2.6. Transport

The dramatic increase in transport demand, and in particular for road transport and aviation, has made the sector a major contributor to several health and environmental problems in Europe. Western European transport systems comply with stricter environmental and safety standards than those in central and eastern Europe and certainly than those in the 12 countries in eastern Europe, the Caucasus and central Asia (EECCA). However, western European citizens use about three times as much transport fuel and face approximately the same probability of death in a transport accident as those in the east.

EU experience shows that vehicle technology and fuel improvements can, through environmental regulation, help to reduce certain impacts per unit of transport significantly, particularly air pollution. But such gains in eco-efficiency seem not to have been sufficient to mitigate the impacts of the rapid growth of transport and infrastructure volumes on greenhouse gas emissions, noise and habitat fragmentation. In addition to technological solutions, better integrated transport and environmental strategies are needed to restrain traffic growth and promote the use of more environmentally friendly modes - two of the key objectives of the EU sustainable development strategy.

The most important short-term challenges for the Balkan countries and the countries of EECCA are to phase out leaded petrol (most countries), abolish fuel subsidies (three countries only), introduce self-financing of the transport system via fuel taxes, and move towards cleaner vehicles and better inspection and maintenance regimes. For the accession countries, the main short-term challenge is complying with the complex and extensive EU environment and transport legislation. The upgrading of their infrastructure networks — while at the same time maintaining their high share of rail transport — is another major challenge.

Despite regular increases in tax, fuel for road transport remains cheaper in real terms than it was 20 years ago. The EU recognises the need to internalise the external costs of transport on society in its common transport policy. Some Member States have begun to introduce instruments to achieve this, but a number of barriers to implementation remain. There is little evidence of similar measures being developed or introduced in other parts of Europe.

Investment in infrastructure remains a priority of transport policy. Investment in western Europe has focused on extending the infrastructure, particularly roads, and investment in the accession countries is moving in the same direction. The multi-modal trans-European transport network and its extension to the east constitute a major pillar of the common transport policy. Although trans-European transport network investments were originally targeted to have a dominant rail share, road network development is currently ahead of the railway network.

Strategic environmental assessment is a useful tool to help integrate environmental concerns at various policy and planning levels. A recent EU directive requires that transport plans and programmes be subject to environmental assessment prior to their adoption as from mid-2004. Large variations exist across the EU; some countries have an established history of strategic environmental assessment of transport plans or policies and others are moving towards systematic strategic environmental assessment of transport. Some accession countries are considering strategic environmental assessment of national transport plans, but these are either non-existent or still optional in others.

2.6.1. Introduction

Transport is essential for the functioning of modern societies. A well-developed transport system should enable the free movement of goods, services and people, and promote inter- and intra-regional communication. It should also allow businesses and people a greater choice of location for work, trade, living, shopping, learning and leisure.

The sector's contribution to air pollution was reduced substantially across Europe but transport also contributes significantly to several environmental (and health) problems, particularly climate change, acidification, local air pollution, noise, land take and the fragmentation and disruption of natural habitats. It is a major consumer of fossil fuels and other non-renewable resources. Transport accidents kill more than 100 000 people every year in Europe.

The challenge for transport policy is to strike a balance between the economic and social benefits of transport and its negative impacts on society and the environment.

2.6.2. Transport growth

Growth in transport is often linked to economic growth and political openness, and to the price and quality of transport. Growth in incomes, opening of borders and better technology (resulting in lower prices and higher speeds) have all contributed to growth in transport. Increases in transport infrastructure and car ownership form a circle of demand: more road infrastructure leads to greater car ownership and use, in turn fuelling demand for more infrastructure.

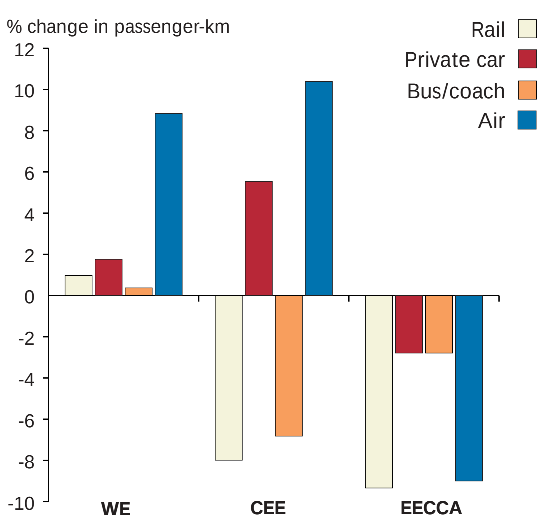
The patterns of growth have differed markedly between Europe's regions (Figures 2.6.1. and 2.6.2.), reflecting differences in economic and political development. A key factor is the quantity and rate of increase in the number of private cars.

In western Europe (WE) both freight and passenger volumes have more than doubled since 1970. The increases in WE in the 1990s were primarily in road and air transport. Total European Union (EU) freight transport increased by 33 % over the 1991-99 period (including road, rail, inland waterways and air transport — the latter excluding Luxembourg) explained mainly by a 44 % increase in road transport. Total EU passenger transport, including passenger car, bus/coach, rail, and domestic, intra- and extra-European aviation, increased by 19 %, due mainly to the 15 % growth in passenger car transport and 97 % growth in aviation (including domestic, intra- and extra-European aviation). Further increases of 38 % in freight and 24 % for passenger transport in WE are expected between 1998 and 2010 (European Commission, 2001a).

Important factors behind the increase in passenger transport by road over the past 20 years in the EU are growing car ownership (increasing affordability), transport prices (in a number of countries private car use has become relatively cheaper than rail and bus use), infrastructure investments that prioritise roads (better flexibility), and the worsening quality of public transport and rail (EEA, 2001; 2002a). Urban sprawl has enhanced this trend. A Dutch case study (SEO, 1991) helps to explain the success of the passenger car. It shows that the price/quality ratio of the Opel Kadett improved by almost 1 % per year over the entire 30-year life span of the model, demonstrating the impressive improvement in the competitive position of the car.

