



**Economic and Social  
Council**

Dist.  
GENERAL

ECE/AC.21/SC/2008/4  
EUR/08/5068055/4  
14 February 2008

Original: ENGLISH

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**ECONOMIC COMMISSION FOR EUROPE**

**WORLD HEALTH ORGANIZATION  
REGIONAL OFFICE FOR EUROPE**

HIGH-LEVEL MEETING ON TRANSPORT,  
ENVIRONMENT AND HEALTH

Steering Committee on the Transport, Health and  
Environment Pan-European Programme

Sixth session  
Geneva, 28–29 April 2008  
Item 4 (b)(i) of the provisional agenda

THIRD HIGH-LEVEL MEETING ON TRANSPORT, HEALTH AND ENVIRONMENT  
MAIN BACKGROUND DOCUMENTS

**Review of transport developments and their effects on health and the environment  
in the UNECE-WHO/Europe Pan-European Region (1997–2007)**

**Executive Summary<sup>1</sup>**

Note by the secretariat

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<sup>1</sup> This Executive Summary is excerpted from “Transport, Health and Environment: Trends and developments in the UNECE-WHO Pan-European Region (1997–2007)”. The full report will be available at the session of the Steering Committee. It will be produced as a background document for the Third High-level Meeting on Transport, Health and Environment (November 2008). References for all trends reflected in this summary can be found in the full report.

## I. GENERAL TRENDS IN TRANSPORT ACROSS THE PAN-EUROPEAN REGION

1. The present report reviews developments and progress in the transport, health and environment since 1997. Bearing in mind that transportation is an integral part of economic and social development and essential to the functioning of all societies, the report shows, however, that current patterns of transport and travel are not sustainable with increasing pressures, in particular on urban areas. These include the negative effects on health and ecosystems of transport-related air pollution and noise, greenhouse gas (GHG) emissions, congestion, road traffic accidents and other effects.

2. The integration of European economies and societies during this period has been accompanied by significant economic and social development. Transport, particularly international freight and passenger transport, has increased steadily in the last decades, and has made a considerable contribution to economic growth. There has been extensive building of new roads and motorways across Europe, and the overall length of motorways in EU<sup>2</sup>-25 grew by 38 per cent between 1990 and 2003. In the 10 countries which acceded to the EU in 2004, this growth was more pronounced, at 75 per cent during the same period. In Eastern Europe, Caucasus and Central Asia (EECCA) and South-Eastern Europe (SEE), the length of newly constructed motorways was even more remarkable, at 144 per cent and 157 per cent, respectively. During the same period, the length of railway network and inland waterways has seen declining trends across Europe.

3. In the EU, the volume of passenger and freight transport has more than doubled over the past 25 years. Road transport is also becoming more important in EECCA and SEE countries. In the EU-25, between 1995 and 2005, passenger transport grew by an annual average rate of 1.8 per cent and freight transport by 2.8 per cent, while the GDP<sup>3</sup> grew by an average rate of 2.3 per cent in the same period. Contrary to this, passenger transport in EECCA and SEE declined sharply during the 1990s. However, since 2000, with the number of vehicles steadily growing, passenger and freight transport picked up and reversed the downward trends. Freight transport is also recovering, and freight volume increasing, both leading to increase of traffic congestion, especially in urban areas. It is predicted that road transport volumes and the number of road vehicles will continue to grow in the next decades. It seems likely that with a few exceptions, rates of walking and cycling are declining across the pan-European region at the expense of travel by car, although there are few trend data available.

4. The use of public passenger transport (rail, buses and coaches) in EECCA experienced a substantial decline between 1990 and 2000, and subsequent recovery has been weak in most countries. A key factor behind the inability of public transport to recover from the decline of the 1990s has been the decrease in funding levels that many public transport systems in SEE and EECCA have experienced in the past 10 years. The use of private cars for transport has increased significantly over the last decade. However, the level of private car ownership, below 180 cars

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<sup>2</sup> European Union.

<sup>3</sup> Gross domestic product.

per thousand of the population in all EECCA countries, and below 290 in SEE, is still much lower than the typical values of 400 to 600 in Western Europe.

## **II. TRENDS AND DEVELOPMENTS REGARDING EFFECTS OF TRANSPORT ON HEALTH AND THE ENVIRONMENT**

### **A. Air quality**

5. The fuel combustion processes in the transport sector produce several chemical compounds that impair air quality. Such compounds include nitrogen oxides, sulphur dioxide, carbon monoxide, hydrocarbons and particles. Emissions of nitrogen oxides also have an impact on the volumes of ground-level ozone, which are harmful to the environment and to health. Impaired air quality is related to a number of negative health effects, especially of the respiratory and cardiovascular system; some air pollutants also have carcinogenic effects.

