



Economic and Social Commission for Asia and the Pacific**Seventy-first session**

Bangkok, 25-29 May 2015

Item 3 (c) of the provisional agenda*

**Review of issues pertinent to the subsidiary structure of
the Commission, including the work of the regional
institutions: transport****Integrated intermodal transport and logistics systems
under the sustainable development agenda****Note by the secretariat***Summary*

Transport is a fundamental pillar for all economic and social activities. It carries raw materials for industrial and agricultural production, delivers products to markets and distributes goods to consumers. In spite of progress in transport connectivity, the transport network in the Asia-Pacific region is basically patchwork, with gaping infrastructural, operational, institutional and technical holes. Too many road and rail links are missing, cross-border procedures are not aligned with the needs of business, transport vehicles across borders operate under different regulations, and, with regard to the rail systems, track gauges, signaling systems and tractive power need to be standardized.

While transport is a key factor in economic and social development, it also has negative effects on the environment and society. The transport sector remains the second largest consumer of energy, the primary urban polluter and the second largest contributor of carbon dioxide emissions. To minimize these effects, the key solution is to develop and operationalize integrated intermodal transport and logistics systems with balanced integration of the economic, social and environmental dimensions of sustainable development.

The present paper presents a case for the need to urgently develop and operationalize integrated intermodal transport and logistics systems in Asia and the Pacific. It includes major challenges in establishing such a system.

* E/ESCAP/71/L.1/Rev.1.

Contents

	<i>Page</i>
I. Introduction.....	2
II. Transport and sustainable development.....	3
A. Role of transport in sustainable development.....	3
B. Need for integrated intermodal transport and logistics systems	4
III. Key challenges to development of integrated intermodal transport and logistics systems in the region	7
A. Policy support.....	7
B. Infrastructure network and development	8
C. Transport facilitation and logistics	9
Table	
Comparison of transport modes.....	5

I. Introduction

1. The ability to move efficiently within an area as vast as the Asia-Pacific region creates opportunities for people and businesses that were unimaginable one or two generations ago. However, these opportunities will only materialize if the region develops an effective transport system.

2. In recent years, Governments of the region have channelled substantial investment into the development of road networks and maritime infrastructure, and have also started to invest in rail networks. Those modes mostly operate independently of one another, cater to a dedicated clientele and, on an individual basis, are unable to meet the region's mobility requirements. Above all, the often-applied unimodal approach to the delivery of transport services is a factor behind: (a) the development gap between coastal and hinterland areas; and (b) the poor environmental performance of the transport sector. Nevertheless, it is possible to accommodate the increasing demand for transport infrastructure and services and at the same time move towards a more equitable growth pattern and reduce the negative externalities of the sector.

3. The continued growth of intraregional trade is resulting in more cargo being carried over longer distances, while the availability of better information systems is providing enhanced capacity to coordinate services across modes as well as between modes and terminals. In other words, current trends point to emerging opportunities for intermodal transport to become a key driver of sustainable development by allowing each mode to play on its specific strengths while complementing others in offering seamless transport solutions.

4. These trends are in consonance with the approach to transport development indicated in the outcome document of the United Nations Conference on Sustainable Development of June 2012 in which the participants of the Conference expressed support for the development of energy efficient multi-modal systems and recognized "the need to promote an integrated approach to policymaking at the national, regional and local levels for transport services and systems to promote sustainable development".¹

¹ General Assembly resolution 66/288, para. 133.

5. In the outcome document of the second United Nations Conference on Landlocked Developing Countries, entitled the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014-2025, one of the specified objectives was to significantly improve intermodal connectivity with the aim of ensuring efficient transfers from rail to road and vice versa and from port to rail and/or road and vice versa.²

6. Through intermodal transport, existing capacities and infrastructure can be used more effectively, serve more adequately the requirements of global supply chains and promote a better balance between modes. However, for those benefits to materialize, the various networks throughout the region must be interconnected and compatible to ensure that freight can be transported easily and under optimal conditions. To achieve this goal, a number of challenges related to network connectivity, transfer facilities, harmonization of technical standards and the definition of common legislative frameworks need to be addressed. The present paper explains those key challenges.

II. Transport and sustainable development

A. Role of transport in sustainable development

7. Transport is the artery of our livelihoods, production and commerce. It provides access to economic and social opportunities by facilitating the movement of people, goods, resources, products and ideas across a country, the region and the world. Transport infrastructure and services contribute directly and indirectly to the economy and shapes the pattern of production, trade and investment. They create market opportunities for consumers and producers, as well as enable manufacturers to benefit from their comparative advantage and specializations and develop supply chains across the globe.

