



Fact Sheet - Meta info cover page for non CSI fact sheets^(*)

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Indicator Title

Indicator title:	Size and composition of the vehicle fleet
ETC/ACC Indicator ID	TERM 2006 32
Sub indicators, ID + title	TERM 2006 32a: Dieselisation

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Internal ETC/ACC Review (by ETC-members and data source owners)

Date	Reviewer/Person	Institution	Modifications / Reason for modification
	Liana Kalognomou	AUTH	

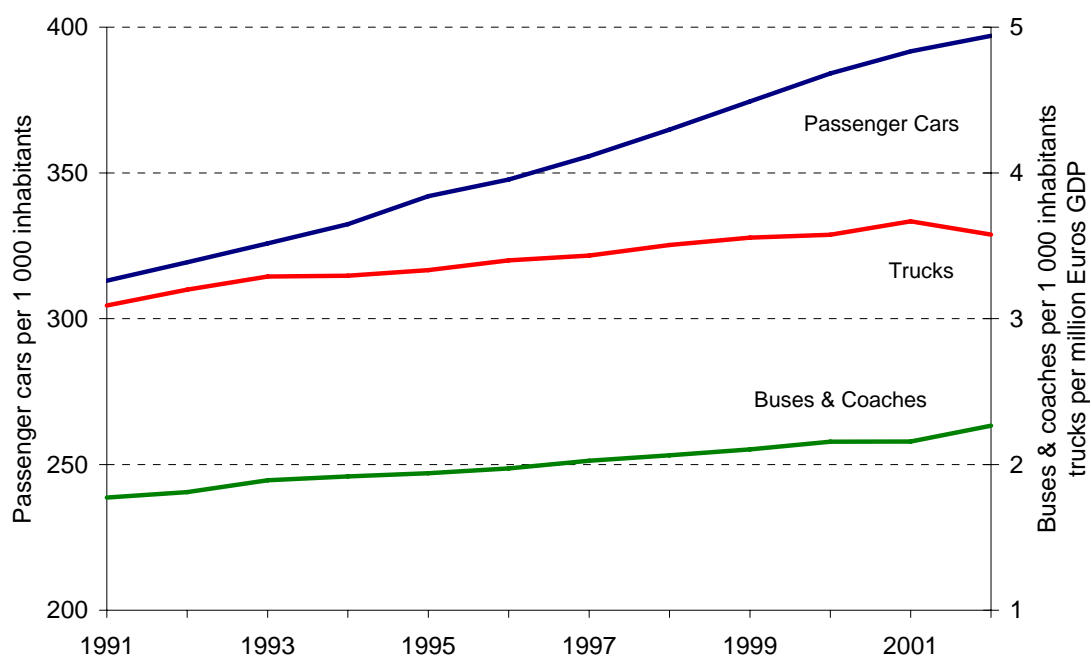


Indicator Fact Sheet

TERM 2006 32 EEA 32 – Size and composition of the vehicle fleet

- ⊗ The level of car ownership is growing rapidly in the EEA area, especially in countries with relatively low car ownership levels, like the new member states (former EU10) and AC3 (Bulgaria, Romania and Turkey). Increasing private vehicle ownership has proven to lead to increased usage of private vehicles and might have the opposite effect on public transport usage in the future, although up to the year 2002, the number of buses-coaches per capita appears to increase. The number of trucks – strongly related to economic development – increased considerably in the new member states and AC3, reflecting the greater dependence of their transport system on road transport. However, in some of the EU15 countries the number of trucks has decreased during the period 1991-2002.