6. Air pollution costs are estimated at 2 per cent of GDP in high-income countries. Road transport is an important source of these emissions. Some 3.6 million of life years were lost due to exposure to air pollution in the EU-25 in the year 2000. The average loss of life expectancy from air pollution is 8.6 months. According to the National Public Health Institute of Finland estimates, as many as 2 million Finns suffer from occasional respiratory symptoms caused by airborne particles and 200 to 400 people die prematurely every year because of air pollution. In the Russian Federation, available data indicate that increased pollution from urban air causes an estimated 40,000 additional deaths in urban areas. The average air pollution levels have not changed substantially in the last few years in most parts of Europe.

7. Air pollutant emissions, including transport-related ones, decreased in the 1990s in EECCA countries, mainly due to the economic recession, but less than the decrease in transport volumes, indicating a reduction in average fuel efficiency. With economic recovery, this decline has ceased. The increase in the number of vehicles, especially private ones, as well as travel distances, is likely to offset technical improvements and to lead to increased levels of harmful emissions in the urban environment. In Moscow, motor vehicles were the main source of air pollution and transport was responsible for more than 80 per cent of all pollutants discharged. Cars contributed an estimated 65.5 per cent, trucks 25 per cent and buses 10 per cent of total air pollution from vehicles in 2003. In other EECCA and SEE countries, the situation is similar, with transport-related emissions increasing in urban areas after the period of decline or stagnation during the 1990s.

### **B. Road traffic casualties**

8. Despite differences between countries, overall mortality rates from road traffic injuries have declined in Western Europe. In the EU-15, the number of road fatalities declined by 45 per cent between 1990 and 2005, and in the EU-25 the number of fatalities was reduced by 21 per cent between 2000 and 2005. The average mortality rates from road accidents in EECCA countries are higher than in the EU-15 and in Central and Eastern European countries. Although the mortality rate declined by 23 per cent in 1991 to 15 per cent (per 100,000 population), it is

still higher in EECCA than in the EU-15 (10% and 13% (per 100,000), respectively, in the EU-15 and in Central and South-Eastern Europe in 2000).

9. From the mid-1990s to 2000, road traffic fatalities declined in several SEE and EECCA countries, probably due to the economic recession (since lower economic growth is correlated with lower transport volumes) rather than to road safety strategies. From 2000 to 2004 and 2005, SEE countries showed a slight decrease in the number of persons killed in traffic. The situation differs in EECCA, in particular in the Russian Federation, with a 21 per cent increase in persons killed in road crashes in the period 2000–2004 in this subregion.

### **C. Noise**

10. It is estimated that approximately 30 per cent of the EU-15 population is exposed to levels of road traffic noise of more than 55 dB. The WHO guidelines limit noise levels for residential areas to 55 dB during the day and to 45 db during the night. Exposure to high noise levels has decreased in some countries since 1980 due to technological measures, noise barriers, and adapted spatial planning. However, some of these achievements are likely to be offset by the expected growth in traffic.

11. In EECCA countries, noise pollution decreased in the 1990s due to reduced economic activity and transport volumes. With the economic recovery, noise levels are increasing due to strong industrial growth and related increasing levels of transport activity. Older vehicle fleets and poor vehicle maintenance in EECCA and SEE additionally contribute to higher noise levels. It is estimated that about 38 million people in the Russian Federation are exposed to annoying transport-related noise. In Moscow, 60 to 80 per cent of the population lives in areas with transport-related noise above permissible levels. In spite of efforts to reduce its harmful effects on urban population, transport-related noise levels are steadily increasing across Europe, with motor vehicles and aircrafts being the most important contributors.

### **D. Energy Use**

12. In Western Europe (EU-15 plus Norway and Switzerland), transport uses 30 per cent of total energy. Since the end of the 1990s, the overall energy consumption has been increasing across Europe. Transport energy consumption in the EEA-17<sup>4</sup> area has grown by about 2 per cent per year during the period 1990–2000, and has equalled some 35 per cent of all energy use in 2005. In 2003 in SEE, transport used about 26 per cent of the total energy, with road transport accounting for about 91 per cent of that energy use. In Western Europe, road transport (81%) has the lion's share of the total fuel use by the transport sector, followed by air transport (13%) and rail and water transport (2% each). Elsewhere, the industrial sector is relatively larger and oil is still used for electricity generation, so that the transport sector's share of 33 per cent of oil demand is somewhat lower.

