

Comparative study on transport infrastructures

M. Rosa Bayà (October 2008)

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Comparative study on transport infrastructures

1. BASIC DATA

1.1. Population, surface area and GDP

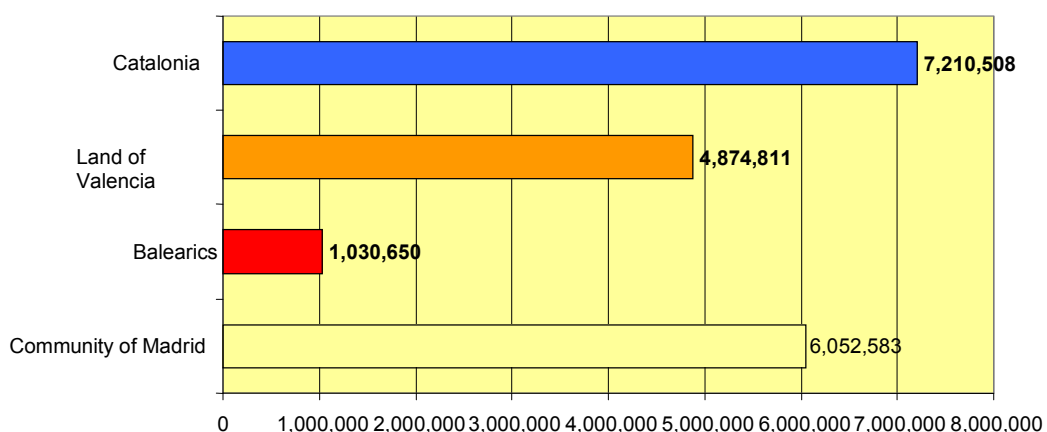
The following table shows the population and surface area data for Catalonia, the Land of Valencia and the Balearics in 2007. The lower rows also show the population of the Community of Madrid and of the whole of Spain, and the percentages for all these data, to aid the comparison:

	Population 2007	%	Surface area (km ²)	%
Catalonia	7,210,508	16%	32,106,54	6.3%
Land of Valencia	4,874,811	10.8%	23,255	4.6%
Balearics	1,030,650	2.3%	4,968,36	1%
Madrid	6,052,583	13.61%	8,027,90	1.6%
Spain	44,474,631	100%	505,990	100%

Sources: Catalonia, Idescat; Land of Valencia, Balearics, Madrid and Spain, INE.

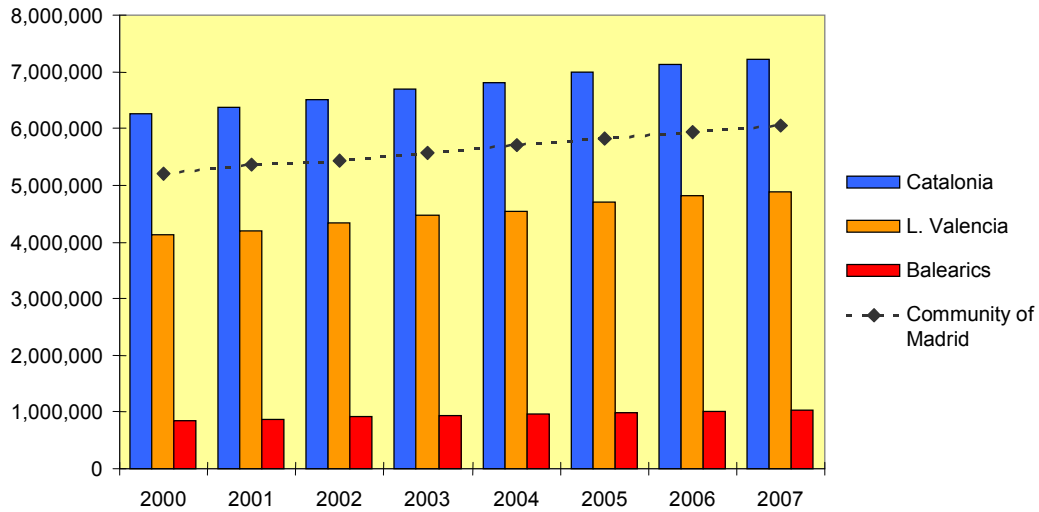
The following graphs show the population data for 2007 (graph 1) and the evolution of the population between the years 2000 and 2007 (graph 2) for the three territories studied plus Madrid:

>>> **Graph 1.** Population of Catalonia, the Land of Valencia, the Balearics and the Community of Madrid in 2007.



Sources: Catalonia, Idescat; Land of Valencia, Balearics and Community of Madrid, INE.

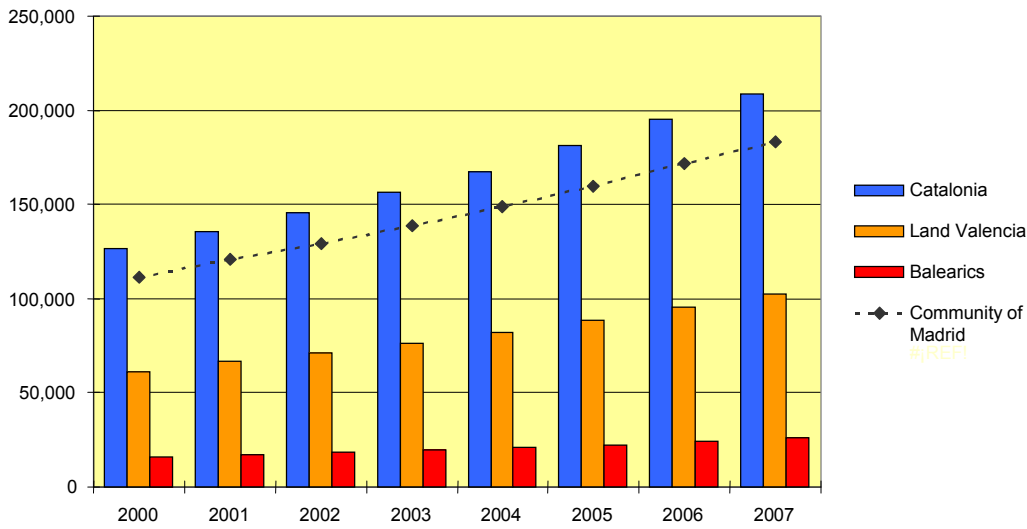
>>> **Graph 2.** Evolution of population in the period 2000-2007.



Sources: Catalonia, Idescat; Land of Valencia, Balearics and Community of Madrid, INE.

In relation to Gross Domestic Product at market prices (GDPmp), graph 3 indicates the evolution between the years 2000 and 2007 for the three territories studied. As always we add the GDPmp corresponding to the Community of Madrid for the same period:

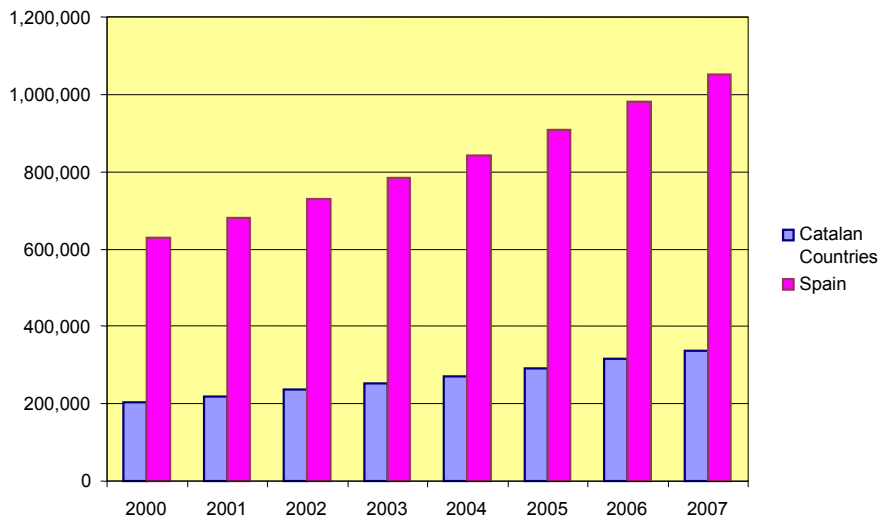
>>> **Graph 3.** Evolution of GDPmp between 2000 and 2007 (millions of euros).



Sources: Catalonia, Idescat; Land of Valencia, Balearics and Madrid, INE.

Graph 4 compares the evolution of GDPmp between 2000 and 2007 between the Catalan Countries overall and Spain. The Catalan Countries represented just over 30% of the Spanish total throughout the period:

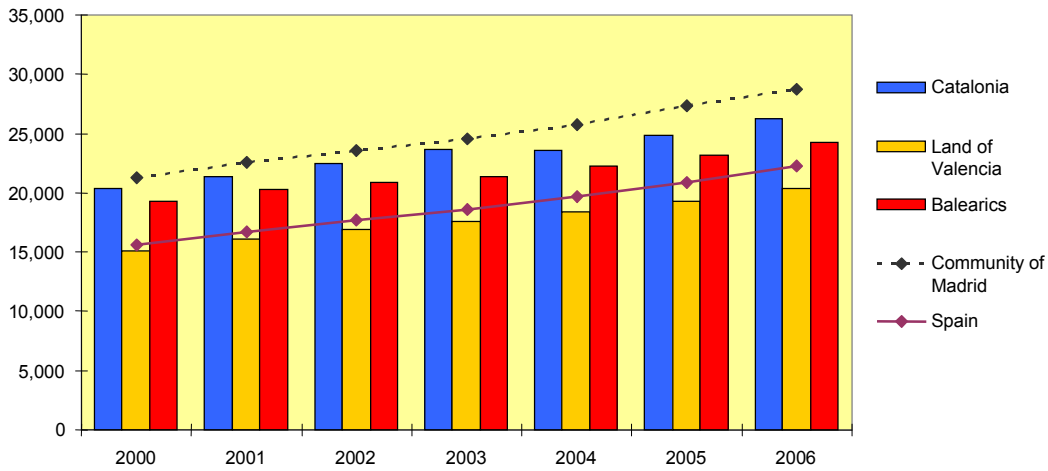
>>> **Graph 4.** Evolution of GDPmp in the Catalan Countries and Spain between 2000 and 2007 (millions of euros).



Own elaboration from the Idescat and the INE.

