million twenty-foot equivalent units by 2030.[5] It is therefore critical that challenges and factors that could impact the development of railway freight transport be identified, such as new routes, infrastructure, terminals, new services and business models, new technologies, changes in consumer behaviour, new regulations and economic changes. Their impact should be studied comprehensively to identify policies that are needed to harness the full potential of railway transport between Asia and Europe.

14. As the rail infrastructure is built in the region, policy planners will also need to focus on operational issues such as harmonized regulatory and operational practices. One significant step in this direction would be further reduction in border crossing delays through the efficient electronic exchange of information among the stakeholders to complete the required formalities. Recognizing the potential of electronic data exchange, railway companies have started substantive work on this issue, and foremost among these efforts are those of the joint stock company Russian Railways, under the INTERTRAN project.

15. The INTERTRAN project of the joint stock company Russian Railways is aimed at increasing the competitiveness of railway transport through the electronic exchange of documents and information for the completion of regulatory formalities. The digital technologies developed within the framework of the INTERTRAN project have helped to reduce the time it takes to process documents, leading to an increase in speed and a reduction in cost.

[3] www.unescap.org/events/joint-escap-osjd-virtual-meeting-experts-challenges-opportunities-international-railway.

[4] See figure II in International Union of Railways, “Eurasian corridors: development potential” (Paris, 2020).

[5] European Commission, *Analysis of the Potential of the Development of Rail Container Transport Market in Poland* (Brussels, 2019), para. 6.

There are plans to further expand the project and use it for intermodal transport between Japan and Europe. The pandemic has encouraged similar efforts.

16. Progress has also been made in the construction of missing links on the network.[6] The railway link between the Islamic Republic of Iran and Afghanistan became operational in December 2020 with the inauguration of Khaf-Herat railway line,[7] presided over by the Heads of State of two countries. The 225 km railway link, of which 140 km has been operationalized, will provide landlocked Afghanistan access to regional and global markets through the Islamic Republic of Iran by way of its railway network and seaports on the Persian Gulf, while also facilitating bilateral trade between the two countries.

17. In South-East Asia, the construction of the railway line between China and the Lao People's Democratic Republic, which is of considerable significance for regional transport connectivity, is making rapid progress and is expected to be completed by the end of 2021. The electrified 414 km railway line will run from Boten station, on the border between the two countries, to Vientiane. The link has the potential to connect the railways of the Association of Southeast Asian Nations member States to the railway routes of the Trans-Asian Railway network.

18. In Thailand, $35 billion, or approximately 7 per cent of its gross domestic product, is being invested to modernize railway infrastructure. The Department of Rail Transport has been established to support these endeavours. As a first step, approximately 1,000 km of the existing railway lines are being double-tracked to increase the capacity of the national railway network. The initial phase of the double-tracking programme is focused on the area between the north-east of Thailand and Laem Chabang port to boost agriculture exports including rice and sugar cane. In the second phase, double-tracking will be pursued between the border with the Lao People's Democratic Republic to the port at Laem Chabang, which could offer significant modal shift potential to transition exports of the Lao People's Democratic Republic from truck to rail, reducing overall costs.[8]

19. Similarly, the railway network in Myanmar is also being rehabilitated. The Yangon-Mandalay railway improvement project is being implemented in two phases with the aim of installing a new signalling system, procuring new rolling stock, carrying out necessary reinforcements of tracks and bridges and constructing maintenance facilities. A feasibility study is also under way for a new railway line between Muse, near the border with China, and Mandalay. Efforts are being made in Myanmar to establish railway connectivity with China, India and Thailand. To that end, Myanmar recently became the 21st party to Agreement.

20. In South Asia, Indian Railways has been constructing two dedicated freight corridors to increase the speed of freight trains and increase the modal share of railway. Some sections have already been operationalized in 2020, and the corridors are likely to be completed by 2022.[9]

[6] The information provided and initiatives described here are indicative, not exhaustive.

[7] www.railwaypro.com/wp/iran-afghanistan-railway-connection-opened/.

[8] www.railwaygazette.com/in-depth/thailand-metre-gauge-enhancements-spearhead-spending-drive/55892.article.

[9] https://pib.gov.in/PressReleasePage.aspx?PRID=1687721.