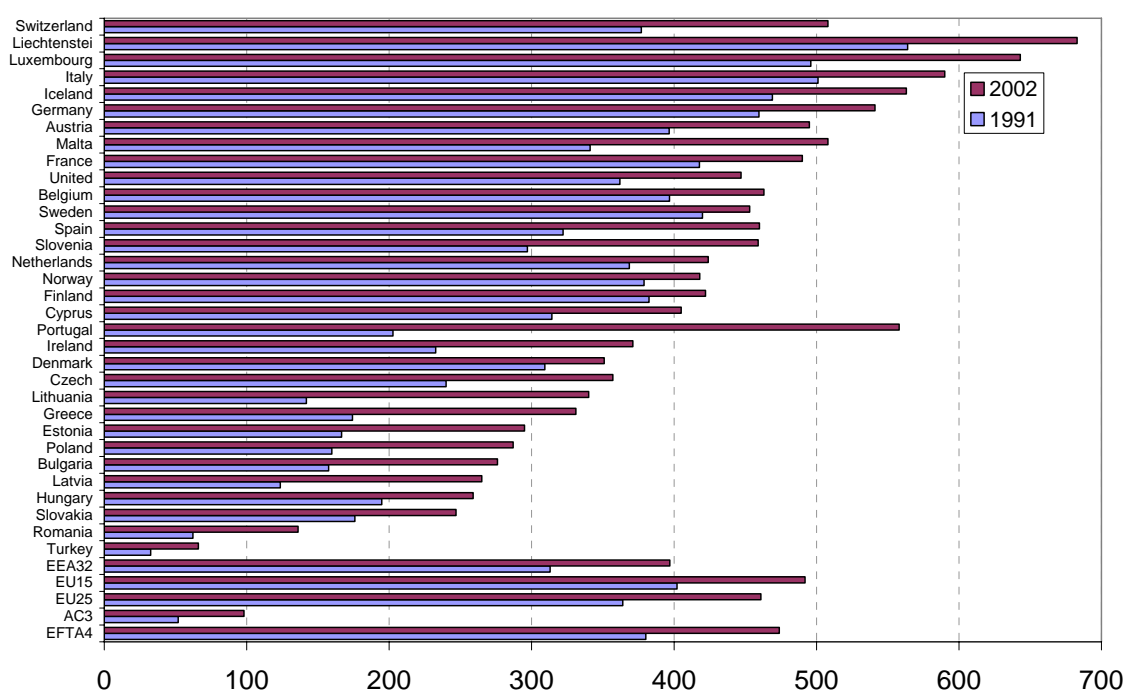
Figure 1: Evolution of the vehicle fleet in the EEA32, 1991-2002



NB: The above figure refers to EEA32 for passenger cars and buses-coaches. For trucks, this figure refers to EEA32 except Liechtenstein.

Source: Eurostat, 2006

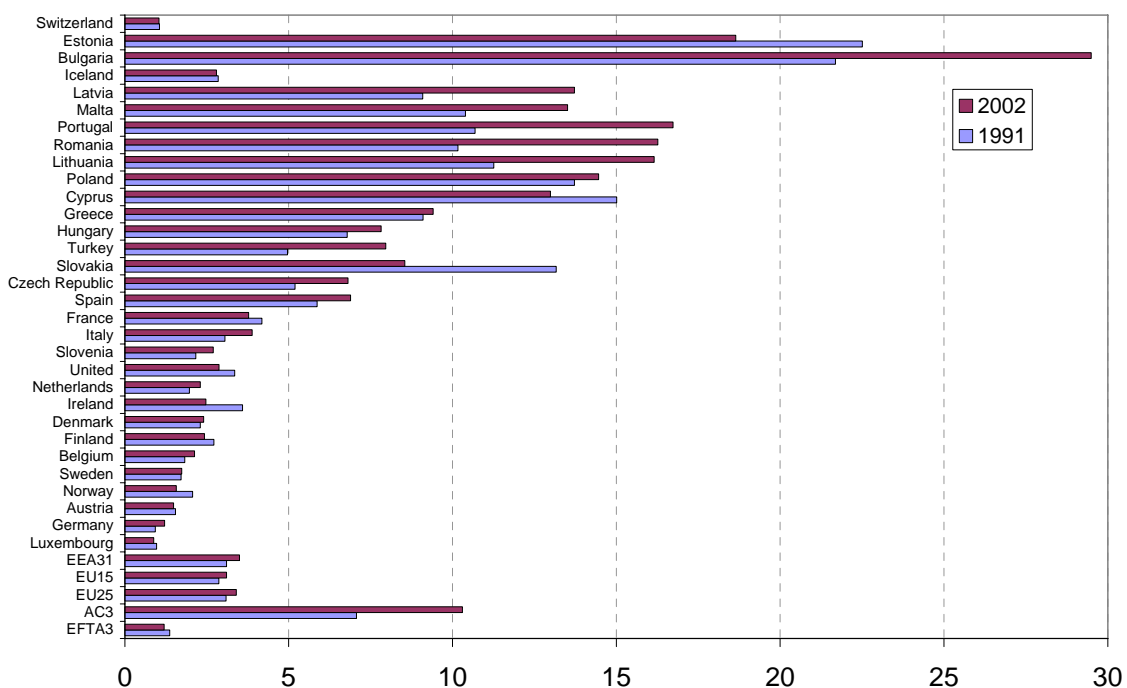
Figure 2: Passenger car ownership (passenger cars per 1000 inhabitants) in the EEA32, 1991-2002



