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EMERGING ISSUES IN TRANSPORT: TRANSPORT AND THE MILLENNIUM DEVELOPMENT GOALS

(Item 5 (f) of the provisional agenda)

INTEGRATED POLICY AND ASSESSMENT IN SUSTAINABLE TRANSPORT DEVELOPMENT

Note by the secretariat

SUMMARY

The present document complements that entitled "Transport and the Millennium Development Goals" (E/ESCAP/MCT/SGO/7), which is also being considered under agenda item 5 (f).

The overall objective of this document is to highlight the importance of sustainable transport and to illustrate elements of desirable future paths and the policy tools available. In particular, it explains the emerging hierarchy of integrated assessment tools, processes and participation that can be employed at the local and national levels, as well as in a cross-border context. Such approaches may help to identify a policy mix that maximizes the contribution of transport to sustainable development and achievement of the Millennium Development Goals.

The "vision" of an Asian integrated transport network (see E/ESCAP/MCT/SGO/2) implicitly incorporates elements of sustainable transport. In fact, managing an integrated transport network also requires integrated policy approaches across transport modes, economic, environmental and health, social and poverty objectives, and across levels of intervention from projects, programmes and plans to policies.

Thus, the approaches outlined in this paper may contribute to the realization of sustainable transport in general and the "vision" in particular.

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INTRODUCTION

A. Context

1. By definition, sustainable development is a necessary objective for humanity in order to sustain improvements in living standards in the future. The Millennium Development Goals[1] consist of a wide set of targets or milestones for measuring progress towards achieving sustainable development by 2015. Consequently, the suggested transport targets for the ESCAP region contained in the document entitled "Transport and the Millennium Development Goals" (E/ESCAP/MCT/SGO/7), measure an important set of milestones towards sustainable transport development in the ESCAP region. Although the two sets of goals and targets are important milestones, they do not cover the whole spectrum of sustainable development that needs to be taken into account in decision-making.

2. Arguably, the participation of countries in international production networks, supported by transport and communications, has helped to lift more people out of poverty in Asia in the last 30 years than ever before in the history of humankind. Consequently, the "vision" (see E/ESCAP/MCT/SGO/2) envisages specific transport interventions to support the extension of international production networks to Asian hinterlands and landlocked countries. Thus, the vision describes one element of a sustainable transport system in the ESCAP region.

3. In order to turn the vision into a sustainable reality and to maximize the contribution of transport to sustainable development, all elements of sustainable transport need to be considered in transport-related decision-making.

B. Objective

4. The overall objective of the present document is to highlight the importance of sustainable transport and to illustrate elements of desirable future paths and the policy tools available. In particular, the document explains the emerging hierarchy of integrated assessment tools, processes and participation that can be employed both at the national level and in a cross-border context. Such approaches may help to identify a policy mix that maximizes the contribution of transport to sustainable development and achievement of the Millennium Development Goals.

C. Rationale

5. Transport is both a prerequisite for and a major driver of economic and social development. However, appropriate measures need to be taken in order to ensure that transport makes the maximum contribution to improving living and working conditions. This requires the management of the positive and negative externalities of transport, for example, pollution, safety, congestion, poverty impacts and increased specialization, in order to achieve sustainable transport (section I).

[1] www.un.org/millenniumgoals/

6. Significant economic growth in the ESCAP region, rapid motorization and increasing freight flows have been the cause and effect of massive investments in transport infrastructure construction and maintenance (equivalent to between 1 and 6 per cent of gross domestic product). In fact, in many ESCAP member countries, more roads, railways, ports and airports are being built in this decade than ever before. Once built, these infrastructure assets will predetermine future development options for decades to come, owing to the longevity of transport assets and their impact. In essence, the next 20 years or so may be a "once in a lifetime" opportunity for decision makers to make transport systems more sustainable, thus avoiding being locked into undesirable future transport systems (section I.B).

7. Sustainable transport can greatly enhance economic development and improve living and working conditions. Figure I provides a glimpse of the complexity of relationships. Essentially a feedback loop system determines how sustainable transport can contribute to improved or worsened living and working conditions.

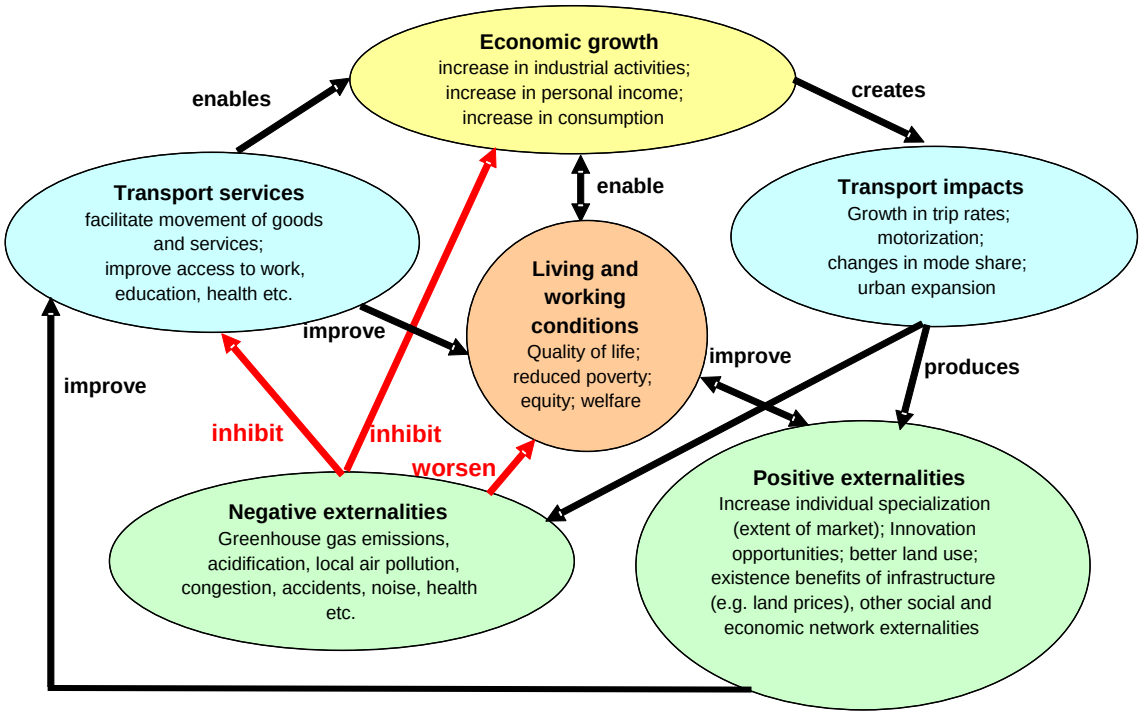

Figure I. Schematic illustration of transport and economic development

8. As elaborated in the present document, current transport systems in the region are unsustainable in several aspects. Even in cases where the negative externalities of transport have not yet inhibited transport services, growth and living conditions to a significant extent, it should be noted that negative change can happen surprisingly quickly owing to the nature of ecosystems and socio-economic networks that often exhibit "tipping point" behaviour.[2]

[2] M. Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference* (Little, Brown and Company, March 2000).