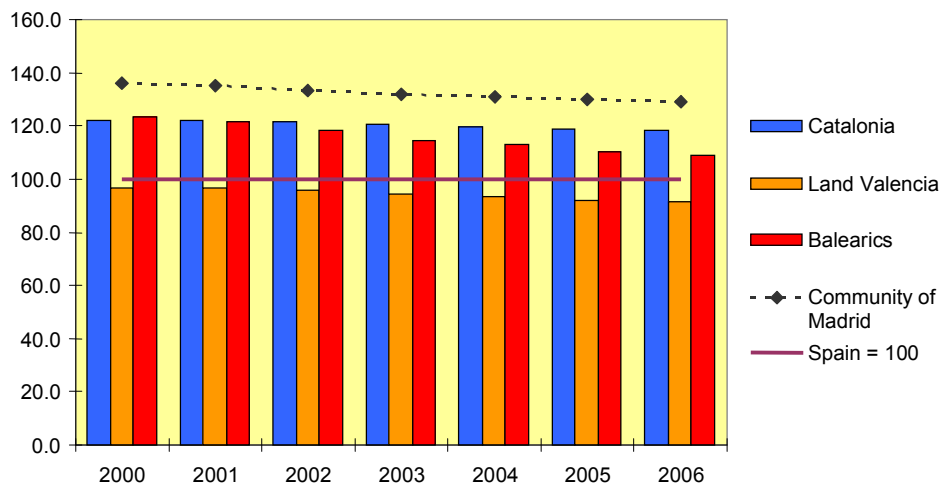
Graphs 5 and 6 reproduce GDP per inhabitant in the period 2000-2006. The former indicates the evolution of GDP per capita in millions of euros while the latter shows the index corresponding to each territory taking Spain = 100 as the reference.

>>> **Graph 5.** Evolution of GDP per capita between 2000 and 2006 (euros).



Source: INE.

>>> **Graph 6.** Index GDP per capita (2000-2006). Spain = 100.



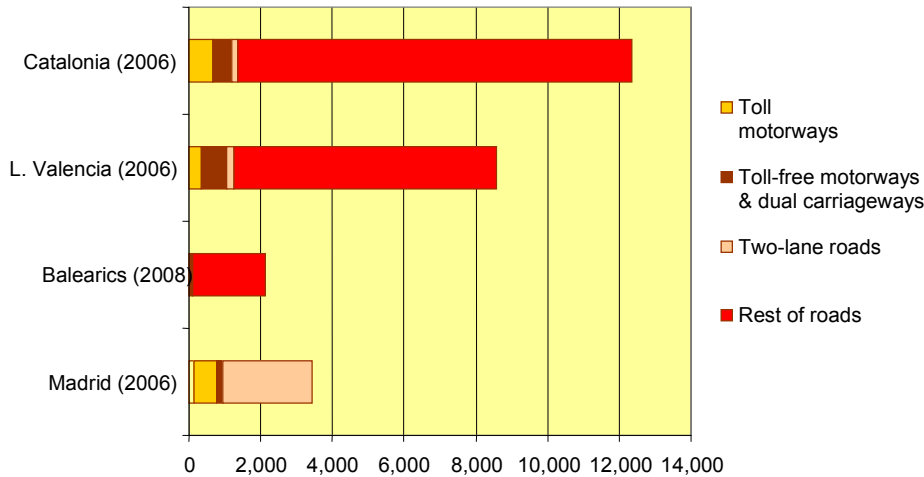
Source: INE.

1.2. Figures

1.2.1. Road network

On the road network we distinguished between toll motorways, toll-free motorways and dual carriageways, two-lane roads and rest of roads. In accordance with this, the total kilometres of roads in the territories studied, plus the Community of Madrid, are shown in graph 7:

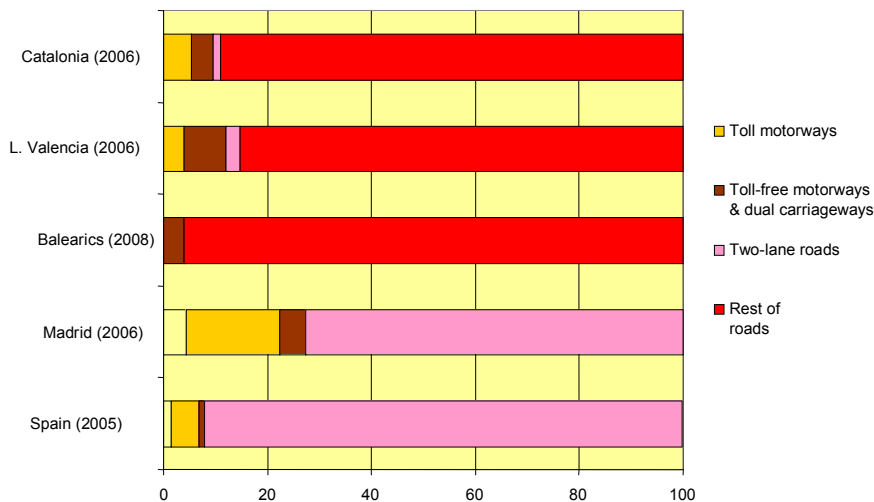
>>> **Graph 7: Kilometres of road in Catalonia, the Land of Valencia, the Balearics and the Community of Madrid.**



Sources: Catalonia, *Anuari Estadístic de Catalunya*; Land of Valencia, *IVE*; Balearics, *Balearic Government*; Community of Madrid, *Anuario estadístico de la Comunidad de Madrid*.

Graph 8, on the other hand, illustrates the above data in percentages, moreover adding the data corresponding to the whole of Spain:

>>> **Graph 8: Main types of road (in percentages).**

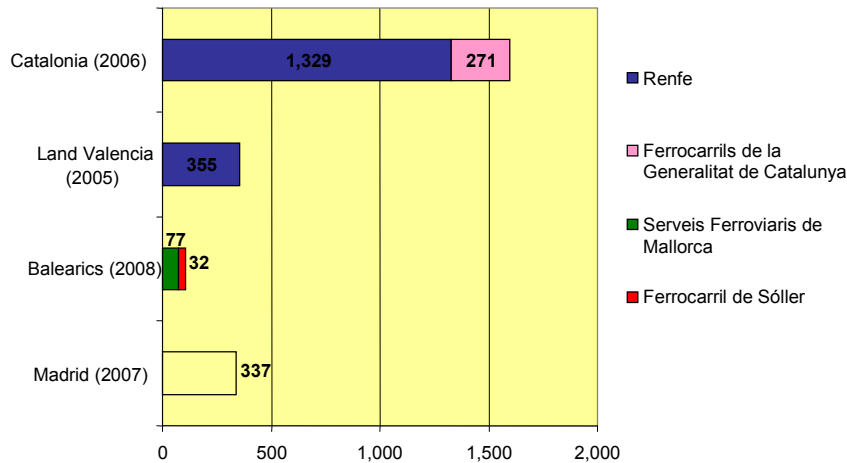


Sources: Catalonia, *Anuari Estadístic de Catalunya*; Land of Valencia, *IVE*; Balearics, *Balearic Government*; Community of Madrid, *Anuario estadístico de la Comunidad de Madrid*; Spain, *INE*.

1.2.2. Railway network

As for the train network, below we show the kilometres in each of the territories, plus Madrid, distinguishing the part corresponding to Renfe from that managed by FGC, for Catalonia, and the small firms in charge of the trains in the Balearics.

>>> **Graph 9. Kilometres of train indicating the bodies which manage them.**

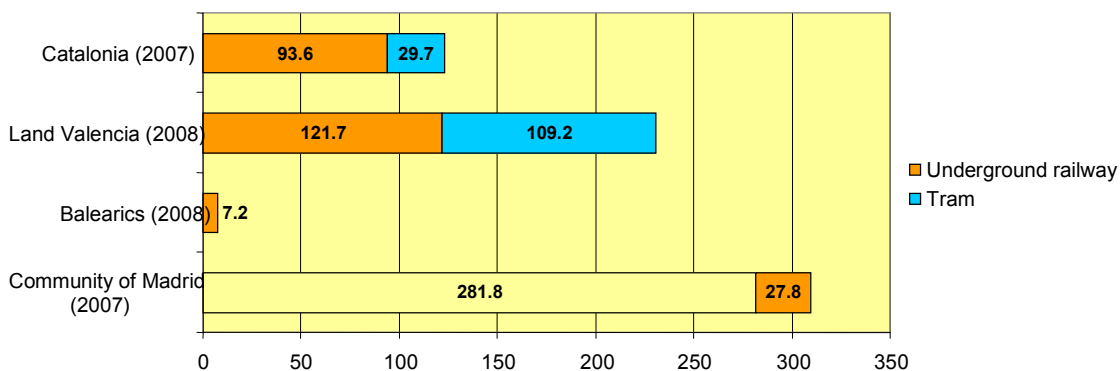


Sources: Catalonia, *Anuari Estadístic de Catalunya*; Land of Valencia, *IVE and Sustainability Report of Renfe 2005*; Balearics, *Balearic Government and Palma City Council*; Madrid, *Department of Transport and Infrastructures of the community*.

1.2.3. Underground railway and tram

The three capitals of the Catalan Countries have an underground railway (the one in Palma, inaugurated in 2007, was idle for some months due to technical problems, but came back into operation in July 2008). In Barcelona, Valencia and Alicante, moreover, there are tram lines or inter-city trains. The following graph shows the kilometres of these infrastructures for the cities mentioned plus Madrid, which has a broad underground railway, light railway and tram network.

>>> **Graph 10: Kilometres of underground railway and tram.**

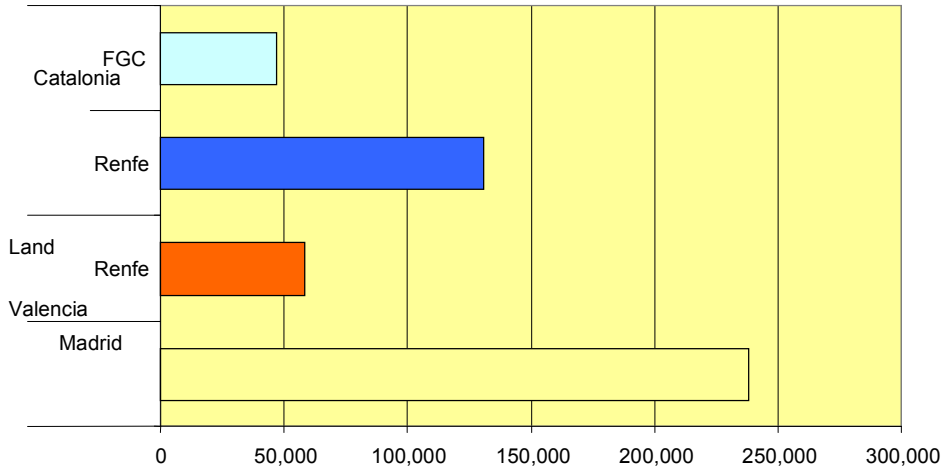


Sources: Catalonia, *Anuari Estadístic de Catalunya*; Land of Valencia, IVE and FGV; Balearics, Balearic Government and Palma City Council; Community of Madrid: www.wikipedia.org.

