The level of car ownership is growing rapidly in the EEA-31, especially in countries with relatively low car ownership levels, like the acceding countries (AC) and the candidate countries (CC). Increasing private vehicle ownership has proven to lead to increased usage of private vehicles and might have the opposite effect on public transport usage.

The number of trucks — strongly related to economic development — also increased considerably, in particular in the AC and CC, reflecting the greater dependence of their transport systems on road transport.

Figure 1: Evolution of the vehicle fleet in the EEA-30, 1990–2000

NB: The above figures refer to EEA-30 (all Member States excluding Liechtenstein). Data series on trucks are based on EEA-28 (excluding Liechtenstein, Iceland and Bulgaria).

Figure 2: Passenger car ownership in the EEA-30, 1990–2000

Passenger cars per 1,000 inhabitants


Figure 3: Trucks per unit of GDP in the EEA-28, 1990–2000

Trucks per million US dollars

Results and assessment

Policy relevance

There are no specific objectives or targets related to the size and composition of the vehicle fleet. Policy objectives are, rather, set with respect to the average age and the environmental performance of the fleets.

Policy context

The level of car ownership is closely related to car use (and thus the volume of mobility) and — especially in urban areas — also to traffic congestion. Policies aiming at limiting the size and growth of the vehicle fleet might only be found in urban areas, where the number of motorised vehicles can give rise to environmental problems in terms of lack of space (see, for example, http://www.22september.org/info/en/qua3.html). However, since there is a strong linkage between vehicle ownership and vehicle usage, this indicator provides information about what is driving transport demand. Additionally, the total size of a vehicle fleet (combined with its average age — see TERM 2002 33 EEA — Average age of the vehicle fleet) gives some indication on time needed for new technologies to penetrate into such fleets.

Environmental context

Vehicle ownership is closely related to vehicle use. The size of the privately owned vehicle fleet (cars and powered two-wheelers) is therefore an important driving factor behind road transport demand and the environmental pressures it causes.

Assessment

Passenger transport vehicles

The entire vehicle fleet in the EEA has grown during the last decade. Especially in the AC and the CC, the vehicle fleets have grown rapidly since the fall of the Iron Curtain, reflecting significant changes in the structure of both passenger transport (from rail to private cars) and freight transport (from rail to trucks).

Car ownership has increased dramatically in recent decades. In the EEA it grew from 305 to 380 cars per 1 000 inhabitants between 1990 and 2000, an average of 2.2 % growth per year. Car ownership is thus growing even faster than per capita income (on average 1.5 % per annum over the same period). The average number of passenger cars per capita increased strongly in the AC and CC between 1990 and 2000 by 58 and 106 % respectively, following economic growth. Despite this increase, the car ownership level in the AC and the CC remains considerably lower compared with the EU and EFTA countries. The average motorisation level in the AC-10 and the CC-3 expressed by the number of cars per 1 000 inhabitants was 275 and 100 respectively in the year 2000, which is somewhat higher than half and almost one fifth of EU-15 average (471) respectively.

The main factors underlying this strong growth in the EEA are the following.

- A decreasing number of persons per household which results in a higher growth in the number of households than explained by the growth of the population. Since many households depend on cars for shopping and other transport needs, the result is higher car ownership.
- An increasing number of cars per household, even though the number of persons per household is decreasing. Increased personal income stimulates this development.
- Increases in the average travel distance (see TERM 14 — Urban spatial characteristics and transport, lower accessibility and flexibility by public transport and TERM 15 — Accessibility to basic services and markets by transport mode) and changes in lifestyle patterns (double incomes, choice of leisure activities).

As regards the AC and CC, an important factor behind car ownership levels is increasing GDP per capita. As income grows, more people can afford to buy a car (see Box 1). Moreover, in most of the AC and CC, cars (especially western models) have been a symbol of wealth and freedom. The car is usually considered as the most comfortable, flexible and convenient transport mode, especially in those countries where public transport is not — or is becoming less — efficient.
Other important factors influencing car ownership levels in the AC and CC follow.