9. The "vision" of an Asian integrated transport network implicitly incorporates elements of sustainable transport. In fact, its realization has the potential to sustain rapid economic growth in the region, balancing growth with the distributive aspects, as well as lead to improved logistics efficiency, reliability, energy savings and better land-use planning. Further, it will provide opportunities to systematically choose desirable paths towards a future ESCAP transport system that is sustainable. For example, an efficient network of dry ports may provide new opportunities for a modal shift from road to rail (where desirable). In this sense, the policy tools and processes described in the present document may prove useful for realizing the "vision" in particular and sustainable transport in general. In this context, it should be noted that the secretariat recently produced a monograph that outlined the scope of the proposed Asian integrated transport network and possible paths towards its realization.[3]

10. Serious consideration of integrated tools and processes in designing transport policies and programmes may lead to a more positive approach in which environmental, social and poverty issues are not seen as a mere "add-on" to economic and transport policies but as an integral part of their objectives. In principle, such an approach is possible at low, and sometimes even negative, cost, as there are many "win-win" solutions available.

I. SUSTAINABLE TRANSPORT

A. Concept and definition

11. The concept of "sustainable transport" derives from the general term "sustainable development", which takes into account all sectors of human activity. This terminology was popularized in the 1987 report of the World Commission on Environment and Development, which defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[4] This definition implies that the movement of people and goods should occur in ways that are environmentally, socially and economically sustainable.

12. The definition proposed by the Organisation for Economic Cooperation and Development (OECD) contains four elements. A sustainable transport system[5] is one that:

(1) Provides for safe, economically viable and socially acceptable access to people, places, goods and services;

(2) Meets generally accepted objectives for health and environmental quality, for example, those set by the World Health Organization (WHO) for air pollutants and noise;

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[3] ESCAP, *Toward an Asian Integrated Transport Network*, Monograph Series on Managing Globalization, No.1 (ST/ESCAP/2399) (http://www.unescap.org/publications/detail.asp?id=1137).

[4] *Our Common Future* (Oxford University Press, 1987), chap. 2, "Towards sustainable development".

[5] See the synthesis report on the OECD project on environmentally sustainable transport (http://www.oecd.org/env/ccst/est/curract/vienna2000/EST-Synthesis-Report-Part1.pdf).

(3) Protects ecosystems by avoiding exceeding critical loads and levels for ecosystem integrity, for example, those defined by the Economic Commission for Europe (ECE) for acidification, eutrophication and ground-level ozone;

(4) Does not aggravate adverse global phenomena, such as climate change and stratospheric ozone depletion.

13. While the OECD definition is widely used, it is strongly focused on environmental objectives. Policymakers in developing and transition economies in the ESCAP region are addressing additional sustainable transport objectives that are considered crucial in the region. Therefore, for the ESCAP region, a working definition of sustainable transport is suggested that includes another six aspects, in addition to those contained in the OECD definition. Thus, a sustainable transport system is one that:

(5) Is designed to contribute to reducing poverty in all its dimensions, including the elements contained in the Millennium Declaration;

(6) Provides increasing levels of transport services that are affordable, reliable, efficient and rapid;

(7) Minimizes resource use to sustainable levels in terms of energy, land and materials use;

(8) Limits the public debt burden to sustainable levels (taking into account changes in public capital and operating expenditure);

(9) Maximizes long-term economic growth that is geared to benefit all parts of the country, including the hinterlands and border regions;

(10) Facilitates the smooth flow of goods and people across national borders, including for transit, thereby supporting regional economic integration and contributing to peace, stability and "good-neighbourly relations" among countries.

14. This suggested working definition for the ESCAP region is also in line with that proposed by the World Business Council for Sustainable Development which defines sustainable mobility as "the ability to meet society's need to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values today and in the future."[6]

B. Sustainability of the transport system in the ESCAP region, current trends and desirable targets

15. In a report on energy and transport submitted to the Commission on Sustainable Development in 2001 as part of the preparatory process for the World Summit on Sustainable Development, the Secretary-General stated that "consumption patterns in [the transport] sector are widely acknowledged to be unsustainable".[7]

[6] World Business Council for Sustainable Development, *Mobility 2030: Meeting the Challenges to Sustainability*: *The Sustainable Mobility Project*, World Business Council for Sustainable Development (2004).

[7] E/CN.17/2001/PC/20, para. 24.

16. The extent to which the transport system can be considered sustainable depends on assumptions about future developments. The consistent and plausible (but not necessarily most likely) sets of such assumptions about the future are often called scenarios or "futures". A typical reference scenario is the "dynamics-as-usual-scenario", which assumes that present trends continue in terms of the key underlying dynamics of change. A dynamics-as-usual scenario differs from a "business-as-usual-scenario" in that the latter assumes that no changes in policies and attitudes occur in the future. In contrast, a "sustainable transport scenario" assumes that special efforts are made to achieve the objectives listed in the working definition of sustainable transport.

17. Table 1 contrasts the implications of a dynamics-as-usual scenario of the transport system in the ESCAP region with what could be achieved in a sustainable transport scenario. The scenarios are characterized using the 10 elements of the working definition of sustainable transport. The comparison illustrates the significant potential benefits of efforts to make the transport system more sustainable in the coming decades. It should be noted that table 1 is a summary of research findings of recent reports published by the World Business Council for Sustainable Development, the Intergovernmental Panel on Climate Change, the World Bank and ESCAP.