NB: AC3: Data for Croatia not available

Source: Eurostat, 2006

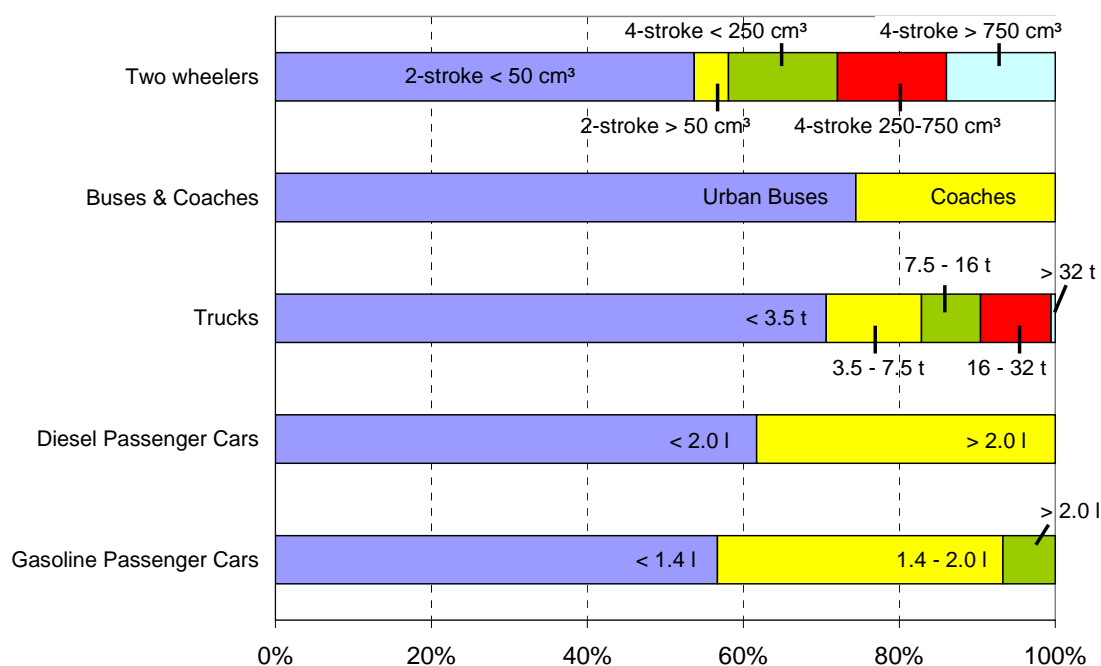
Figure 3: Trucks per unit of GDP (million Euro) in the EEA31, 1991-2002