21. An important development along the northern routes of Trans-Asian Railway network, against the backdrop of rising freight volumes, is the construction of railway terminals and hubs. In Kazakhstan, significant investment is being directed towards building railway terminals to enhance container handling capacity. Four new container terminals are under construction at Dostyk Station to increase the handling capacity to one million twenty-foot equivalent units over the period 2021–2024, with an investment of approximately $84 million.

22. In the Russian Federation, as part of a broader federal project, a plan is in place to establish a dozen major rail hubs (selected on the basis of their location, potential and links with other projects) to decrease logistics costs by 1 per cent by 2024. The active development of rail hubs is also ongoing in Western Asia, especially in Turkey, with the opening of Baku-Tbilisi-Kars line, as well as rail-port links. Key rail hubs are located in Istanbul, Mersin and Samsun (maritime and rail) as well as in Ankara and Kars (rail).

23. The development of rail hubs will have a positive impact on container transport by rail by making it possible to combine longer transit and shorter export-import flows and to balance eastbound and westbound flows, which would not otherwise be possible owing to export structure differences between Europe and China.

24. In addition to the measures described in the present section, during the pandemic, the railways of the region took specific measures to deal with the extraordinary situation. They are described in detail in the ESCAP policy brief on COVID-19 and its impact on the railway sector in Asia and the Pacific.[10]

IV. Enhancing the competitiveness of railway transport along the Trans-Asian Railway network

A. Challenges in enhancing competitiveness along the network

25. To enhance the competitiveness of railway transport, it is imperative to address railway connectivity challenges which, along the network, can be understood mainly in two dimensions: physical and operational. The network still has approximately 12,400 km of missing links posing a clear challenge to connectivity over the network. In the member countries in which these lines fall, efforts have been under way to construct the missing links, but there are massive gaps between actual and required investments. Rough estimates suggest that $75 billion is required to complete missing links along the network, indicating that this going to be a long-term task for railways in the region.

26. In addition to missing links, the network has to contend with a break-of-gauge challenge. There are five different gauges, with three of them, 1,520 mm, 1,435 mm and 1,676 mm, being predominant. The break of gauge prevents seamless connectivity along the network; however, the railways of the region are finding pragmatic ways to overcome it. The most common successful solutions include bogie changing and trans-shipment. However, it should be clarified that the break of gauge is not as serious a challenge to seamless connectivity as it appears, because trains have to stop at border crossings anyway to complete various regulatory formalities and operational requirements. If the break of gauge is addressed in parallel with other cross-border connectivity issues, then the delays can be kept to a minimum.

[10] www.unescap.org/resources/covid-19-and-its-impact-railway-sector-asia-and-pacific.

27. More broadly, the greater challenge to connectivity along the network stems from operational connectivity issues. These include the lack of harmonization in formalities among border agencies, in particular customs, as well as operational requirements of railway companies. Recognizing the importance of these challenges, in 2015 the Economic and Social Commission for Asia and the Pacific adopted its resolution 71/7 on the adoption of the Regional Cooperation Framework for the Facilitation of International Railway Transport, in which it identified 4 fundamental issues and 11 areas for cooperation to facilitate international railway transport.

28. Furthermore, in 2017, at its 5th meeting, the Working Group recognized that the operational readiness of the network would require concurrent facilitation measures, such as harmonized customs formalities and efficient electronic information exchange among the stakeholders. Since then, these issues have received heightened attention from the railway policymakers of the region. The persistent challenges include the following: (a) lack of harmonized electronic exchange of data and information among railway operators and between railway operators and control agencies; (b) inadequate port-hinterland railway linkages for landlocked developing countries; (c) cumbersome border-crossing formalities for international railway transport; and (d) lack of coordination among stakeholders in operationalizing railway corridors.

B. Opportunities for enhancing the sustainability of railway transport along the network

29. The COVID-19 pandemic dealt a big blow to transport demand globally. Within a short time, operations across all modes of transport were disrupted owing to government-instituted containment measures that interrupted production and wider economic activities. Despite the global disruption, the international freight trains on the Asia-Europe route demonstrated considerable resilience, maintaining an upward growth trend and ensuring the functioning essential supply chains as well as those related to food supplies and medical equipment.

30. Though there has been minimal impact on international railway freight flows, the pandemic impacted the railways of the region in multiple ways. It has promoted the establishment of green lanes and other similar initiatives for essential supplies and given further momentum to the digitalization of railway transport in the region. As railway revenues come under pressure, particularly on the passenger front, and many of them request support from their Governments, the pandemic has also highlighted the need for a dedicated funding support programme for railway operators at the international level.[11] In addition, most national railway strategies have yet to take into account the full impact of the COVID-19 pandemic over the medium and long term.