- The quality and availability of public transport: in general, public transport systems (railway, bus/coach, metro and tram) are suffering from deteriorating quality — especially in central and east European countries (CEEC) — having a rather old rolling stock and lacking sufficient service and frequency. Consequently, public transport is in many cases not considered as an attractive alternative for travelling.

- Urban sprawl: as towns spread over larger land extensions, it becomes more and more difficult and more costly to provide most people with accessible and convenient public transport alternatives. Therefore, cars may become in some case the only available option to cover mobility needs.

- The price of public transport versus private car transport: as for other public services, the population of central and east European countries in many cases experienced an abrupt change from a situation where prices were low, or services were even free, to a situation where governments had to introduce some partial cost recovery, which increased public transport prices considerably.

The strong growth is slowing down in most EU countries, as there is already a relatively high number of cars per capita. This can be explained by the fact that households may need one or two cars, but generally not more. In contrast, countries with a lower numbers of cars per capita show rapid increases in vehicle ownership. The latter applies to all AC and CC, but also to a couple of EU countries. In 1990, the lowest levels of car ownership in the EU were found in Greece and Portugal (171 and 187 cars per 1 000 inhabitants, respectively). These countries had the highest increases in car ownership between 1990 and 2000 (77 % in Greece and 87 % in Portugal). In 2000, Greece and Portugal were still the countries with the lowest car ownership levels (along with Denmark due to its high registration taxes) in the EU, though the differences with other Member States are getting smaller. It can be expected that the increase in Greece and Portugal as well as in the AC and CC will continue.

The average level of powered two-wheeler (including motorcycles) ownership in the EEA grew by 12 % between 1992 and 1999. This might be a result of people buying them for pleasure rather than everyday travelling, like commuting. However, increasing congestion might also be a reason for buying motorcycles, which are then specifically used for commuting. While the increase in the EU and the CC was as high as 17 and 21 % respectively, the overall increase in the EEA was restricted to 12 % due to the corresponding 24 % decrease in the AC. The latter could be partially due to the replacement of motorcycles with cars as income grows.

Regarding the fleet of buses and coaches, the situation is similar to the above. While there is a slight increase of 6 % in the number of buses and coaches per 1 000 inhabitants in the EU and a rapid increase of 62 % in the CC, there is a 13 % decrease in the corresponding number in the AC, resulting in an overall increase of 19 % in the EEA. The high increase in the CC could possibly be explained by the low motorisation levels and the consequently higher dependency on public transport.

**Goods vehicles**

The number of trucks per unit of GDP (truck intensity) is much higher in the AC and the CC than in the EU. The trend in ‘own account’ transport (i.e. operations in which a company transports its own goods from one place to another) in EU-15 has been declining over the years. On the other hand, according to a pilot survey conducted by Eurostat (Eurostat, 1999), central and east European AC and CC have a relatively higher share of road freight transport carried out as ‘own account’ and consequently a lower share of ‘hire or reward’ transport (i.e. when the transport operator is not the owner of the goods) compared with EU Member States. Typically dedicated transport companies will be better organised to pick up different loads at ends of their route, reducing the amount of empty running. This means that a higher ‘own account’ share will require more trucks for the same amount of transport, which could explain the higher truck intensity in the AC and CC.

The high number of trucks per unit of GDP observed in the Baltic States and the CC are related to low GDP levels and relatively high (road) freight transport intensity. Malta and Cyprus also show relatively high numbers of trucks per unit of GDP, which could be explained by the absence of alternative inland freight transport modes (there are no railways on these islands).
Another possible explanation might be the high number of tourists visiting these small countries every year, leading to a relatively higher freight transport demand (EEA, 2001).

Data on the fleet of ships controlled by the EEA countries are only available for March 2003. In general, ships are strongly related to economic activity; however, due to lack of data on GDP for 2003, an indicator on the ships’ fleet could not be established. The ships are divided into six major categories, i.e. tankers, bulk carriers, general cargo, container ships, passenger ships and other. All the ships of 500 gross tonnage and over are counted, excluding fishing vessels. As the lack of complete data-series does not allow for a complete assessment, from the available data it can only be stated that Greece (2 524 ships) has the largest fleet, followed by Germany (2,298 ships) and Norway (1,774 ships) (Lloyd’s, 2003).

