

# 2.11

# TRANSPORT



An efficient transport system is essential to guaranteeing economic development and social cohesion. In current times, it is also required to be environmentally sustainable.

Transport is one of the most important economic sectors, because apart from its intrinsic characteristics as a production sector, it contributes to a large extent to the development and competitiveness of all other sectors, and hence to the whole economic system.

The European Union's transport policy has developed considerably over recent years. The transport systems it proposes must be effective and efficient and, among other things, must ensure high levels of mobility for people and goods in such a way that it is competitive and protects the environment, whilst guaranteeing its own energy supply (as one of the largest energy consumers) and the rights of both users and those working in the industry.

In Spain, The Strategic Infrastructure and Transport Plan (PEIT – *Plan Estratégico de Infraestructuras y Transportes*), approved by the Cabinet on 15 July 2005, lays down the basic guidelines for action on matters of infrastructure and transport for which the State has jurisdiction and sets a medium to long-term horizon (2005-2020). This Plan addresses the challenges facing Spain's transport system and proposes measures to help improve economic competitiveness, territorial and social cohesion, and service



INDICATOR	GOAL	TREND
<b>Total inter-city transport volume: modal distribution</b>	Achieve a balance between transport modes, promoting the more environmentally-friendly options	Road transport continues to generate greatest demand for both passengers and goods
<b>Atmospheric emissions of pollutants by transport</b>	Reduce atmospheric pollutant emissions and contribute to meeting environmental targets	Emissions of acidifying pollutants and ozone precursors are falling, but GHGs continue to increase
<b>Air transport</b>	Achieve a balance between transport modes, promoting the more environmentally-friendly options	Air passenger transport is the fastest growing mode: passenger-km rose 266.8% over 1990-2006
<b>Waste generated by transport: End-of-Life Tyres (ELTs)</b>	In this order: reduce, reuse, recycle and recover End-of-Life Tyres (ELTs)	In 2005, ELT generation dropped 0.9% in comparison with 2004
<b>Bio-fuel consumption</b>	Ensure bio-fuels account for 5.75% of total fuel consumption by 2010	Although still a minority fuel, bio-fuel consumption is growing faster than that of petrol and diesel
<b>Motorisation and accident rate</b>	Reduce fatalities to half the 2001 figure by 2010	In 2006, the number of traffic accident fatalities fell for the third year running, although the number of deaths is still very high
<b>Eco-efficiency in transport</b>	Decouple economic growth from the environmental pressure exerted by the sector	Although still linked, transport's GVA is growing faster than GHG emissions

safety and quality in all modes of transport, based on principles of rationality and efficiency in resource use.

Its approach includes clear concern for sustainable development, shown by the application of environmental criteria. In fact, the Plan included a strategic environmental assessment even before Act 9/2006 (*Ley 9/2006*), of 28 April, on assessment of the effects of plans and programmes on the environment, came into effect and which is independent from and complementary to each individual project's environmental impact assessment. The Plan's strategic environmental assessment laid down a series of recommendations and represents an innovation in sustainable planning for Spanish infrastructure.

The increase in the sector's development has taken place alongside significant environmental pressure, affecting citizens' quality of life and the environment in general. This environmental pressure includes deterioration in air quality, noise, congestion in cities, contribution to climate change processes, waste generation, loss of biodiversity, accidents, etc. Accordingly, policies and measures have been implemented in recent years to encourage more efficient modes of transport, improve interconnection between national and international networks, improve vehicle technology, develop less polluting fuels, and reduce the number of traffic accidents and associated fatalities.

In this respect, increased road safety is one of current policy's main concerns. Reducing road accidents and their consequences is one of modern society's chief demands. In fact, the EU proposes to halve the number of road accident deaths by 2010 (cutting numbers from 54,000 in 2001 to 27,000 in 2010) and, in 2003, adopted an Action Programme with 60 specific measures related to road safety. Nevertheless, in 2007, the number of fatalities in the EU-27 had only been reduced by 20%, when a fall of 37% would have been necessary to remain on target.

Many of the measures adopted require approval of an appropriate legal and regulatory framework. In Spain, and to provide just two examples, in December 2007, Organic Law 15/2007 (*Ley Orgánica 15/2007*), of 30 November 2007, came into effect, This modified Organic Law 10/1995 (*Ley Orgánica 10/1995*), of 23 November 1995, on the Spanish Penal Code in relation to road safety matters and was intended to define offences against traffic safety and those relating to road safety with greater precision. The previous month, the Air Quality and Atmospheric Protection Act 34/2007, of 15 November (*Ley 34/2007 de calidad del aire y protección de la atmósfera*) had come into effect. This environmental law strengthens the Government's remit to act against air pollution in order to achieve healthy levels of air quality and, among other measures, modifies vehicle registration tax by taking environmental criteria into account. As a result, vehicles that generate higher levels of pollution are subject to higher tax rates while the most environmentally-friendly ones are exempt.