Table 1. Implications of a "dynamics-as-usual" scenario versus a sustainable transport scenario for the ESCAP region, for the period 2006-2030*

No.	Implications of "dynamics-as-usual" scenario	Sustainable transport scenario
1a	Congestion may worsen in urban areas and on major freight corridors in both the developed and developing countries.	Congestion levels are actively managed and mitigated through a combination of measures, including market instruments and encouraging modal shifts.
1b	There could be around 610,000 road fatalities in the region by 2020.	By 2030, the region's road fatality rate per motor vehicle is reduced to the current world average rate.
2a	Local air pollution will remain a major health concern in Asian urban clusters.	Local air pollution is reduced significantly in developing countries by 2015.
2b	Noise pollution will not decrease.	Noise pollution, particularly along busy roads, rail corridors and airports, is decreased.
3	Critical loads for certain ecosystems will be exceeded in the coming decades.	Exceeding critical loads is avoided in most parts of the region.
4a	Absolute amounts of nitrogen oxides (NO_x) emissions and carbon monoxide (CO) emissions from transport will remain roughly constant, or decrease slightly, by 2030.	NO_x and CO emissions from transport are drastically reduced by 2010 to between one third and one half of current levels.
4b	Carbon dioxide (CO_2) emissions from transport will continue to increase more rapidly than those of most other sectors.	The increase in CO_2 emissions from transport is decelerating, but its share in total CO_2 emissions continues to increase until 2030.
5	The contribution of transport to poverty reduction will primarily be limited to the "trickle-down" effect, with 40 per cent of all poor people living in urban areas by 2025.	By 2015, at least 66 per cent of all villages in the ESCAP region are connected by all-weather roads and all villages are connected by 2030.
6a	Transport efficiency (especially ports and airports and their land linkages) and reliability will continue to increase and freight costs will continue to decline.	Better integration of transport modes, as well as improvements in "domestic logistics", lead to even higher efficiency and reliability.

6b	By 2030, the region's personal mobility levels will reach 270 motor vehicles per 1,000 persons, while railways both in urban areas and on inter-city routes will lose ground in most countries of the ESCAP region.	By 2030, high mobility levels are reached, through not only vehicle ownership but also near-universal access to urban mass transit, new high-speed rail freight corridors and high-speed passenger railways.
7a	Road construction alone will consume 3 million to 6 million hectares of land from 2005 to 2015.	Land consumption by roads is reduced to 2.5 million hectares or less from 2005 to 2015, owing to the re-emergence of railways and other measures.
7b	Transport-related energy use will remain almost entirely in gasoline and increase by another 400 million tons of oil equivalent per year in the region by 2020.	While transport-related energy use increases, the fuel mix changes towards a higher renewable content (e.g. biofuels, flex fuel).
7c	The use of virgin materials will continue to increase, despite higher recycling rates. Natural rubber prices will increase rapidly due to road freight.	Special efforts are made to increase recycling rates even further and to limit the need for additional amounts of natural rubber.
8	The public debt burden will increase substantially in many developing countries over the next 30 years.	The public debt burden is limited through innovative ways of financing, including environmental co-financing and viability funding arrangements.
9	Participation in international production networks will continue to be concentrated in maritime regions around major ports and a select group of countries.	All ESCAP member countries, including landlocked countries and hinterlands, participate to a varying extent in international production networks by 2030.
10a	Overall overland cross-border transport flows will continue to increase slowly in Asia but, with few exceptions, will remain small compared with Europe or North America; cross-border facilitation issues, and especially transit issues, will continue to constrain traffic.	Infrastructure and cross-border transport facilitation are improved, so that by 2015 significant cross-border overland traffic (including for transit) emerges as a veritable alternative to maritime and air transport between neighbouring countries and certain long-distance routes, including the Euro-Asian land route.
10b	Whereas the integration or "melding" of physical transport and communication networks will continue as a business trend ("logistics"), Governments will continue to regulate them in isolation from each other. Melding with relevant non-physical networks will occur only in rare cases.	Public sector policies facilitate the integration or "melding" of physical and non-physical networks, including transport networks (e.g. road, rail, inland waterways and shipping), communication networks, and non-physical networks (e.g. freight forwarders, multimodal transport operators, banking, customs, health, security etc).
10c	An increasingly complex "hub and spoke" system of international agreements on transport will emerge in the region. It will be difficult to manage. There will be concerns that this system is too closed and inequitable, and that commitments under some of the agreements are incompatible.	A coherent system of agreements is developed that is equitable, open to accession by any United Nations member, non-discriminatory and allows for a phased process for participation by ESCAP members, as they become ready for the various commitments.

Sources: World Business Council for Sustainable Development, *Mobility 2030: Meeting the Challenges to Sustainability: The Sustainable Mobility Project* (2004); Intergovernmental Panel on Climate Change, *Climate Change 2001: Third Assessment Report* (2001); World Bank, *Cities on the Move – A World Bank Urban Transport Review (*Washington, DC, 2002); ESCAP, *Enhancing Regional Cooperation in Infrastructure Development, including that Related to Disaster Management* (ST/ESCAP/2408) (United Nations publication, Sales No. E.06.II.F.13), chap. III, "Transport infrastructure" and *Toward an Asian Integrated Transport Network,* Monograph Series on Managing Globalization, No. 1 (ST/ESCAP/2399).

* Numbers in the left column correspond to the 10 elements of the working definition of sustainable transport (section I.A). Item 9 corresponds to the "vision" in document E/ESCAP/MCT/SGO/2.

C. Policy analysis with sustainable transport scenarios

18. What policies are needed in order to move from the current unsustainable trends towards the more sustainable transport system scenarios in the ESCAP region in the coming decades? Clearly, different paths are possible, making use of different policy mixes with varying emphasis on

information, regulation, planning or economic instruments. The emphasis will vary according to the national and local conditions and the implied rate of time preference of decision makers.

19. While a large number of policy tools[8] are available to address the many interconnected issues, the challenge lies not so much in selecting the "right" policy tool as in choosing an optimal combination of the various policy tools to make the best use of synergies. A strategic process, such as integrated assessment (see the following section), can help to identify this policy mix.

20. The most basic approach for systematic analysis of policy options, and one usually incorporated in integrated assessments, is to carry out a scenario analysis, an approach that in the past was mainly used by the military but today is also used by businesses and civilian governments. In scenario analysis, potential policy mixes are tested against possible, but not necessarily likely, alternative future developments.