In central and eastern Europe (CEE) and the 12 countries of eastern Europe, the Caucasus and central Asia (EECCA) there was a sharp decline in transport volumes after 1989 following economic recession. Freight transport in both regions is back at the level of the mid-1970s and still well below that in the 1980s. In CEE freight volumes have been on the rise again since the mid-1990s, following economic recovery. The limited passenger transport data show a more mixed picture: volumes in EECCA are currently at about 1970 levels, whereas in CEE they are back at 1990 levels and rising rapidly. The figures given for CEE and EECCA may be unreliable because of data limitations — data on car use are lacking for most of the countries. However, judging from the steady growth in passenger car ownership in these regions, demand for passenger car use is likely also to have risen rapidly, especially in CEE.

Figure 2.6.1. **Annual changes in demand for passenger transport by mode in Europe, over the 1990s**



Notes: Waterborne passenger transport excluded as it has such a small share. WE figures apply to EU over 1991–99 period (including passenger car, bus/coach, rail, and domestic, intra- and extra-European aviation). CEE figures exclude Cyprus, Albania, Bosnia-Herzegovina, Serbia and Montenegro, and Malta and apply to 1990-99, except the air figure which applies to 1993–98 period. CEE data on car passenger transport apply to Hungary and Poland only. EECCA figures apply to 1994–98 period, and include all countries for rail passenger transport and all except Armenia for air passenger transport. Bus and coach passenger transport figures apply to Armenia, Azerbaijan, Republic of Moldova, Russian Federation, Kazakhstan and Kyrgyzstan. Private car passenger transport only applies to Azerbaijan, Republic of Moldova, Kazakhstan and Kyrgyzstan.

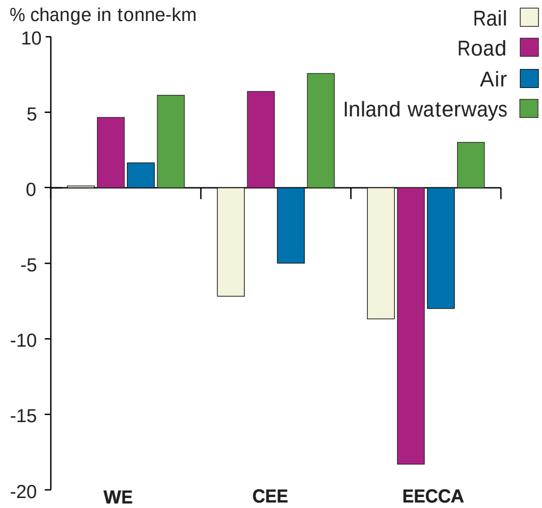
Sources: Eurostat, 2002 (EU); ECMT, 2002 (CEE); UNECE, 2002a (EECCA)

As well as transport volumes, shares of road, rail, waterways and air transport differ markedly across the regions (Figure 2.6.3). Road has been increasingly dominant in WE for many decades. The stabilisation of its share in passenger transport in the EU in the 1990s at around 80 % is mainly due to strong growth in air transport. For freight transport, road is also dominant with a 74 % share. The share of road in inland freight transport is still growing (from 68 % in 1991), while that of the alternative modes (rail, inland waterways) continues to decline. Short sea shipping in western Europe is also quite successful, carrying almost the same amount of tonne-km as road. While rail and public transport dominated the transport system in the CEE countries in the early 1990s, road is gaining rapidly at the expense of rail. The market share of rail in CEE is however still much higher than in WE. In EECCA, the position of rail remains strong, with no signs of decline. Aviation is the fastest growing mode. Its EU passenger market share (5 %) is about to overtake that of rail, but its share in other regions is still much smaller.

In order to combat the environmental, safety and congestion problems resulting from the continuing growth in transport, the EU's sustainable development strategy, adopted at the Gothenburg Council in 2001, contains policy objectives to break the link between economic growth and the growth of transport, to stabilise modal shares at the 1998 level by 2010, and to shift transport from road to rail, inland waterways and shipping from 2010 onwards.

> Transport volumes grew at a fast rate in western Europe in the 1990s. They fell in central and eastern Europe and EECCA in the first part of the decade but are again beginning to rise.
>
> At the same time transport volumes shifted away from the more environmentally friendly modes, towards road and aviation. Rail and public transport still have a higher share in central and eastern Europe and EECCA countries than in western Europe.

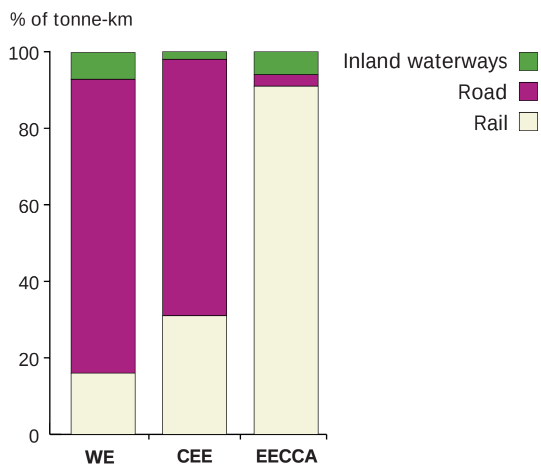
Typical annual changes in demand for freight transport by mode in Europe, over the 1990s — Figure 2.6.2.



Notes: WE data apply to EU over 1991–99 period (including road, rail, inland waterways and air transport — the latter excluding Luxembourg). CEE figures exclude Cyprus, Albania, Bosnia-Herzegovina, Serbia and Montenegro, and Malta and apply to 1990–99 period, except air transport figure which applies to 1994–2000 period. EECCA figures only include Republic of Moldova, Russian Federation, Ukraine and Kyrgyzstan and apply to 1993–98 period except air transport figure which applies to 1993–2000 period.

