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Major issues in transport: Promoting sustainable and inclusive transport

Promoting sustainable and inclusive transport

Note by the secretariat

Summary

As noted by the United Nations Conference on Sustainable Development, which was held in Rio de Janeiro in 2012, transport and mobility are central to sustainable development. Sustainable transport systems contribute to increased economic competitiveness and assist safe, clean and affordable mobility. Each level of transport development, whether it be at the regional, national, urban or rural level, is needed to reduce poverty effectively and to provide people with access to economic and social activities. Meanwhile, transport systems must also consider safety issues in order to enhance, and not detract from, the welfare of passengers and road users.

The present document contains an outline of some of the emerging trends affecting transport development in the region, together with a discussion of selected policy options for responding to these trends. It also contains the Joint Statement on Improving Road Safety in Asia and the Pacific, adopted by the regional Expert Group Meeting on Progress in Road Safety Improvement in Asia and the Pacific, which was held in Seoul from 8 to 10 May 2013. The Forum may wish to provide guidance to the secretariat on how it may support members and associate members in their efforts to make their transport systems more sustainable and inclusive.

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I. Introduction

1. The United Nations Conference on Sustainable Development, which was held in Rio de Janeiro, Brazil, in June 2012, recognized that transport and mobility are central to sustainable development. In recognition of this, various elements of sustainable transport systems were supported in the outcome document of the Conference, “The future we want”,¹ including: an integrated approach to policymaking; energy-efficient multi-modal transport systems; public mass transportation systems; urban-rural linkages; non-motorized mobility; modal-shift; clean fuels and vehicles; road safety; and the needs of landlocked and transit developing countries. The importance of developing sustainable cities with locally appropriate transportation systems was also stressed in the document. Many of these issues are addressed under the themes of “sustainable transport development” and “road safety” within the Regional Action Programme for Transport Development in Asia and the Pacific, phase II (2012-2016), which was adopted by the Ministerial Conference on Transport at its second session, in March 2012.²

2. Long-term serviceability, safety, reliability, affordability and equitable access are essential attributes of a sustainable and inclusive transportation system. Such a system should comprise various modes, such as roads, railways,

¹ See General Assembly resolution 66/288, annex, paras. 132-133.

² E/ESCAP/MCT.2/13, annex 1.

inland waterways, maritime, air transport as well as non-motorized forms of transport such as cycling and walking. Within the “hierarchy” of transport systems, national, urban and intercity transportation tends to receive more priority than rural and rural-urban transportation links. Yet, all levels of transport should be considered within a sustainable transport system, especially as the majority of the population living below the poverty line resides in rural areas and informal urban settlements.

3. While recent trends suggest a greater acceptance among policymakers of the need to reorient transport development to be more sustainable and inclusive, there is still a significant gap between stated intentions and actual implementation. The present document contains an outline of some of the emerging trends in transport development in the region, proposals for priority areas and ways in which Governments can intervene to make transportation systems more sustainable and inclusive.

II. Major trends affecting transport development in the region

A. Increasing motorization and energy consumption

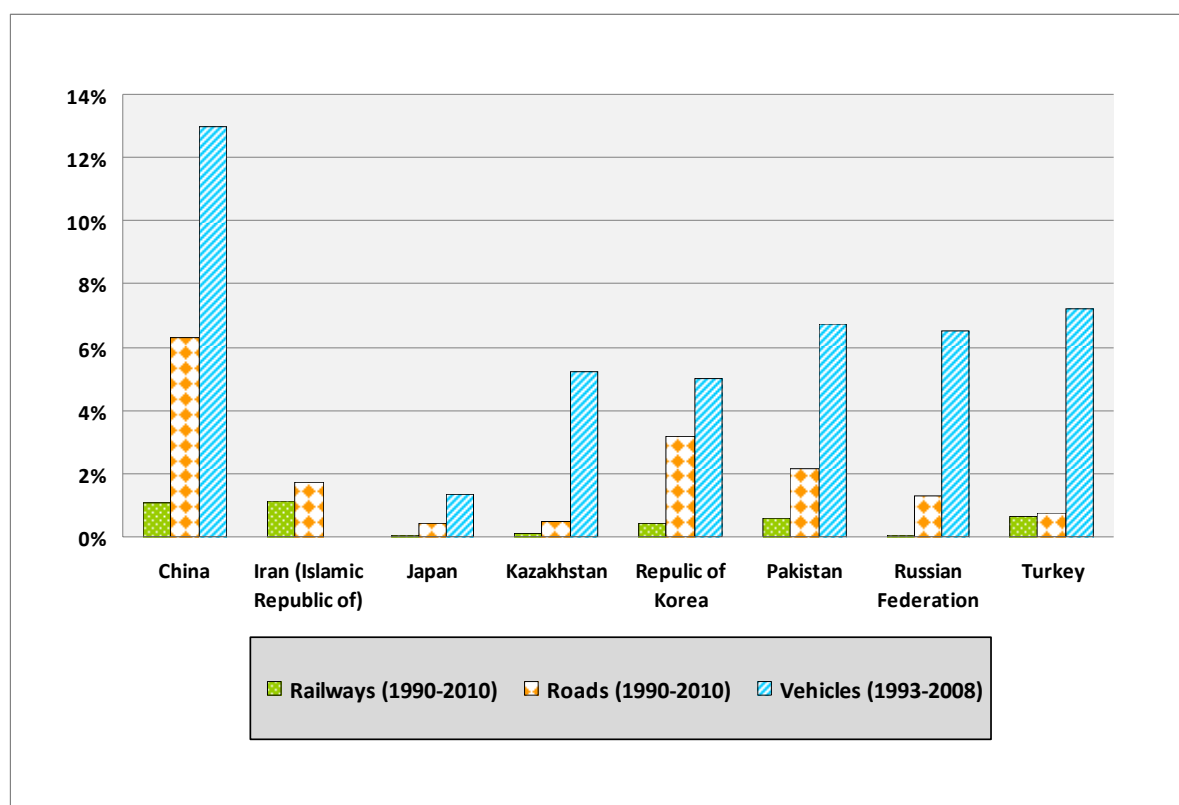
4. The transport sector is a major consumer of energy resources – particularly petroleum products. It is also one of the major emitters of carbon dioxide. In 2008, the world’s road, rail and aviation sectors consumed 2,299 million tons of oil equivalent, of which the Asia-Pacific region was responsible for 26 per cent, or 598 million tons of oil equivalent. The bulk of this amount in the region, 79.4 per cent (475 million tons of oil equivalent), was consumed by the road sector. In the same year, the transport sector in the region was responsible for 1,704 million tons of carbon dioxide emissions, which accounted for about a quarter of the global total from this sector. Most of the emissions came from the road sector, which released 1,390 million tons of carbon dioxide.³