8. The development of transport infrastructure and services that support and contribute to sustainable development is a priority of the global development agenda. To create mobility solutions that are equitable, safe, clean, efficient, reliable and affordable, this process must take into account economic, social and environmental dimensions.

9. On the other side, the negative externalities resulting from existing transport systems, namely the large share of fossil fuels consumption, high volume of emissions and air pollution, and striking numbers of road accident fatalities, are significant environmental and social burdens on the economies.

10. The transport sector accounted for approximately 27 per cent of energy consumed globally in 2010 and 22 per cent of total carbon dioxide (CO₂) emissions derived from fossil fuel use in 2012. In both groupings, it was ranked second behind industry (28 per cent) with regard to energy consumption,³ and behind electricity and heat production (42 per cent) with regard to CO₂ emissions.⁴

² A/CONF.225/L.1, para. 25 (c).

³ Intergovernmental Panel on Climate Change (IPCC), "Summary for policymakers", in *Climate Change 2014: Mitigation of Climate Change*, pp. 21-23. Available from <http://mitigation2014.org/report/publication/>.

⁴ International Energy Agency (IEA), *CO₂ Emissions from Fuel Combustion Highlights 2013* (Paris, OECD/IEA), page 11.

11. In 2012, the transport sector of the Asia-Pacific region accounted for the consumption of 748.5 million tons of oil equivalent (Mtoe), or 34.7 per cent of the global energy consumption, and the emission of 2,146.5 million tons of CO₂, or about 30 per cent of the global CO₂ emissions.⁵

12. As reported by the World Health Organization in its Global Status Report on Road Safety 2013, an estimated 1.24 million people are killed in road crashes each year and as many as 50 million people are injured. Road accident injury is the eighth leading cause of death and the leading cause of death of young people (15-29 years old).⁶ In Asia and the Pacific, an estimated 770,000 lives were lost in road accidents in 2010.

13. The United Nations Conference on Sustainable Development renewed the global commitment to sustainable development and recognized that transport and mobility are central to sustainable development. In its outcome statement, the participants expressed support for the development of sustainable transport systems, including energy efficient multimodal transport systems, notably public mass transport systems. The Open Working Group on Sustainable Development Goals has proposed 17 goals and 169 targets on sustainable development.⁷ The proposed goals and targets are an input to the development agenda beyond 2015 and define priority areas. The following four proposed sustainable development goals are directly relevant to transport:

- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12. Ensure sustainable consumption and production patterns
- Goal 13. Take urgent action to combat climate change and its impacts

14. In addition, the transport sector also significantly supports the implementation of other proposed goals.

B. Need for integrated intermodal transport and logistics systems

15. There is need to ensure the following: (a) the integration of economic, social and environmental dimensions in transport is balanced; and (b) the negative effects of the sector on economic development are reduced.





16. The most common modes of transport are road, rail, maritime and air transport. Different modes of transport generate different levels of economic, social and environmental impacts. Each mode of transport has its own comparative advantages and disadvantages (see table).

⁵ United Nations, *Statistical Yearbook for Asia and the Pacific 2014* (ST/ESCAP/2704).

⁶ World Health Organization, *Global Status Report on Road Safety 2013: Supporting a Decade of Action* (Geneva, 2013). Available from http://www.who.int/violence_injury_prevention/road_safety_status/2013/en/.

⁷ A/68/970.

Table
Comparison of transport modes

Advantage/ disadvantage	Economic					Environment			Social		
	Cost	Capacity	Speed	Reliability	Flexibility	Energy intensity	CO2 emission	Air pollution	Access	Congestion	Accident
	Moderate	Low	Moderate	Very good	High	High	High	High	High	High	High
	Low	Moderate	Moderate	Good	Low	Low	Low	Electric – lowest Diesel – high	Medium	Minimal	Low
	Low	High	Slow	Good	Low	Low	Low	Low	Low	Minimal	Low
	High	Low	Very good	Very good	Medium	High	High	Low	Low	Medium	Low

Source: ESCAP, Transport Division.

17. To design and achieve a transport system that better supports sustainable development, greater emphasis needs to be placed on developing integrated intermodal transport and logistics systems that optimize modal choice and are more inclusive, safer, affordable and have reduced negative externalities, such as pollution and congestion.