31. Depending on how the pandemic situation evolves, fully or partially easing border-crossing restrictions could lead to a high level of uncertainty regarding planning and operations for railway companies. Potentially asynchronous actions by Governments and significant differences in admission rules from country to country, including additional health checks, would also challenge railway connectivity.

[11] www.railjournal.com/news/ec-proposes-economic-relief-measures-to-support-rail-through-pandemic/?utm_source=&utm_medium=email&utm_campaign=17474.

32. Therefore, the pandemic provides several opportunities for railway transport. In the short run, they should include priority/green lanes for transit freight trains. Railway border crossings have fewer restrictions than road, which could lead to more demand for railway freight. Over the long term, railway freight could become more competitive for international and national connectivity, as it is faster than maritime transport and cheaper than air transport and requires fewer staff than truck transport. The pandemic has encouraged e-connectivity, including the use of electronic documents and the overall digitalization of railway freight transit, which could further boost the comparative advantages of railway freight.

33. Freight transport between Asia and Europe is dominated by maritime transport that carries most of the bulk and non-time-sensitive containerized cargo, while air transport carries time-sensitive cargo. Therefore, railway freight has had to struggle to create its niche. However, over the past decade, it has been proven that rail can also be a competing mode in transporting goods across two continents. The regular operation of freight train services and opening of new routes clearly point to an emerging trend that has been intensified by the pandemic.

34. Given that rail is energy efficient and environmentally friendly, the crisis should be used as an opportunity to scale up the sustainability of international railway transport by addressing remaining challenges for more-sustainable operations along the network.

35. Scaling up the sustainability of railway freight would include the following: (a) deepening digitization of railway processes and systems; (b) decarbonizing railway transport; (c) mitigating climate impact on railway infrastructure; and (d) increasing railway freight by promoting modal shift policies. It would also include developing an online geographic information system to provide a visual representation of the network including detailed information on border crossings, and analytical tools for the network to support railway companies in developing and implementing evidence-based policies for railway investment and operations. The pandemic also provides an opportunity for closer cooperation among railways through the exchange of information, good practices and smart railway solutions in a range of areas, which could be considered on a case-by-case basis for replication.

V. Work of the secretariat on strengthening transport connectivity along the Trans-Asian Railway network

36. To support member countries in their efforts to strengthen railway transport along the network, the secretariat has been making continuous efforts in line with guidance provided by the Working Group as well as the Committee on Transport and the Commission. In 2015, following the entry into force of the Agreement in 2009, the Commission adopted its resolution 71/7 in which it underscored the importance of facilitation issues for efficient operations along the network.

37. The secretariat's work on strengthening international railway transport has been consolidated, described and linked to the Sustainable Development Goals (see table). Currently, there are 10 focus areas of work, which are discussed in the following paragraphs.

Linkages between the secretariat's work on strengthening international railway transport and the Sustainable Development Goals

Objective	Enhancing sustainability of transport along the Trans-Asian Railway network to achieve the Sustainable Development Goals
Outcomes	1. Increased freight transport along the network 2. Reduced time and costs as well as environmental and social externalities of freight transported by rail
Sustainable Development Goals, targets and indicators supported	1. Target 9.1: develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all 2. Indicator 9.a: facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States 3. Target 3.6: by 2020, halve the number of global deaths and injuries from road traffic accidents 4. Target 7.3: by 2030, double the global rate of improvement in energy efficiency 5. Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Focus areas	1. Promote electronic exchange of information and data among railway operators and between railway operators and control agencies 2. Harmonize customs formalities for international railway transport 3. Facilitate international passenger railway transport 4. Strengthen port-hinterland sustainable railway connectivity for landlocked developing countries 5. Support railway corridor management mechanisms 6. Develop an online geographic information system and analytical tools for the network 7. Enhance resilience of railway transport through smart railway solutions 8. Deepen digitalization among member railways in the region 9. Support railway decarbonization initiatives 10. Encourage innovative policies for railway freight
Enablers	Intergovernmental support, knowledge products, analytical tools, guidelines, expert meetings, capacity-building workshops, seminars, experience-sharing and partnerships

A. Promote exchange of electronic information and data among railway operators and between railway operators and control agencies

38. Under the project on the harmonization of rules and regulations for the facilitation of international railway transport implemented by the secretariat, a draft framework for enhancing the efficiency of railway border crossings along the network and beyond was developed together with the Organization for Cooperation between Railways. The draft framework served to elaborate upon four issues critical to the efficiency of railway border crossings. Two of them, namely (a) electronic information exchange among railway companies and between railway companies and control agencies and (b) harmonization of customs transit formalities for international railway transport, have been receiving increasing attention from the railways of the region.