1.2.4. Passenger volume

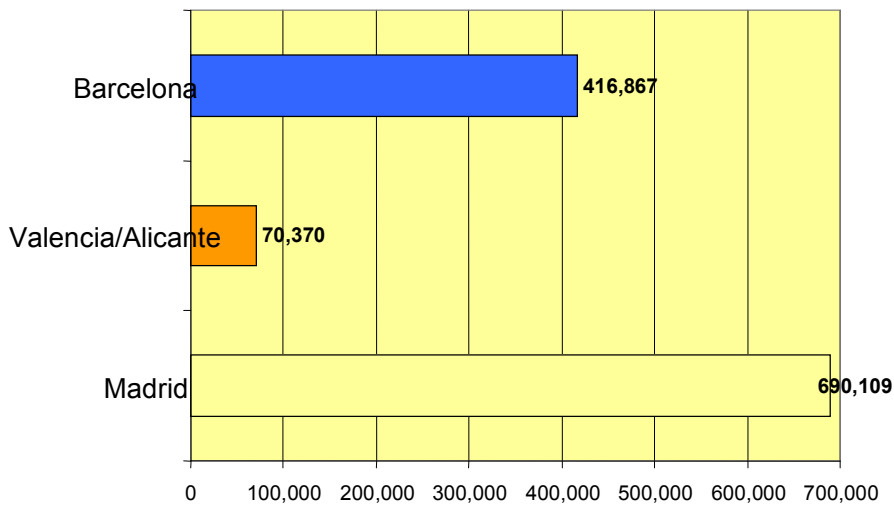
The passenger figures for each of the means of transport are indicated below:

>>> **Graph 11:** Train passenger transport figures 2004 (in thousands).



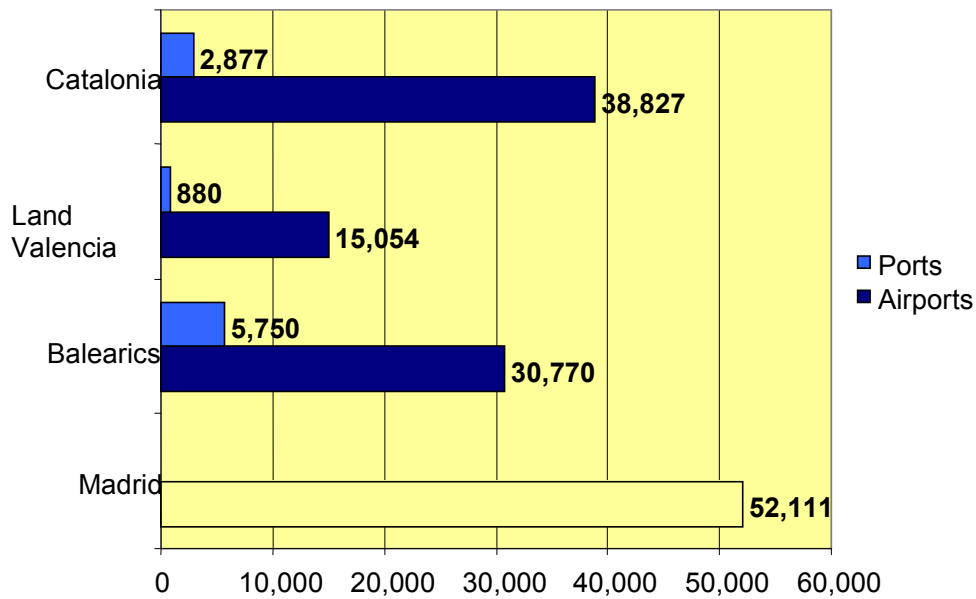
Sources: Catalonia, *Anuari Estadístic de Catalunya*; Land of Valencia, IVE and INE; Madrid, INE.

>>> **Graph 12:** Underground railway and tram passenger transport figures 2007 (in thousands).



Sources: Catalonia, *Anuari Estadístic de Catalunya*; Land of Valencia, IVE; Madrid, Department of Transport and Infrastructures of the community.

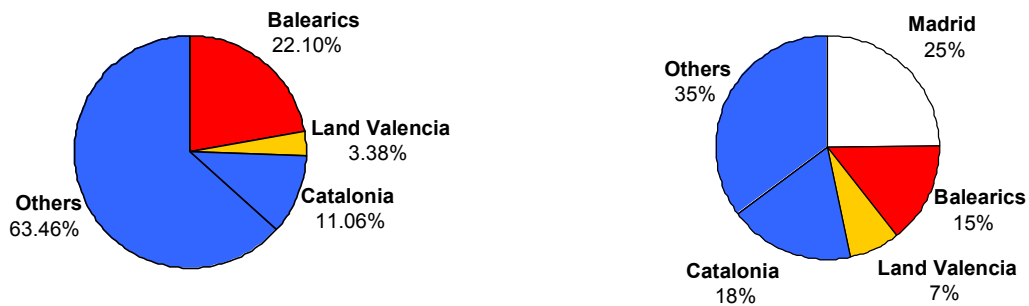
>>> **Graph 13:** Passenger transport figures in ports and airports 2007 (in thousands).



Sources: Catalonia, *Anuari Estadístic de Catalunya*; Land of Valencia, Ministry of Public Works and AENA; Balearics, Port Authority of the Balearics and AENA; Madrid, AENA.

In the following graphs we can observe the percentages represented by the passenger figures for the ports and airports studied in relation to the whole of Spain:

>>> **Graph 14:** Percentage of passengers in the ports and airports of the Balearics, Catalonia and the Land of Valencia in relation to the whole of Spain.

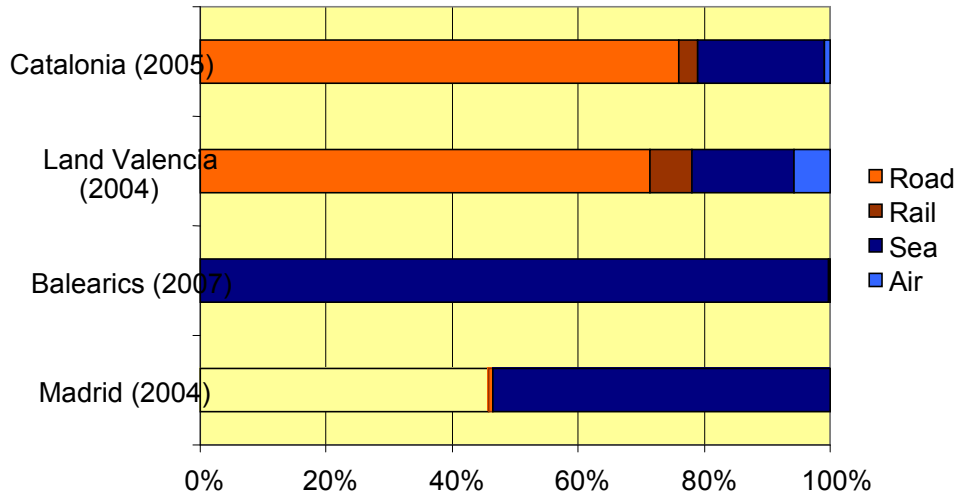


Own elaboration from the Ministry of Public Works and AENA.

1.2.5. Goods percentages

As regards the weight of the different infrastructures in relation to goods transport, the percentages are distributed as follows:

>>> **Graph 15: Percentages of the means of transport used to transport goods.**



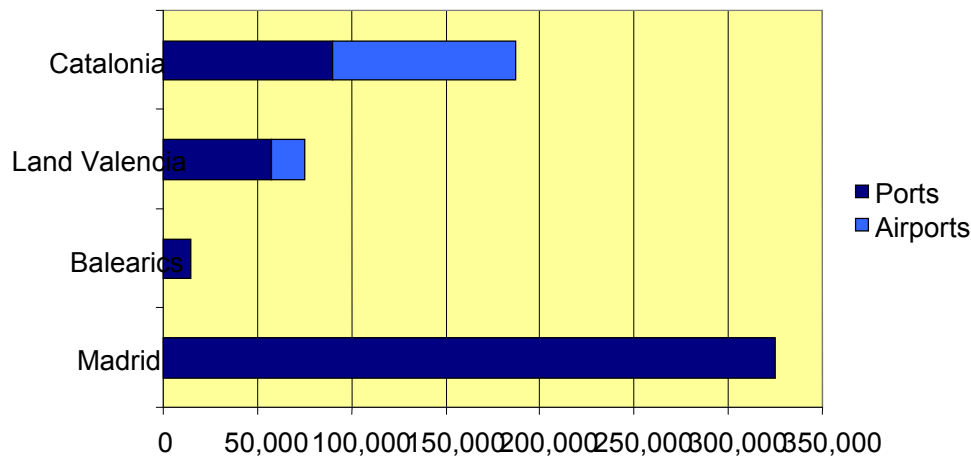
Sources: Catalonia, Generalitat de Catalonia; Land of Valencia, INE; Balearics, Port Authority of the Balearics and AENA; Madrid, INE and AENA.

1.2.6. Tons of goods in ports and airports

In relation to the quantities of goods transported by ship and plane, the details are as follows:

>>> **Graph 16: Thousands of tons of goods in ports and airports (2007).**

Comentari [js1]: Aquest apartat s'ha de revisar pel que fa a les dades de Catalunya. No quadren els percentatges del gràfic 11 amb les tones (crec que no sé interpretar bé les xifres).