18. Among the major modes of transport, road transport has the greatest operational flexibility, but is among the lowest in terms of being environmentally friendly. Of the energy consumed in 2012 by the transport sector in the region, the share attributed to the various subsectors were: 82.9 per cent to the road sector, 12.1 per cent to air transport and 4.8 per cent to the rail sector. Similarly, 84.4 per cent of the CO2 emission in the region during 2012 were attributed to the road sector, 12.5 per cent to aviation and 2.2 per cent to rail.⁸ Passenger per kilometre and freight per ton-kilometre transported through the road system accounts for higher consumption of energy and greater emissions in comparison with transport through railways or waterways.

19. Modal shift from road to railway and waterway is important for achieving the long-term vision of integrated intermodal transport and logistics systems. Such systems are needed to develop intermodal networks comprised of well-designed, maintained and interconnected highways, railways, inland waterways, sea ports, river ports, airports and dry ports with appropriate capacities to handle traffic volumes and well-planned operations, and operate facilities. An efficient modal change at an interconnected point and a user-friendly transport facilitation regime ensures the safe, smooth, and seamless flow of vehicles, cargoes and people within a country and between countries of the region. Such a system will allow people and businesses of landlocked countries to have affordable access to the sea and those of archipelagic and island developing States to have access to safe, regular and affordable transport services that are more energy efficient and produce less emissions.

⁸ United Nations, *Statistical Yearbook for Asia and the Pacific 2014* (ST/ESCAP/2704).

20. The characteristics and operating efficiency boundaries among the different types of transport operations vary widely. Therefore, each mode must be utilized based on what suits it best. For example, maritime transport would be best suited for the long distance, large volume, less time-value shipments. On the contrary, air transport more efficiently serves the high value or time dependent small volume cargoes. Road transport has the most advantages when transporting smaller volumes at shorter distances. Road access is necessary in connecting from a production to a trans-shipment centre and in complementing other modes of transport to deliver from port/station to the door. Railway transport is the most efficient mode for larger volumes, bulk cargoes and medium distance travel.

21. The European Union has been promoting intermodal integration (also named multimodal or combined transport) since the 1990s. On 7 December 1992, it issued Council Directive 92/106/EEC on the establishment of common rules for certain types of combined transport of goods between member States.

22. Combined transport is a form of goods haulage that involves a combination of road transport with alternative rail and/or water-based transport, using these alternative modes for the majority of the journey, with use of road haulage limited as far as possible to a relatively short distance at the start and/or end of the journey. The goods are carried in a load unit, with the entire load unit then transferred between transport modes at interchanges as required during the journey. Using the various modes of transport in this combination can help reduce the overall environmental impact of freight transport compared to road haulage alone. In addition to improving the environmental performance of freight transport, this will also reduce road congestion.

23. Combined transport is promoted within the European Union through liberalization of road cabotage, the elimination of authorization procedures for combined transport operations and extending financial support through fiscal incentives for certain combined transport operations.

24. Since 2003, the European Union has been implementing Marco Polo, a long-term programme, which aims to ease road congestion and reduce pollution by promoting a shift to greener transport modes, such as railways and coastal and inland waterways. The programme provides financial grants to companies implementing projects to change the transport of cargoes from roads to greener modes. More than 500 companies have already received financial support from the programme.⁹

25. In Asia and the Pacific, the Ministerial Conference on Infrastructure in 2001 requested the ESCAP secretariat to give priority attention to the formulation, development and improvement of integrated intermodal transport. This request was further articulated as the long-term regional vision, namely an international integrated intermodal transport and logistics system, in the Busan Declaration on Transport Development in Asia and the Pacific and endorsed by the Commission in its resolution 63/9. It was reaffirmed by the Commission in its resolution 68/4.

⁹ http://ec.europa.eu/transport/marcopolo/about/index_en.htm.

III. Key challenges to development of integrated intermodal transport and logistics systems in the region

A. Policy support

26. Efforts to develop intermodal transport and logistics systems that are sustainable and inclusive must be accompanied by appropriate policy. Such support should entail the following: adopting a comprehensive integrated approach to transport planning; assigning due priority to less developed modes; moving towards sustainable and integrated urban public transport systems; ensuring overall policy formulation and coordination among various government agencies; strengthening cooperation and partnerships with the private sector and development partners; implementing road safety policies; and enhancing resilience of transport systems.