39. The secretariat has been advocating the need for harmonization of various initiatives on the electronic exchange of information and data for the seamless flow of information among the railway companies and control agencies. This would help border agencies and railway companies to complete operational and regulatory requirements at the border crossings expeditiously. The efficient completion of railway border crossing processes hinges on the availability of information on various aspects of freight trains that is required by neighbouring railway companies and by regulatory authorities to complete the formalities. The electronic exchange of information among railways could enormously enhance the efficiency of processes at the border crossings, an aim which has become even more important during the pandemic.

40. At its 6th meeting,[12] the Working Group recognized that electronic information exchange among railways, driven by scattered initiatives, could potentially lead to the development of diverse ways of exchanging information electronically. Therefore, to support the harmonization of such initiatives in the region, the Working Group requested the secretariat to take further steps in facilitating expert discussions and consultations among interested member countries with the goal of identifying good practices, performance indicators and possible multilateral arrangements, including an annex or protocol to the Agreement, in that area.

41. Accordingly, the issue of electronic information exchange figured prominently during the deliberation at the joint ESCAP-Organization for Cooperation between Railways meeting of experts on challenges and opportunities for international railway transport along the network and beyond in the times of COVID-19. Participants at the meeting reiterated the need for guiding principles of electronic information exchange to be potentially annexed to the Agreement. Such an annex would make it possible for the secretariat to take proactive steps to support railways of the region on electronic data exchange and related issues. Some railways of the region have already approached the secretariat for assistance in this area. The secretariat also developed a study on electronic information exchange systems in railway freight transport,[13] to expand understanding among railway policymakers of the region about various options and a possible way forward.

[12] ESCAP/TARN/WG/2019/6, para. 17.

[13] www.unescap.org/resources/electronic-information-exchange-systems-rail-freight-transport.

B. Harmonize customs formalities for international railway transport

42. Similarly, harmonized customs formalities can also play a key role in reducing transport time and cost, especially when freight trains have to traverse numerous railway border crossings. There is a strong link between electronic information exchange among railway companies and between railway companies and control agencies and harmonizing customs formalities, as the former supports the latter. The areas requiring a common understanding for harmonized customs formalities have also been detailed in the draft framework (ESCAP/CTR/2018/3) and include the following: submission of pre-arrival electronic information; harmonized message exchange required for railway transit; reduced guarantees for transit by rail; recognition of railway consignment note as a customs declaration; use of new technologies for efficient completion of control measures; joint controls at railway border crossings; and standardization of harmonization of document requirements.

43. Harmonized customs formalities would particularly benefit railway transport in long-distance corridors in which freight trains have to traverse numerous railway border crossings. If information can reach customs authorities along the corridor before trains arrive, authorities would be able to use their risk management systems to decide on required inspections before arrival. Harmonization can be best accomplished by establishing an electronic interface whereby railway companies can share the required information with customs authorities, enabling information to flow within each railway, from railway to railway and from railways to customs authorities all along the long-distance corridor.

44. The above-mentioned INTERTRAN project of the joint stock company Russian Railways has clearly demonstrated the importance and benefits of electronic exchange and harmonization, clearly indicating the enormous efficiency they can bring to international railway transport. To support the railways of the region in these areas, the secretariat is currently working on guidelines for the harmonization of customs formalities by rail.

C. Facilitate international passenger railway transport

45. Given the rising significance of international passenger transport by rail, the secretariat organized a policy segment at the 6th meeting of the Working Group to discuss the findings of the study conducted by the secretariat under the project on supporting the efficient operation of international passenger trains along the network. The study served to elaborate upon the current situation of international passenger trains along the network, the existing legal and regulatory framework for the operation of international passenger trains and the key issues and operational challenges to international passenger trains. It also includes a proposed action plan to strengthen the operations of such trains along the network. The study is being reviewed in the light of the COVID-19 pandemic, which has substantially impacted the dynamics of passenger transport by rail.