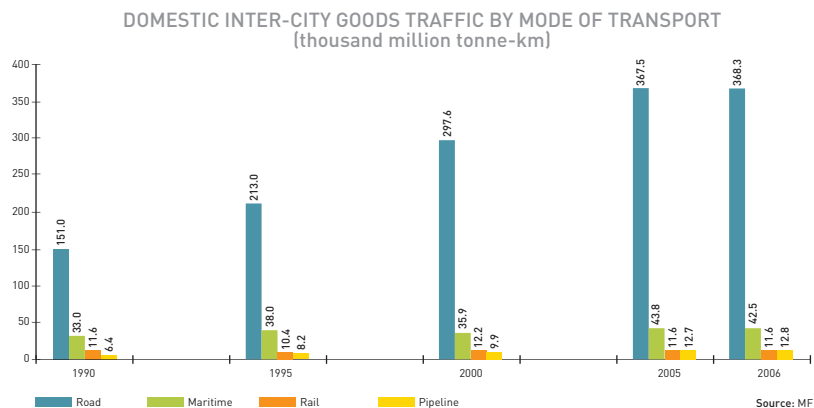
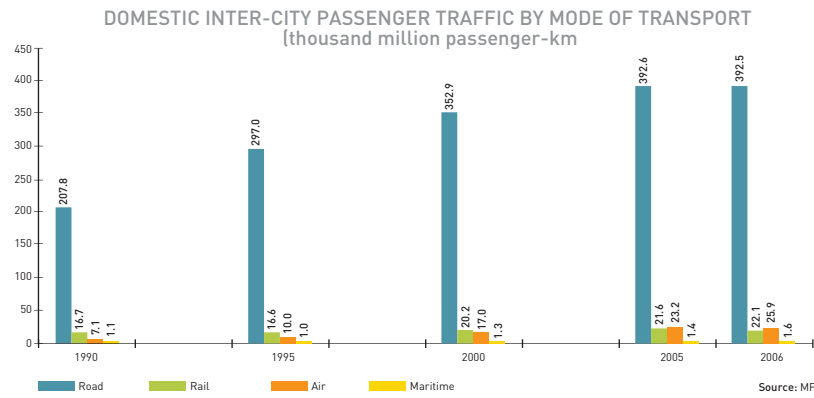
The sector analysis carried out for 2006 by the Ministry of Public Works (MF – *Ministerio de Fomento*), "Transport and Mail Services. Annual Report 2006" (*Los transportes y los servicios postales. Informe anual 2006*) used specific indicators and drew the following conclusions, among others:

- The length of Spain's high-capacity roads continues to grow at a considerable rate (32.8% in 6 years) and now exceeds 13,800 km.
- In 2006, Spain's vehicle fleet grew by 11.6% compared to 2005 to exceed 28.5 million vehicles.
- Total investment in roads dropped by 0.7% in 2006. However, railway investment grew by 12.9% and that made in port and airport infrastructure rose by 19.4% and 20.9%, respectively. It is especially worth highlighting the increase in investment in pipeline transport, which was 67.6% higher than in 2005.

With respect to the previous edition, this chapter includes two new indicators: "Air transport" and "Bio-fuel consumption". Meanwhile, the "Energy consumption by transport" indicator has been eliminated, although information on energy consumption is briefly included under the indicator "Atmospheric emissions of pollutants by transport".

# Total inter-city transport volume: modal distribution

Road transport is the most used mode, accounting for 89% of passenger journeys and 85% of goods transport



In the period 1990-2006, the total volume of passenger transport grew by 90%, while goods transport increased by over 115%. In the last six years, passenger transport grew by 12.9% and goods transport by 22.4%, indicating slowing average annual growth. In fact, between 2005 and 2006, there was a slight increase of 0.7% in passenger transport and a 0.11% drop in goods transport.

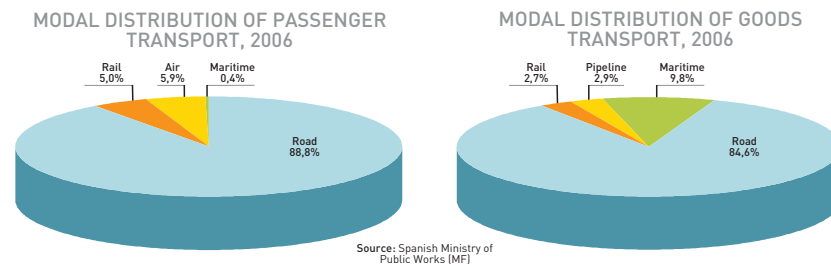
By mode, between 1990 and 2006, air passenger transport increased by 266.8% and road passenger transport by 88.9%. Maritime passenger transport increased considerably less, growing only 47.4%, while rail passenger transport rose by just 32.1%. By comparison with 2005, the largest increase in passenger transport in 2006 was in maritime transport (15.2%), followed by air (11.3%) and rail (2.4%). Road transport fell slightly, by 0.04%.

As regards this last point, it is interesting to note the increase of motorcycles in passenger transport, which grew by 25.6% in the period 2000-2006. This compares with a 21.8% increase for cars and a 1.8% drop in the number of bus passengers. In 2006, motorcycle passenger transport increased 32.1%, while the other modes either remained stable (cars: 0.93%) or fell (buses: -7.16%) with respect to 2005. This was encouraged by the measure approved in July, 2004, allowing motorcycles up to 125 cc to be ridden with a type-B driver's licence, without the need for specific authorisation (type-A1 licence) required up until then, and the greater mobility these vehicles offer in increasingly congested cities.

As regards goods transport, in the period 1990-2006, a 0.2% drop was seen in rail while the other modes all increased, ranging from 28.6% in maritime transport to 100.7% in pipeline transport and 143.9% in road transport. With respect to 2005, only slight increases were seen in 2006 (less than 1%) in pipeline and road transport, while the volume carried by maritime and rail transport fell.

Air freight has remained below 100 million tonnes per year so far, dropping from 97 (million tonnes) in 2000 to 86 in 2006.