NB: EEA31, EFTA3: Data for Liechtenstein not available

Source: Eurostat, 2006

Figure 4: Estimated vehicle category split in size and weight classes in the EU15 in 2005



Source: TRENDS (Giannouli et al., 2006)

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 to 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 is related to increased traffic congestion and the associated higher concentration of air pollutants in the atmosphere (see e.g. <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 2005 33 – Average age of the vehicle fleet) also 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 area has grown during the last decade. Especially the vehicle fleets in the new member states and AC3 have grown rapidly, 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 EEA32 area it grew from 313 to 397 cars per 1 000 inhabitants between 1991 and 2002, an average of 2.3 % per year. Car ownership is thus growing even faster than per capita income (on average 1.8 % per annum over the same period). The average number of passenger cars per capita increased strongly in the EU25 (especially in the new member states) and AC3 between 1991 and 2002 by 25 % and

90 % respectively, following economic growth. Despite this increase, the car ownership level in the new member states and AC3 remains considerably lower compared to the EU15 and EFTA countries. In the AC3 countries, the average motorisation level expressed by the number of cars per 1 000 inhabitants was 98 and in the year 2002, which is approximately five times lower than the corresponding number for EU15 countries (492).

The main factors underlying the growth of PCs per capita in the EEA area are:

- Decreasing number of persons per household. This decrease 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.
- Increasing number of cars per household. Even though the number of persons per household is decreasing, the number of cars per household is increasing. Increased personal income (European Commission, 2004) stimulates this development.
- Increases in the average travel distance (see TERM 14 – Urban spatial characteristics and transport), lower accessibility and flexibility by public transport (see 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 new member states and AC3, an important factor behind car ownership levels is increasing GDP per capita. As income grows, more people can afford buying a car (see Box 1). Moreover, in most of the new member states and AC3, 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 new member states and AC3 are:

- The quality and availability of public transport: in general, public transport systems (railways, bus/coach, metro and tram) are suffering from deteriorating quality – especially in Central and Eastern 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 means of 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, population of Central and Eastern 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 the number of cars per capita is already relatively high. This can be explained by the fact that households may need one or two cars, but generally not more. In contrast, countries with lower numbers of cars per capita show rapid increases in vehicle ownership. The latter applies to the new member states and AC3, but also to a couple of EU15 countries. In 1991, the lowest levels of car ownership in the EU were found in Greece and Ireland (174 and 233 cars per 1 000 inhabitants, respectively). These countries had the highest increases in car ownership between 1991 and 2002 (90 % in Greece, 61 % and in Ireland). In 2002, Greece and Ireland 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 become progressively smaller. It can be expected that the increase in Greece and Ireland, as well as in new member states and AC3, will continue.

The average level of powered two-wheeler (including motorcycles) ownership in the EU15 area, increased by 11 % between 1991 and 2002. This might be a result of people buying two-wheelers for recreational purposes rather than every day travelling, like commuting. However, increasing congestion might also be a reason for buying motorcycles, which are then specifically used for commuting.

Regarding the fleet of buses and coaches in the time period 1991-2002, there is an increase of 17 % in the number of buses and coaches per 1 000 inhabitants in the EU25 and a rapid

increase of 57 % in the AC3, while in the entire EEA area there is an increase of 32%. The high increase in the AC3 can 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 considerably higher in the new member states and AC3 than in the EU15. The trend in 'own account' transport (i.e. operations in which a company transports its own goods from one place to another) in the EU15 has been declining over the years. On the other hand, according to a pilot survey conducted by Eurostat (Eurostat, 1999), the new member states and AC3 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 to EU15 Member States. 'Hire or reward' 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 new member states and AC3.