D. Strengthen port-hinterland sustainable railway connectivity for landlocked developing countries

46. The issue of stronger linkages between ports and inland container depots or dry ports has regularly figured in the policy discussions at previous meetings of the Working Group. Given the rising level of container transport by railway and the importance of this issue for landlocked developing countries of the region, transport connectivity between ports and inland ports needs to be

further strengthened. To that end, the secretariat developed the Secure Cross Border Transport Model, demonstrating the use of new technologies in transit facilitation, such as electronic seals coupled with tracking capabilities to make real-time enforcement possible.

47. The use of real-time enforcement technologies can further secure the transit corridors to reduce transport costs for landlocked developing countries, in which guarantees provided by transport operators for transit goods are a major contributor to transit costs. The use of the technologies can increase the confidence of control authorities. When coupled with the consideration that railway transport is much more secure than road, the use of the technologies can reduce the need for guarantees to a bare minimum.

48. In addition, the use of electronic tracking systems provides considerable opportunities to reduce cumbersome procedures and related formalities and thereby further reduce transit costs. Nepal, a landlocked developing country, is experiencing huge benefits from the simplification of transit procedures by using electronic cargo tracking for rail-transported containers to and from India. Such solutions can be scaled up throughout the region and can potentially reduce transit costs for the landlocked developing countries. The secretariat is working on a manual on good practices in port-hinterland connectivity for the landlocked developing countries.

E. Support railway corridor management mechanisms

49. The secretariat has also been working with the landlocked developing countries of the region to enhance their access to seaports. In this direction, it recently completed a study project on the commercialization of railway corridors between three countries, namely Kazakhstan, Turkmenistan and the Islamic Republic of Iran, which was implemented jointly with the Economic Cooperation Organization with funding support from the Islamic Development Bank. The project included studies on (a) enhancing freight flows along the corridor; (b) key physical and non-physical barriers along the corridor and ways to address them; and (c) developing a marketing plan for the corridor.

50. In addition, the establishment of a permanent working group among the railways of the three countries was proposed to serve as a corridor management structure with a view to increasing coordination among the stakeholders in order to commercialize railway operations along the corridor. The draft memorandum of understanding for establishing a permanent working group for the railway corridor is now under consideration by the Governments of the three countries.

F. Develop an online geographic information system and analytical tools for the network

51. Updating the network with regard to route configuration, technical characteristics and traffic levels has been consistently recognized by railways of the region as an area of priority. The Working Group at its 6th and 4th meetings made special reference to this area. An updated online database and analytical tools would support the railways of the region in harnessing the full potential of the network by enabling them to generate a range of scenarios to make optimal decisions on railway-related investment, planning and operations. Such tools have become even more important during the pandemic in the light of uncertainty surrounding railway freight flows.

52. A prolonged pandemic with significantly asynchronous trends in the spread of and recovery from COVID-19 could worsen the economic crisis, further decreasing demand, and the short-term disruptions to regional and global supply chains could have permanent repercussions, resulting in the suspension of some railway freight services. The various scenarios can be modelled to understand the potential impacts on railways, and optimal policy decisions can be taken to minimize negative impacts.

53. Forecasting future railway freight flows is always challenging, as they are contingent on multiple factors; however, modelling tools can generate various demand scenarios with associated probabilities, making it possible for railway managers to make optimal investment and operational decisions based on data analytics rather than on pure speculation. As a first step, the secretariat is now developing an online database to update the routes and configuration of the network. The addition of information on border crossings has also been proposed to add to the network's utility for member countries. The designated focal points for the network in each country will be given access to navigate the online tool in due course.

G. Enhance resilience of railway transport through smart railway solutions

54. One key question when considering the resilience of railway transport is whether the demand surge for railway freight observed during the pandemic will persist once the situation returns to normal. There can be no clear answers to this question, as multiple factors impact railway demand. However, given the resilience shown by railway freight during the pandemic, there is a high probability that demand is likely to be sustained and may even increase over the medium-to-long term. Therefore, to harness the emerging opportunities, railways of the region need to prepare themselves well by further increasing their comparative advantages, including by integrating seamlessly with other modes of transport to provide efficient transport logistics solutions.