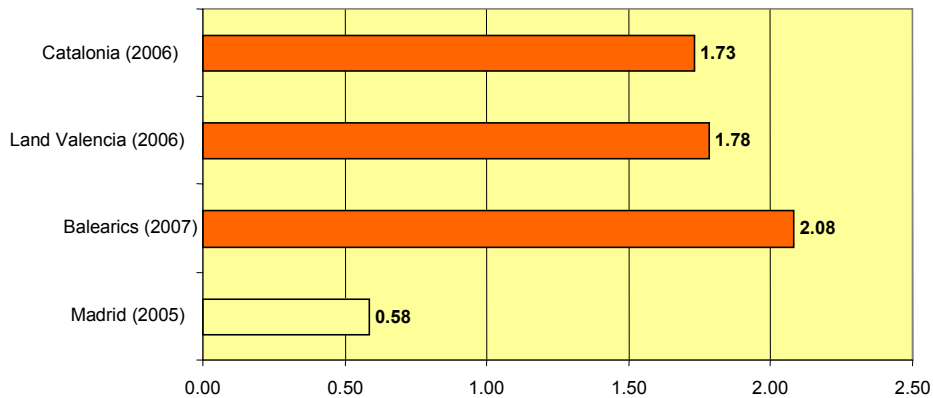
Sources: For airports, AENA; For ports, Catalonia: Idescat; Land of Valencia, Ministry of Public Works; Balearics, Port Authority of the Balearics.

1.3. Ratios

1.3.1. Number of kilometres of road per 1,000 inhabitants

Starting from the total number of kilometres of road — of any kind: motorways, toll-free dual carriageways and one or two-lane roads — in the territories studied (see graph 7), the following ratios are deduced per 1,000 inhabitants:

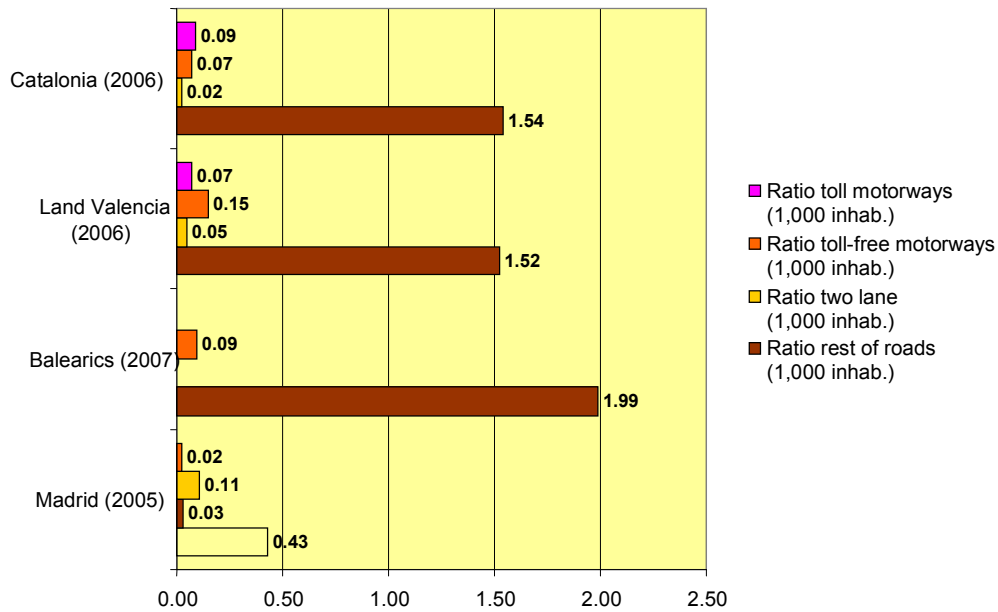
>>> **Graph 17: Kilometres of road per 1,000 inhabitants.**



Own elaboration from data from graphs 2 and 7.

If we distinguish between type of road, the resultant ratios are as follows:

>>> **Graph 18: Kilometres of road per 1,000 inhabitants according to type of road.**

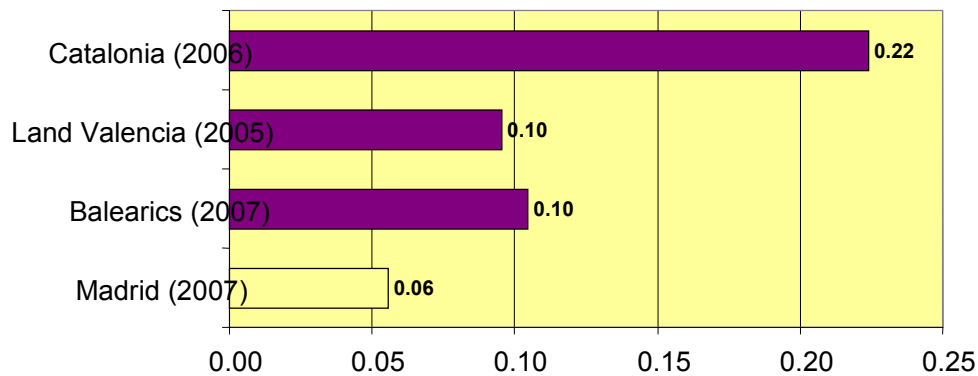


Own elaboration from data from graphs 2 and 7.

1.3.2. Number of kilometres of railway per 1,000 inhabitants

In relation to the kilometres of railway line, the resultant ratios are as follows:

>>> **Graph 19: Kilometres of railway per 1,000 inhabitants.**

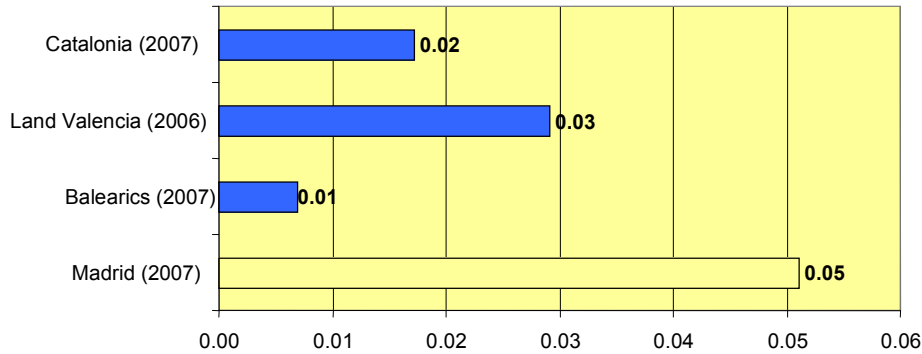


Own elaboration from data from graphs 2 and 9.

1.3.3. Number of kilometres of underground railway and tram per 1,000 inhabitants

The ratios corresponding to the kilometres of underground railway and tram are shown in graph 20:

>>> **Graph 20:** Kilometres of underground railway and tram per 1,000 inhabitants.



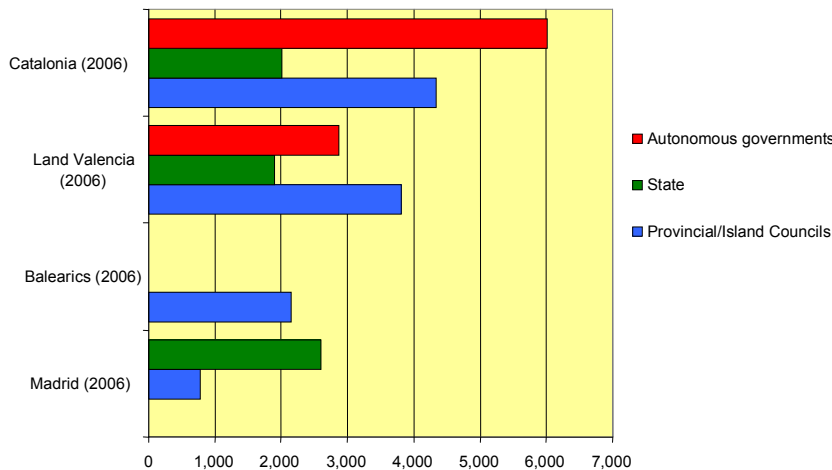
Own elaboration from data from graphs 2 and 10.

1.4. Transport infrastructure management

1.4.1. Road

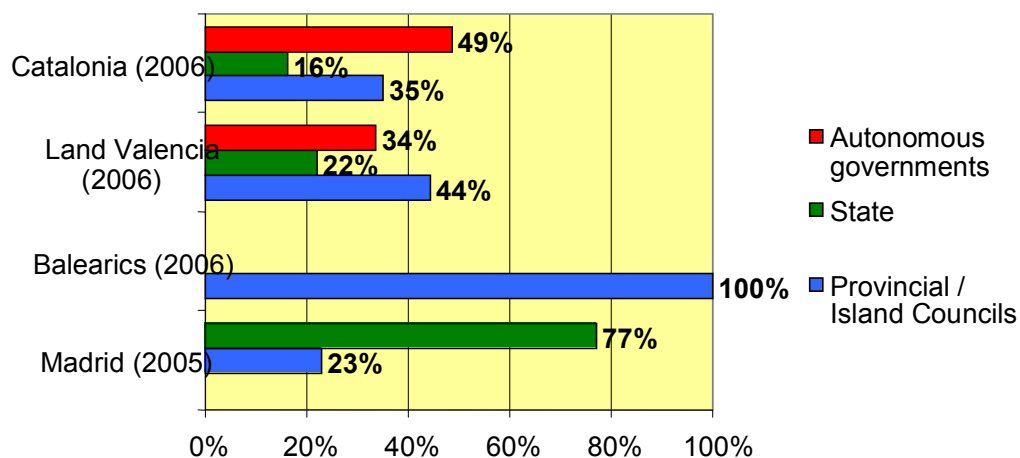
The management of roads can be the responsibility of the state government in some cases, of the regional governments in others, and there are also some which depend on the provincial councils or, in the Balearic Islands, on the Island Councils. The two following graphs represent how management of roads is distributed between the administrations in each of the territories. The first one indicates the total number of kilometres managed by the different administrations, while the second one expresses the data in percentages:

>>> **Graph 21:** Number of kilometres of road managed by each administration.



Sources: Catalonia, Idescat; Land of Valencia, IVE; Balearics and Madrid, INE.

>>> **Graph 22:** Distribution of the management of roads between administrations in percentages.



Own elaboration.