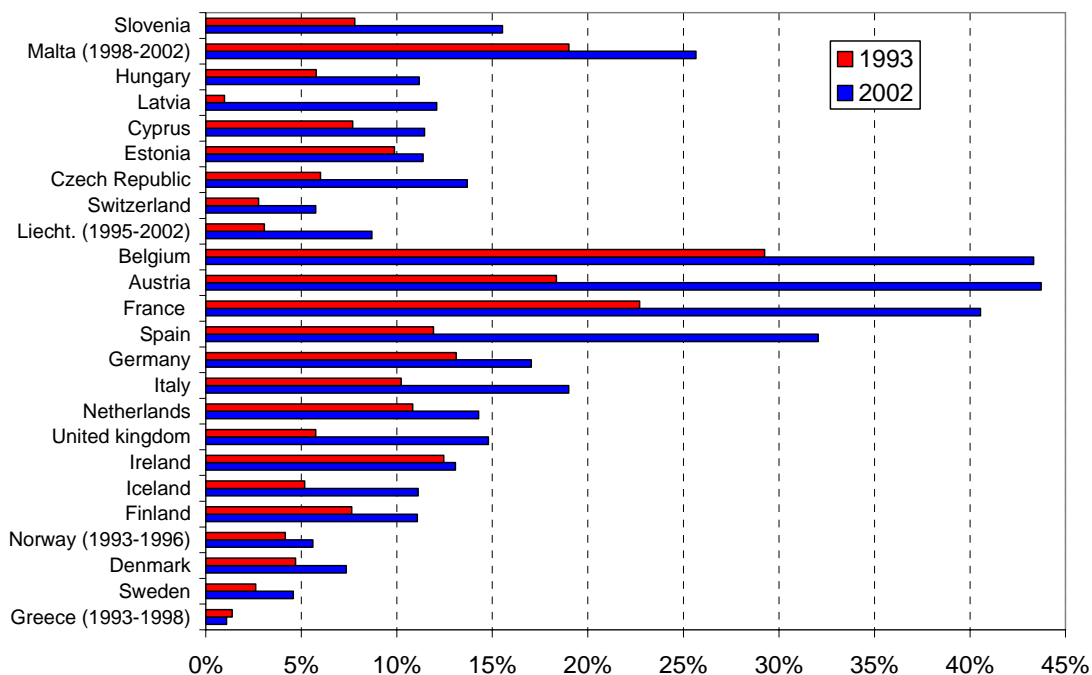
The high number of trucks per unit of GDP observed in the Baltic States and the AC3 are related to low GDP levels and relatively high (road) freight transport intensity. Malta and Cyprus also show relatively high numbers of trucks per unit of GDP, which could be explained by the absence of alternative 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. The ships are divided into six major categories, i.e. tankers, bulk carriers, general cargo, containerships, 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 doesn't 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). The amount of goods transported by sea in EU25 was approximately 3.4 bn tones for the year 2003 (Eurostat, 2006), while 94% of this amount was transported in EU15 countries. France, Italy, Netherlands and the UK have the highest contribution to the overall seaborne transport of goods in EU25 (9.7%, 14.1%, 12.1% and 16.4% respectively).

Sub-indicator TERM 2006 32a: Dieselisation

- ☺ **The share of diesel cars in the entire passenger car fleet continuously increased in most Member States in the time period 1993-2002. 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 a considerable decrease of the carbon monoxide and hydrocarbon emissions, but also in an increase in nitrogen oxides and particulate matter emissions.**

Figure 5: Share of diesel cars in passenger car fleet in EU25, EFTA4 and Slovenia in 1993 and 2002



NB: No data for AC3, Luxembourg, Portugal Lithuania, Poland and Slovakia. Norway refers to 1993 and 1996 and Greece refers to 1993 and 1998. Malta refers to 1998 and 2002 and Liechtenstein refers to 1995 and 2002.

Source: Eurostat, 2006

Assessment of the sub-indicator

Only in Greece the share of diesel cars in the entire passenger car fleet decreased in the time period considered. In all other Member States this share increased, especially in Austria (by 25.4 %), France (by 17.8 %), Belgium (by 14.1 %) and Spain (by 20.1 %). These four countries are also the countries with the highest dieselisation 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 2002.