Sources: Eurostat, 2002 (EU), ECMT, 2002 (CEE); UNECE, 2002a (EECCA); World Bank (ICAO), 2002

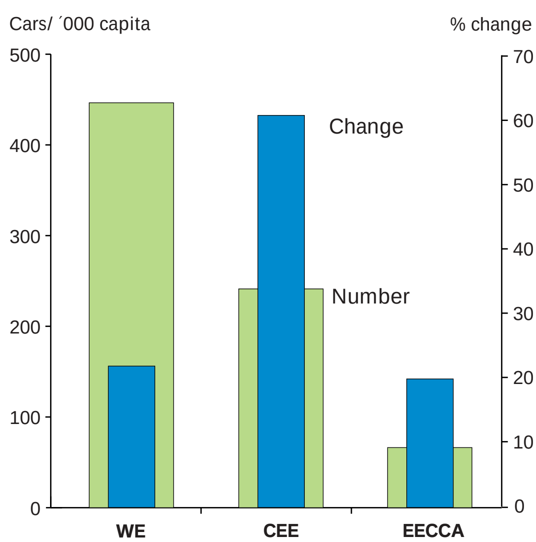
Modal shares in tonne-kilometres in Europe, 1998 (EECCA) and 1999 (WE and CEE) — Figure 2.6.3.



Notes: WE figures refer to EU and apply to 1999. CEE figures exclude Cyprus, Albania, Bosnia-Herzegovina, Serbia and Montenegro, and Malta and apply to 1999. EECCA figures only include Republic of Moldova, Russian Federation, Ukraine and Kyrgyzstan and apply to 1998.

Sources: Eurostat, 2002 (EU), ECMT, 2002 (CEE and EECCA)

Car ownership in Europe and changes 1999 to 1990 — Figure 2.6.4.



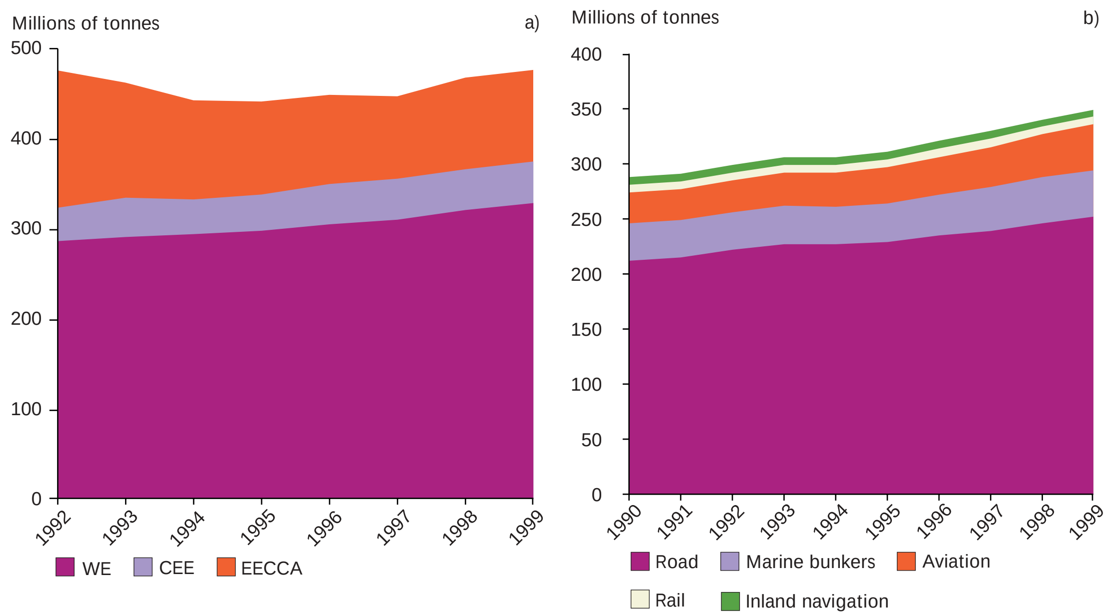
Notes: All countries included except Bosnia-Herzegovina. WE: data only for EU.

Source: UNECE, 2002a

Figure 2.6.5. **Total energy consumption by transport in Europe (a) and split of EU transport energy consumption between modes (b), 1990–1999**

Note: Transport by oil pipelines is responsible for between 1 and 1.5 % of total energy consumption by transport and is therefore omitted. Marine bunkers: fuel oil sold for international seaborne shipping.

Source: IEA energy balances, 2002 ; Eurostat, 2002



2.6.3. Environmental impacts

The most important environmental impacts of transport are climate change (greenhouse gas), loss of biodiversity due to habitat disruption, and effects on human health (e.g. local air pollution) and well-being due to accidents, air quality and noise.

2.6.3.1.Greenhouse gas emissions

Greenhouse gas emissions from the transport sector are almost entirely dependent on the amount of energy used.

For Europe as a whole, energy consumption by transport in 1999 was the same as in 1992 (Figure 2.6.5.), mainly because of the economic downturn in EECCA, which drastically reduced consumption between 1992 and 1997. In WE transport is the second largest energy consumer (with 30 % in 1999), and — given its almost entire reliance on fossil fuels — also a major contributor to carbon dioxide (CO_2) emissions (see Chapter 2.1). The sector's share in energy consumption is much lower in CEE countries (22 % in 1999) and EECCA (17 % in 1999). There are also large differences between the regions in transport energy use per person (about 840 kg of transport fuel in WE, 240 kg in CEE and 360 kg in EECCA). Following the dramatic growth in road transport and aviation, transport energy consumption rose by almost 2 %/year in WE (1990-99) and almost 3 %/year in CEE. As a result, the sector's greenhouse gas emissions are growing dramatically, thus jeopardising achievement of the reduction targets set by the Kyoto protocol (see Chapter 3). Energy consumption and CO_2 emissions are expected to grow in EECCA as economies recover and the demand for transport increases. Achieving economic growth while reducing greenhouse gas emissions from transport therefore poses a major policy challenge; furthermore, there are no sectoral transport greenhouse gas emissions targets.

Aviation requires special attention. It is the fastest growing energy user in the sector, and the impact on the climate of all aviation

Transport energy consumption and greenhouse gas emissions in Europe are now growing strongly along with traffic volumes after a drop in the early 1990s in central and eastern Europe and EECCA.

The sector's contribution to air pollution was reduced substantially across Europe due to a mixture of policy-driven technological improvements, fleet renewal and reduced transport volumes.

emissions is estimated at two to four times that of the CO_2 alone, mainly because of nitrogen oxide (NO_X) emissions and condensation trails at higher altitudes (IPCC, 1999).