The following table indicates the kilometres of road for which each administration is responsible, likewise specifying the type of road in each case:

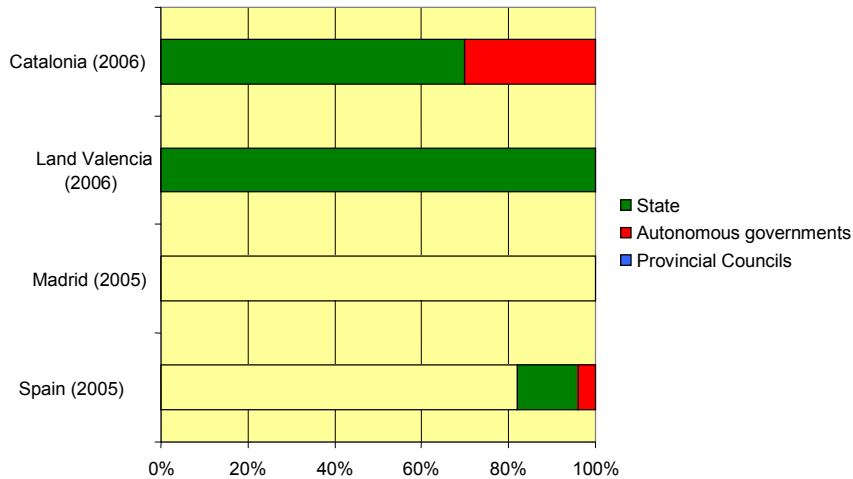
	Catalonia (2006)	L. Valencia (2006)	Balearics (2006)	Madrid (2005)
Autonomous governments	6,008 km	2,874 km		2,606 km
Toll motorways	197 km			
Toll-free dual carriageways	239 km	129 km		68 km
Two-lane roads	72 km	122 km		165 km
Single-lane roads	5,500 km	2,623 km		2,373 km
State	2,015 km	1,901 km		809 km
Toll motorways	459 km	334 km		135 km
Toll-free dual carriageways	286 km	573 km		534 km
Two-lane roads	100 km	57 km		11 km
Single-lane roads	1,170 km	937 km		107 km
Regional / Island Councils	4,339 km	3,805 km	2,145 km	
Toll motorways				
Toll-free dual carriageways	3 km			
Two-lane roads		50 km		

Single-lane roads	4,337 km	3,755 km		
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Sources: Catalonia, Idescat; Land of Valencia, IVE; Balearics, Balearic Government; Madrid, INE.

As can be seen in the above table, the state is responsible for the majority of the toll motorways. The following graph shows in percentages which authority is responsible for the management of the toll motorways, both in the territories studied, and in the whole of Spain:

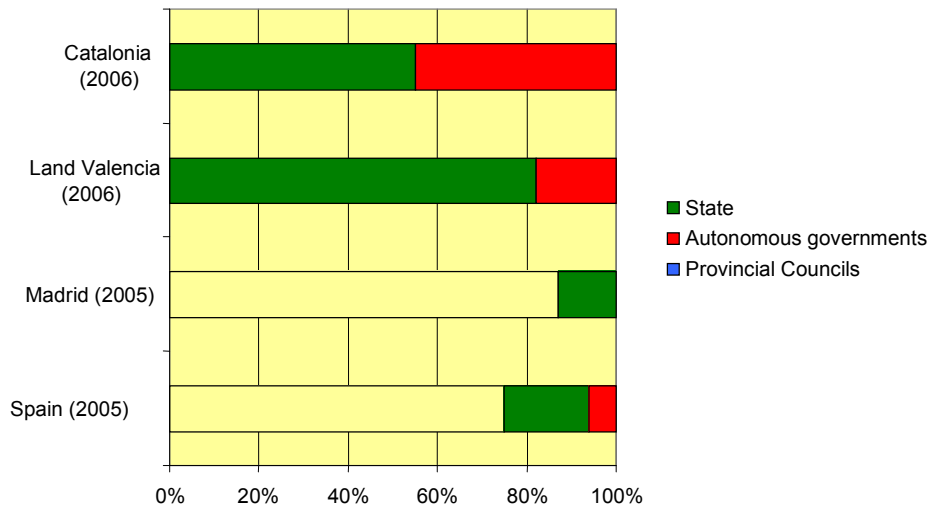
>>> **Graph 23: Management of the toll motorways (in percentages).**



Sources: Catalonia, Idescat; Land of Valencia, IVE; Madrid and Spain, INE.

And graph 24 shows the same but in relation to toll-free dual carriageways:

>>> **Graph 24: Management of toll-free dual carriageways (in percentages).**

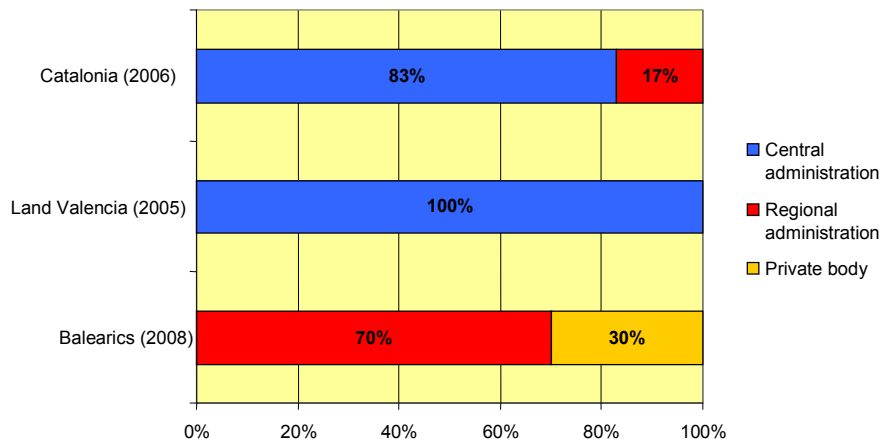


Sources: Catalonia, Idescat; Land of Valencia, IVE; Madrid and Spain, INE.

1.4.2. Railway and underground railway

The railway network is managed, in Catalonia, by Renfe (central administration) and Ferrocarrils de la Generalitat de Catalonia (regional administration). In the Land of Valencia it is the responsibility of Renfe, while on the Islands the railways belong to the public company Serveis Ferroviaris de Mallorca (Balearic Government), and to the privately owned Ferrocarril de Sóller. Thus, responsibility for the trains is distributed as follows:

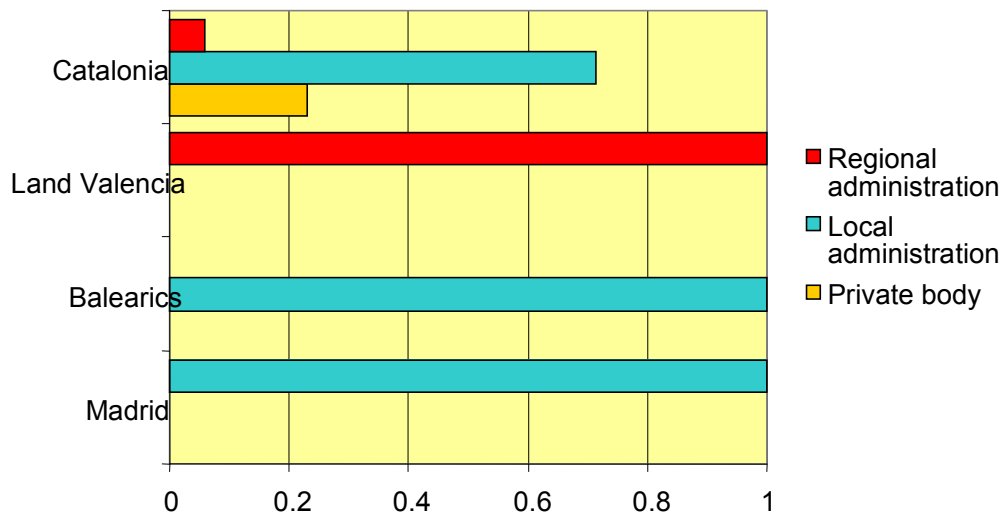
>>> **Graph 25. Management of the railway network.**



Own elaboration.

In relation to the management of the underground railway and tram services, the responsibilities are distributed as indicated below:

>>> **Graph 26: Management of the underground railway and tram.**



Own elaboration.

1.4.3. Port and airport management

The management of the airports in the territories studied corresponds to the public organization AENA, dependent on the Ministry of Public Works.

Management of the big ports also depends on the Ministry of Public Works, which determines the policies to follow, although the different port authorities have a mixed arrangement: there are representatives from the different administrations and from the economic sectors related to the port activity.

In the Balearics, some ports (Ciutadella, Cala Rajada and Sant Antoni), in addition to the fishing ports, are answerable to the Regional Environment Department, while the marinas are operated by private companies through concessions.

In Catalonia, the ports of Vilanova i la Geltrú, Palamós, Sant Carles de la Ràpita, Alcanar and Vallcarca are answerable to the Generalitat.

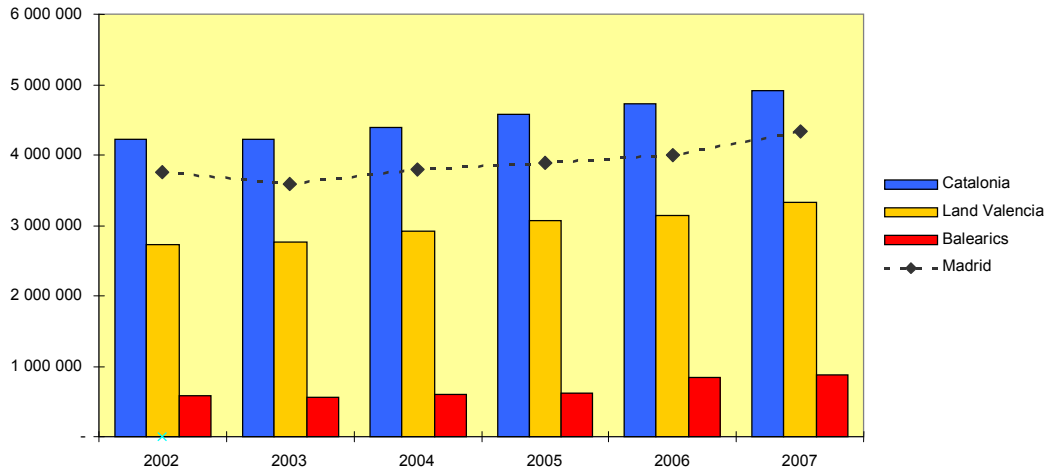
In the Land of Valencia there are about forty ports which are answerable to the Generalitat, either directly or through concessions. The following big ports are, however, excluded: València (Sagunt and Gandia), Castelló and Alicante. These are answerable to the Ministry of Public Works.