27. Key challenges to applying the necessary support to the development of integrated intermodal transport systems are highlighted as follows:

(a) **Lack of an integrated approach and comprehensive planning.** Despite increasing emphasis on enhancing sustainability by reducing energy consumption and emissions, many Asian countries are still following a conventional unimodal approach to transport planning. They are not giving due consideration to: (a) an integrated approach to comprehensive transport planning, which would entail considering all modes of transport, prioritizing greener modes of transport and ensuring their true integration, such as physical integration between modes, to facilitate a smooth transfer of passenger and goods from one mode to another; (b) operational integration to facilitate the functioning of physically linked modes; and (c) service integration, such as common/combined fare ticketing system. The region faces the daunting task of enhancing resiliency of transport systems to the impacts of climate change and disasters. As these impacts could substantially affect the design, construction and operation of the transport systems, they must be integrated into the planning process; Also, based on the premise that enhancing resiliency after construction tends to be more difficult and costlier, various design options need to be evaluated while planning new transport infrastructure;

(b) **Less developed integrated urban public transport systems.** Moving away from car-centric development by building a sustainable integrated urban public transport system is another challenge for Asian cities. It is estimated that, by 2030, 2.7 billion people will be residing in urban areas in Asia. The continuous growth of urban residents has resulted in a sharp rise in transport activities and private vehicle ownership. Rapid motorization in cities results in increased traffic density and energy consumption. This, in turn, results in a lower quality of life due to greater pollution, congestion and increased traffic injuries and fatalities. Governments have focused heavily on addressing urban mobility in mega-cities, however, planning and implementing activities that promote integrated and sustainable land use and innovative transport planning strategies in secondary and medium-sized cities in their early stages of development remains limited;

(c) **Weak institutional and policy coordination.** Transport has a multi-sectoral dimension, with multiple agencies belonging to all levels of Government (national, provincial and urban/local) involved in developing and implementing transport policies, strategies and programmes. However, lack of institutional as well as policy coordination among various transport and related agencies is hampering implementation of policies and programmes. It is essential that related actions are coordinated and plans and policies are consistent and complementary;

(d) **Limited role of the private sector and development partners in financing.** Owing to limited budgetary resources, many Asian countries are facing challenges in mobilizing financial resources to meet the large investment needs for developing, operating and maintaining intermodal transport systems. In order to attract additional financing as well as adopt models of development and operation of transportation systems, member countries need to recognize the growing role of the private sector and development partners and strengthen cooperation and partnerships among the public sector, the private sector and development partners;

(e) **High road accident fatalities.** Despite growing global concern on road safety, many Asian countries are still slow to initiate and implement road safety policies, target vulnerable road users, and regularly monitor the progress achieved and refine their strategies.

B. Infrastructure network and development

28. The Intergovernmental Agreement on Dry Ports,¹⁰ together with the intergovernmental agreements on the Asian Highway¹¹ and Trans-Asian Railway networks,¹² form an institutional framework that is aimed at supporting member countries in their efforts to work together towards developing intermodal transport networks using the routes of the Asian Highway and Trans-Asian Railway and identified dry ports of international importance as a suitable foundation for a coordinated approach to the development of intermodal transport infrastructure.

29. Under the sustainable development agenda, transport infrastructure faces the following challenges:

(a) **Gaps in the Trans-Asian Railway network.** An intermodal transport network serving hinterland areas and landlocked countries should be rail-based. In that regard, too many transcontinental trunk routes of the Trans-Asian Railway network are discontinuous and thus impede regional and interregional transport connectivity;

(b) **Operationalization of intermodal corridors.** The Asian Highway and Trans-Asian Railway networks were identified separately by respective ministries/agencies responsible for the development and operation of each mode. It is essential that intermodal corridors that use both networks and link with the region's main ports be identified and institutionalized for integrated development and operations. New routes reflecting emerging traffic flow patterns also need to be identified;

(c) **Need for wider geographical coverage.** The transport infrastructure networks are currently land based. They link maritime transport through major seaports, but do not connect to island economies. Therefore, a maritime transport element should be added to form a regional integrated network that incorporates all major modes of transport. In addition, the role of transport networks to support poverty alleviation needs to be further explored and made explicit;

(d) **Harmonization of technical standards.** A primary requirement for intermodal corridors is to carry all kinds of containers routinely used in maritime shipping. To effectively do this, a number of technical standards have to be harmonized among rail, road and maritime transport, including some uniformity in interchange terminals. In that regard,

¹⁰ Commission resolution 69/7.

¹¹ United Nations, *Treaty Series*, vol. 2323, No. 41607.