Sub-indicator: Dieselification

The share of diesel cars in the entire passenger car fleet continuously increased in most Member States. From an energy efficiency point of view this means that less energy is consumed for the same transport activity (expressed in passenger-kilometres or tonne-kilometres). From the pollutant emissions point of view there are strong indications that dieselisation could result in considerable decrease of the carbon monoxide and hydrocarbon emissions, but also in an increase in nitrogen oxides and particulate matter emissions.

Figure 4: Share of diesel cars in passenger car fleet in the EU, Iceland and Norway, in 1993 and 2001

Assessment for the sub-indicator

Only in Greece did the share of diesel cars in the entire passenger car fleet decrease between 1993 and 1998. In all other Member States this share increased, most profoundly in Austria (by 20.8 %), France (by 12.9 %), Belgium (by 12.3 %) and Spain (by 12.1 %). These four countries are also the countries with the highest dieselification of the passenger car fleet. It should be noted that the share of diesel cars in Iceland, the United Kingdom, Spain and Austria more than doubled between 1993 and 2001.

In its third annual report on the effectiveness of the Community’s strategy to reduce CO₂ emissions from passenger cars, the European Commission reports that all associations...
increased further the share of diesel cars in their respective sales within the reporting period (European Commission, 2002). More specifically, the share of new diesel cars registered in the EU increased by 14.2%, from 22.2% in 1995 to 36.4% in 2001.

As diesel cars are generally more energy efficient, the increasing share of diesel cars in the passenger car fleet can be seen as a positive development. The objective to reduce CO\textsubscript{2} emissions from the entire passenger car fleet to an average 140 g CO\textsubscript{2} per km in 2008–09 (see TERM 2002 27 EU — Specific energy consumption and CO\textsubscript{2} emissions) will become easier to reach with more diesel cars on the road. However, in general, diesel cars emit more NO\textsubscript{x}, SO\textsubscript{2} and particulates than gasoline cars. Further limiting the sulphur content of diesel and introducing PM traps in passenger cars can help to combat excessive diesel car emissions.

References

EEA, 2001, Personal communication with Mr H. Passades, Permanent Secretary of the Ministry of Communications and Works, Cyprus.


### Table 1: Number of passenger cars, powered two-wheelers, buses and coaches per capita; number of trucks per unit of GDP

Unit: Passenger cars, powered two-wheelers, buses and coaches per 1,000 inhabitants; trucks per million US dollars

<table>
<thead>
<tr>
<th>Country</th>
<th>Passenger cars</th>
<th>Powered two-wheelers</th>
<th>Buses and coaches</th>
<th>Trucks</th>
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<tr>
<td>Austria</td>
<td>387</td>
<td>505</td>
<td>67*</td>
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<td>347</td>
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<td>413</td>
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NB: Figures indicated with * and ** refer to 1992 and 1999 respectively.


File: TERM 2003 32 EEA — Size and composition of the vehicle fleet.xls
Metadata

Technical information

1. Data source: Vehicle fleet data on AC-10 and CC-3 from the Energy and Transport DG Pocketbook (European Commission, 2003) and on EU-15, Iceland and Norway from Eurostat NewCronos databases (Eurostat, 2003); Data on population from Eurostat Statistical compendium (Eurostat); Data on European merchant fleet from Lloyd’s database (Lloyd’s, 2003); Data on bicycles from European Cyclists’ Federation (UITP/ECF, 1997).

2. Description of data: Number of vehicles

   Original measure units: Number of cars, number of powered two-wheelers, number of buses and coaches, number of trucks, number of bicycles, number of ships, number of households and population.


5. Methodology and frequency of data collection: Data are collected by a common questionnaire developed jointly by Eurostat, UNECE and ECMT. Data are collected annually.