1. Lessons learned from the OECD scenario analysis

21. OECD recently carried out a project on scenario analysis and backcasting techniques in the transport sector.[9] Experts from the OECD secretariat and its member countries, including some ESCAP members, used these techniques in order to determine the consistent policy mixes (paths) required for achieving sustainable transport systems in their respective countries by 2015.[10,] The project showed that the external costs of transport in OECD countries could be reduced by 39 per cent over the period 1990-2015, compared with an expected increase by 30 per cent over this time frame in a business-as-usual scenario.

2. Scenario analysis in the ESCAP region

22. The OECD project and guidelines provide useful directions for sustainable transport development programmes, including those in developing and transition economies of the ESCAP region. In line with the expanded working definition of sustainable transport, additional aspects would probably be featured in the case of most ESCAP members.

23. A scenario analysis of national and regional transport plans and policies similar to that carried out by OECD might prove useful for Asia and the Pacific. In particular, it would allow Governments to assess their current and planned transport policies in terms of their sustainability impacts and regional consistency.

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[8] Policy tools can be either market instruments (e.g. rebates, vehicle tax reform, full budgetary cost pricing, charges to account for external costs), command-and-control measures (e.g. corporate average fuel economy standards and controls on emission levels of vehicles) or voluntary self-regulation. They may be based on transport infrastructure, vehicles or users. For an overview, see, for example, document E/ESCAP/SGO/MCI(2)/8, submitted to the Meeting of Governmental Officials in preparation for the Ministerial Conference on Infrastructure, held in Seoul in 2001.

[9] The Environmentally Sustainable Transport Programme.

[10] Organisation for Economic Cooperation and Development, *Policy Instruments for Achieving Environmentally Sustainable Transport* (OECD, Paris, 2002); and *OECD Guidelines towards Environmentally Sustainable Transport* (OECD, Paris, 2002).

II. INTEGRATED POLICY, ASSESSMENT AND LEGAL INSTRUMENTS

24. Scenario analysis is but one of several methodologies that can be used in the systematic assessment of policies, plans, programmes and even projects, in support of decision-making at various levels. This section outlines the concepts, national experiences, relevant international mandates and specific issues that arise in the cross-border context, including international legal instruments.

A. National experiences

25. It is important to note that the different assessment tools and processes at the project, programme, plan and policy levels are mutually supportive but answer different, though interrelated, questions. For example, while an environmental assessment of a road construction project linking two cities can help to ensure that the route is appropriately chosen and that the road is constructed in an environmentally friendly way, the question of whether a road or rather a railway line should be built needs to be decided beforehand through an assessment of transport plans and programmes.

26. Similarly, the question whether a construction permit should be issued will be decided at a different level from that of whether public funds are to be used to construct a transport link between the two cities. The issuance of a construction permit will largely be an outcome of an assessment at the local project level. The decision on the source of funds will typically be an outcome of assessments of national or regional transport policies. As a result, the emerging assessment hierarchy supports the implementation of national policies as well as specific projects designed to achieve the objectives of the policies, thereby having the added advantage of improving the effectiveness of overall governance.

1. Integrated intermodal transport requires integrated decision-making

27. The creation of a truly integrated and intermodal transport system is increasingly seen as a way of not only improving economic efficiency but also making the local, national and regional transport systems sustainable in the long run.

28. However, such an approach requires decision-making that is integrated in terms of transport modes (including roads, railways, shipping/ports, airports and dry ports), the type of sustainability (economic, environmental and health, social, poverty), the level of intervention (policy, plan, programme and project) and the spatial dimensions (for example, municipality, province, state, country, subregion, region, global) (see figure II).

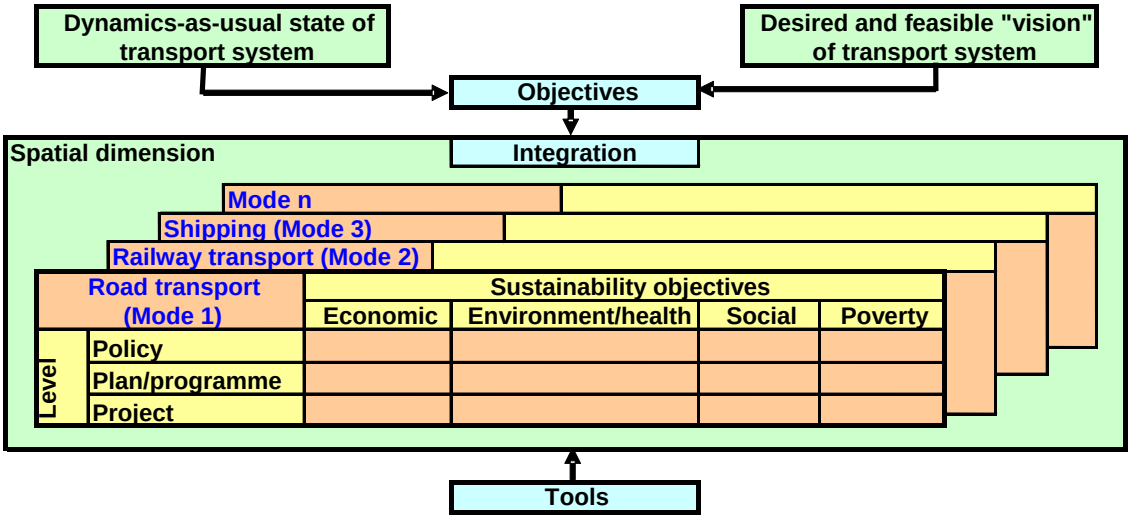

Figure II. From project and mode-specific to integrated approaches

29. In other words, a logical consequence of trying to achieve sustainable transport through the creation of an international integrated intermodal transport network is that an integrated decision-making approach is needed which allows for the assessment of transport policies, plans and programmes across various transport modes, in addition to the predominant project-specific assessments.

2. Assessment approaches for transport policies, plans, programmes and projects

30. The need for more integrated approaches has been reflected in the hierarchy of assessment tools and processes that have emerged over several decades, in order to help decision makers in the transport sectors make balanced and consistent choices at the local, national and cross-boundary levels.