2. EVOLUTION

2.1. Evolution of land traffic

The first aspect that we will illustrate in relation to the evolution of land traffic is the growth in the number of vehicles in recent years:

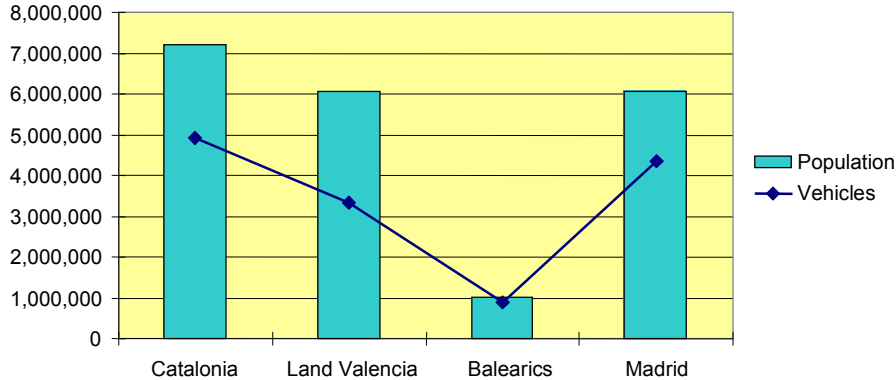
>>> **Graph 27:** Growth in number of vehicles, period 2002-2007.



Source: State Traffic Office. Ministry of the Interior.

In relation to the population of each territory, the total number of vehicles for 2007 can also be represented like this:

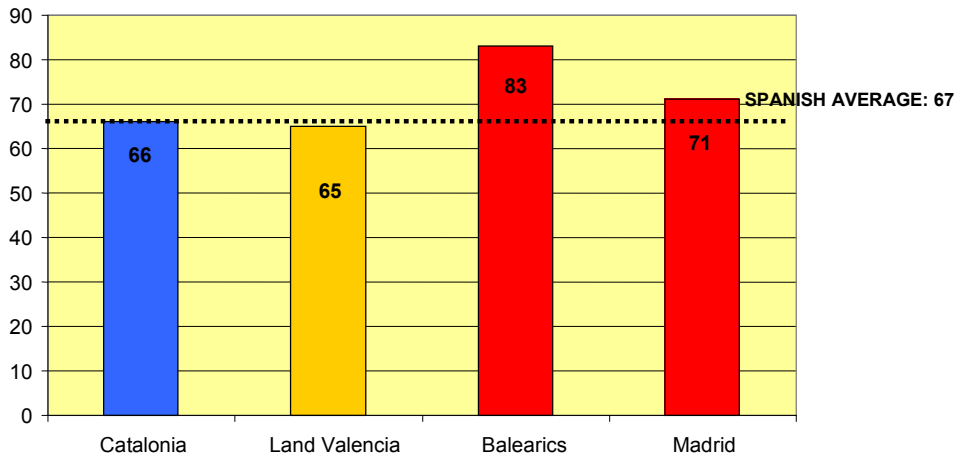
>>> **Graph 28:** Population and vehicles (2006).



Own elaboration.

The motorization rates which result from the above data are shown in graph 29:

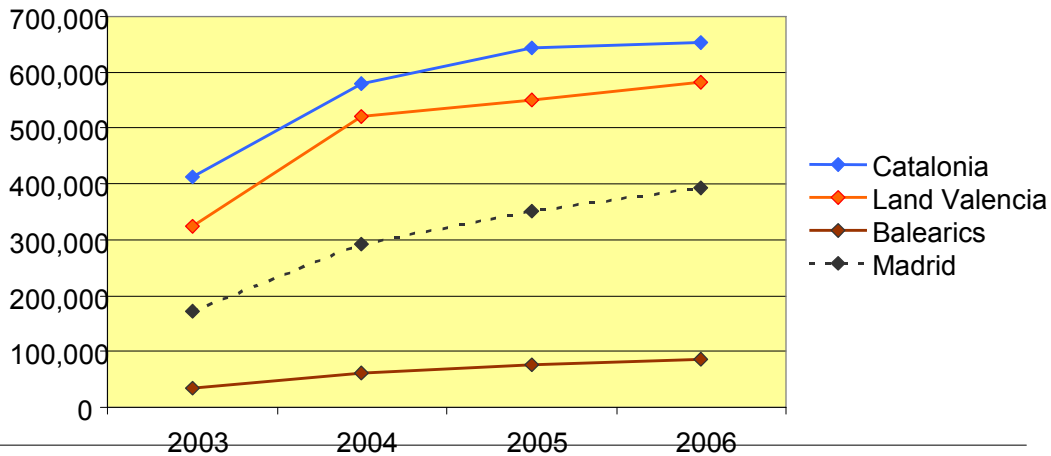
>>> **Graph 29:** Vehicles per 100 inhabitants (2007).



Source: State Traffic Office. Ministry of the Interior.

As for the evolution of goods traffic, the following graph represents the growth in goods transport by road in recent years:

>>> **Graph 30:** Evolution of goods traffic by road, period 2003-2006.



Own elaboration starting from the INE.

In the following table we break down, for each territory, whether the goods are leaving for other destinations (origin) or whether they are arriving in the territory in question (destination):

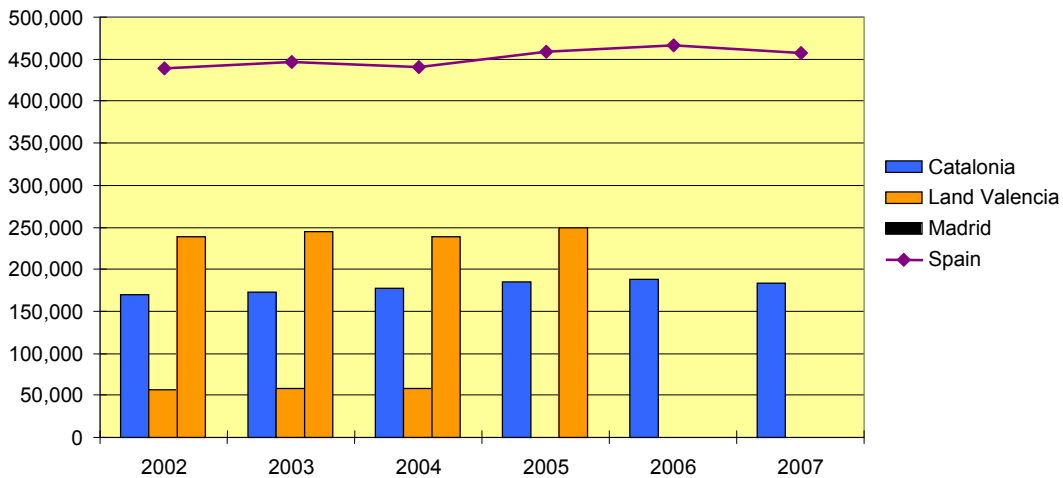
	Balearics		Land of Valencia		Catalonia		Madrid	
	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination
2003	16,491	17,103	161,272	163,342	206,930	204,739	80,377	92,343
2004	30,024	30,527	257,180	264,030	291,601	287,006	139,259	152,817
2005	37,569	38,454	273,299	277,585	324,303	319,277	165,560	185,427
2006	41,908	42,977	290,326	292,102	330,188	323,486	185,295	207,033

Source: INE.

2.2. Evolution of railway traffic

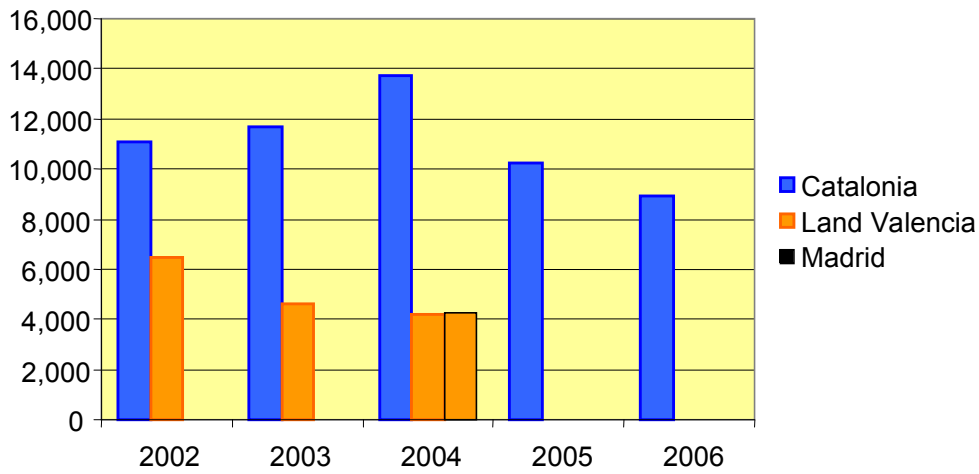
As regards the evolution in the volume of train users (graph 31), we have the data corresponding to Catalonia, the Land of Valencia, Madrid and the whole of Spain. We have not included the Balearics in this section. There are very limited data on the evolution of goods transport (graph 32).

>>> **Graph 31: Railway traffic. Evolution of number of passengers (thousands).**



Sources: Catalonia, Idescat; Land of Valencia, Madrid and Spain, IVE and Renfe.

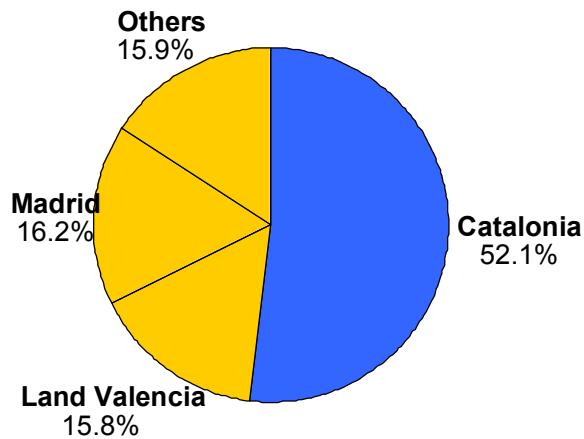
>>> **Graph 32:** Railway traffic. Evolution of goods transport (thousands of tons).



Sources: Catalonia, Idescat; Land of Valencia and Madrid, INE and Renfe.