The break-down of passenger and goods transport by mode for 2006 is shown in detail in the following graph, highlighting the predominance of road transport in both. As regards passenger transport, air and rail are the next most used modes while, in the case of goods, maritime transport is the second most widely used mode, followed by pipeline and rail (both with similar proportions).

**NOTES**

- The unit of measurement for passenger transport is passenger-kilometre (p-km), which is calculated by multiplying the annual number of passengers by the number of kilometres travelled on each mode of transport.
- The unit of measurement for goods transport is the tonne-kilometre (t-km), calculated by multiplying the number of tonnes transported by the number of kilometres travelled on each mode of transport.

**SOURCES**

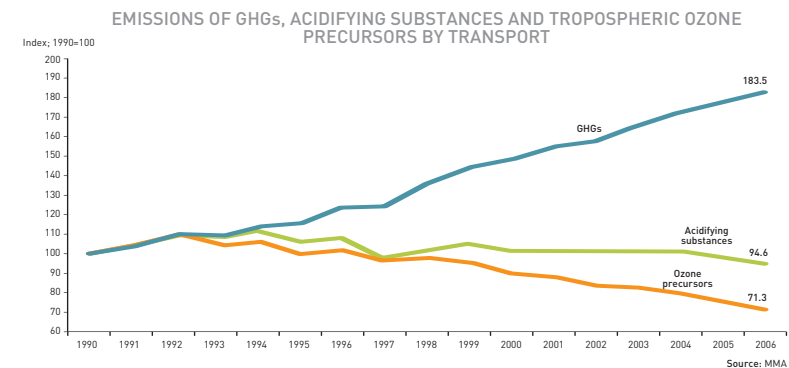
- Spanish Ministry of Public Works (MF), 2005. "Transport and Mail Services. Annual Report 2004".
- Spanish Ministry of Public Works (MF), 2006. "Transport and Mail Services. Annual Report 2005".
- Spanish Ministry of Public Works (MF), 2007. "Transport and Mail Services. Annual Report 2006".

**FURTHER INFORMATION**

- <http://www.mma.es>
- <http://www.fomento.es>
- <http://www.eea.europa.eu/>

## Atmospheric emissions of pollutants by transport

Transport's emissions of ozone precursors and acidifying substances are falling, whilst GHG emissions continue to rise



Atmospheric emissions of pollutants by transport are characterised by an increase in greenhouse gases (GHGs) and by a drop in ozone precursors and acidifying substances. In the period 1990-2006, GHG emissions by transport grew by 83.5% (not taking into account emissions from stationary sources caused by pipeline transport). This growth is much greater than the 50.6% increase in total GHG emissions (an increase of 49.5% if the 1990 emissions level used as a basis for monitoring Kyoto Protocol adherence is considered), giving some idea of how important this sector is as regards its effects on global warming and control of the same.

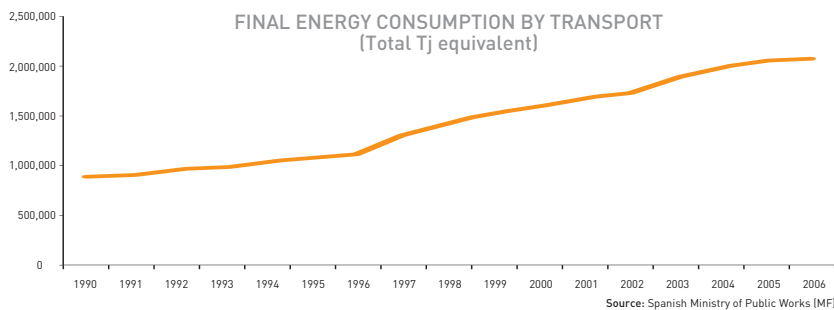
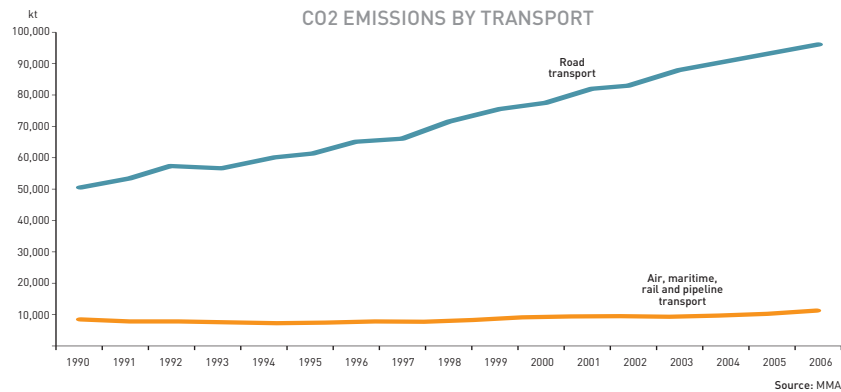
Acidifying substances emissions, however, fell by 5.4% in the same period, with significant drops in the last two years. There was significant reduction in ozone precursor emissions by transport, which amounted to 28.7% in 2006.

If emissions from stationary sources caused by pipeline transport (SNAP group 01.05.06) are taken into account, IPCC criteria determine that GHG emissions by transport increased by 88.8% between 1990 and 2006.

CO<sub>2</sub> is the main component of GHG emissions: in 2006, it accounted for 83% of the total. In the period 1990-2006, CO<sub>2</sub> emissions by transport showed continuous growth,

increasing by 81.8%. CO<sub>2</sub> emissions by road transport alone grew by 88.6%, while those by air, maritime, rail and pipeline transport as a whole rose by 41.0%.