31. An increasingly wide range of assessment tools has been adopted since the 1950s. In the 1950s and 1960s, economic cost-benefit analysis was applied to large-scale infrastructure projects, in addition to simple financial analysis. During the 1970s and 1980s, many countries also established environmental impact assessment requirements, mainly at the project level. Beginning in the late 1970s and early 1980s, various other assessment tools emerged, including social impact assessment, health assessment, technology assessment, poverty assessment and risk assessment. From the mid to the late 1980s, at the policy level, the environmental, social and economic effects were integrated and the cumulative effects considered. Since the early 1990s, attention has increasingly been given to integrated assessment and sustainability assessment in planning and decision-making in support of sustainable development in a growing number of countries.

32. However, until recently, most of the broader approaches were mainly promoted, and implemented, by environment ministries rather than by transport-related ministries or economic planning agencies. While environment ministries typically promoted integrated assessment at the

broadest level, economic and transport planners adopted a narrower approach to assessment. More recently, transport planners have started using strategic approaches, including integrated assessment, and consideration of comprehensive options across transport modes, sectors and locations, taking into account all elements of sustainable transport.

33. Table 2 provides a conceptual overview of key assessment tools, along the lines of economic, environmental/health, social,[11] and poverty-related sustainability objectives, from the project to the policy level. The classification applies equally to national or local governments as well as in the international context. Essentially, assessment tools have gradually been used for higher-level decisions, thus ensuring consistency from policy to project level and vice versa ("top-down" versus "bottom-up").

Table 2. Classification of assessment tools for transport-related decision-making

Timeline of adoption (1950s to 1990s)	Transport	Economic	Environment including health	Social	Poverty	
	Policies (Primarily intermodal)	Integrated assessment (IA)				Top-down
		Sustainability assessment (SA)				
		Traditional policy analysis	SEA			
	Plans and programmes (intermodal or mode-specific)	Integrated assessment (IA)				
		Sustainability assessment (SA)				
			SEA		PIA	
	Projects (usually mode-specific)	Economic CBA	ESIA			
		Financial Analysis	EIA	SIA or HIA	PIA	Bottom-up

CBA – cost-benefit analysis
EIA – environmental impact assessment
ESIA – environmental and social impact analysis
HIA – health impact assessment
PIA – poverty impact assessment
SEA – strategic environmental assessment
SIA – social impact analysis

(a) Project level

34. When complemented with strategic tools at the sector or network level, the environmental, social and health impact assessments of transport-related projects have proved to be useful preventive tools. Environmental impact assessment and environmental and social impact analysis are the most widely practised and standardized. These tools for transport planners help to take into account issues of major concern in the project design, their principal objective being to mitigate or prevent the negative environmental and social impacts of projects.

35. A number of countries in the region have taken such measures, including Bangladesh, China, India, Indonesia, the Islamic Republic of Iran, Kazakhstan, Malaysia, Nepal, the Philippines, the Republic of Korea, Thailand, Turkey, Uzbekistan and Viet Nam. In fact, at the project level, most Asian countries have established environmental impact assessment processes and some now have

[11] For the purpose of this paper, "social elements" include issues such as gender, HIV/AIDS, gains and losses of livelihoods (e.g. due to resettlement), access to social opportunities (health, education and social networking) etc.

considerable experience with such assessment. Environmental impact assessment and/or environmental and social impact analysis have also become requirements of the development banks and international financial institutions and other donors, particularly for projects of regional importance, such as in the context of the Asian Highway and the Trans-Asian Railway networks.

(b) Plan and programme level

36. Strategic environmental assessment refers to "a range of analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the interlinkages with economic and social considerations".[12] Strategic environmental assessment can complement environmental impact assessment and other project-level assessment tools. It is applied at the earliest stages of decision-making and needs to be adapted to the specific context. Various forms of the assessment have been developed over the past 15 years. It can be used to evaluate impacts which may result from major developments, to help in project selection and to assess cumulative and large-scale impacts.

37. In practice, a continuum of strategic environmental assessment tools exists that involves increasing degrees of integration all the way to integrated assessment, which aims to fully integrate environmental, social, poverty and economic factors. Integrated assessment in its various forms is clearly the broadest and most adaptable assessment tool for strategic purposes. Transport planners can benefit from the body of experience built up in the past 30 years by scientists and policy analysts in the area of global environmental issues.

38. Comparative assessment of development options is a particular variant of integrated assessment which compares development programmes according to their respective contributions to poverty reduction, economic goals and environmental sustainability, taking into account various sectoral choices and locations.

39. It should also be noted that strategic environmental assessment, integrated assessment and comparative assessment of development options usually include both quantitative and qualitative features, in contrast to cost-benefit analysis, which largely focuses on those dimensions to which monetary values can be assigned.

40. The ESCAP Ministerial Conference on Infrastructure, held in Seoul in 2001, discussed and encouraged the use of strategic assessment tools such as strategic environmental assessment and integrated assessment for infrastructure-related plans, programmes and policies.[13] Since then, many

[12] OECD, "Good practice guidance on applying strategic environmental assessment (SEA) in development cooperation" (DCD/DAC(2006)37), 6 July 2006.

[13] See note 8 above.

countries have made progress in adopting or implementing such processes, particularly at the level of transport plans and programmes. In the last five years, a framework of national and international legislation on environmental impact assessment and strategic environmental assessment has emerged in which both developed and developing countries increasingly participate (see http://www.iied.org/Gov/spa/docs.html).

41. Related assessment processes for plans and programmes are the so-called poverty reduction strategies papers and poverty and social impact analysis[14] which were introduced by the World Bank and the International Monetary Fund. In a similar manner to environmental and social impact analysis, these two processes only consider alternative designs of a given reform and do not evaluate alternative reforms.

(i) Experience outside the region

42. Integrated assessment, strategic environmental assessment and related institutional mechanisms to formalize a systematic process for ensuring consistency in decision-making have been used in Europe and Canada for quite a few years. In the European Union, strategic environmental assessment was mandated in 2001 and a directive entered into force in 2004. The European Commission has established its own comprehensive system for integrated assessment/strategic assessment of internal and external policy documents. Over the past decade, it has also made strategic environmental assessment analyses on individual transport corridors[15] of the Trans-European Network. Notably in Belgium, Denmark, Finland and the Netherlands, transport strategic environmental assessments deal with all transport modes together, along with infrastructure and non-infrastructure measures and linkages with other sectors. At the level of the United Nations Economic Commission for Europe (ECE), a legally binding international instrument, the Protocol on Strategic Environmental Assessment to the Espoo Convention, was adopted in 2003 (see box 2).[16]

43. Among developing countries, interesting applications of integrated assessment as well as strategic environmental assessment in the transport sector are being reported in South America, such as the integrated assessment of the “Trans-Amazonia” in Brazil. The World Bank has carried out strategic environmental assessment-type regional and transport sector environmental assessments since the early 1990s.