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<sup>4</sup> EEA-17 (European Environment Agency-17) = EU-15 plus Iceland and Norway.

13. On average, in EECCA countries, transport consumes 17 per cent of total energy use, less than in Western Europe (35%) and Central and Eastern Europe (22%). In the Russian Federation, the transport sector uses about 19 per cent of total energy consumption and in Tajikistan about 28 per cent which is the highest rate in the region. In most EECCA countries, road transport consumes more than 70 per cent of the energy consumed in transport sector. The highest share of energy consumption by road sector is in Tajikistan with 98.4 per cent of the overall transport sector consumption, and the lowest in the Russian Federation, with about 44 per cent.

#### **E. Carbon dioxide emissions**

14. As a consequence of the growing energy consumption, carbon dioxide (CO<sub>2</sub>) emissions from transport sector have also continued to increase. Although some countries have made significant efforts to cut their transport sector CO<sub>2</sub> emissions, the overall emission levels have continued to increase steadily over the last 10 years. According to the International Energy Agency, transport sector emissions grew 1,412 million tons (31%) worldwide between 1990 and 2003, and increased 820 million tons (26%) in OECD<sup>5</sup> countries, accounting for 71 per cent of worldwide CO<sub>2</sub> emissions from transport.

15. In the EU, the transport sector's share of CO<sub>2</sub> emissions in 1994 was 26 per cent, and about 8 per cent in Central and Eastern Europe. During the period 1990–2000, transport contribution to GHG emissions increased by 4 per cent in Central and Eastern Europe and by 19 per cent in EU-15. Between 2003 and 2004, the increase of climate-changing GHG emissions from the transport sector, excluding international aviation and shipping, was 2.2 per cent.

16. In EECCA and SEE, total CO<sub>2</sub> emissions during the 1990s were estimated to be lower than in the rest of Europe, partly due to restructuring or closure of heavily polluting and energy-intensive industries as well as to the overall decline in economic and transport activities in this period. With the increase in economic activity and growing transport demand, however, transport-related CO<sub>2</sub> emissions were expected to have grown since 2000.

### **III. PROGRESS MADE IN THE THREE PRIORITY AREAS OF THE PEP<sup>6</sup>: POLICY INTEGRATION, URBAN TRANSPORT AND DEMAND MANAGEMENT**

#### **A. Policy Integration**

17. There have been significant developments in the integration of environment and health issues into transport policy in Western Europe in the last 10 years. Sustainable development became a fundamental objective of the EU when it was included in the Amsterdam Treaty as an overarching objective of EU policies from 1997, and in 1999 when the Cardiff European Council defined its strategy on integration. This meant that sustainable development issues had to be integrated into EU policies, including those on transport. This issue has been sustained

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<sup>5</sup> Organisation for Economic Co-operation and Development.

<sup>6</sup> Transport, Health and Environment Pan-European Programme.

throughout the period 1997–2007 with a number of far-reaching integrating policies. Nevertheless, there are still challenges to be tackled regarding full policy integration in Western Europe.

18. Overall, policy reform and integration for sustainable transport in SEE and EECCA countries has been slow in the period 1997–2007. One reason for the limited progress is that the need for economic revival (especially in EECCA) in the period 2000–2007 eclipsed environmental goals. Other challenges hindering environmental and health performance and policy integration in the EECCA and SEE include: (a) fragmentation of the policymaking process; (b) the lack of appropriate environmental criteria, indicators and methodologies; and (c) the lack of concrete targets for implementation.

### **B. Sustainable Urban Transport**

19. Often, institutionally separated and non-integrated transport, environment and health policies and urban land-use planning have led to unsustainable and unhealthy development in urban areas. The shift from public to private transport has led to a sprawl of new roads, streets and parking spaces in many regions of Europe, further increasing congestion and causing greater pollution and noise instead of improved mobility for the urban population.

20. In several cities in the region, local and national authorities have devoted resources and targeted policies toward sustainability at the urban level, drawing on good practices and innovative transport solutions. Most people in the UNECE Region live in cities and most transport-related environmental and health problems occur in cities and their surroundings. Better understanding both of the complexities of the relationship between transport and its effects on health and environment and of the positive effects of bringing together various sectors together to develop regulatory instruments and multilateral environmental agreements have also played a role. One important instrument for reducing air emissions, including from transport, has been the UNECE Convention on Long-range Transboundary Air Pollution and its eight protocols. Under the Convention, each contracting party must develop effective policies, strategies and measures for air pollution abatement, including air quality monitoring, modelling and measurements.