2.6.3.2. Air and noise pollution

Transport is a significant source of emissions of acidifying pollutants, eutrophying compounds, ozone precursors and particulate matter (see Chapter 5). In WE, regulations on vehicle technology (e.g. introduction of catalysts) and fuel quality have helped to reduce emissions substantially. Substantial reductions are also expected in CEE, with gradual fleet renewal and uptake of EU regulation. However, the environmental benefits of technological improvements are being partly offset by growth in road transport, and air quality in most European cities remains poor.

Road, rail and air transport are also major causes of noise nuisance. Data are however scarce and not harmonised. In the EU, it is estimated that more than 30 % of citizens are exposed to road noise levels, and around 10 % to rail noise levels, above 55 Ldn dB(A) (EEA, 2001). Data on noise nuisance by aircraft are the most uncertain, but 10 % of the total EU population may be highly disturbed by air transport noise. Noise levels around several large airports in the EU have dropped in recent years as a result of the phasing out of noisier 'Chapter 2' (International Civil Aviation Organization noise category) aircraft. However, this trend is expected to reverse as the growth in aircraft movements is no longer compensated for by the use of quieter aircraft.

2.6.3.3. Accidents

Road transport accidents are now the largest cause of death for people under 45 in Europe (the impacts of transport emissions on human health are discussed in Chapter 12, Box 12.2).

More than 100 000 people died on European roads in 2000 (ECMT, 2002) and almost 2 million people were reported injured in the EU alone (European Commission, 2001a), but there are signs that the latter figure is largely underestimated. All regions show a gradual reduction in the annual number of fatalities — although levels have remained more or less stable in WE and EECCA during the last two to three years. The numbers of injuries and accidents in WE, however, are still rising. Annual fatality rates per million road vehicles range from 100 to 150 for the 'best' WE countries (United Kingdom, Sweden, Switzerland, Norway, Netherlands) to more than 1 000 for some EECCA and Balkan countries. Fatality rates per million inhabitants give a different and more mixed picture of 'worst performers' — Latvia, the Russian Federation, Greece and Portugal (180 to 270) have three to four times the rate of the best countries (ECMT, 2002).

In WE, one accident in two occurs in the urban environment (European Commission, 2001a). Pedestrians, cyclists and motorcyclists are the most vulnerable so their protection, for example via separate infrastructure, is of vital interest for road safety.

Lack of harmonisation and enforcement of speeding and 'drink-driving' rules hinder efforts to reduce driver-related accidents and their consequences. The European Commission has adopted a target of halving the annual number of road fatalities by 2010 (European Commission, 2001a).

2.6.3.4. Infrastructure and biodiversity

Trends in infrastructure lengths indicate that infrastructure investments are gearing the accession countries' road density in the direction of EU road density. While the motorway length in accession countries is less than 10 % of the EU's, it almost doubled between 1990 and 1999. In both regions the length of railways is decreasing (Figure 2.6.6).

The road and rail density in the accession countries remains lower than in the EU, and their territory therefore less fragmented. The expansion of transport infrastructure networks — in WE as well as CEE — leads however to increasing land take and fragmentation, and increases the pressure on designated nature conservation sites (Figure 2.6.7.). Fragmentation by transport infrastructure in the Czech Republic, Hungary and Slovakia is already more severe than the EU average. The needed development of the trans-European transport network, and its extension to the east, risks aggravating further the conflicts between infrastructure development and nature conservation.

> The development of infrastructure throughout Europe continues to increase pressure on habitats and ecosystems due mainly to fragmentation, and to disturb a large proportion of the population by traffic noise.

Figure 2.6.6. **Changes in transport infrastructure length, 1990-99, accession countries (a) and EU Member States (b)**

Notes: Road, excluding motorways, excluding Czech Republic, Estonia and Turkey. Due to incomplete time series oil pipelines and inland waterways remained more or less stable and are therefore left out of the chart.

Sources: UNECE, 2001; Eurostat, 2002

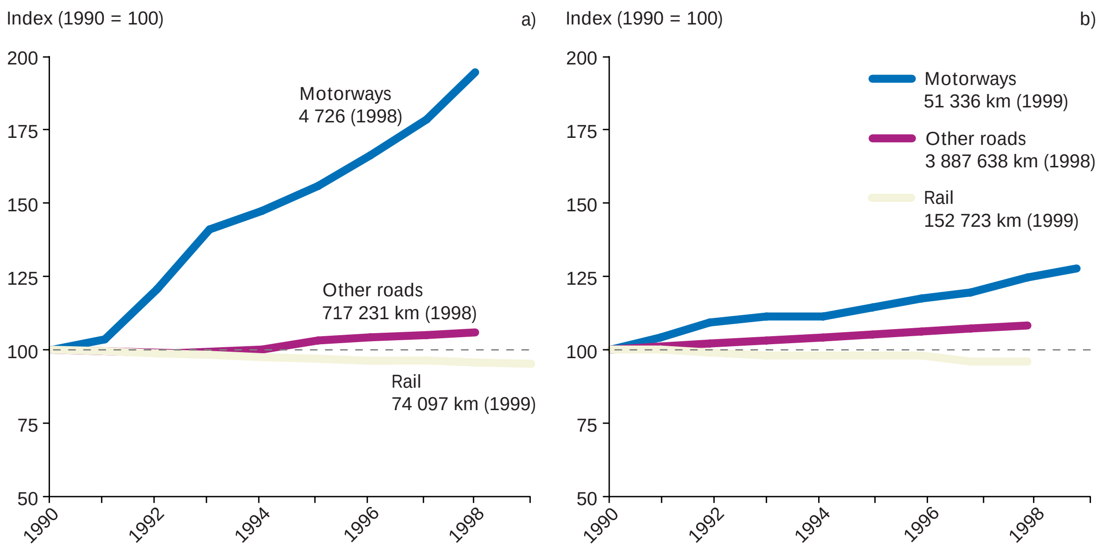
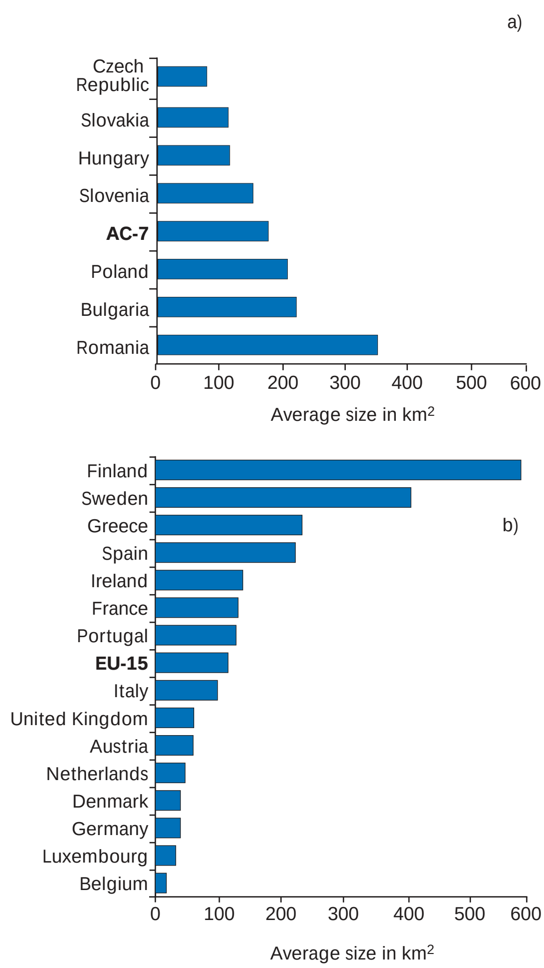