5. Among the various modes of transport, the road sector consumes the most energy and is responsible for more than 80 per cent of carbon dioxide emissions from all forms of transport. This is perhaps unsurprising, as both Governments and multilateral development banks have prioritized the construction of roads over other forms of transport. For example, between 1970 and 2009, 74 per cent of investments in the transport sector made by the Asian Development Bank were for roads, followed by 15 per cent for railways, 7 per cent for water transport, and 2 per cent each for urban and air transport.⁴ Figure 1 shows the growth rate of land transport infrastructure and the vehicle population in selected countries in Asia between 1990 and 2010. It shows that the growth of road construction greatly outpaced the growth of railways, while the growth of the vehicle population is far higher than the growth of roads.

³ *Statistical Yearbook for Asia and the Pacific 2011* (United Nations publication, Sales No. E.11.II.F.1), p. 142.

⁴ Asian Development Bank, *Sustainable Transport Initiative: Operational Plan* (Mandaluyong City, 2010).

Figure 1
**Growth of railways, roads and vehicles in selected countries in Asia
 between 1990 and 2010**



Source: Based on data from the *Review of developments in Transport in Asia and the Pacific, 2011* (United Nations publication, Sales No. E.12.II.F.8) pp. 35 and 38, and the World Development Indicators 2013.

B. The growth of cities and urban areas

6. The growth of cities is another emerging challenge. Cities are production and consumption centres and account for more than two thirds of all energy use and greenhouse gas emissions.⁵ Half of the world's population now live in towns and cities,⁶ while 90 per cent of the world's urban expansion is taking place in the developing world. In many Asian cities, however, the resulting pattern of urban growth is unsustainable as municipal authorities are finding it difficult to provide sustainable and inclusive transport to meet the mobility needs of people. The negative externalities of existing transportation systems, such as the costs associated with congestion, consumption of fossil fuels, road accidents, emissions and air pollution, are a burden on economies. Health costs and the congestion costs associated with delays and wasted fuel are estimated to be about 2 per cent of gross domestic product. Furthermore, urban transport and planning policies need to take into account the marginalized urban poor who are isolated from growth opportunities, denied an opportunity to contribute effectively to the gross domestic product and excluded from access to public transport modes, thus suffering the effects of reduced mobility.⁷

⁵ International Energy Agency, *World Energy Outlook, 2008* (Paris, International Energy Agency/Organisation for Economic Co-operation and Development, 2008).

⁶ Message from the Secretary-General on World Habitat Day, 1 October 2012.

⁷ United Nations Human Settlements Programme and Economic and Social Commission for Asia and the Pacific, *The State of Asian Cities 2010/11* (Fukuoka, Japan, 2010).

7. While addressing urban mobility in megacities attracts a great deal of attention from national Governments, there is also great scope to plan for migration and growth and implement innovative transport strategies and policies in secondary and medium-sized cities in their early stages of development. Secondary and medium-sized cities will follow the same unsustainable pattern of growth if the necessary strategies for integrated and sustainable land use and transportation planning are not developed and implemented.⁸

C. The road safety crisis

8. The issue of road safety has been on the global agenda for quite some time, as casualties from road crashes continue to rise at an alarming rate. Globally, road crashes kill about 1.24 million people and injure another 50 million each year. The World Health Organization recently published the *Global Status Report on Road Safety 2013: Supporting a Decade of Action*,⁹ in which it is said that 777,000, or more than half of the world's total road traffic deaths in 2010, occurred on roads in the ESCAP region. The economic cost of road crashes has been estimated at between 1 and 3 per cent of gross domestic product on average, and up to as high as 5 per cent for some developing countries.

9. The overall progress in road safety in the region is mixed. Data on road traffic deaths in the ESCAP region for 2007 and 2010 are reproduced in the table below. While the number of global fatalities in 2010 remained similar to those in 2007, over the same period of time, the number of road traffic deaths in the ESCAP region increased by more than 10 per cent.

Table
Road traffic deaths in the ESCAP region in 2007 and 2010

Subregion	Reported death (adjusted for 30-day definition) ^a		Estimated number of deaths (using a model)	
	2007	2010	2007	2010
Pacific ^b	2 471	2 151	3 183	2 876
North and Central Asia ^c	12 041	9 574	12 702	11 332
East and North-East Asia ^d	145 950	108 455	270 067	319 064
South-East Asia ^e	53 586	75 454	102 573	117 360
South and South-West Asia ^f	151 203	172 361	311 126	326 381
ESCAP^g	365 251	367 995	699 625	777 013
	(55.23 per cent)	(57.72 per cent)	(56.69 per cent)	(62.67 per cent)
World	661 319	637 584	1 234 026	1 240 000

Source: Based on information available at www.who.int/violence_injury_prevention/road_safety_status/2013/data/en/index.html.

^a For definitions of reported death and estimated deaths, see the *Global Status Report on Road Safety 2013* by the World Health Organization.

^b Australia, Fiji, Kiribati, Marshall Islands, the Micronesia (Federated States of), New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu.

^c Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

⁸ *Cities of Opportunity: Partnerships for an Inclusive and Sustainable Future* (United Nations publication, Sales No. 11.II.F.12).