The following graph shows, for 2004 (precisely the year when the highest volume of goods was transported in Catalonia), the proportion of these volumes between Catalonia, the Land of Valencia and Madrid:

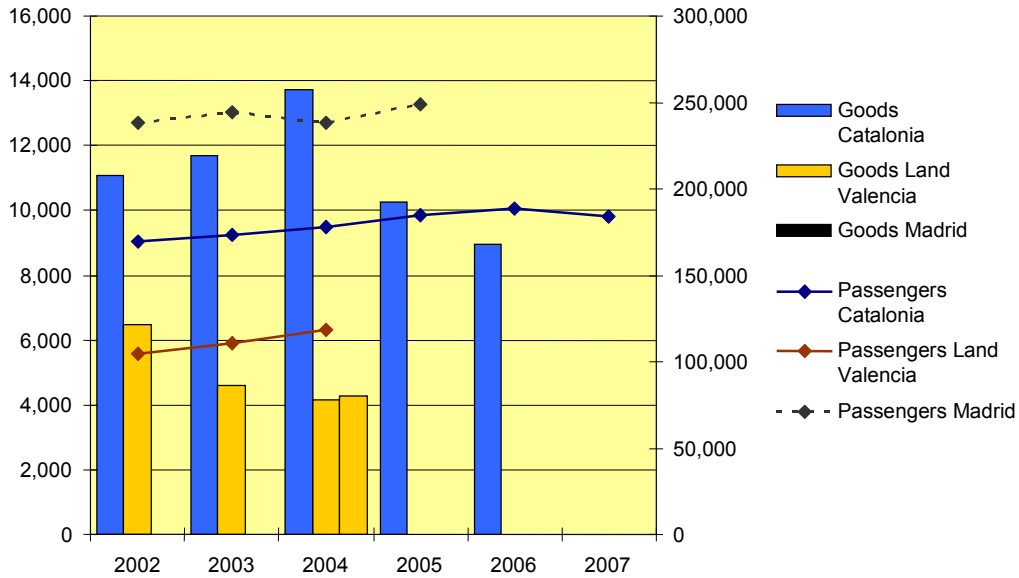
>>> **Graph 33:** Railway traffic. Proportion between volumes of goods (2004).



Own elaboration.

Graph 34 illustrates in an overall manner the evolution in the volume of passengers and of goods:

>>> **Graph 34:** *Railway traffic. Evolution of the volume of passengers (thousands) and goods.*

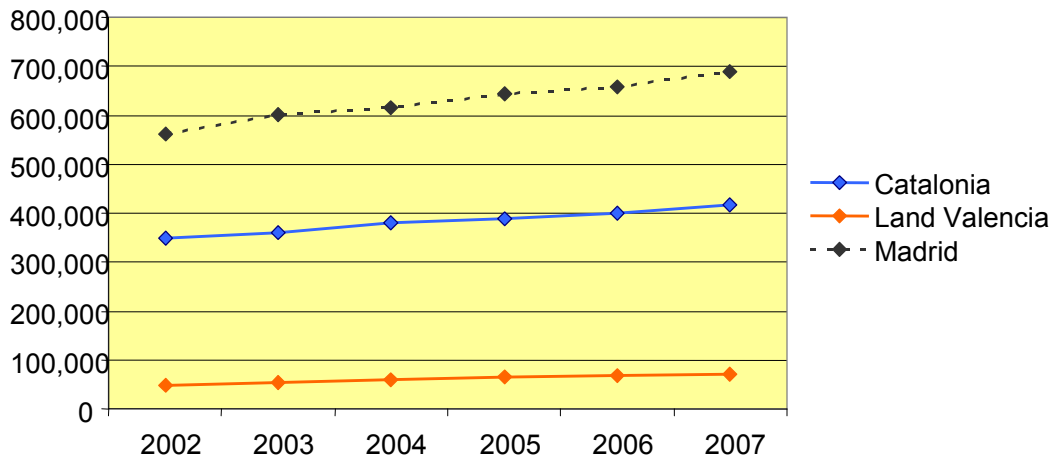


Own elaboration.

2.3. Evolution of underground railway and tram passenger volume

The underground railway and tram users in Barcelona, Valencia and Madrid, in the period 2002-2007, present the evolution indicated in graph 35:

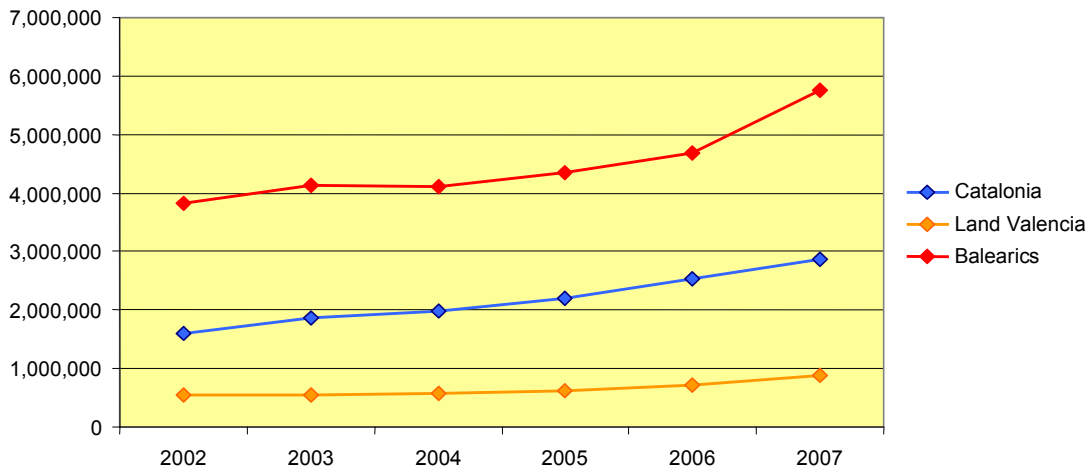
>>> **Graph 35:** *Evolution of the underground railway and tram passenger volume (in thousands).*



Sources: Catalonia, Idescat; Land of Valencia, IVE.

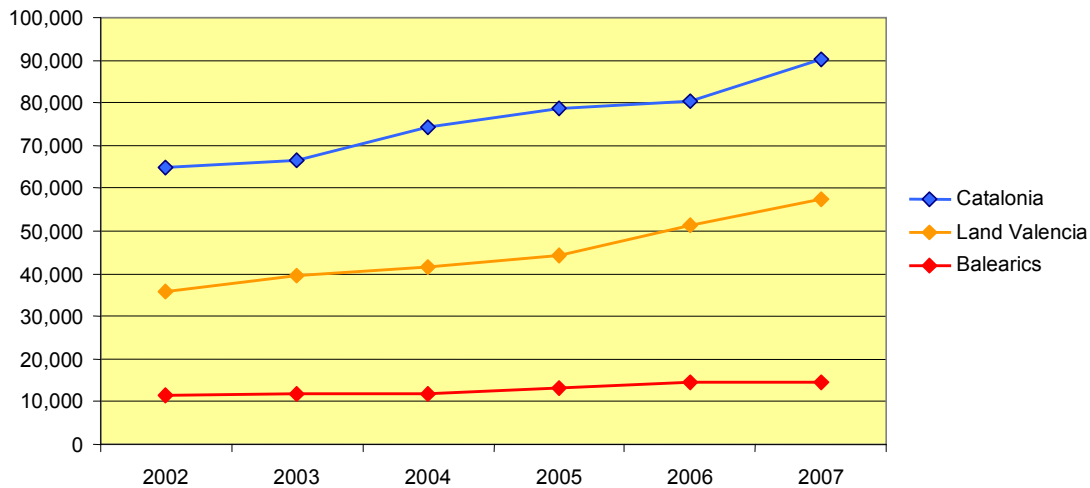
2.4. Evolution of sea traffic

>>> **Graph 36:** Sea traffic. Evolution of the number of passengers.



Sources: Catalonia and Land of Valencia, Ministry of Public Works; Balearics, Port Authority of the Balearics.

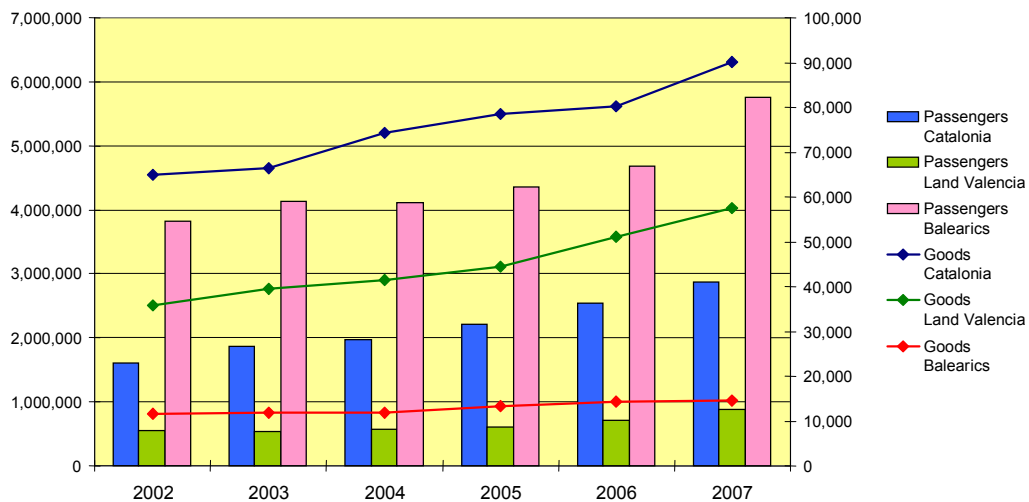
>>> **Graph 37:** Sea traffic. Evolution of goods cargo (thousands of tons).



Sources: Catalonia, Idescat; Land of Valencia and Balearics, On-line statistical bulletin (Ministry of Public Works).