Figure 2.6.7. **Average size of non-fragmented land, 1998, EU accession countries (a) and EU Member States (b)**

Source: EEA, 2002b



2.6.4. Policy prospects

2.6.4.1. Cleaner vehicles and fuels

Introduction of cleaner vehicles and fuels has proved to be extremely effective in reducing air pollution from transport. In the 1970s, WE gradually started introducing environmental standards in transport, following the US example. Harmonised and binding EU legislation for road vehicles (passenger cars, vans, trucks) has been coming into force since 1993, accompanied by the gradual phase-out of leaded petrol, which was completed in the EU in 2002.

During the past five years, the EU has taken several steps to reduce the sulphur content of road fuels to almost zero (by 2009). This increases the possibility of using the highly effective DeNO$_X$ catalysts and particle filters, which further reduce air pollution and enable the fuel efficiency of vehicle engines to be optimised. As a result, emissions of NO$_X$, HC and PM$_{10}$ (particulate matter with a diameter less than 10 µm) from the newest generation of vehicles will be only a few per cent of those from the vehicles of the 1980s. Improvements are also needed for other transport modes, but pollutant emissions standards for rail, aviation and shipping are generally less regulated or lacking.

For CEE and EECCA, the most important measures needed in the short term are the phase-out of leaded petrol (for direct health benefits and to avoid catalyst poisoning), the adoption of stricter standards for new vehicles (sometimes difficult because of the outdated technological level of domestic vehicle production) and an effective inspection and maintenance regime for the existing fleet (particularly important as old vehicles often have very high emissions).

The average age of the passenger car fleet is currently 7.3 years in the EU and 11.5 in the accession countries. Most accession countries have already introduced higher taxes on leaded petrol or banned it completely. They are in the process of adopting the strict EU environmental standards and inspection regimes. Non-accession countries do not feel the pressure of the EU body of legislation and therefore generally lag behind.

Most of the EECCA countries have not yet banned leaded petrol but are planning to do so; Belarus and Turkmenistan banned leaded petrol in 1998 and 2000, respectively. A number of EECCA countries have signed a resolution which states that they support the total phase-out of leaded petrol by 2005 (2008 in Uzbekistan). Support was also expressed for better vehicle and fuel inspection and maintenance and air quality monitoring. They also requested that these recommendations be included in the agenda of the Kiev environment ministers conference (World Bank, 2001).

Despite efforts at the EU level to promote alternative and renewable transport energy sources, such as natural gas, biofuels or electricity, their use and penetration remains low. The Commission proposes that 5.75 % of fossil-based fuels should be replaced with biofuel substitutes by 2010 (COM(2001)547). The environmental impact of this is highly dependent on how and where such fuels are produced and any resulting emissions from the production plant and vehicles.

> Emission and fuel quality standards have greatly contributed to the reduction of air pollution from road vehicles in western Europe. The implementation of such standards in central and eastern Europe and EECCA countries is in progress but needs an effective enforcement and inspection regime to fully benefit from these developments.

2.6.4.2. Infrastructure investments

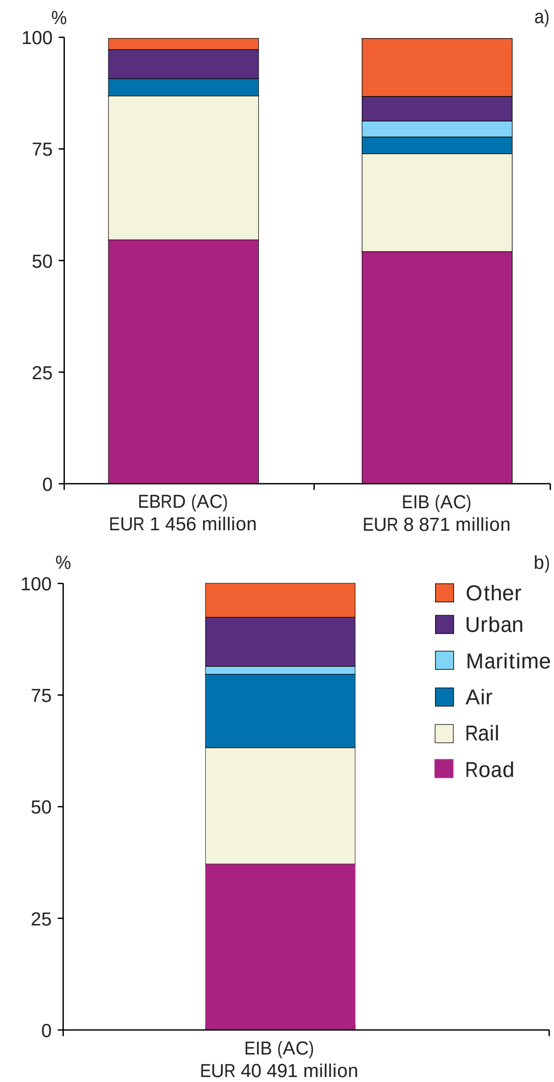
Infrastructure investment is another long-standing priority of transport policy. A good quality transport infrastructure network is an essential backbone for society and the