⁹ World Health Organization, *Global Status Report on Road Safety 2013: Supporting a Decade of Action* (Geneva, 2013). Available from www.who.int/violence_injury_prevention/road_safety_status/en/index.html.

^d China, Democratic People's Republic of Korea, Japan, Mongolia, Republic of Korea and Russian Federation.

^e Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Viet Nam.

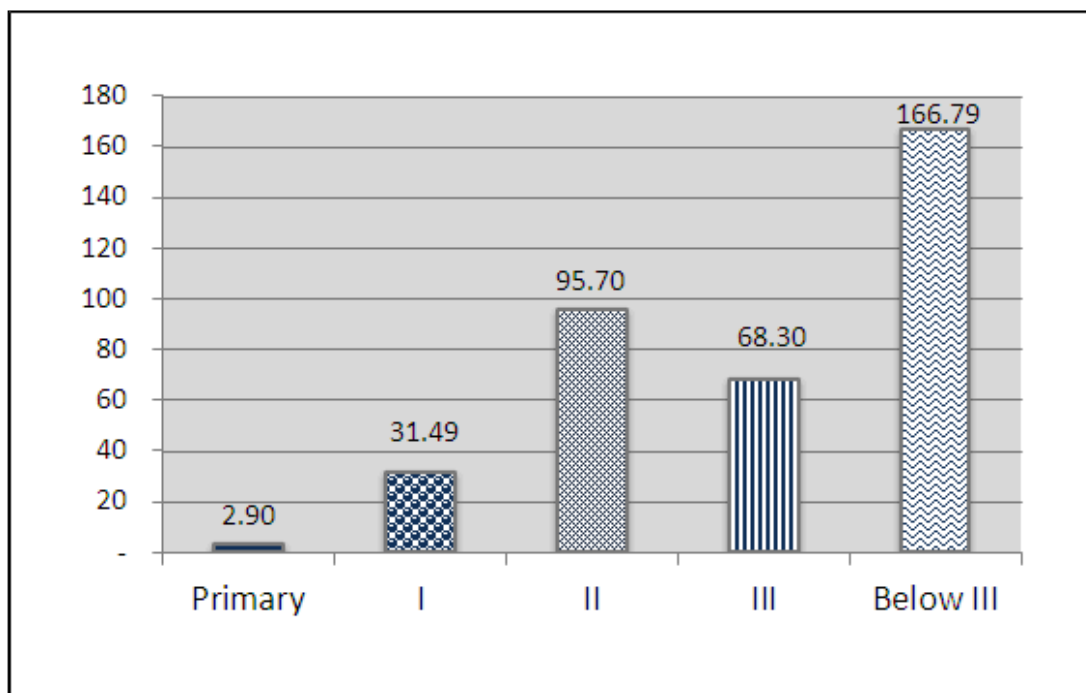
^f Afghanistan, Bangladesh, Bhutan, India, Iran (Islamic Republic of), Maldives, Nepal, Pakistan, Sri Lanka and Turkey.

^g Figures in parentheses show the corresponding percentages of the world total.

10. Figure 2 shows average fatality rates¹⁰ per billion vehicle kilometres by Asian Highway class. It shows that the primary (access-controlled) roads have the best safety record, while those below class III have the worst record. The upgrading of roads to access-controlled primary class and other higher classes has significant benefits in reducing fatality rates. The upgrading of roads to higher standards has been linked to improved road safety in many countries, particularly when the upgrades involved: (a) the construction of barriers to separate opposing directions of traffic and different types of vehicles; and/or (b) the improvement of road shoulders.

Figure 2

Average fatality rates per billion vehicle kilometres by Asian Highway class



Source: Based on information available from the Asian Highway Database.

11. Road fatalities among pedestrians, cyclists and motorcyclists (collectively referred to as vulnerable road users) are a cause of serious concern in many countries in the ESCAP region. In recent years, most developing countries in the region have experienced rapid growth in their vehicle populations. The rapid growth of motorized vehicles makes roads more dangerous for vulnerable road users. The World Health Organization identified five key risk factors in road safety, namely speed, drink-driving, helmets, seat

¹⁰ The fatality rates in figure 2 are based on reported fatalities on 24.12 per cent of the Asian Highway network's length, which includes 485 road sections (or 32.5 per cent of all sections), covering 34,370 kilometres of highways in 23 countries and for which the required data for calculation was available in the database. It should be noted here that fatality rates along the entire length (64,818 kilometres) of the network could not be provided as the necessary data were not available.

belts and child restraints. Each of these risk factors was considered to be an essential component of comprehensive national legislation on road safety.

D. The increasing frequency of natural disasters

12. Recent disasters have caused tremendous damage to transport infrastructure and operations. The floods in Thailand in 2012 submerged many roads, while the earthquake in Japan in 2011 damaged roads, railways and airports. Transport can also be interrupted: in coastal areas of Bangladesh, the Maldives, the Pacific islands and Viet Nam, transportation systems will be highly vulnerable to rises in sea levels.

III. Policy options for sustainable and inclusive transport systems

A. Evidence-based policies for addressing energy and emissions in transport

13. Governments around the world are adopting different strategies to reduce energy consumption and emissions from transport operations. These include the use of alternative fuels, greater use of higher quality and efficient public transport systems, use of innovative technology and efficient vehicle design, reducing trips or distance travelled, and various forms of travel demand management.

14. One of the challenges facing Governments is the lack of a comprehensive assessment tool to understand, first, the level and sources of energy use and emissions in the transport sector and, second, the impact of different options on these variables. The secretariat along with the other United Nations regional commissions is implementing a project on Development and Implementation of a Monitoring and Assessment Tool for CO₂ Emissions in Inland Transport to Facilitate Climate Change Mitigation, which is funded by the United Nations Development Account. As part of the project, a global status report on CO₂ emissions from inland transport was prepared. Moreover, the development of a model to measure emissions from inland transport (road, rail and inland waterways) — For Future Inland Transport Systems (ForFITS)¹¹ — is now complete and should prove to be a useful planning tool in sustainable transport policies.