The fifth annual report on the effectiveness of the Community's strategy to reduce CO₂ emissions from passenger cars (European Commission, 2005) states that all associations increased further the share of diesel cars in their respective sales within the reporting period. More specifically, the share of new diesel cars registered in the EU15 doubled from 1995 to 2003 (from 22.2 % in 1995 to 44.4 % in 2003).

As diesel cars are generally more energy efficient compared to petrol cars, the increasing share of diesel cars in the passenger car fleet can be seen as a positive development. The objective to reduce CO₂ emissions from the entire passenger car fleet to an average 140 g CO₂ per km in 2008/9 (see TERM 2005 27 – Specific energy consumption and CO₂ emissions) will become easier to reach with more diesel cars on the road. However, in general, diesel cars emit more NO_x 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.

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Data

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 Euros in constant 1995 prices

	Passenger cars		Powered 2-Wheelers		Buses and Coaches		Trucks	
	2002	1991	2002	1991	2002	1991	2002	1991
EEA-32	397	313	n/a	n/a	2	2	3	3
EU-15	492	402	47	36	2	1	3	3
EFTA4	474	380	n/a	n/a	7	3	1	1
AC3	98	52	n/a	n/a	4	3	10	7
EU25	461	364	n/a	n/a	2	2	3	3
BE	463	397	30	14	1	2	2	2
DK	351	309	15	8	3	2	2	2
DE	541	460	44	28	1	1	1	1
GR	332	174	230	27	3	2	9	9
ES	453	322	37	28	1	1	7	6
FR	475	418	40	35	1	1	4	4
IE	374	233	8	11	2	1	2	4
IT	590	501	71	98	2	1	4	3
LU	672	496	n/a	9	3	2	1	1
NL	424	369	31	12	1	1	2	2
AT	493	397	74	64	1	1	1	2
PT	558	203	37	14	2	1	17	11
FI	422	382	43	32	2	2	2	3
SE	453	420	21	5	2	2	2	2
UK	446	362	21	15	3	1	3	3
IS	563	469	10	3	6	5	3	3
NO	412	379	n/a	36	8	5	2	2
BG	265	158	n/a	n/a	6	3	29	22
CY	405	314	n/a	76	4	4	13	15
CZ	357	240	118	n/a	2	2	7	4
EE	294	167	5	74	4	5	19	23
HU	259	195	10	17	2	2	8	7
LV	265	124	9	86	5	4	16	10
LT	340	142	6	56	5	4	14	11
MT	510	341	n/a	n/a	3	1	14	10
PL	288	160	33	32	2	2	14	14
RO	148	62	n/a	n/a	2	1	16	10
SK	247	176	9	53	2	3	9	13
SL	459	297	6	7	1	1	3	2
TR	64	33	n/a	n/a	5	4	8	5
LI	683	564	n/a	n/a	3	4	n/a	n/a
CH	508	377	103	103	6	2	1	1

NB: Data for trucks not available for Liechtenstein (EEA31, EFTA3). Average values (e.g. EEA32), with the exception of the EU15 countries, cannot be produced for 2-wheelers due to lack of data.

Source: Eurostat, 2006

File: TERM 2006 32 EEA - Size and composition of the vehicle fleet.xls

Meta data

EEA32 = EU15, EU10, AC4 – HR (Croatia), EFTA4.

EU15 = Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and UK.

EU10 = Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

AC4 = Bulgaria, Croatia, Romania and Turkey.