With respect to the national total, road transport emissions in 2006 made up 26.5% of total CO<sub>2</sub> equivalent emissions, while those from air, maritime, rail and pipeline transport accounted for 3.3%.



In terms of energy consumption, transport is the largest consumer. It accounts for 39.2% of the total, surpassing industry's consumption since 2000. Its final energy consumption, expressed in terajoules, has grown by 133.5% since 1990, with road transport consuming the most, followed by maritime, air and rail transport. Nevertheless, the largest increases in energy consumption since 1990 took place in pipeline and air transport (261% and 130%, respectively).

#### NOTES

- The information provided corresponds exclusively to emissions covered by group 7 of the SNAP classification (Road Transport) and part of group 8 (Other Transport Modes: rail, air and sea). When specified, pipeline transport (SNAP 01.05.06) is also included.
- The GHG emissions estimate takes into account CH<sub>4</sub>, N<sub>2</sub>O and CO<sub>2</sub> emissions, while excluding fluorinated gases. Total emissions (index 1990=100) are obtained from annual emissions of each of the three pollutants, expressed as tonnes of CO<sub>2</sub> equivalent in accordance with their global warming potential: 1 for CO<sub>2</sub>, 21 for CH<sub>4</sub> and 310 for N<sub>2</sub>O.
- In estimating the total acidifying effect, expressed as acid equivalent, annual emissions of SO<sub>2</sub>, NO<sub>x</sub> and NH<sub>3</sub> are taken into account and the following weighting factors employed:
  - SO<sub>2</sub>: 2/64 acid equivalent/g = 31.25 acid equivalent/kg.
  - NO<sub>x</sub> (expressed as NO<sub>2</sub>): 1/46 acid equivalent/g = 21.74 acid equivalent/kg.
  - NH<sub>3</sub>: 1/17 acid equivalent/g = 58.82 acid equivalent/kg.
- Emissions of tropospheric ozone precursors were estimated using the tropospheric ozone depleting potential (expressed as NMVOC equivalent) of the four following precursors: nitrogen oxides (NO<sub>x</sub>), non-methane volatile organic compounds (NMVOCs), carbon monoxide (CO) and methane (CH<sub>4</sub>). The following weighting factors were employed: 1.22 for NO<sub>x</sub>; 1.00 for NMVOC; 0.11 for CO; and 0.014 for CH<sub>4</sub>. Total emissions are shown as an index (1990=100).
- In comparing CO<sub>2</sub> and NO<sub>x</sub> emissions with the number of passenger cars, the information on CO<sub>2</sub> emissions refers only to CO<sub>2</sub>. It only takes into account emissions from passenger cars (SNAP group 0701) and the existing passenger car fleet at the end of each year.

#### SOURCES

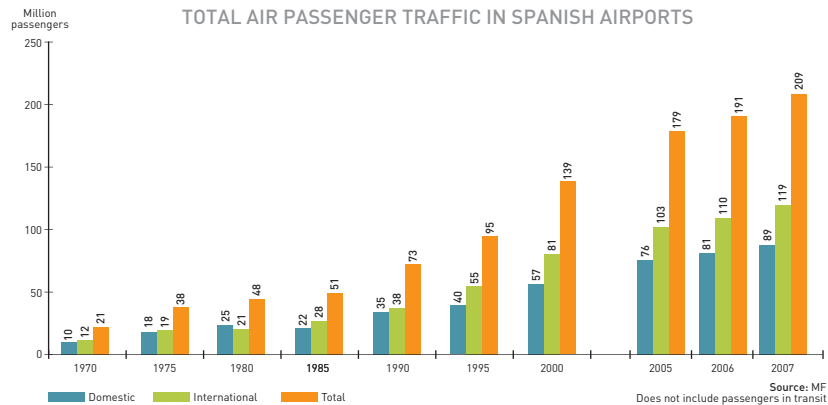
- Emissions figures: Spanish Ministry of the Environment (MMA – *Ministerio de Medio Ambiente*). Sub-directorate General for Air Quality and Risk Prevention (*Subdirección General de Calidad del Aire y Prevención de Riesgos*). Spanish National Atmospheric Emissions Inventory (*Inventario Nacional de Emisiones a la Atmósfera*).

#### FURTHER INFORMATION

- <http://www.mma.es>
- <http://www.fomento.es>
- <http://www.eea.europa.eu/>
- <http://www.dgt.es>

## Air transport

Air transport continues to grow, carrying 210 million passengers in 2007



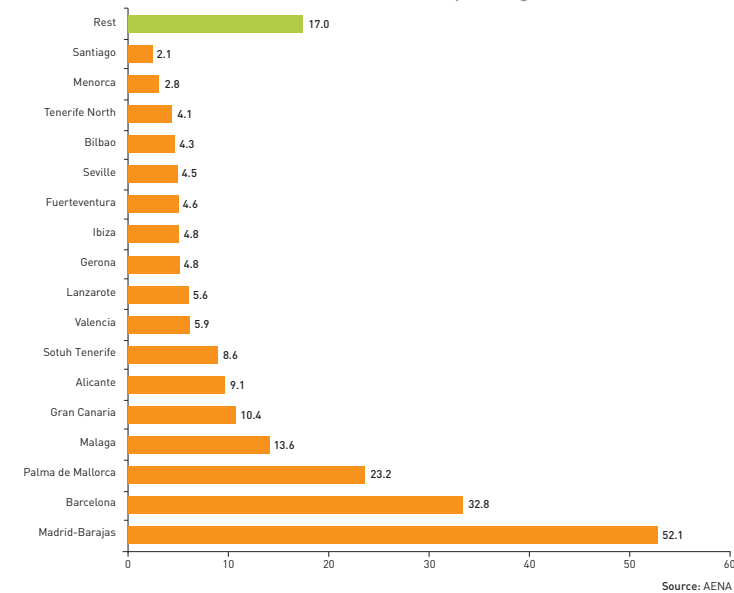
In 2007, total air passenger traffic in Spain surpassed 210 million passengers, 8.7% more than the 2006 figure. If passengers in transit are excluded, the total number of passengers amounted to 208,546,308, with 19,499,282 corresponding to international flights and 89,047,025 to domestic flights.