15. The secretariat is planning a piloting exercise for the model together with organizing regional and national capacity-building workshops that will provide opportunities to learn about various emission measurement methods and mitigation policies, as well as about the use of the model. In collaboration with the Government of Thailand, the secretariat is planning to hold the first national capacity-building workshop to pilot the model in Bangkok on 23 and 24 September 2013. A regional capacity-building workshop on emission measurement and mitigation policies is planned for 26 and 27 September 2013 in Bangkok.

B. Sustainable urban transport

16. Comprehensive policies and an integrated approach to urban transport planning are necessary along with a substantial shift in priorities. Therefore, a paradigm shift in the development of urban transport systems and the provision of services in the Asia-Pacific region is necessary. Countries need to evaluate existing policies and transportation systems, identify policy gaps and adopt

¹¹ The model and user manual are available from www.unece.org/trans/theme_forfits.html.

innovative strategies and policies, and adopt appropriate technology and integrated approaches for sustainable and inclusive transport development. In this regard, a sustainable and inclusive urban transportation system normally includes the elements described below.

17. *Integrated land use and urban transportation planning.* Urban transportation planning should consider the land-use planning and growth patterns of cities. Integrated transport master plans should be developed with future growth and expansion in mind. Short, medium, and long-term transportation plans need to be developed and implemented. The plans should consider integration of all modes of transport, such as roads, subways, light rail transit (LRT), bus rapid transit, railways, and routes for bicycles and pedestrians, and allow for seamless intermodal transfer of users. The various modes of public transport within a city should not be designed and developed as competing modes — but as complementary modes. Usually, a trip needs to use a combination of modes, including walking — which depends on patterns of spatial development and the availability of transport services. Multimodal transport and transit stations need to be accessible, with walkways, and cycling and parking facilities for bicycles available nearby.

18. *Public transportation system.* Once the various elements of urban transportation infrastructure are developed based on an integrated urban transportation plan, then a public transportation service should be provided to urban populations, including the marginalized urban poor. There might be various forms of interconnected public transport such as bus, bus rapid transit, light rail transit, subway and metro systems, trams, urban railways and so on, depending on the size and wealth of the city. In order to reduce dependency on private transport modes, policies to increase the share of public transport modes are essential. Public transport should be safe, secure, reliable, frequent, convenient, affordable and comfortable. The elimination of subsidies for competing modes of transport, such as private cars and taxis, is essential for a vibrant and functioning public transport system, as is the enforcement of laws against unsafe and undesirable forms of transport. Coordination among various public transport modes and routes, integrating timetables and providing real-time information to users can enhance the efficiency of operations and services. One important aspect of using various modes is fare integration and integrated ticketing — which makes it more efficient, attractive as well as convenient for users. Many cities are using integrated ticketing on public transport.¹²

19. *Use of new technology.* Fuel-efficient electric and hybrid cars, which are emerging due to advances in vehicle technology, are a major contribution to lessening the problems associated with air pollution and fossil fuel use. Promotion and use of electric vehicles can be cost effective and reduce emissions. However, more technological advancement and development is necessary in order to develop sustainable vehicle technology and guarantee that vehicles are commercially available and attractive, especially as concerns range, performance and recharge time. The Philippines has launched an electric eJeepney.¹³ Alternative forms of fuels, such as biofuels, are also being developed, although they are not available on the market in abundant quantities. Use of information and communications technology and intelligent transport systems can also enhance efficiency and safety of transport operations (see section F). As the private sector usually drives technological innovation,

¹² Booz and Company, *The Benefits of Simplified and Integrated Ticketing in Public Transport*, prepared for the Passenger Transport Executive Group (2009). Available from www.pteg.net/resources/types/reports/benefits-simplified-and-integrated-ticketing-public-transport.

¹³ See www.ejeepney.org.

Governments should consider supporting their efforts through policies such as annual emissions testing, tax allowances and access priorities for cleaner, fuel-efficient engines. Another technological advance in a separate sector is the potential use of information and communications technology to avoid the need to travel by reducing non-essential trips. This would contribute to traffic demand reduction (see below). For example, citizens can pay municipal and utility bills using online computers from home or local kiosks. Videoconferences and webinars can also help to reduce business travel.

20. *Transport demand management.* Transport demand management measures, such as promotion of the use of public transport and discouraging use of private vehicles, can be employed to improve operational efficiency, limit traffic congestion and improve traffic flows in urban areas. Common policies include parking restrictions and pricing, congestion charging, area licensing schemes, electronic road pricing, car sharing, designation of high-occupancy lanes and improvement of public transportation services. The introduction of congestion charging in Central London led to a 19 per cent reduction in CO₂ emissions and a 37 per cent increase in travel speed. In a similar fashion, the introduction of electronic road pricing in Singapore reduced total traffic within the cordon area by 14 per cent and increased travel speed by 22 per cent.¹⁴ A more radical approach to transport demand management is to promote “compact cities”, or to design cities in such a way as to build living, working, recreational and shopping facilities close to each other, thereby reducing the need to travel. The earlier concept of satellite cities is losing its popularity. For example, Tianjin Eco-city¹⁵ is planned around, among other things, the concept of green transport with the aim of increasing trips using public transport, walking and cycling. Integration of land use and transport planning are used to develop high-density cities where shops, businesses, schools and services are close to residential facilities.