EFTA4 = Iceland, Liechtenstein, Norway and Switzerland

Technical information

1. Data source: Vehicle fleet and population data from Eurostat NewCronos databases (Eurostat, 2006); Data on the vehicle split into size and weight classes from the TRENDS database (Giannouli et al., 2006); 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.
3. Geographical coverage: EEA32 (all Member States). For the truck fleet: EEA31 (all Member States excluding Liechtenstein). For the passenger cars diesel share: EU25 (excluding Luxembourg, Portugal Lithuania, Poland and Slovakia), EFTA4 and Slovenia. For the bicycle fleet: EU13 (excluding Greece and Ireland)
4. Temporal coverage: 1990-2002 (for passenger cars, powered two-wheelers, buses & coaches and trucks), 1993-2002 (for passenger cars diesel share), 1992-1996 (for bicycles), 2003 (for ships).
5. Methodology and frequency of data collection: Data is collected by a Common Questionnaire developed jointly by Eurostat, UNECE and ECMT. Data is collected annually.
6. Methodology of data manipulation, including making 'early estimates':
Data gaps were filled either by interpolation, in case that data was 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 capita calculated by dividing total number of passenger cars by total population;

Quality information

7. Strength and weakness (at data level): data can be considered relatively strong. However, the data is 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 reliable and accurate, though it 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 will also benefit the assessment of the environmental performance of the vehicle fleet, since engine type and size will also become available, as does average age.

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 compared to other vehicles.

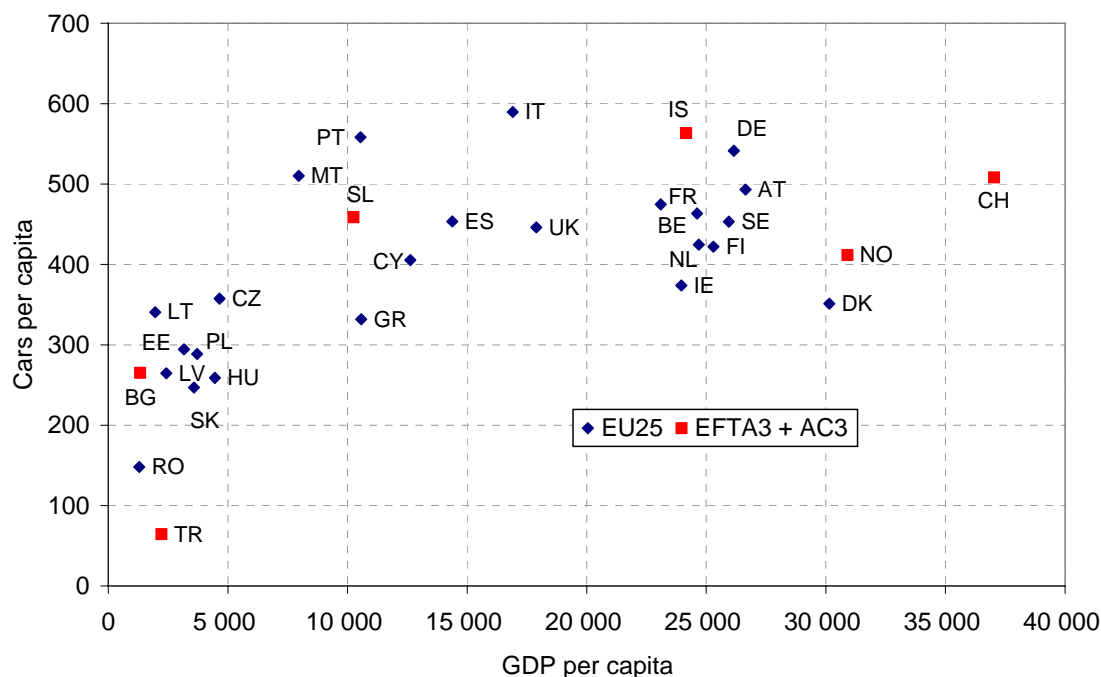
Although a split of the light and heavy-duty vehicles into weight classes is provided by the TRENDS model, the data are still not sufficient to estimate the evolution of this split. The latter would be valuable in order to see changes in the road freight transport sector. Along the same lines, it would be valuable to have more information available on the evolution of the engine size split of the passenger car and two-wheeler fleet.