6. Methodology of data manipulation, including making ‘early estimates’:

   Data gaps were filled either by interpolation, in cases where data were missing in between reported data, or by using the first (or last) reported value.

   Share of diesel passenger cars in the entire passenger car fleet is calculated by dividing diesel passenger cars by total passenger car fleet.

   Cars per household calculated by dividing total number of passenger cars EU by total number of households EU;

Quality information

7. Strength and weakness (at data level): data can be considered relatively strong. However, the data are estimated and not based on registration of passenger cars, motorcycles, mopeds, buses, coaches and trucks.

8. Reliability, accuracy, robustness, uncertainty (at data level): Data considered to be reliable and accurate, though they might be improved by using car registrations.

9. Overall scoring (give 1 to 3 points: 1 = no major problems, 3 = major reservations): 1

   Relevancy: 1.

   Accuracy: 2 (data are estimated rather than based on vehicle registrations).

   Comparability over time: 1.

   Comparability over space: 1.

Further work required

The coverage of transport modes other than road is still rather limited. Further efforts are needed to develop data-series for the size and composition of the aircraft and ship fleets.

The number of vehicles should be based on registration of these vehicles rather than estimations based on sales figures, etc. Using registrations would also benefit the assessment of the environmental performance of the vehicle fleet, since engine type and size would also become available, as would average age.
The number of passenger cars per type of household should be further analysed to improve knowledge about the interaction between household types and car ownership. Statistics on the number of cars per type of household are only available for one year (1994). Analysing this kind of data can give valuable insights into household transport needs.

Statistics on the number of powered two wheelers need to be improved. The main problem in this category lies in the stock of mopeds, because in some countries mopeds are registered in a different way to other vehicles.

It would be valuable to know the evolution of the number of heavy-duty vehicles compared with light-duty vehicles in order to see changes in the road freight transport sector. Along the same lines, it would be valuable to have more information available on the composition of the passenger car fleet (weight, size, fuel efficiency).
Box 1: Cars and GDP

In Figure 5, GDP per head is plotted against car ownership level for all EEA countries.

The data show a positive and relatively sound correlation between GDP per capita and the number of passenger cars per 1,000 inhabitants. The data also suggest that the relationship between GDP and motorisation is steeper for lower-income levels and becomes progressively flatter as the GDP per capita grows. In other words, increasing GDP per capita will, when still relatively low, not result in high increases in car ownership. But there is a kind of GDP per head threshold — not easily quantifiable — after which increasingly more families can afford to purchase one or even more cars, and therefore the fleet grows rapidly in size. After that period, when most families own at least one car, further increases in GDP per capita will not lead to correspondingly high increases in the size of the fleet and car ownership.

Figure 5: Motorisation and GDP per capita in the EEA in 2000

NB: GDP per capita in US dollars at constant 1995 prices. Since Luxembourg has a very high GDP per capita, it is left out of the graph in order to be able to focus better on the remaining countries.

**Box 2: Number of bicycles in the EU**

The number of bicycles in the EU varies widely between Member States (see Figure 6). The highest number per capita is in the Netherlands — more than one bicycle per person. Spain and Portugal have relatively low ownership levels.

**Figure 6: Number of bicycles per capita in EU, 1992-96**

![Chart showing the number of bicycles per capita in EU, 1992-96.](chart)

NB: Based on bicycle ownership data between 1992 and 1996. No data are available for Greece and Ireland.

*Source: UITP/ECF, 1997.*

Bicycle sales are gradually dropping (see Figure 7). It seems that bicycle popularity is decreasing. However, bicycle stocks and sales may have no direct influence on bicycle use. Different types of bicycles are used for different purposes (e.g. sports bikes, children’s bikes and mountain bikes). Hence, the number of bicycles is an indicator of the popularity of cycling and of cycling potential, but not (directly) an indicator of its potential to change the modal shares of passenger transport demand.

**Figure 7: The number of bicycles sold in the EU per 1 000 inhabitants (1992-96)**

![Chart showing the number of bicycles sold per year in EU, 1992-96.](chart)

*Source: UITP/ECF, 1997.*