In the 1990-2007 period, total air passenger traffic grew by 184.2%, with domestic traffic increasing by 152.7% and international traffic by 213.4%. In the last 7 years (2000-2007), total traffic grew by 50.5%, with domestic traffic increasing by 55.0% and international traffic by 47.2%.

Of the 45 active airports managed by the Spanish Airports Authority (AENA – *Aeropuertos Españoles y Navegación Aérea*) in 2007, 3 handled over 20 million passengers (these 3 accounted for more than 51.4% of total passenger traffic), 2 handled between 10 and 20 million passengers, 4 between 5 and 10 million passengers, 17 between 1 and 5 million passengers and 19 handled fewer than 1 million passengers. Madrid-Barajas continues to receive the most traffic, handling over 52.1 million passengers (13.8% more than in 2006). It is followed by El Prat in Barcelona, with over 32.8 million passengers (3.9% more than in 2006) and Palma de Mallorca, with 23.2 million (3.7% more than in 2006).

The main routes for domestic flights were Madrid-Barcelona (4.4 million passengers), Madrid-Palma de Mallorca, and Barcelona-Palma de Mallorca (1.7 million passengers).

TOTAL AIR PASSENGER TRAFFIC IN SPANISH AIRPORTS HANDLING OVER 2 MILLION PASSENGERS. 2007 (million passengers)



The pressure that air transport exerts on the natural and urban environment is increasingly significant, as the increase in air traffic counteracts the technological improvements made and corrective measures implemented. Two of the most significant cases of environmental pressure are noise pollution caused by aeroplanes (mainly during take-off and landing), which mostly affect areas near flight paths, and emissions of atmospheric pollutants. In 2006, air transport had the third highest level of energy consumption (12.13%) among the various modes, coming behind road and maritime transport. If pipeline transport is excluded, in the period 1990-2006, its energy consumption (mainly kerosene for fuel) showed the greatest increase (129.6%).

The increase in tourist flights, largely driven by the boom in low-cost airlines, is one of the main causes behind the growth in this transport mode. This substantial increase is being boosted by its increasingly wide coverage.

The IPCC (Intergovernmental Panel on Climate Change) estimates that the air transport sector is responsible for 3.5% of all CO<sub>2</sub> emissions, a percentage that is increasing rapidly as a result of low-cost airlines' expansion and burgeoning international flights from emerging economies such as China and India. Growth is such that in 2020, emissions from aviation are expected to at least double current levels.

The European Commission considers that aviation is one of the fastest growing sources of GHG emissions, and so plans to include it in the EU emission allowance trading scheme, which could bring about a 46% cut in estimated CO<sub>2</sub> attributable to aviation as compared with not adopting new measures (through to 2020). Since 1990, emissions generated in the EU by international aviation have increased by 87%. All flights taking off and landing within the EU are expected to be bound by this regulation from 2012 onwards.

Regulation (EC) No. 549/2004 of the European Parliament and of the Council, of 10 March 2004, lays down the framework for the Single European Sky. The objective of creating the Single European Sky, which has yet to be fully defined, is to unify national air traffic management systems, while enhancing current safety standards and overall efficiency for general air traffic in Europe, optimising capacity to meet the requirements of all air-space users and minimising delays. Although the reduction in congestion brought about by applying this regulation may give rise to increased use of this mode of transport, the measure may be positive for the environment by reducing the distances travelled between destinations and, therefore, reducing energy consumption.

#### NOTES

- Total air traffic includes incoming and outgoing journeys and refers both to domestic and international traffic (both scheduled and charter flights).

#### SOURCES

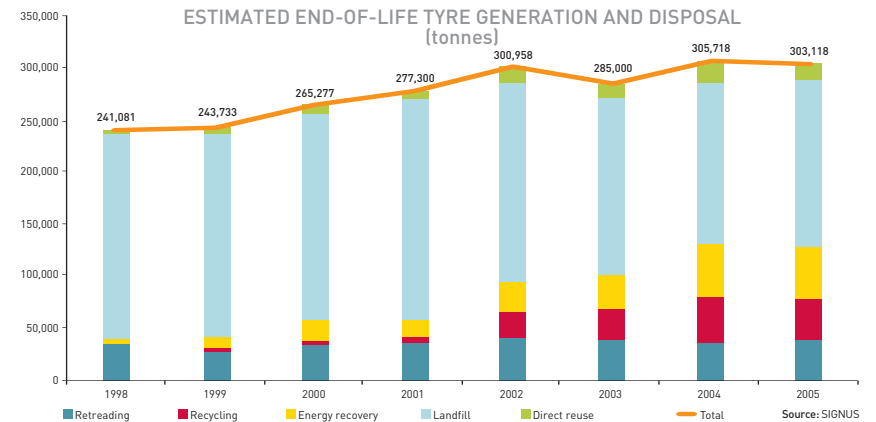
- Ministry of Public Works (MF), 2007. "Transport and Mail Services. Annual Report 2006". Information compiled from data provided by the Directorate General for Civil Aviation (*Dirección General de Aviación Civil*).