21. *Non-motorized transport.* Non-motorized transport is a viable alternative to other modes of transport; it reduces air pollution and CO₂ emissions as well as conserving fossil fuel. Two popular forms of non-motorized transport are walking and cycling. In order to promote infrastructure for non-motorized transport, such as pavements, cycleways and sky walkways, pedestrian zones need to be designated, free or rental cycles need to be provided — along with bicycle parking areas near stations — and car-free zones and car-free days need to be stipulated. The construction of sky walkways below some of the BTS Skytrain lines and the installation of elevators has increased mobility and use of public transportation in Bangkok. Singapore is planning to make transport nodes more accessible under the Walk2Ride initiative.¹⁶ Many countries in the region are paying attention to this area as we can see from the *Global Status Report on Road Safety 2013*, in which it is stated that 19 countries in the ESCAP region have either national or subnational policies to promote the use of non-motorized modes of transport, namely walking and cycling.⁹

¹⁴ Frederik Strompen, Todd Litman and Daniel Bongardt, *Reducing Carbon Emissions through Transport Demand Management Strategies: A Review of International Examples — Executive Summary* (Deutsche Gesellschaft für Internationale Zusammenarbeit/Beijing Transportation Research Center, Beijing, 2012). Available from http://tdm-beijing.org/files/International_Review_Executive_Summary.pdf.

¹⁵ See www.tianjinecocity.gov.sg/bg_masterplan.htm.

¹⁶ “Singapore to spend S\$700 million to improve transport accessibility”, *Global Accessibility News*, 24 January 2013. Available from <http://globalaccessibilitynews.com/2013/01/24/singapore-to-spend-s700-million-to-improve-transport-accessibility>.

C. Making transportation resilient

22. Transport systems and, in particular, vital elements of these systems can be designed to be more resilient to the impacts of climate change and disasters. Some of the strategies and policies that could be considered in the development of resilient and sustainable transport infrastructure include: taking account of the potential impact of extreme events and disasters in the planning process; reviewing and incorporating higher design standards in structural elements; using innovative construction technology and sustainable materials; increasing awareness and coordination among stakeholders; and enhancing the capacity of planning and implementing officials. This would also increase the serviceability and life of costly structures.^{17, 18} For example, in the United States after Hurricane Katrina, the clearance height of bridges was increased¹⁹ and in Canada the design of the Confederation Bridge allows for a 1-metre sea-level rise.²⁰

23. Coastal sections of roads and railways can be moved to higher ground or given protective walls or embankments. During the 2011 earthquake in Japan and the subsequent tsunami, the embankment section of the motorway along the coast protected the inland side from inundation. It also offered an evacuation space, saving many lives. The reconstruction project envisages evacuation stairs for the embankment slopes. A study in Bangladesh found that it was economically viable to raise road embankments from 0.5 to 1.0 metres to protect the roads from floods.²¹

24. In mountainous areas, roadside slopes can be made more stable through bioengineering using living plants, as in Nepal. Combined with civil engineering measures, these can provide cost-effective and environmentally friendly solutions.²² Drains can also be built with extra capacity to cater for surges in water flow. The Bipartisan Policy Center offers a list of options.²³ Transport planners and designers may consider and evaluate design options to increase resilience while planning new transportation infrastructure, as it would usually be costlier and more difficult to enhance their resilience after construction.

¹⁷ S. Wooller, *The Changing Climate: its Impact on the Department for Transport* (London, Department for Transport, 2003).

¹⁸ National Research Council of the National Academies, *Potential Impacts of Climate Change in U.S. Transportation* (Washington, D.C., Transport Research Board, 2008). Available from www.nap.edu/openbook.php?record_id=12179&page=R1.

¹⁹ Michael D. Meyer, *Design Standards for U.S. Transportation Infrastructure: the Implications of Climate Change* (Transportation Research Board, 2008). Available from <http://onlinepubs.trb.org/onlinepubs/sr/sr290meyer.pdf>.

²⁰ Jean Andrey and Brian Mills (2003), "Climate change and the Canadian transport system: vulnerabilities and adaptations", in *Weather and Transportation in Canada*, J. Andrey and C.K. Knapper, eds., Department of Geography Publication Series, Monograph 55 (Waterloo, Canada, University of Waterloo, 2003).

²¹ Thomas Tanner and others, *ORCHID: Piloting Climate Risk Screening in DFID Bangladesh: Summary Research Report* (Brighton, United Kingdom, Institute of Development Studies, University of Sussex, 2007). Available from www.ids.ac.uk/files/dmfile/ORCHIDBangladeshSummaryResearchReport2007.pdf.

²² John Howell, *Roadside Bio-engineering* (Katmandu, Department of Roads, Government of Nepal, 1999). Available from www.cd3wd.com/cd3wd_40/cd3wd/SOILWATR/H2079E/EN/B1364_3.HTM.

²³ Bipartisan Policy Center, *Transportation Adaptation to Global Climate Change* (Washington, D.C., 2009). Available from <http://bipartisanpolicy.org/sites/default/files/Transportation%20Adaptation%20%283%29.pdf>.

D. Improving road safety

25. In order to focus global and regional attention on addressing the road safety issue, the General Assembly has, since 2003, adopted six resolutions calling for strengthened international cooperation and multisectoral national action to improve road safety. In its resolution 64/255 of 2 March 2010 on improving global road safety, the Assembly proclaimed the period 2011-2020 as the Decade of Action for Road Safety, with a goal to stabilize and then reduce the forecast level of road traffic fatalities around the world by increasing activities conducted at the national, regional and global levels.

26. ESCAP resolution 68/4 of 23 May 2012, in which the Commission endorsed the Ministerial Declaration on Transport Development in Asia and the Pacific, also provides a broad mandate to the secretariat to assist member countries in meeting their commitments under the Decade of Action for Road Safety (2011-2020). Pursuant to global and regional mandates, the ESCAP secretariat has developed regional road safety goals, targets and indicators for the period 2011-2020. In this regard, the secretariat has been organizing national workshops and providing advisory services to assist member countries in developing road safety strategies, and setting or refining national road safety goals and targets for the Decade of Action for Road Safety. National workshops on road safety were organized in collaboration with the relevant national ministries in Azerbaijan (October 2011), the Lao People's Democratic Republic (November 2011) and Sri Lanka (February 2013).