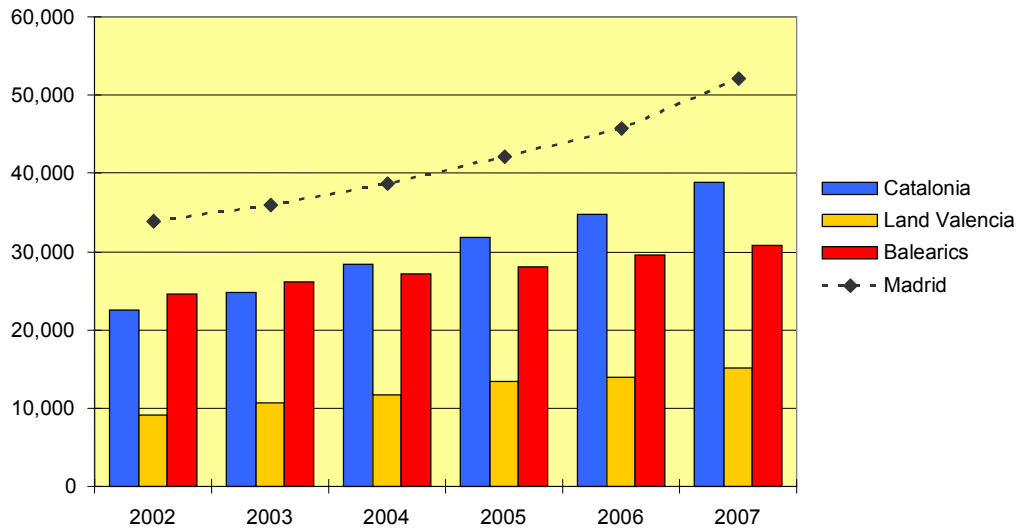
The following graph illustrates in an overall manner the evolution in the volume of passengers and goods for the three territories studied in the period 2002-2007:

>>> **Graph 38: Sea traffic. Evolution of passengers and goods (thousands of tons).**

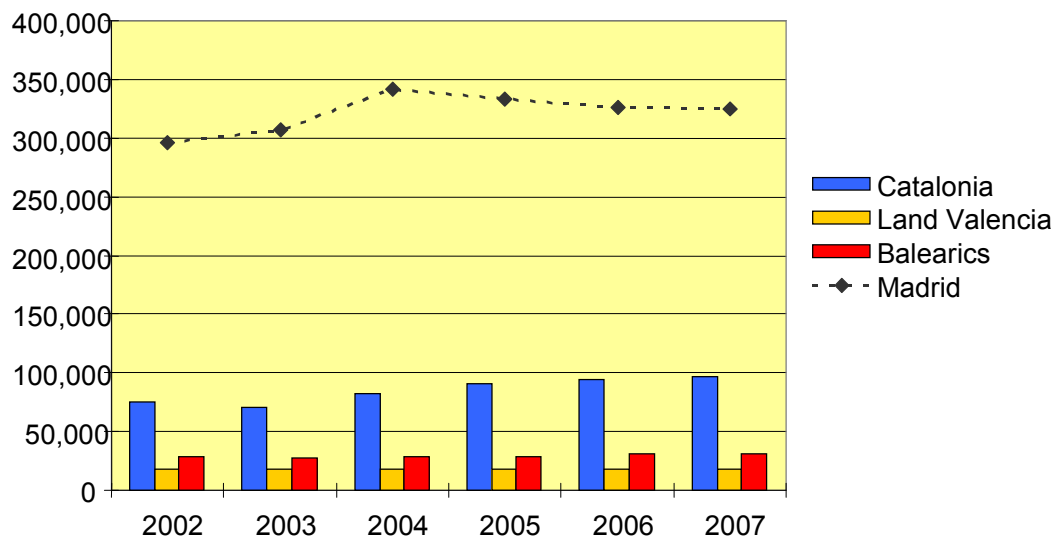


Own elaboration.

2.5. Evolution of air traffic

>>> **Graph 39:** Air traffic. Evolution of the number of passengers (thousands).

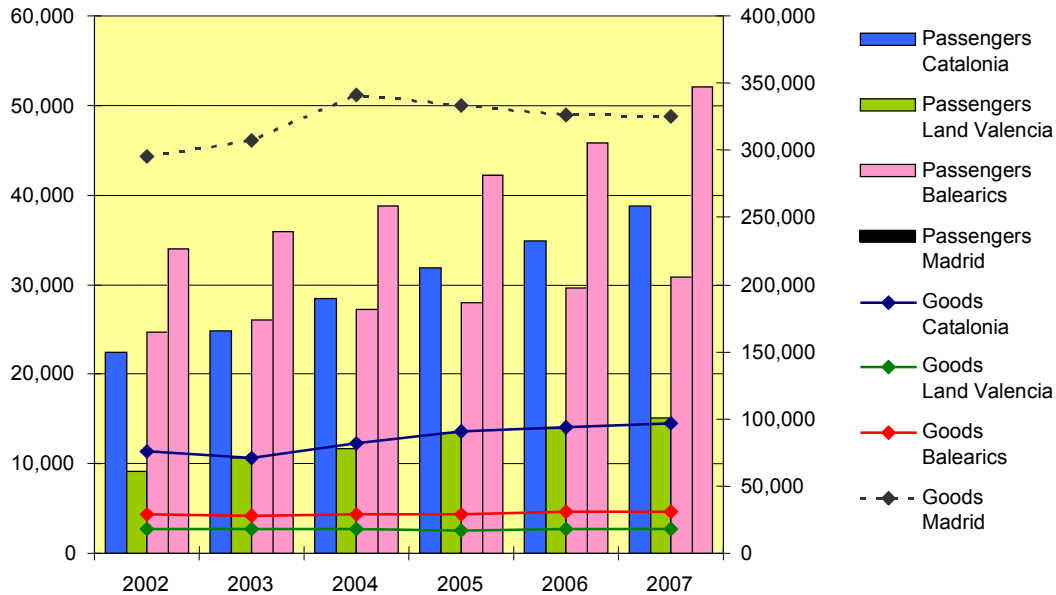
Sources: Catalonia, Idescat; Land of Valencia, Balearics and Madrid, AENA.

>>> **Graph 40:** Air traffic. Evolution of the goods cargo (thousands of tons).

Sources: Catalonia, Idescat; Land of Valencia, Balearics and Madrid, AENA.

Graph 41 illustrates in an overall manner the evolution in the volume of passengers and of goods for Catalonia, Land of Valencia, the Balearics and Madrid in the period 2002-2007:

>>> **Graph 41: Air traffic. Evolution of passengers (thousands) and goods (thousands of tons).**



Own elaboration.

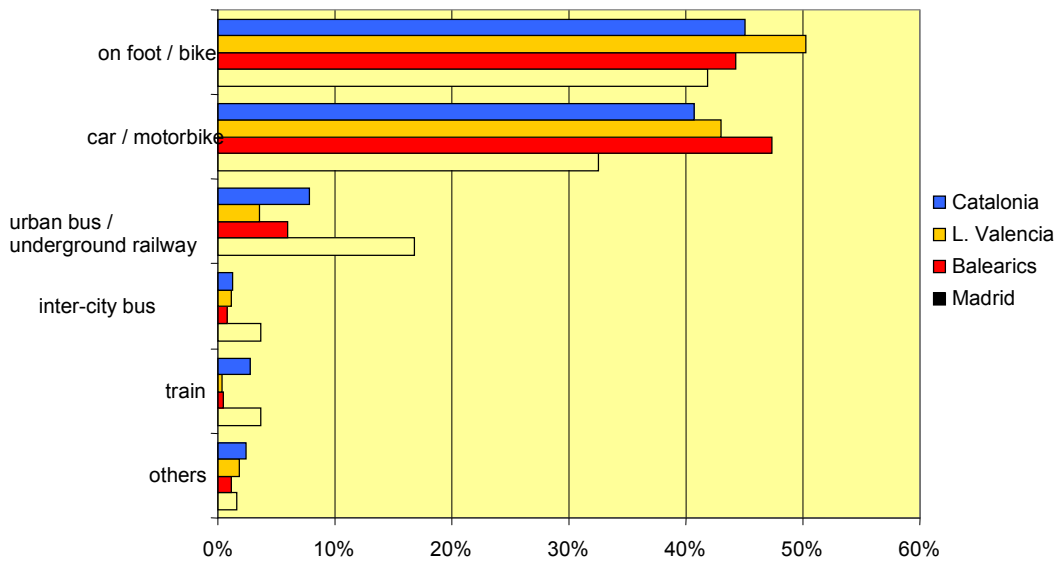
3. ENVIRONMENT

For the data corresponding to the number of vehicles, see section 2.1.

3.1. Urban and suburban journeys

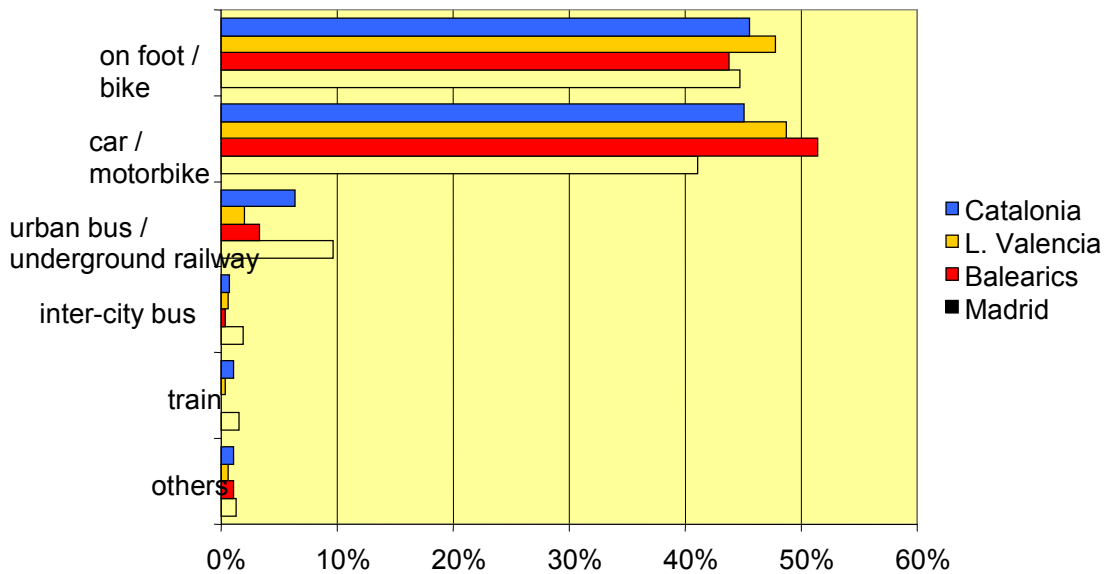
The following two graphs show, in percentages, the means of transport usually used for travelling. We distinguish working days (graph 42) from weekends (graph 43), although the differences are not very significant:

>>> **Graph 42:** Type of journey on working day.



Own elaboration from data from the Movilia survey (2006-2007) of the Ministry of Public Works.

>>> **Graph 43:** Type of journey at weekend.



Own elaboration from data from the Movilia survey (2006-2007) of the Ministry of Public Works.