[14] Defined as “the analysis of positive and negative distributional and poverty impact of policy change on the well-being of different groups in society, with a focus on the poor and vulnerable.”

[15] Five corridors in Sweden, the United Kingdom of Great Britain and Northern Ireland, Austria, Italy, France and Belgium.

[16] ECE and WHO, “Overview of instruments relevant to transport, environment and health and recommendations for further steps – synthesis report” (ECE/AC.21/2001/1).

(ii) Legal requirements in the ESCAP region

44. While most ESCAP members have legal assessment requirements at the project level, contained in environmental impact assessment laws or transport sector laws, an increasing number have introduced legislation requiring assessment of transport plans and programmes.[17]

45. Environmental impact assessment-type frameworks that include elements of strategic environmental assessment are in place in almost all ESCAP members in Central Asia and the Caucasus. This is due to the introduction of a combination of state environmental reviews and assessment of environmental impact procedures in the former Union of Soviet Socialist Republics during the mid-1980s. Whereas that system appears to have remained in place almost unchanged in Azerbaijan, Kyrgyzstan, Tajikistan and Uzbekistan, Western-style assessment elements have been added in Armenia, Georgia, Kazakhstan, the Russian Federation and Turkmenistan. In Armenia, the Law on Environmental Impact Assessment of 1995 requires environmental impact assessment not only of projects but also of concepts, which include proposals, programmes, complex designs and master plans and documentation on regional planning.

46. In China, regional environmental assessments have been mandated for large construction projects since 1998. The new Environmental Impact Assessment Law, in force since 2003, requires a strategic environmental assessment-type approach to be applied to long-term strategic plans at the national, provincial and sector levels and to short-term project plans at the local level. Indonesia follows the Canadian environmental assessment review process and requires an environmental impact assessment to be carried out for every plan which is considered likely to have a significant impact on the environment.

47. In Samoa, the Planning and Urban Management Act of 2003 promotes environmental planning, including environmental impact assessment, strategic planning and infrastructure coordination, and provides for strategic environmental assessment of area-wide plans.

(iii) Selected examples from the transport sector of ESCAP members

48. While strategic environmental assessments as well as broader assessment processes have become common in most OECD countries, they have been applied in a systematic way in the transport sector in only a few developing countries of the ESCAP region. This is not primarily due to limited capacity, as most countries in Asia and the Pacific have the infrastructure in place to make strategic environmental assessment work.

[17] ECE has conducted an informal review of legislation in ECE countries, including information on nine ESCAP member countries, “EIA and SEA legislation across South-Eastern and Eastern Europe, Caucasus and Central Asia”; see www.unece.org/env/eia/legislation.htm.

49. Table 3 lists selected, publicly documented, examples of the application of strategic environmental assessment, integrated assessment and related tools for the assessment of transport plans, programmes and policies in ESCAP members. Particularly noteworthy examples include strategic environmental assessments that have been carried out in China since 1995, and the application of the comparative assessment of development options in Papua Province of Indonesia.

Table 3. Selected examples of the application of strategic environmental assessment, integrated assessment, comparative assessment of development options and related tools for the assessment of transport-related plans, programmes and policies in the ESCAP region

Location	Type	Date	Description
Papua Province of Indonesia	Comparative assessment of development options	2003	At the request of the provincial government, four development scenarios were considered: (a) do nothing ("business-as-usual"), (b) Trans-Papua Highway, (c) mega hydropower development programme, and (d) urban development plan in two cities
China	Strategic environmental assessment	Since the early 1990s	Great Western Development Strategy (2002); Pudong Economic Development Zone in Shanghai (1993); Automobile Industry Development Policy (1997)
Hong Kong, China	Strategic environmental assessment	Since 1989	Port and airport development strategy (1989); railway development strategy (1993), freight transport study (1994), third comprehensive transport study (1999), second railway development study (2000); future strategic growth areas (1999)
Armenia	Strategic environmental assessment	2005	Master Plan of Yerevan City
Australia and New Zealand	Integrated assessment	2005	ICLEI-Local Governments for Sustainability works with its 105 local governments to develop a "triple-bottom-line" (financial, environmental and social/labour accounts) and carry out sustainability assessment and reporting
India	Strategic environmental assessment	2000	Gujarat State Highway Programme (financed by the World Bank)
Russian Federation	Strategic environmental assessment	1997-1999	Moscow City Master Plan for the Period to 2020

(c) Policy level

50. Existing legislation in ESCAP member countries typically does not require strategic environmental assessment or broader integrated assessment of transport policies or development options to be undertaken. However, in practice, a number of members and associate members have recently started to carry out such assessments. For example, in Hong Kong, China, all major transport-related policies and plans have been subject to strategic environmental assessment since 1998.

51. In practice, certain institutional barriers need to be overcome by Governments, in order to achieve policy integration that adequately reflects the increasing importance of integrated transport and the multitude of government objectives that are linked to transport policy decisions. An overview

of issues and possible institutional arrangements to enhance integrated assessment at the policy level and policy integration in general has recently been put together by the WHO/ECE pan-European programme project (see http://www.thepep.org/en/workplan/ia4pi/ia4pi_docs.htm).

3. Participation and information

52. Good transport-related decision-making needs to be based on access to information for stakeholders and their participation in the evaluation and decision-making process.

53. All the assessment processes institute various levels of participation of stakeholders, improving access to information and transparency, preventing conflicts and improving governance in general. A notable example of participation in urban transport-related decision-making is an ESCAP pilot project in the Rattanakosin area of Bangkok.[18]

54. The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, the so-called "Aarhus Convention" (see box 1), is open for accession by any United Nations Member States.

Box 1. Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters and its Protocol on Pollutant Release and Transfer Registers

The so-called "Aarhus Convention" was adopted in 1998 and entered into force in October 2001. The Convention grants public rights and imposes on Parties and public authorities obligations regarding access to information, public participation and access to justice. As at August 2006, 10 ESCAP members were Parties to the Convention: Armenia, Azerbaijan, France, Georgia, Kazakhstan, Kyrgyzstan, the Netherlands, Tajikistan, Turkmenistan and the United Kingdom of Great Britain and Northern Ireland. The Convention is open for accession by any United Nations Member States, but approval is required by the Meeting of the Parties (article 19, para. 3). On several occasions, including at the Second Meeting of the Parties in May 2005, accession by non-ECE member States was encouraged.