27. The secretariat, in collaboration with Korea Transportation Safety Authority, organized a regional Expert Group Meeting on Progress in Road Safety Improvement in Asia and the Pacific in Seoul from 8 to 10 May 2013. The theme of the meeting was on vulnerable road users in line with the theme of the second United Nations Global Road Safety Week. The meeting adopted the Joint Statement on Improving Road Safety in Asia and the Pacific (see annex) and helped better understanding of road safety as part of the development agenda beyond 2015. The ESCAP secretariat, in collaboration with the secretariat of the Economic Commission for Europe, is planning to organize a Europe-Asia Road Safety Forum in New Delhi on 4 December 2013.

28. A number of countries have prepared or are in the process of finalizing their draft national strategies and action plans on road safety. Member States may wish to initiate policy measures and implement national road safety action plans and programmes in order to achieve global and regional goals and targets and to monitor their achievements.

E. Sustainable maintenance of roads

29. Policy reforms for road maintenance and road funds were introduced in the region nearly 20 years ago by ESCAP, the World Bank and other development partners. Many countries have initiated collecting additional resources through user charges such as fuel levies, tolls, vehicle taxes, and overloading charges for road maintenance and established road maintenance funds. However, despite progress in some areas, road maintenance is still a major challenge for countries in the region. This is partly due to the fact that motorization rates are increasing and Governments are constructing new roads without due attention given to the management of existing assets and appropriate preventative maintenance thereof.

30. The secretariat, the World Bank in Viet Nam and the Directorate of Roads of the Ministry of Transport of Viet Nam organized an Expert Group Meeting on Road Maintenance and Management in Hanoi from 29 to 31 May

2013. The meeting brought together senior government officials from South and South-East Asia to discuss different approaches and major challenges in road maintenance. The meeting covered various issues related to finance and asset management, new technologies, good practices and successful value-for-money systems in road maintenance in the region, and capacity-building needs, and discussed ways of revitalizing interest in road maintenance and management issues as part of the development agenda. The meeting noted that despite progress in some areas, road maintenance was still a major challenge for countries in the region. More attention may need to be given to constructing lower maintenance roads.

31. Some of the major issues identified were: insufficient and irregular funding for maintenance; the need to persuade policymakers of the importance of maintenance; the need for coordination amongst the many agencies and ministries; the need to take maintenance into consideration when designing roads, particularly as regards expected future costs; and how to involve the private sector, local people and communities in the maintenance process since the issue of maintenance cannot be addressed by Governments alone. The development of a “maintenance culture” and the need for a change in attitudes towards maintenance were stressed.

32. The meeting suggested that it would be useful to revitalize the road maintenance initiatives started in the 1990s and to re-establish road maintenance as an important issue in the international development agenda. There is potential for developing regional approaches on: (a) funding issues for road maintenance; (b) exchange of good practices in road and rural road maintenance; (c) preventing overloading of trucks; and (d) efficient water management. In this context, the meeting suggested that a regional review of road maintenance practices and road funds would be useful to review and compile Asian success stories and disseminate lessons learned, as many countries are using some form of user charges and some have established and operated road maintenance funds for sustainable road maintenance.

33. As regards rural roads, all too often they are not properly engineered and once the construction is complete their maintenance is usually neglected. Some rural roads are unpaved and only accessible in drier seasons. Depending on the geology and topography of the location, sections of roads are frequently damaged by waterborne soil erosion, obstructed by landslides, subsidence of tracks and lack of preventative maintenance. As rural roads are lifelines for communities, they should be properly engineered and low-cost all-weather pavement options should be considered that utilize and adapt local materials and engage local people in design, construction and maintenance. The capacity of local bodies should be enhanced for maintenance planning and implementation.

34. The Forum may consider encouraging member countries to prioritize maintenance of transport infrastructure, mobilize and allocate sufficient financial and human resources, and consider ways to mobilize additional resources to improve management of the maintenance of highways and rural roads, including through the introduction of user charges and the establishment of road maintenance funds.

F. Intelligent transport systems

35. Information and communications technology used to improve the efficiency and safety of transport operations is often referred to as an intelligent transport system. The most common use of such systems are in traffic regulation and management, providing real-time travel information to users,

assisting route planning, ticketing, toll collection and electronic payments. Intelligent transport systems can provide assistance to drivers and vehicle control by providing information on the interactions among different highway systems, vehicles and drivers. Use of such technology can improve vehicle and infrastructure safety, and make road transport safer, faster, less polluting, more energy efficient and cheaper. Many countries in the region have considered various applications; the three most popular are: electronic toll payments and pricing according to time of day and congestion levels; coordinating linked traffic signals (mostly in urban areas); and traveller real-time information systems. Countries like Japan, the Republic of Korea, Singapore and Thailand have used such technology to varying degrees to improve traffic operation and safety. Intelligent transport systems can help to make informed choices about public transport, telecommuting or driving outside peak hours.²⁴ They can enable commuters to plan their trips and avoid unnecessary journeys and congested routes; they can help road freight service providers and operators to reduce the proportion of empty backloads and/or increase the load factor of their trucks.²⁵ Although the benefits of intelligent transport systems will vary greatly depending on the existing situation and type of application, they could be substantial. Publications outlining details of intelligent transport systems and their potential benefits are now available.^{26, 27, 28}

36. Member States and transport operators in developing countries may consider greater use of appropriate intelligent transport systems to improve the efficiency and safety of transport operations.

G. Long-haul intermodal freight transport

37. The differing emission rates of the various modes of transport show that there are clear benefits associated with moving freight from road to other modes. For long-haul freight, in particular, railways are clearly more energy efficient than trucks per ton-kilometre, while inland water transport is more energy efficient than railways per ton-kilometre. While there are limited inland water transport routes available in Asia,²⁹ there is great potential to increase the use of railways, particularly for long-haul international freight transport.