Box 2.6.1. Transport infrastructure funding by the European Investment Bank and European Bank for Reconstruction and Development

Looking at loans by the European Investment Bank (EIB) and investments by the European Bank for Reconstruction and Development (EBRD) can tentatively indicate more recent investment trends. Even though these account for only a part of the total financing for transport infrastructure, funding by international banks is often a catalyst to attract funding from the private sector and other international financial institutions. Both the loans signed and the investments made by the EIB and EBRD incline towards road, in the accession countries as well as in the EU. Despite the EIB being an important contributor to almost all major railway investment projects in the accession countries (EIB, 2001b), rail investments cover 24 % of all loans signed by the bank, versus 59 % for road. EBRD loans to EECCA countries between 1992 and 2002 amounted to EUR 656 million in total; 50 % for road, 14 % for rail, 20 % for air, and 17 % for ports.

The imbalance between road and rail investments has worsened in the accession countries since 1995, when road transport volumes rapidly recovered and rail traffic continued to decline. Under these circumstances, funding for road improvements was probably easier to obtain than for rail.

Modal distribution of transport infrastructure funding by European Investment Bank and European Bank for Reconstructions and Development, EU accession countries (a) and EU Member States (b) Figure 2.6.8.



Notes: EIB data for the accession countries refers to 1990 to June 2002, for the EU to 1995-2001. 'Other' for accession countries refers to repairs of different infrastructure after floods (Czech Republic, Hungary and Poland), oil pipelines (Czech Republic and Slovakia), multi-modal (road-rail) transport (Czech Republic) and improvement of navigation on the Sulina Canal in the Danube Delta (Romania).
Sources: EBRD, 2002; EIB, 2001a; EIB, 2002

economy. Transport investment policies in the EU have traditionally focused on extending infrastructure, particularly roads, as a response to increasing traffic demand. Better road networks, in turn, have further boosted road transport.

The few statistics available on transport infrastructure investments show that between 1993 and 1995 47 % of infrastructure spending in the accession countries went to roads and 42 % to railways. In the EU, road received 62 % of total investment, and rail 29 %, i.e. a larger share than its share of transport volume. This has, however, not been sufficient to make rail flexible enough to meet new transport demands. Maintenance budgets are allocated mainly to railways in the accession countries (54 %) and to roads in the EU (72 %). More up-to-date figures on investments by international banks indicate more bias towards road funding in the accession countries as well as in the EU (see Box 2.6.1).

The multi-modal trans-European transport network (TEN-T), and its extension to the east, constitutes a major pillar of the common transport policy (European Commission, 2001a). Total TEN-T investments were estimated to exceed EUR 400 billion by 2010. Although these investments were originally targeted to have a dominant rail share, to support, in particular, the development of the high-speed rail network, the building of the TEN-T road network is currently running ahead of the railway network development. In 2001, only 2 800 km of high-speed railway lines were in service, and it is expected that the completion of this 12 600 km network will take 10 years longer than planned (i.e. until 2020) (European Commission, 2001a). At the same time, the average speed of international rail freight transport is only 18 km/hour (European Commission, 2001a). The recently revised TEN-T guidelines include measures to tackle this problem, in particular by giving investment priority to the creation of a dedicated rail freight network, including port connections (European Commission, 2001b).

> Rail infrastructure is generally better developed in central and eastern Europe, but the apparent prioritisation of road investments may jeopardize a balanced development of transport modal split.

The network's extension to the east relies heavily on the transport infrastructure needs assessment (TINA) process. This has resulted in the definition of a network centred on 10 trans-European corridors but also including some additional links and all international air and seaports. By 2015, the TINA rail network is planned to extend to 21 000 km and the motorway network to 19 000 km. The network's costs are estimated at EUR 91.5 billion, with 48 % for the motorway network and 40.5 % for the rail network (European Commission, 2001c).

An overall assessment of the transport, economic, social and environmental impacts and benefits of the TEN-T or the TINA has not yet been made.