All "public authorities", including transport-related ministries and agencies, are covered by the Convention. All Parties have to follow minimum standards in terms of information and participation in the case of transport-related projects with potential significant adverse environmental impact (article 6), including railway lines, airports, motorways, inland waterways, ports and dry ports (annex I to the Convention). There are also minimum provisions for decision-making on transport-related plans, programmes and policies (article 7). While the requirements for public participation in preparation of plans and programmes prescribe procedural requirements (article 6), the legal standard for transport-related policies in article 7 is much weaker: "To the extent appropriate, each Party shall endeavour to provide opportunities for public participation in the preparation of policies relating to the environment".

The Protocol on Pollutant Release and Transfer Registers was adopted in Kiev in 2003 and signed by 36 States and the European Community and is expected to come into force shortly. It includes provisions regarding information on releases from diffuse sources such as transport.

For further information, see ECE, *Summary of Convention contents and principles* (http://www.unece.org/env/pp/welcome.htm and http://www.unece.org/env/pp/contentofaarhus.htm); *Implementation guide* (http://www.unece.org/env/pp/acig.pdf); and *Clearinghouse* (http://aarhusclearinghouse.unece.org/resources).

[18] ESCAP, *Traffic and Transportation for Sustainable Environment, Mobility and Access: Application of a Comprehensive and Integrated Approach to Policy Development in the Rattanakosin Area of Bangkok* (ST/ESCAP/2171) (United Nations publication, Sales No. E.02.II.F.27).

55. Well-documented examples of applying the Aarhus Convention in transitional economies include the Convention's Compliance Committee report on decision-making regarding motorways in Hungary, and the adoption of the Act on Access to Information on the Environment and Public Participation in Environmental Decision-making in Poland in 2000 (in the light of the ratification of the Convention by Poland), which introduced mandatory public participation in decision-making on transport policies, strategies, plans and programmes.

B. International policy agenda and sharing of experiences

1. International policy agenda

56. In recent years, the need for integrated policy, assessment and decision-making has been featured prominently on the international transport policy agenda.

57. The United Nations Millennium Declaration [19] reaffirmed support for the principles of sustainable development and Goal 7 calls for the integration of the principles of sustainable development into country policies and programmes. In the discussions at the World Summit on Sustainable Development, held in Johannesburg in 2002, the importance of "strategic approaches and balanced decision-making" was stressed and reference made to the importance of taking a holistic and intersectoral approach.

58. In 2004, the OECD Council strongly emphasized the importance of integrated decision-making and adopted a recommendation on assessment and decision-making for integrated transport and environment policy. The Council recommended that systematic evaluation of economic, social and environmental effects should underpin all transport plans and programmes and all major transport sector investments, agreed that integrated assessment and decision-making procedures should be designed to facilitate effective and transparent decisions and their implementation, and adopted guidelines for good assessment and decision-making support, drawing on earlier work by the European Conference of Ministers of Transport.

59. The Paris Declaration on Aid Effectiveness of 2005[20] also calls upon donors to develop and apply common approaches for strategic environmental assessment at the sector and national levels.

2. Capacity-building and international sharing of experiences

60. A number of national and international organizations have recently produced background documents and training materials and have started carrying out capacity-building activities on integrated assessment.

[19] See General Assembly resolution 55/2 of 8 September 2000.

[20] Adopted at the Senior Level Forum on Development Effectiveness in Fragile States, held in London in January 2005.

C. Cross-border issues and experiences

61. Issues similar to those in the national context also arise in the cross-border context, in terms of integrated policy and planning, assessment processes and participation. However, additional issues need to be taken into account when a transport policy, plan/programme or project is cross-border in nature, for example, a bridge across a river that demarcates a national border, or when it has major impacts across national borders, for example, plans and programmes for the long-term development of the Asian Highway or Trans-Asian Railway, airports or ports that affect areas in neighbouring countries, including landlocked countries.

62. To date, most examples of assessment in a cross-border context have taken place in Europe; however, the number of potential applications in the ESCAP region is large and increasing in line with cross-border traffic.

1. Project level

63. The types of issues in cross-border project environmental impact assessment are illustrated by the example of a bridge construction project over the Danube River between Bulgaria and Romania (costing € 230 million). Whereas Bulgaria had a one-step assessment procedure at the beginning of the project design process, Romania had an assessment procedure in the framework of the approval process, that is, before obtaining the construction permit. To resolve this difference, and to provide a stronger overall environmental impact assessment, the cross-border assessment took place in two stages, that is, a preliminary assessment according to Bulgarian legislation covering both countries, and a final assessment according to Romanian legislation, also covering both countries.

64. Similar issues arise in the ESCAP region, even though systematic cross-border assessments are carried out only rarely. For example, in the Greater Mekong Subregion, Cambodia, the Lao People's Democratic Republic, Thailand and Viet Nam all have standard environmental impact assessment procedures and legislation in place, but so far none have procedures to deal with transboundary impacts.

65. In the ECE region, the Convention on Environmental Impact Assessment in a Transboundary Context, the Espoo Convention, which entered into force in 1997, provides a solution to such cross-border issues. In essence, it specifies minimum standards for environmental impact assessment processes, including information and participation requirements, to be carried out for transport infrastructure projects, and other activities, that are either cross-border or have a significant cross-border impact (see box 2). As at August 2006, seven ESCAP members, Armenia, Azerbaijan, France, Kazakhstan, Kyrgyzstan, the Netherlands and the United Kingdom, were Parties to the Convention. An amendment has been passed, and is expected to come into force in 2007, according to which all States Members of the United Nations can become Parties to the Convention.

66. The Espoo Convention covers all major economic sectors, with the transport sector being one of the most important sectors in practice. In fact, a review of implementation of the Espoo Convention, published by ECE in 2004, showed that the majority of reported projects (8 of 15) to which the Convention was applied were in the transport sector.

Box 2. Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) and its Kiev Protocol

The Espoo Convention was adopted in February 1991 and entered into force in September 1997. As at August 2006, there were 41 Parties to the Convention, including the following ESCAP members: Armenia, Azerbaijan, France, Kazakhstan, Kyrgyzstan, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland. A number of non-ECE member countries have expressed interest in becoming a Party. At their second meeting, the Parties adopted an amendment to the Convention allowing non-ECE member States to become Parties. This amendment is expected to come into force in 2007.