#### FURTHER INFORMATION

- <http://www.fomento.es>
- <http://www.eea.europa.eu>

## Waste generated by transport: End-of- Life Tyres (ELTs)

Recycling and energy recovery are on the increase, while landfill is declining



Another of the pressures that transport exerts on the environment is generation of waste, such as end-of-life tyres (ELTs). Their increased use, together with their composition, part of which is highly polluting, and the fact that they do not easily degrade naturally, make reuse and recovery (for their energy value or for recycling) the best management options.

In 2005, there was a 0.9% drop in ELT generation with respect to 2004. In the 2000-2005 period, there was a 20.6% reduction in landfill and a rise in the other management options. Their use as recycled material (925% increase) and for energy recovery (151.2% increase) is particularly significant.



## NOTES

- The 2<sup>nd</sup> Spanish National End-of-Life Tyre Plan 2007-2015 (*II Plan Nacional de Neumáticos Fuera de Uso 2007-2015*), set forth in Annex 4 of the Spanish National Integrated Waste Plan (PNIR – *Plan Nacional Integrado de Residuos*), implements the requirements of Royal Decree 1619/2005 (*Real Decreto 1619/2005*), of 30 December, on the management of end-of-life tyres (drawn up to regulate appropriate management of tyres when they become waste, and to lay down the obligations of all the economic agents involved in the life-cycle of tyres). This second Plan is intended to meet the following environmental objectives:
  - 10% reduction in the weight of ELTs generated.
  - Recovery and reuse of 98% of ELTs generated by 2008.
  - Retreading of at least 20% of the weight of ELTs generated.
  - Recycling of 50% of the weight of ELTs generated (40% as material for road surfaces and 10% in other industrial applications).
  - Recovery and recycling of 100% of steel.
  - Recovery of the energy value of 30% of ELTs generated.

## SOURCES

- Integrated Management System for End-of-Life Tyres (*Sistema Integrado de Gestión de Neumáticos Usados*), 2007. "2006 Report. Treading a New Path" (*Memoria 2006. Hacia una nueva rodadura*).

## FURTHER INFORMATION

- <http://www.mma.es>
- <http://www.fairguide.com/A-E-R>
- <http://www.signus.es>
- <http://www.tnu.es>

## Bio-fuel consumption

Although still small-scale, bio-fuel consumption has grown considerably in recent years

FUEL CONSUMPTION (kilotonnes)

Tipo	2000	2001	2002	2003	2004	2005	2006	2007(*)
Petrol	8,539.0	8,406.0	8,174.0	8,052.0	7,721.0	7,269.0	6,940.0	66,696.0
Diesel	26,054.0	27,901.0	28,767.0	31,004.0	33,019.0	34,295.0	35,257.0	36,730.0
Bio-ethanol				152.0	168.6	176.5	178.9	176.0
Bio-diesel				5.8	9.4	27.0	62.9	303.0

Source: APPA and CORES (MITYC)

In Spain, bio-ethanol and bio-diesel are the two bio-fuels commercially available. Among non-liquid bio-fuels, bio-gas shows growth potential, although it is currently used more for electric power production than for transport.

Since 2003, when it became obligatory for Member States to inform the European Commission of use of alternative fuels, their consumption has increased faster than that of petroleum derivatives, despite the latter being in much greater demand (particularly diesel). The case of bio-diesel is especially significant, as use of this fuel has increased enormously (multiplying 52.1 times) since 2003. The increase in bio-diesel consumption in 2007 is largely driven by major imports (mostly from the USA).

In 2005, Spain was the EU-25's biggest bio-ethanol producer. It was followed in the ranking by Sweden, Germany and France. Moreover, it was placed fourth in the table for bio-diesel production, behind Germany, France and Italy.

In 2005, bio-fuel consumption in the EU-25 represented 1.0% of the total. Its target was to reach 1.4%. In Spain, consumption stood at less than 1% (0.44%). Thus, in order to achieve 2010 consumption targets, it will be necessary to promote national demand, raise domestic production and increase imports. As regards Spain's Renewable Energies Plan 2005-2010 (*Plan de Energías Renovables 2005-2010*), national bio-fuel consumption will practically have to quadruple from 550 Ktoe in 2006 to 2,200 Ktoe by 2010 if the Plan's targets are to be met.



## NOTES

- Directive 2003/30/EC, of 8 May 2003, on the promotion of the use of bio-fuels or other renewable fuels, sets the target of achieving a 5.75% share of the transport market for these fuels by 2010. This commitment was transposed to Spanish legislation by Royal Decree 61/2006 (*Real Decreto 61/2006*), of 31 January, and incorporated into the Renewable Energies Plan 2005-2010, although the target was raised to a slightly more ambitious 5.83%. The new measures adopted by the EU in set a 10% minimum obligatory target for bio-fuel use of in transport by 2020.
- It should be noted that the ambitious Community targets for bio-fuel penetration seem to be contributing to tensions on world food commodity markets. These tensions are also generated by the significant increase in demand for these commodities in Asia's major emerging economies (China and India) and also, possibly, by market speculation. In order to minimise these negative effects on biodiversity and food commodities, the EU is drawing up some basic sustainability criteria for bio-fuels, which will be incorporated into the legislation governing the quality of fuels and promotion of renewable energies.