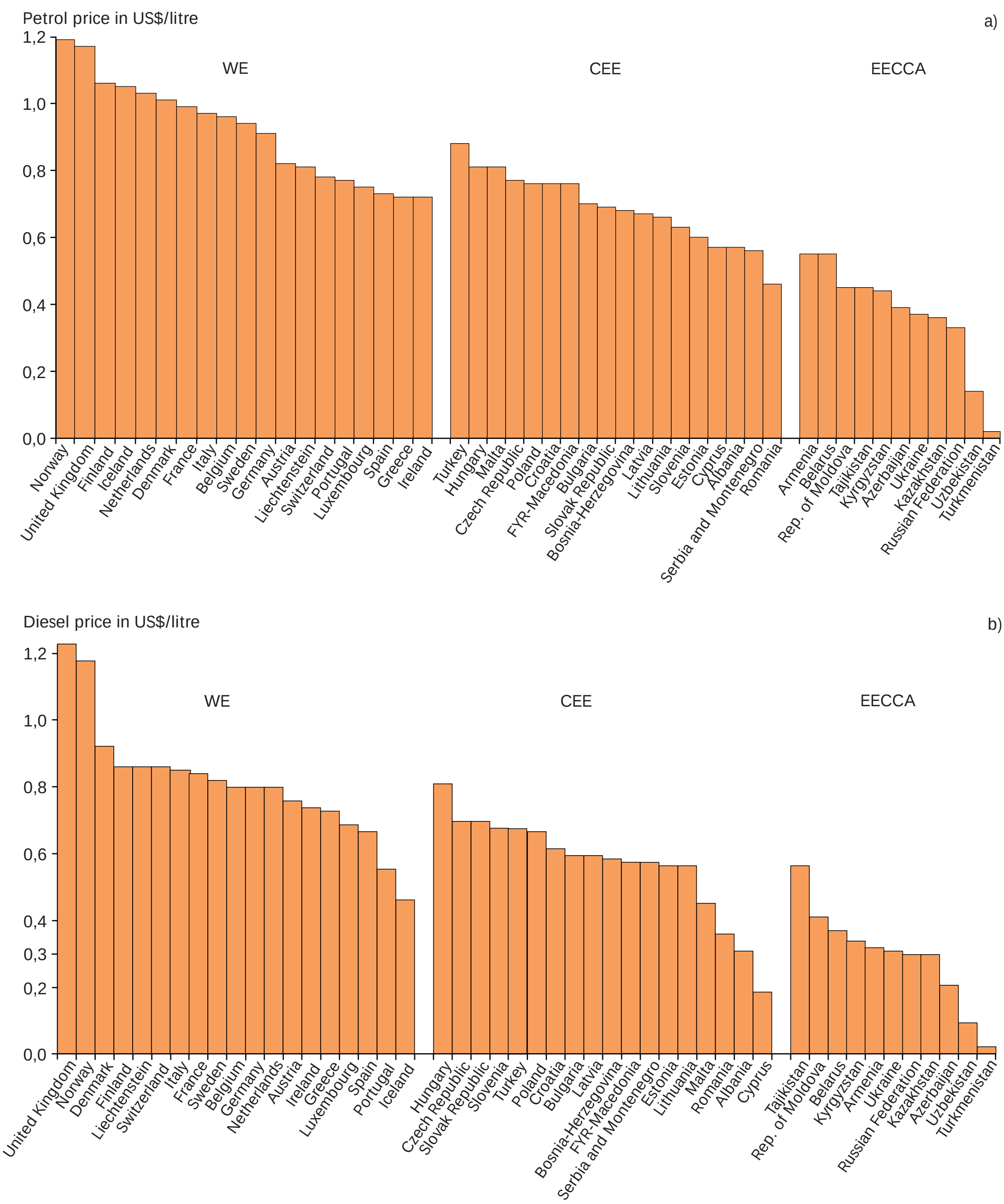
2.6.4.3. Fuel taxes

Fuel taxation is an important policy tool that provides a direct incentive to improve the energy efficiency of transport and thereby reduce greenhouse gas emissions. Fuel tax can also serve as a tool for payment of the costs of infrastructure and the external costs of infrastructure, congestion, accident risks, air pollution and noise, but a differentiated kilometre charge is generally considered a more effective tool for internalising and reducing these costs (see Section 2.6.4.4). Finally, increasing fuel taxes provides an opportunity to lower other taxes, such as those on labour, which reduces unemployment.

Figure 2.6.9 shows European petrol and diesel fuel prices in November 2000 (GTZ, 2001). The figures also show the pre-tax retail price of petrol and diesel (i.e. world market price plus distribution costs). Some countries actually subsidise their transport fuels, in the sense that the fuel is sold below the world market price plus distribution costs. In November 2000, Turkmenistan and Uzbekistan subsidised both petrol and diesel and Cyprus and Azerbaijan subsidised diesel. Cyprus intended to abolish the diesel subsidy by January 2003. A number of countries, particularly in EECCA, levy hardly any tax on petrol or diesel. Despite regular rises in fuel tax, the weighted average EU road fuel price is still 10–15 % lower than it was 20 years ago and has remained fairly stable over the past 15 years, with the exception of a price hike in autumn 2000 (EEA, 2002a).

> Trends in transport fuel prices are not encouraging the use of more fuel-efficient transport modes.

Petrol (a) and diesel (b) prices in Europe as of November 2000, in US$/litre Figure 2.6.9.



Shipping and aviation fuels are not taxed at all. Railway diesel and electricity are either not taxed or relatively mildly taxed. This distorts competition between transport modes and the untaxed sectors face no extra incentives to reduce their greenhouse gas emissions.

2.6.4.4. Internalisation of external costs

Every transport user poses a burden of unpaid costs on other people, including the costs of accidents, pollution, noise and congestion. In the EU, these costs are estimated at 8 % of GDP (INFRAS/IWW, 2000). At the same time, many transport taxes are poorly targeted and unequal. They do not differentiate between users and their different impacts on infrastructure, contributions to pollution, accidents and bottlenecks.

A restructuring (and in many cases increase) of transport taxes and charges could contribute to making individual users pay the true costs imposed on society. With such internalisation of external costs, users would have incentives to drive cleaner and safer vehicles and avoid peak hours, and accidents and congestion should decrease.

Switzerland is the only country to have introduced a kilometre-dependent transport

Figure 2.6.10. **Specific test-cycle fuel consumption of passenger cars in the EU, 1990–2000**

Notes: Source for test values: national agencies, except Ireland, Luxembourg and Portugal. For these countries the data are elaborated for ODYSSEE from data provided by Association of Car Manufactures from Europe (ACEA), Japan (JAMA) and Republic of Korea (KAMA). Data based on the new test cycle according to Directive 93/116/EC. For 1995, data were initially based on the old cycle; they have been adjusted by the ACEA applying a 9 % adjustment 'across the board'. For previous years, data have been adjusted to be consistent within the new cycle. Please note that fuel consumption in practice, i.e. outside the test cycle, is different from the test values, because the test cycle does not account for factors like harsh driving and air conditioning.