55. To support railways of the region in the context of COVID-19, the secretariat, together with the Organization for Cooperation between Railways, issued a joint statement on strengthening international railway transport for more-sustainable transport connectivity in the aftermath of the pandemic.[14] In the statement, both entities urged railway policymakers to further reduce border crossing delays and expand the use of smart railway solutions. In addition, under the United Nations Development Account project on transport and trade connectivity in the age of pandemics, the secretariat published a policy brief on COVID-19 and its impact on railway sector in Asia and the Pacific,[15] in which it elaborated upon challenges posed by the pandemic and the opportunities for railway policymakers to make transport more sustainable.

56. The secretariat also developed a study on smart railway solutions under the above-mentioned project to disseminate a range of smart solutions to address many of the challenges faced by railway policymakers during the pandemic. Smart railway solutions have been successful elsewhere and are potentially replicable and scalable. Their overarching objective is to further enhance the comparative advantage of rail and deepen the sustainability of transport. However, not all solutions would have equal importance or relevance for the member railways. Each railway could assess its own situation and

[14] www.unescap.org/sites/default/d8files/2020-06/ESCAP%20-OSJD_EN.pdf.

[15] www.unescap.org/resources/covid-19-and-its-impact-railway-sector-asia-and-pacific.

determine which smart solutions would be more beneficial and applicable for them.

57. In the study, smart railway solutions were detailed in the following areas: railway operations, predictive maintenance, rolling stock, railway border crossings, client orientation and railway financing. Each module of the study has sub-modules on specific solutions. A guide on smart railway solutions has also be prepared to supplement the study, with a view to conducting demand-driven capacity-building on smart railway solutions to support member railways in addressing post-pandemic challenges.

H. Deepen digitalization among member railways in the region

58. Digitalization has gained further momentum in the COVID-19 pandemic. The crisis unleashed by the pandemic has provided an opportunity for member railways of the region to further their digitalization efforts. Railways are undergoing major transformation driven by emerging digital technologies such as fifth-generation (5G) wireless system networks, big data, cloud computing, the Internet of things, automation, artificial intelligence and blockchain. Digitalizing railway transport generates huge prospects for the railways, owing to numerous benefits including lower operating costs and improved capacity, traffic management, reliability, energy efficiency and services.

59. Though enhancing digitalization among railways presents a formidable challenge due to the disparity in digital infrastructure, research, innovation and digital skills, many railways of the region are already deep into it. The pandemic is providing further momentum to these measures as well as an opportunity to initiate digital interventions in the member railways that are lagging. Some of the areas in which digitalization could be pursued include rolling stock and fixed asset maintenance, railway operations and rail safety. In addition, the most difficult aspect of digitalization is not so much the implementation of automated systems as it is the development of new mindsets and approaches. Moreover, with increased digitalization, the rail assets and systems will face threats from cyberattacks and will therefore need a comprehensive approach to address them.

60. The member railways have expressed the need for a common approach to deepen digitalization in railway transport. In this regard, the joint ESCAP-Organization for Cooperation between Railways meeting of experts underscored the importance of digitalizing railways to further enhance the efficiency of railway transport. Participants recommended that the secretariat consider developing a comprehensive framework for digitalizing railway transport in the region for further consideration by the relevant subsidiary bodies of the Commission. Given the diversity in railway development among countries of the region, digital mainstreaming in railways needs to be managed systematically with a staggered approach, which can be duly supported by ESCAP.

61. There is a need to identify the areas in which digitalization can be scaled up and to develop a regional strategy or framework for digitalizing railway transport, in particular to support landlocked developing countries and least developed countries in leapfrogging to digital technologies. Doing so would require considerable policy advocacy and high-level political support, including enhancing the capacity of railway officials to manage the digital transition. The secretariat has already initiated background studies to develop a draft regional framework. Once finalized, the draft would be presented to the relevant subsidiary bodies of the Commission for further consideration.

I. Support railway decarbonization initiatives

62. While enhancing the competitiveness of railway transport is imperative, the decade of action for the Sustainable Development Goals also provides an opportunity to strengthen the sustainability of railway transport in all its dimensions. Though the carbon footprints of rail are not as deep as those of other modes, every effort is worthwhile given the ambitious global targets to reduce carbon emissions. In this direction, zero-emission railway transport could be a goal worth pursuing.