38. The shift to railways could be greatly enhanced through the integrated use of railways and highway networks and the development of dry ports. It is expected that the Intergovernmental Agreement on Dry Ports will enhance recognition of dry ports of international importance and encourage member States to develop and operate dry ports and logistics centres at strategic locations that serve as intermodal interfaces, thereby facilitating the efficient transfer of goods between different modes of transport. Furthermore, dry ports and logistics centres can act as freight consolidation centres with the potential

²⁴ Ito Takayuki and Shantanu Chakraborty, "Intelligent transport system: a vision for 21st century cities", background paper for the Seventh Regional Environmentally Sustainable Transport Forum in Asia and the Global Consultation on Sustainable Transport in the Post-2015 Development Agenda, 23-25 April 2013, Bali, Indonesia (United Nations Centre for Regional Development, 2013).

²⁵ Many studies show that the proportion of empty runs can be as high as 30-50 percent.

²⁶ United Nations, Economic Commission for Europe, *Intelligent Transport Systems (ITS) for Sustainable Mobility* (Geneva, 2012).

²⁷ United States Department of Transportation, *Intelligent Transportation Systems Benefits, Costs, Deployment and Lessons Learned: 2008 Update* (Washington, D.C., 2008). Available from <http://ntl.bts.gov/lib/30000/30400/30466/14412.pdf>.

²⁸ IBM Institute for Business Value, *Transportation and Economic Development: Why Smarter Transport is Good for Jobs and Growth* (New York, IBM Corporation, 2011).

²⁹ See E/ESCAP/MCT.2/7.

to reduce empty backloads. For example, 12 to 30 per cent of lorry trips are empty in Pakistan, while the figure is 43 per cent in China.³⁰ It was revealed in a study by the Organisation for Economic Co-operation and Development that improving the organization, coordination and route planning of logistics could reduce CO₂ emissions by between 10 and 20 per cent.³¹

39. In parallel to such a modal shift, efforts are also needed to make the road freight sector more environmentally friendly. In Europe, for example, several major manufacturers, road transporters, and representatives from the European Parliament and European Commission launched the “Green Freight Europe” initiative in 2012, which is working towards the establishment of a pan-European system for collecting, analyzing and monitoring CO₂ emissions from road freight operations.³² The Seventh Regional Environmentally Sustainable Transport Forum, which was held in Bali, Indonesia, in April 2013 discussed the concept of a voluntary regional agreement on green freight in Asia, with delegates supporting the concept and recommending initiation of a consultation process with the Forum’s member countries. The Forum recommended, among others, the following core elements to be considered as part of a possible regional agreement: (a) green freight programmes at the national or subregional level; (b) a set of plans and policies for a socially inclusive green freight agenda; (c) a standard set of indicators for green freight; and (d) a regional collaboration framework on green freight.³³ The process is being facilitated by the United Nations Centre for Regional Development, with support from ESCAP and other partners.

IV. Moving towards sustainable and inclusive transport development

40. Many guidelines relating to the development of sustainable transport systems³⁴ and sourcebooks for policymakers are available.³⁵ However, many developing countries in Asia have yet to initiate and implement integrated strategies and plans to address the issues of sustainability.

41. Comprehensive policies and integrated approaches to transport planning are necessary along with a substantial shift in priorities. Therefore, a paradigm shift in the development of transport systems and the provision of services in the Asia-Pacific region is necessary. Countries need to evaluate existing policies and transportation systems, identify policy gaps and adopt innovative strategies and policies, and adopt appropriate technology and integrated approaches for sustainable and inclusive transport development. The priority

³⁰ Pilar Londoño-Kent, *Freight Transport for Development Toolkit: Road Freight* (Washington, D.C., World Bank, 2009).

³¹ Organisation for Economic Co-operation and Development, *Globalisation, Transport and the Environment* (Paris, 2010).

³² See www.greenfreighteurope.eu/about-us.aspx.

³³ Chair’s Summary: Seventh Regional Environmentally Sustainable Transport Forum in Asia and the Global Consultation on Sustainable Transport in the Post-2015 Development Agenda, 23-25 April 2013, Bali, Indonesia. Available from www.uncrd.or.jp/env/7th-regional-est-forum/doc/Chairs%20Summary-Bali%20EST%20Forum.pdf.

³⁴ Asian Development Bank, *Changing Course: a New Paradigm for Sustainable Urban Transport*, Urban Development Series (Mandaluyong City, Philippines, 2009). Available from www.adb.org/sites/default/files/pub/2009/new-paradigm-transport.pdf.

³⁵ See the 31 modules of the *Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities* (Eschborn, Germany, Deutschen Gesellschaft für Internationale Zusammenarbeit). Available from www.sutp.org.

action needed to help policymakers and planners weigh up the various strategies and policies, and take bold measures to make transportation more sustainable and inclusive in the region is outlined below.

A. Strengthen coordination within Governments

42. National and local governments as well as municipalities and city councils are key stakeholders in developing sustainable and inclusive urban transportation systems. Therefore, targeted programmes should be planned to establish/strengthen institutional linkages between national, local and city agencies and to provide support to strengthen institutional capacities as well as to enhance their capacities to implement sustainable and inclusive urban transport policies. Furthermore, different policies and activities will be required for different groups/sets of cities as national/local policies and strategies would depend on the size and characteristics of cities.

B. Strengthen partnerships between the public sector, private sector and development partners

43. In addition, as private-sector transport operators and logistics service providers are involved in the development and operation of transport systems, the concept of sustainability in business practices and their operations and service need to be introduced to the business sector as well. While planning and implementing advocacy and capacity-building activities, collaboration and partnerships also need to be strengthened with development partners, related United Nations agencies, international organizations and ESCAP subregional offices, as well as the private sector.

C. Step up efforts to increase awareness and build capacities of government officials

44. Planning and implementation of an advocacy and capacity-building programme for transport planners and policymakers in member States would help in: (a) advocating and raising awareness among policymakers of sustainable and inclusive transport; (b) sharing and exchanging good practices; and (c) developing and implementing effective strategies and policy measures for promoting sustainable and inclusive transport. Advisory missions, national and subregional workshops and seminars, regional expert group meetings and conferences targeting senior and mid-level officials in national governments, local governments, municipalities and city councils can be considered an effective delivery mechanism. Placing the issues related to sustainable and inclusive transport high on the agenda of ESCAP legislative meetings, such as the Committee on Transport, the Forum of Asian Ministers of Transport, the Ministerial Conference on Transport and annual Commission sessions, would generate policy debate and high-level attention.