## SOURCES

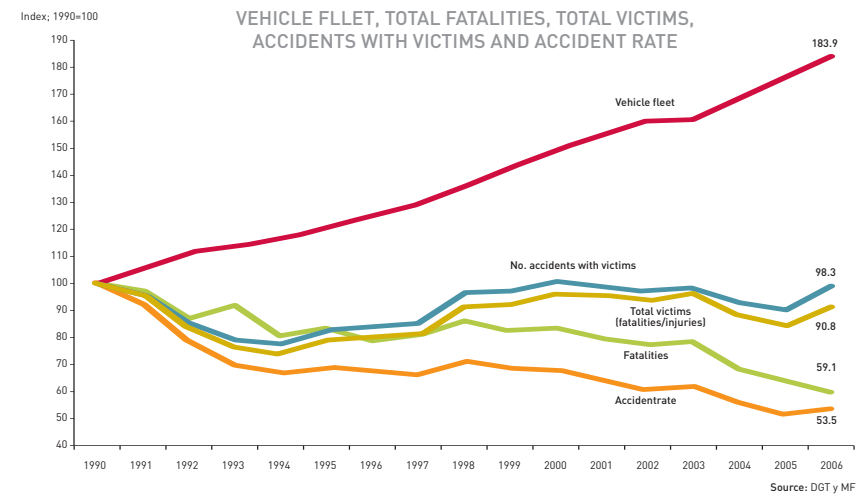
- CORES (Strategic Petroleum Product Reserves Corporation – *Corporación de Reservas Estratégicas de Productos Petrolíferos*), various years. "Summary Annual Report of the Fuel Statistics Journal. 2001 to 2006". (*Informe resumen anual del Boletín Estadístico de Hidrocarburos. Años 2001 a 2006*). Spanish Ministry of Trade, Industry and Tourism (MITyC – *Ministerio de Industria, Turismo y Comercio*).
- Renewables Energies Producers Association (Biofuel) (*Asociación de Productores de Energías Renovables [APPA Biocarburantes]*).

## FURTHER INFORMATION

- <http://www.appa.es>
- <http://www.cores.es>
- European Commission, 2007. "Report on the progress made in the use of bio-fuels and other renewable fuels in the Member States of the European Union". Communication from the Commission to the Council and the European Parliament, COM (2006) 845 final. Brussels.

## Motorisation and accident rate

In 2006, the number of traffic accident fatalities fell for the third year running since the rise in 2003. Nevertheless, there were still 4,104 deaths



In 2006, the number of traffic accident fatalities reached 4,104 (from 99,797 accidents). This figure is lower than the 5,528 average annual fatalities for the period 1989-2006 and than that for previous periods (5,776 and 6,948 in 2000 and 1990, respectively).

Nevertheless, this figure is still alarming as it means that over 11 people per day died in 2006 as a result of traffic accidents, making them one of the most significant social problems affecting the transport system.

In the 1990-2006 period, the number of fatalities dropped by 40.9%, while the total number of victims (including deaths and injuries) only fell by 9.2% and the number of accidents with victims only shrank by 1.7%. These figures take on their real value when the fact that the vehicle fleet grew by nearly 84% in this period is taken into account.

The relationship between the number of accidents with victims (deaths and injuries) and the vehicle fleet is expressed as the "accident rate", a ratio that is clearly decreasing and that has fallen from 6.47 in 1990 to 3.46 in 2006, meaning a reduction of 46.7% over the period. Nevertheless, as may be seen, there were isolated rises in the intermediate years; in 2005, for example, the accident rate was 3.30, a slightly lower level than in 2006.

Car manufacturers are incorporating an increasing number of more effective safety measures into vehicles, which contributes to the drop in fatalities being greater than the fall in the number of accidents. Meanwhile, the Public Administration is working to raise public awareness of the issue through on-going information campaigns intended to prevent accidents. Additional measures include the introduction of the points-based driver's licence in July 2006 or the recent amendment to the Penal Code to modify its application to matters of road safety.

According to the provisional report by the Spanish Directorate General for Traffic (DGT – *Dirección General de Tráfico*) "Road Accident Figures. 2007" (*Balace siniestralidad. Año 2007*) published in January 2008, the road accident rate dropped for the fourth consecutive year. Comparing 2007 with 2003 (4 years), reveals 1,288 fewer fatalities (taking into account only deaths in the 24 hours following the accident), representing a 32% drop. Road deaths have fallen from 11 per day in 2003 to 7.5 in 2007, i.e. 3.5 fewer deaths every day. In the 2003-2007 period, the drop in fatalities occurred in a scenario of overall growth: more vehicles (18% increase in vehicle fleet), more drivers (12% increase in number of drivers), and more journeys (6% increase in number of journeys).

#### NOTES

- The vehicle fleet includes: lorries, vans, buses, passenger cars, motorcycles, industrial tractors and other vehicles (trailers, semi-trailers and special vehicles, excluding self-propelled agricultural machinery and towed agricultural machinery). It does not include mopeds.
- The accident rate is calculated by dividing the total annual number of accidents with victims (on both highways and in urban areas) by the vehicle fleet recorded at the end of each year (multiplied by one thousand). This indicator is represented by means of a reference index (1990), with percentage figures for subsequent years being given in terms of this index.