Box 1: Cars and GDP

In Figure 6, GDP per head is plotted against car ownership level for the 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, result in high increases in car ownership. For higher GDP per capita, 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 6: Motorisation and GDP per capita in the EEA in 2002



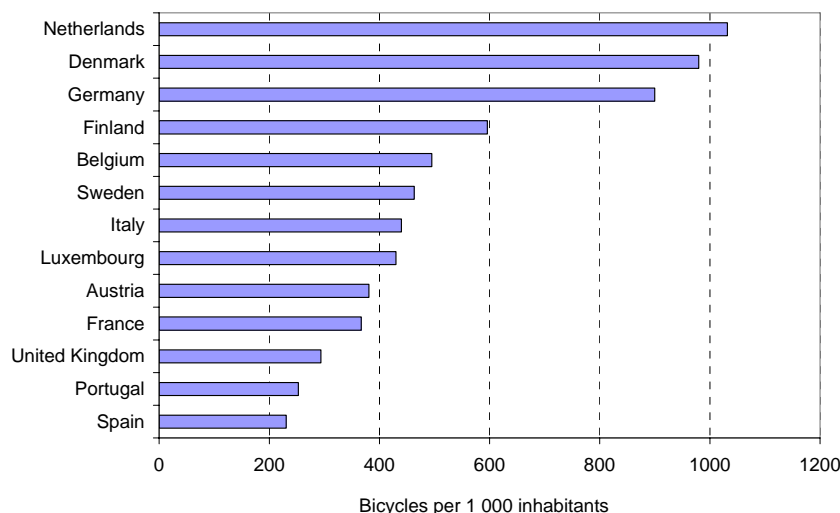
NB: GDP per capita in Euros at constant 1995 prices. Since Luxembourg has a very high GDP per capita, it is not presented in the graph in order to focus on the remaining countries.

EFTA3: No data for Liechtenstein.

Source: Eurostat, 2006

Box 2: Number of bicycles in the EU

The number of bicycles in the EU15 varies widely between Member States (see Figure 7). The highest number per capita is in the Netherlands - more than one bicycle per person. Spain and Portugal have relatively low ownership levels.

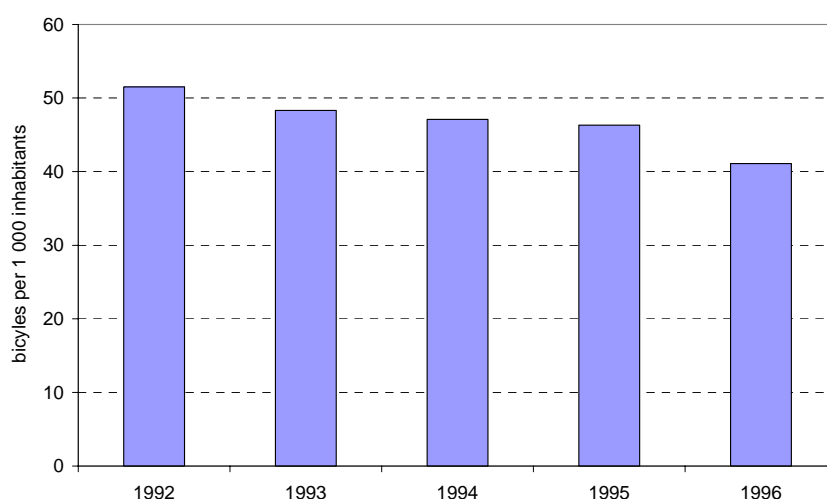
Figure 7: Number of bicycles per capita in EU, 1992-96

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 8). 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-bikes and all terrain 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.

Europe is the world leader in bicycle use. In Amsterdam, 33 percent of all trips are made by bicycle, while in Copenhagen, one third of all commuters bike to work (Earth Policy Institute 2005).

Figure 8: The number of bicycles sold in the EU15 per 1 000 inhabitants (1992-96)

Source: UITP/ECF, 1997