21. A number of technical and legal measures implemented since 1990 – notably the ban of lead petrol, a decrease in the sulphur content of fuels, and emission standards for vehicles – have led to a reduction of some vehicle exhaust emissions in Western Europe. Perhaps the most significant is that since 1 January 2002, all petrol sold in the EU has been unleaded. In 2007, the European Commission proposed new standards for transport fuels which will further reduce their contribution to air pollution and climate change.

22. There has been positive progress across the EU on injury reduction. Better enforcement of speed limits, as well as alcohol limits, are among the most effective elements used to reduce fatality rates in spite of strong growth in transport demand.

23. Many countries in the region have observed trends towards separate places live, work, and spend leisure time, favouring motorized mobility and contributing to decreased opportunities

for cycling and walking. There is some indication that transport professionals are increasingly working with health professionals to improve conditions for walking and cycling and to help to make physical activity part of daily activities. A small number of countries (Austria, Belgium, the Czech Republic, France, Germany, the Netherlands, Norway, Switzerland and the United Kingdom) have implemented effective cycling policies and others, including some SEE countries, have started to follow this lead. However, the potential for a more sizeable share of walking and cycling still remains largely untapped in many countries.

24. It is only relatively recently that road transport regulation has included a focus on noise, most notably through the EU directive on environmental noise adopted in 2002. The evidence of insufficient national noise emission standards, together with unsustainable trends in noise pollution, indicates gaps in the existing legislation. A holistic and integrated approach to reducing human exposure to noise is lacking at the international level.

### **C. Demand management and modal shift**

25. There have been a number of developments aimed at managing or limiting the demand for transport in Western Europe. These include EU instruments such as the European Spatial Development Perspective, the EU Transport Strategy (1999), the European Commission Communication “Sustainable Urban Development in the EU: A Framework for Action” (1998), and the European Sustainable Cities and Towns Campaign. Despite these efforts, there is little evidence that transport demand has been curbed to a sustainable level which would correspond with the objectives of demand management and modal shift policies.

26. The EU White Paper on transport (2001) has predicted that between 1990 and 2010, road transport will have increased by 50 per cent, with forecasts indicating that this growth will apply to both the overall volume of transport and the intensity in terms of kilometres travelled and tons transported.

27. There was limited progress during the period 1997–2007 on transport-sector demand management in SEE and EECCA, particularly with respect to the implementation of measures to reduce the need to travel through land use planning, policies, and other measures.

28. The 2001 EU White Paper on transport pointed out that the existing transport price structure generally fails to reflect all the costs of infrastructure, congestion, environmental damage and accidents. The European Conference of Ministers of Transport stated that in 2003 a pricing and charging system which was clearly and fairly related to the value of infrastructure and external costs caused by its use was “many years” away. The gap between subsidies and external costs is also high in EECCA countries because of comparatively higher external costs and lower charges (i.e., fuel prices and taxes). In most EECCA countries, low fuel prices hamper their potential as an effective policy tool for demand management and modal shift, and the potential use of taxation to encourage environmentally less damaging behaviour is far from being fully exploited. In general, the use of economic instruments in EECCA countries to influence demand and modal shift is limited.

#### IV. CONCLUSIONS

29. Trends over the past 10 years point to the need for innovative solutions that address the challenges of sustainability, accessibility, mobility and making cities more liveable. Meeting this need requires a strengthened and sustained commitment from Governments at national and local levels and a renewed political impetus for change.

30. There is likewise a great need to integrate the principles of sustainable development into transport policies. These include the system elements that best protect health, conserve resources, are energy efficient, consume the least land, have the lowest externalities, are socially acceptable, and are the safest.

31. THE PEP is a unique policy framework that aims to encourage governments to pursue more sustainable and healthy transport policies. For further information, consult THE PEP website (<http://www.thepep.org/en/welcome.htm>) or THE PEP Clearing House (<http://www.thepep.org/en/workplan/clearing/ch.htm>). Further examples of practice in countries in the region, as well as a number of recommendations and guidance for future action, can be found in THE PEP Assessment Report (ECE/AC.21/SC/2008/3-EUR/08/5068055/3).

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