Source: ODYSSEE, 2002

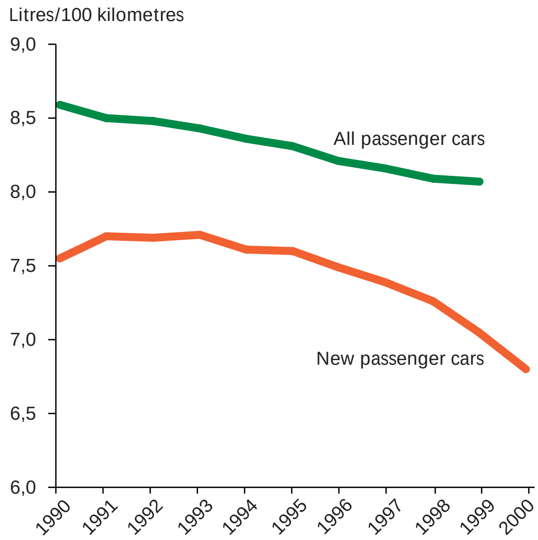
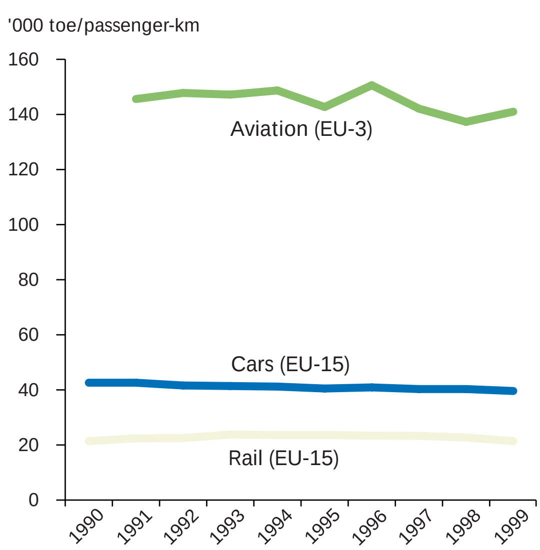


Figure 2.6.11. **Energy efficiency of car, rail and air passenger transport, EU, 1990–1999**

Notes: EU-3 refers to Denmark, Germany and Finland

Source: ODYSSEE, 2002



charge in its whole territory. A heavy goods vehicle (HGV) charge is dependent on distance driven in Switzerland, size of truck and the environmental class of the engine. Germany has planned for the introduction of such charges in August 2003. London has introduced a congestion charge for its centre, starting 17 February 2003, of around 8 EUR (www.cclondon.com).

The European Commission intends to publish a framework directive on infrastructure charging which aims to coordinate the principles on which transport pricing should be based. Following this framework directive, subsequent daughter directives are to be published for each mode, starting with road freight.

Some western European countries pave the way for internalisation by restructuring transport taxes and charges.

2.6.4.5. Voluntary agreements

The EU focuses its policy efforts mainly on the Community strategy to reduce CO_2 from passenger cars, which includes three pillars: the voluntary agreement with the European car manufacturers, car labelling and fiscal measures for new passenger cars. Other transport modes are as yet much less addressed by EU policies.

The voluntary agreement between car manufacturers and the European Commission aims to reduce average CO_2 emissions from new vehicles sold on the EU market (European Commission, 2001d). The target for European manufacturers is 140 g CO_2/km by 2008 (compared with 186 in 1995) and by 2009 for manufacturers in Japan and the Republic of Korea. The car manufacturers are on track to meet their intermediate targets — CO_2 emissions from new cars were reduced by 10 % between 1995 and 2001 — but extra efforts are needed to reach the 120 g CO_2/km target for 2010. By 2001 the intermediate target range (165–170 g CO_2/km) envisaged for 2003 was achieved (European Commission, 2001b). The improvement of fuel efficiency of new cars (Figure 2.6.10) has contributed to a 2 % improvement of energy efficiency of the entire EU car fleet (Figure 2.6.11). However, the increased share of diesel cars in sales, which partly explains the energy consumption reduction, raises concerns regarding higher emissions of particulates and NO_X. General technical improvements have also led to improvements in the energy efficiency of road freight transport in a number of Member States. Trucks and vans are not yet included in the voluntary agreement. The Commission has however submitted a proposal to measure CO_2 emission and fuel consumption from light commercial vehicles (European Commission, 2001e) and is currently studying measures to reduce their CO_2 emissions.

There are no voluntary requirements (or, indeed, legal requirements) for air and rail transport to reduce their CO_2 emissions. There have been no improvements in the energy efficiency of rail, but this remains the most energy-efficient mode. Despite improvements during the 1990s, aviation is generally the least energy-efficient mode. Meanwhile, transport energy consumption continues to grow dramatically (see Section 2.6.3.1), indicating that technology improvements are being offset by growth in transport.

> The voluntary agreement between car manufacturers and the European Commission has contributed to a 10 % improvement of energy efficiency of new cars in the EU. However, there are no voluntary requirements for air and rail transport to reduce their CO_2 emissions.

2.6.4.6. Strategic environmental assessment and monitoring

Strategic environmental assessment (SEA) can be a useful tool to help integrate environmental concerns at various policy and planning levels. According to the recently adopted SEA directive (Directive 2001/42/EC) — to be implemented by EU Member States by 2003 — transport plans and programmes should be subject to environmental assessment prior to their adoption. UNECE is developing a protocol on SEA. This would also require countries to establish mechanisms for SEA at international, national, regional and local levels as well as in transboundary and non-transboundary contexts (UNECE, 2002b).

Large variations exist across the EU, with Denmark, Finland, Sweden and the Netherlands having an established history of SEA of transport plans or policies, supported by legal instruments. Seven other countries are moving towards systematic SEA of transport (EEA, 2002a). Bulgaria, the Czech Republic, Poland and the Slovak Republic are considering SEA of national transport plans, but these are either non-existent or still optional for most accession countries (EEA, 2002a).

In addition to the necessary legal requirements, practical implementation also requires sufficient administrative capacity to perform the SEA, which is often not present. Moreover, to be effective, the findings of SEAs should also be taken into account in decision-making, which is as yet rarely the case — in the EU as well as in the accession countries (IEEP, 2001).

One of the strengths of SEA is that it would also provide for a trans-boundary assessment of international transport planning. It is therefore indicative that major infrastructure programmes such as the TEN-T and TINA have not yet been assessed at a strategic level.

Finally, regular monitoring is crucial to asses whether transport and environment policies are successful or not, and whether adjustments are needed. In order to do so the EU has established the transport and environment reporting mechanism (TERM), in which indicators are used to track progress in various policy areas. TERM's aim is to build up a policy-oriented system of data generation, integration and interpretation.

2.6.5. References

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