#### SOURCES

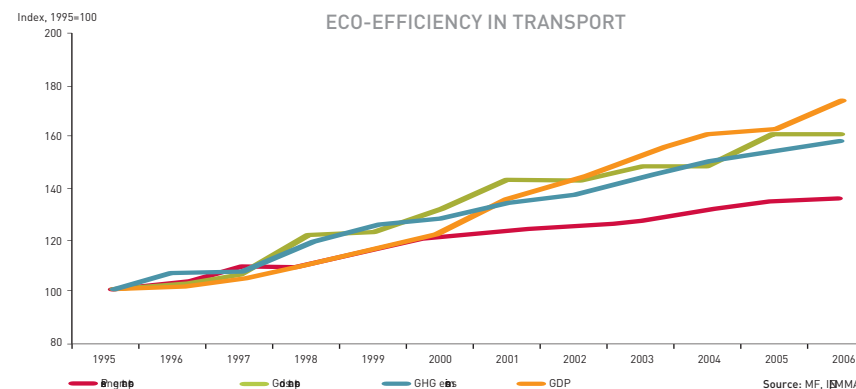
- Directorate General for Traffic (DGT). "Statistical Series for Accidents and Victims I" (*Series estadísticas sobre accidentados y víctimas I*). Web page: [http://www.dgt.es/dgt\\_informa/observatorio\\_seguridad\\_vial](http://www.dgt.es/dgt_informa/observatorio_seguridad_vial). Spanish Ministry of the Interior (MI – Ministerio del Interior).
- Directorate General for Traffic (DGT). "General Statistics Yearbook" (*Anuario Estadístico General*). Various years. Spanish Ministry of the Interior (MI).
- Spanish National Road Safety Monitoring Centre (*Observatorio Nacional de Seguridad Vial*). "Key Road Accident Figures. Spain 2006" (*Las principales cifras de la Siniestralidad Vial. España 2006*). Directorate General for Traffic (DGT). Spanish Ministry of the Interior (MI).
- Directorate General for Traffic (DGT), 2008. "Road Accident Figures. 2007. Provisional Data" (*Balace de siniestralidad. Año 2007. Datos provisionales*). Spanish Ministry of the Interior (MI).
- Spanish Ministry of Public Works (MF), 2007. "Statistics Yearbook 2006" (*Anuario estadístico 2006*).

#### FURTHER INFORMATION

- <http://www.fomento.es>
- <http://www.dgt.es>
- [http://www.ec.europa.eu/transport/roadsafety/charter/index\\_es.htm](http://www.ec.europa.eu/transport/roadsafety/charter/index_es.htm) [European Road Safety Charter].
- <http://www.eea.europa.eu/>
- <http://www.etsc.be>
- Commission of the European Communities. "Transport White Paper. European transport policy for 2010: time to decide". [COM (2001) 370 final]. Brussels, 12 September 2001.
- Commission of the European Communities. "European Road Safety Action Programme. Halving the number of road accident victims in the European Union by 2010: a shared responsibility". [COM (2003) 311 final, 2 June 2003].
- Commission of the European Communities "European Road Safety Action Programme. Mid-Term Review" [SEC (2006) 221]. Brussels, 10 February 2006.

## Eco-efficiency in transport

In recent years, transport's economic growth has been greater than the increase in GHG emissions, although both are linked



The relationship between transport's economic growth (measured by its Gross Value Added) and the pressure that its development exerts on the environment (measured in terms of GHG emissions, which are affected to a large extent by demand for passenger and goods transport), paints an unfavourable picture for the environment as there exists a clear link between these variables. Nevertheless, and without denying the obvious environmental pressure it generates, the fact that transport's economic growth is greater than the rise in GHG emissions means that the sector is moving towards greater eco-efficiency and that it is not one of the worst productive sectors.

The eco-efficiency analysis shows that since 2002, transport's GVA has grown at a higher rate than its emissions. Specifically, in the 1995-2006 period, the sector recorded economic growth of 74.3%, while GHG emissions increased by 59.0%. In turn, demand for goods and passenger transport also increased less than the GVA (61.4% and 36.2%, respectively), showing that relatively less transport is being used to make the activity more economically profitable.

**NOTES**

- Greenhouse Gas (GHG) emissions by transport refer to those produced by group 7 of the SNAP classification (Road Transport) and part of group 8 (Other Transport Modes: rail, air and sea) and pipeline transport included in stationary sources (SNAP 01.05.06). The estimates include emissions of CH<sub>4</sub>, N<sub>2</sub>O and CO<sub>2</sub>, but omit fluorinated gases. These estimates are obtained from annual emissions of each of the three pollutants, converted into tonnes of CO<sub>2</sub> equivalent in accordance with their global warming potential: 1 for CO<sub>2</sub>, 21 for CH<sub>4</sub> and 310 for N<sub>2</sub>O.
- GVA refers only to transport, excluding the part corresponding to communications. It refers to current prices (Base 2000).

**SOURCES**

- Ministry of the Environment (MMA), 2008. "Spanish National Atmospheric Emissions Inventory 2006". Sub-Directorate General for Air Quality and Risk Prevention.
- Spanish National Institute of Statistics (INE - *Instituto Nacional de Estadística*). Spanish National Accounts (*Contabilidad Nacional de España*). Economic Accounts (*Cuentas económicas*). Base 1995. Series 1995-2002.
- Ministry of Public Works (MF), 2007. "Transport and Mail Services. Annual Report 2006".

**FURTHER INFORMATION**

- <http://www.mma.es>
- <http://www.fomento.es>
- <http://www.ine.es>
- <http://www.eea.europa.eu/>