45. In this regard, the secretariat is currently undertaking a study on policy options for sustainable transport development with the Korea Transport Institute and Korea Maritime Institute. The study includes three broad themes, namely general transport policies, urban transport, and port and maritime transport. A policy-level regional expert group meeting on sustainable transport development is tentatively planned for the second half of November 2013 in Incheon, Republic of Korea, to disseminate the findings and recommendations of the study and share best practices on sustainable and inclusive transport development among member States and experts.

46. The secretariat also plans to produce “policy briefs” on a range of policies supporting sustainable transport development, such as greener freight

and urban transport. These policy briefs will refer to existing policies and guidelines where available as there are many good examples of policies and actions, such as improvement of public transport, promotion of alternative biofuels, use of non-motorized transport and modal shift, being implemented by developed countries.

47. Sustainable transport development will become increasingly important at the forefront of the development agenda beyond 2015. The secretariat intends to coordinate with the United Nations Department of Economic and Social Affairs to contribute to the agenda in the wake of the United Nations Conference on Sustainable Development as regards the contribution of transport to sustainable development, including the strategic prioritization of the role of transport in the development of the sustainable development goals, the successors to the Millennium Development Goals.

48. There is an intention to have ongoing support for the Environmentally Sustainable Transport initiative coordinated by the United Nations Centre for Regional Development and ongoing collaboration with multilateral development banks for initiatives in the wake of the United Nations Conference on Sustainable Development.

V. Issues for consideration

49. The Forum may wish to encourage member States to consider developing and implementing strategies, policies and initiatives for sustainable and inclusive transport development, including policy options presented in the current document.

50. The Forum may wish to provide the secretariat with further guidance on the activities of the secretariat in enhancing awareness and building capacity of government officials in order to develop and implement appropriate policies for sustainable and inclusive transport development.

Annex

Joint Statement on Improving Road Safety in Asia and the Pacific

We, the participants from member countries of the Economic and Social Commission for Asia and the Pacific (ESCAP) and experts attending the regional Expert Group Meeting on Progress in Road Safety Improvement in Asia and the Pacific, held in Seoul on 8 and 9 May 2013,

Recalling General Assembly resolution 64/255 on improving global road safety, which proclaimed the period 2011-2020 as the Decade of Action for Road Safety, with a goal to stabilize and then reduce the forecast level of road traffic fatalities around the world by increasing activities conducted at the national, regional and global levels,

Also recalling General Assembly resolution 66/260 on improving global road safety, in which the World Health Organization and the regional commissions, in cooperation with other partners in the United Nations Road Safety Collaboration and other stakeholders, were requested to continue their activities aimed at supporting the implementation of the objectives of the Decade,

Taking note of the *Global Status Report on Road Safety 2013*, prepared by the World Health Organization, in which it was estimated that 1.24 million people were killed on the world's roads in 2010, that 60 per cent of the casualties occurred in the Asian and Pacific region,

Expressing deep concern that the number of road users killed in road traffic crashes and the number of deaths per population have been particularly high in many developing countries of the ESCAP region, and that in some countries casualties among the pedestrians, cyclists and motorcyclists were exceptionally high,

Recognizing the importance of road safety as a sustainable development issue as reflected in the outcome document of the United Nations Conference on Sustainable Development, entitled "The future we want",^a

Also recognizing the view that road safety in many countries in the region is a development issue of concern considering its magnitude and gravity and consequent negative impacts on economy, public health and general welfare of the people, particularly the low-income group, and that it contributes to the perpetuation of poverty,

Taking note of the countries' efforts and commitment to cut down the number of deaths on their roads, and that despite an increase in total road traffic deaths in the region in 2010, 21 countries in the region had reduced the number of road traffic deaths, which shows that improvements are indeed possible, if appropriate action is taken and political commitment is applied,

Agreeing on the need to inculcate a safety culture at the grass-roots level among students,

^a General Assembly resolution 66/288.

Thanking the secretariat of the Economic and Social Commission for Asia and the Pacific and the Korea Transportation Safety Authority for organizing the Expert Group Meeting during the second United Nations Global Road Safety Week (6-12 May 2013), in line with a request contained in General Assembly resolution 66/260,

1. *Resolve* to reduce the level of road traffic fatalities in countries in the region by increasing activities conducted at the global, regional, national and local levels;

2. *Call for* the recognition of road safety as a sustainable development issue and for stronger actions to be taken to ensure the safety of vulnerable road users, particularly in low- and middle-income countries, through collaboration among State actors, members of the United Nations Road Safety Collaboration, and other stakeholders;

3. *Commit* ourselves within our individual capacities as advocates of road safety, experts, educators and disseminators of information to continue to promote and support activities aimed at implementing the objectives of the Decade, paying particular attention to reducing deaths and injuries among vulnerable road users;

4. *Request* member countries to consider implementation of the recommendations contained in the *Global Status Report on Road Safety 2013*, in line with General Assembly resolution 64/255 on improving global road safety;

5. *Urge* countries in the region and other stakeholders, as appropriate, to address road safety issues, including but not limited to, those in the following areas:

(a) Building consensus on making road safety a sustainable development policy priority and allocating sufficient financial resources;

(b) Making roads safer for vulnerable road users, including children, senior citizens, pedestrians, cyclists, motorcyclists and persons with disabilities;

(c) Making roads safer and reducing the severity of road crashes;

(d) Improving national road safety management and enforcement;

(e) Improving post-crash care for road crash victims;

(f) Improving cooperation and fostering partnerships;

6. *Call for* promoting networking among road safety stakeholders within the framework of United Nations Road Safety Collaboration;

7. *Urge* countries to impart education and training on road safety to students at schools and universities, thus inculcating a culture of safety at the grass-roots level;

Adopt this statement on 9 May 2013 at Seoul.