63. To further decarbonize railways, solutions such as state-of-the-art battery, hydrogen and hybrid technologies are becoming viable alternatives to diesel traction. While electrification remains the preferred method to further decarbonize the rail sector, the new technologies can be used where electrification is challenging for economic or technological reasons. Given the benefits that railway decarbonization would yield, the secretariat is working to develop recommendations for member countries on possible ways to decarbonize railway transport.

64. Another area of concern for railways of the region is addressing the impact of climate change on railway assets. Rising sea levels, changes in temperature and rain patterns, and increasing severity and frequency of floods and storm events are key consequences of climate change that could impact railway infrastructure. The damage to railway infrastructure due to climate change needs to be better understood and managed to minimize disruptions. Upon request from member railways, the secretariat could conduct assessments of infrastructure vulnerabilities due to climate change, with a view to suggesting appropriate mitigation measures.

J. Encourage innovative policies for railway freight

65. Lastly, increasing the modal share of railway freight has become crucial to addressing the sustainability of transport. With regard to increasing railway freight modal share in the region, it needs to be underscored that there are no uniform prescriptions across the region. While some generic suggestions would be beneficial across the region, each railway network is distinct in size, capacity, traffic mix and competition. An analysis is therefore needed to understand the pattern and volume of existing domestic, international and transit traffic in the member countries, taking into account major streams, modes and costs.

66. Generic suggestions on modal shift could include the consolidation of freight through strategically located dry ports, the seamless integration of railway with other modes of transport, and expanded railway freight capacity to cope with pandemics. Shifting more freight to railway transport would support the decongestion of roads, reducing road accidents and vehicle emissions, as well as the social dimension of sustainability. Together, these initiatives could allow railway transport to reach its full potential to contribute to the achievement of the Sustainable Development Goals.

VI. Issues for consideration by the Working Group

67. The COVID-19 pandemic is among the greatest health crises in history. It is having a profound socioeconomic impact at the global and regional levels. International transport suffered a demand shock due to restrictions on the movement of people imposed by Governments around the world. During these challenging times, railway freight has played a crucial role in preserving

international transport connectivity, amply demonstrating its own comparative advantages. The railways of the region should take the opportunity provided by the raised visibility of railway transport due to its resilience during the pandemic to further institute measures to address the remaining challenges facing the Trans-Asian Railway network and enhance the competitiveness of railway transport.

68. Enhancing the competitiveness of railway transport, however, is not an end unto itself, but rather a means to achieve more-sustainable operations along the network to contribute effectively to the achievement of the Sustainable Development Goals in the member countries. As detailed in the present document, the secretariat has been making continuous efforts to support member countries in strengthening international railway transport operations along the network in all its dimensions, with the overall objective of increasing the sustainability of transport networks.

69. Taking into consideration the information provided in the present document, the Working Group may wish to provide the secretariat with additional guidance on policies and approaches relating to further development and operationalization of the Trans-Asian Railway network including through the work in the 10 focus areas as described above.

Annex

Excerpts from the reports of meetings related to the Trans-Asian Railway network

Meeting	*Decisions and recommendations*
Committee on Transport, sixth session, Bangkok, 12 and 13 November 2020	The Committee reaffirmed its support for the development of the Asian Highway network, Trans-Asian Railway network and network of dry ports of international importance and recognized their role as the key building blocks for sustainable transport infrastructure and operational connectivity in the region. In that respect, the Committee noted the progress made in developing and upgrading transport infrastructure in member countries, including the Asian Highway network, the Trans-Asian Railway network and network of dry ports of international importance.[1] The Committee also highlighted the importance of intermodal connections along the Asian Highway network and the Trans-Asian Railway network, especially connections to seaports, and acknowledged that the introduction of new technologies and the strengthening of regional cooperation could further improve regional connectivity.[2] The Committee noted the resilience shown by railway transport during the pandemic and reaffirmed the significance of enhancing operational connectivity along the network to further strengthen international railway transport. In that regard, representatives underscored the key role of the electronic/digital exchange of data which could significantly improve the efficiency of regulatory formalities and operational requirements for international railway transport. Furthermore, representatives requested the support of the secretariat in conducting pilot projects on that topic and related areas. The Committee was also informed of numerous initiatives by members in further developing and strengthening railway transport in the region, including container transportation by railway through countries in Central Asia.[3]

[1] ESCAP/CTR/2020/6, para.6.

[2] ESCAP/CTR/2020/6, para.14.

[3] ESCAP/CTR/2020/6, para.16.