¹² United Nations, *Treaty Series*, vol. 2596, No. 46171.

annex II to the Intergovernmental Agreement on the Trans-Asian Railway Network, annexes II and III to the Intergovernmental Agreement on the Asian Highway Network and annex II to the Intergovernmental Agreement on Dry Ports provide basic guidance. Further technical specifications need to be harmonized to realize seamless interoperability;

(e) **Compatibility of transfer facilities.** Inland traffic generating locations, whether they rely on shipping, rail or road transport for the movement of consignments from or to ultimate destinations, require facilities for the local consolidation and modal transfer of those consignments. They also need to have facilities to expedite en route freight handling when there is a need to reconsolidate consignments at borders or to tranship between different modes or between differing track gauges. In this connection, the development of freight-handling facilities, in particular for containers, needs to follow a region-wide coordinated policy and related development plans must be drawn up in consultation with all stakeholders.

C. Transport facilitation and logistics

30. Apart from the need for infrastructure connectivity, an integrated intermodal transport and logistics system also requires a smooth operational connection between different modes of transport by using simplified formalities, harmonized documents and coordinated rules and regulations.

31. Operational connectivity over land in the region remains weak. Cross-border and transit transport is impeded by inefficient border-crossing procedures that include cumbersome documentation, duplicate inspections and the need to tranship, which results to double handling of cargoes. Estimates by the International Road Transport Union and its partners have found that on many routes 40 per cent of truck travel time was spent on completing border-crossing procedures and formalities. The same is true for railways. Surveys conducted by the Organisation for Co-operation between Railways indicate that a train may take up to 74 hours to cross a typical border. These figures indicate that, despite progress made, a lot more effort should be applied towards further simplifying border-crossing procedures over land to develop an efficient and smooth integrated transport system.

32. Major challenges in the field of transport facilitation in support of an integrated intermodal transport system include:

(a) **Different technical specifications.** The technical specifications for different modes of transport are regulated by each country and vary across the region. This makes interoperability, among different modes and even within the same mode, difficult. For example, incompatible technical specifications for various aspects of railway transport results in the need to trans-load at border crossings in the region. Some of these obstacles are: different technical standards for rolling stock, power supply, and braking and signaling systems; different operating rules and tariff structures, requirements for train drivers and crew, cross-border information and data transmission systems; and lack of qualified manpower to operate cross-border trains. Similar constraints exist for international road transport and include differences related to: vehicle weights and dimensions specifications, vehicle registration and inspection certificates, procedures for issuance of visas for crew and drivers, and requirements for insurance of vehicles;

(b) **Different transport documents and associated liability regimes.** Each mode of freight transport has its own set of documents, such as bill of lading for maritime, way bill for air and different consignment notes for railway and road transport. The diverse set of documents leads to complicated formalities at the border crossings, ports and intermodal terminals during clearance or trans-shipment of freight. In addition, the liability regime for cargo lost or damaged during transport is regulated historically by unimodal legal instruments. This leads to the application of a range of legal instruments along the intermodal transport chain, such as unimodal international conventions/rules/agreements, subregional legal arrangements, national laws, and standard contractual terms and conditions developed by the industry, resulting in an uncertain and complicated liability attribution process;

(c) **Lack of a common standard for data interchange.** The absence of common standards for data interchange along the intermodal transport chain results in duplication of formalities. This includes re-entry of data at intermodal terminals and gateway ports, resulting in delays and high transport costs. Lack of minimum standards for electronic communication among different stakeholders in the intermodal chain prevents advance sharing of information that could be useful for planning and organizing the modal shift efficiently and pre-clearances. Also, the increase in the number of modes and nodes in the intermodal transport chain makes it more vulnerable to security concerns for which the advance sharing of information is one of the definitive means to address them;

(d) **Difficulty in coordination and cooperation.** Despite efforts to consolidate different modes of transport under one ministry, many countries in the region continue to have separate ministries for each mode of transport, leading to lack of coordination and coherence in policies, regulations and procedures related to intermodal transport within and among the countries. As the different modes of transport are managed independently, the responsibility for strengthening links between them remains unclear.

33. In the field of transport logistics, most developing countries in the region have high logistics costs, ranging from 15 to 24 per cent of gross domestic product (GDP). These high costs indicate that the transport logistics systems have limited capability and a low performance level, which impedes competitiveness in the global markets. To develop an integrated intermodal transport system, it is imperative that the environment friendly modes of transport, such as railways, inland waterways and coastal shipping, are integrated into the logistics system. These are currently underutilized in most countries, with roads currently the dominant mode of transport.

34. The potential of railway, inland waterways and coastal shipping is not being fully exploited in the transport logistics systems of ESCAP member countries. This can be attributed to the non-existence of appropriate policy frameworks, excessive and cumbersome documentation, and the absence of common standards for sharing information.