The Espoo Convention is intended to promote international cooperation in assessing and mitigating the likely impact of a proposed activity, such as transport infrastructure development, on the environment. It applies, in particular, to activities that could have an adverse impact on the environment in other countries. The Convention ensures that explicit consideration is given to environmental factors well before the final decision is taken. It also ensures that the people living in areas likely to be affected by an adverse impact are informed of the proposed activity, provided with an opportunity to make comments or raise objections, and enabled to participate in relevant environmental impact assessment procedures.

The Protocol on Strategic Environmental Assessment, also known as the Kiev Protocol, or SEA Protocol, was adopted in May 2003. The Protocol was adopted by 37 signatories, including the following ESCAP members: Armenia, France, Georgia, the Netherlands and the United Kingdom. It requires its Parties to evaluate the environmental consequences of their official draft plans and programmes and recommends a similar process for draft policies. Strategic environmental assessment is undertaken much earlier in the decision-making process than environmental impact analysis. The Protocol also provides for appropriate public participation in government decision-making, including in all the major transport subsectors.

For further details, see the ECE website www.unece.org/env/eia/, in particular: (a) ECE, *Guidance on the Practical Application of the Espoo Convention* (ECE/MP.EIA/8), 2006; (b) *Resource Manual to Support Application of the UNECE Protocol on Strategic Environmental Assessment,* July 2006; and (c) *Report of the Third Meeting of the Parties* (ECE/MP.EIA/6).

2. Plan and programme level

67. The Protocol on Strategic Environmental Assessment, the Kiev Protocol, or SEA Protocol, to the Espoo Convention, requires its Parties to evaluate the environmental consequences of their official draft plans and programmes and recommends a similar process for draft policies. It also provides for appropriate public participation in government decision-making, including all major transport subsectors. It is expected that the Protocol will lead to a global strategic environmental assessment standard, as it will be open to all United Nations Member States.

68. The need for such an international instrument for the ESCAP region is evident. It should be noted that the Asian Development Bank has recently started preparatory work for possible strategic environmental assessment and integrated assessment to be carried out for the Greater Mekong Subregion. In this context, it may be noted that the World Wildlife Fund has published an overview

paper[21] which provides a range of arguments to show why a comparative assessment of development options-style integrated assessment should be carried out for all Greater Mekong Subregion infrastructure plans.[22] Similarly, integrated assessment of other regional transport plans, programmes or agreements, for example, the Asian Highway and Trans-Asian Railway networks, could highlight the regional overall costs and benefits of various large-scale development options.

3. Policy level

69. It is more likely that national transport-related policies rather than projects will have cross-border impacts. Furthermore, regional organizations, programmes and agreements have de facto introduced an international layer of policy-relevant aspects which might be assessed in a similar way. For example, ESCAP members and associate members might be interested in collaboratively assessing various paths towards realizing the aforementioned "vision", in order to test their planned future transport policies. Similarly, a scenario analysis of the development of the Asian Highway and Trans-Asian Railway might be beneficial.

70. It should be noted that the Kiev Protocol to the Espoo Convention recommends, although it does not require, strategic environmental assessment for the assessment of all transport policies with cross-border impacts.

III. ISSUES FOR CONSIDERATION

71. Transport has a significant impact on the environment, health and safety as well as on economic and social systems in the ESCAP member countries. This document has outlined the need to formulate strategies that incorporate all dimensions of a sustainable transport system using an appropriate mix of policy tools. Governments may use integrated assessment and futures-based policy analysis to determine a transport policy mix that "optimally" reflects their special objectives. Therefore, the following action is suggested for consideration at the national and regional levels:

A. At the national level

72. At the national level, Governments may wish to consider:

(a) Promoting close coordination and cooperation in terms of planning, assessment and operations among all transport-related ministries and with other relevant sectoral ministries, including those relating to the environment, energy and trade;

[21] World Wildlife Fund, *Economic Corridors: Transport and Energy Infrastructure Transforming the Greater Mekong Subregion (GMS)* (2005).

[22] It should be noted, as a first step in this direction, that a strategic environmental framework is being developed by the Asian Development Bank for the Greater Mekong Subregion Programme which, however, appears to focus mainly on data collection.

(b) Implementing processes and activities as contained in the recommendation of the OECD Council on assessment and decision-making for integrated transport and environment policy adopted on 21 April 2004 (see para. 58 above);

(c) Gradually building capacity for and implementing a hierarchy of assessment tools and processes, ranging from project-level environmental and social impact analysis, to strategic environmental assessment, to comprehensive integrated assessment at the programme, plan and policy levels; and to make full use of these assessments by exploring environmental co-financing mechanisms such as the Clean Development Mechanism of the United Nations Framework Convention on Climate Change and the Global Environment Facility, as well as making use of innovative transport infrastructure solutions;[23]

(d) Exploring the use of futures-based policy analysis for analysing the sustainability of national transport systems and comparing the simulated performance of alternative transport policies.

B. At the regional level

73. At the regional level, Governments may wish to consider sharing experiences and resources on the issues contained in the present document. Governments are also invited to provide the secretariat with further guidance as to which activities to include in a new five-year regional action programme, the suggested elements of which are listed below:

Immediate objective: Increased awareness and understanding of alternative policy options for sustainable transport by decision makers

Outputs

1. Regular publication of the *Review of Developments in Transport in Asia and the Pacific*, the *Transport and Communications Bulletin for Asia and the Pacific*, and ad hoc regional transport policy studies
2. Advisory services, meetings and networking of transport decision makers and advisers on the application of integrated assessment, strategic environmental assessment and related approaches in transport plans, programmes and policies
3. Studies of alternative policy paths (“regional futures”) towards the achievement of sustainable transport

Indicators of achievement

1. Positive evaluation of publications, analysis and outputs by countries and other concerned groups
2. Reflection of methodologies, policies and intervention measures promoted by ESCAP in national or local policy documents
3. Participation of stakeholders, including research groups and national institutions

. . . . .

[23] Promising examples include dedicated road corridors both in the urban (e.g. bus rapid transit) and the inter-city context (dedicated lanes for trucks and longer-combination vehicles, as well as hybrid buses).