



# Metropolitan Mobility OBSERVATORY (MMO)

Summary Report  
Data **2011**

## The Metropolitan Mobility Observatory (MMO)

The MMO is an analysis and observation initiative made up of the Public Transport Authorities (PTAs) of the main Spanish metropolitan areas, the Ministry of Agriculture, Food and Environment and the Ministry of Public Works and Transport, with the aim of reflecting the contributions of public transport to the improvement of quality of life and sustainable development in cities. Other collaborators include RENFE, the Institute for Energy Diversification and Savings, the Spanish Railway Foundation, the Association of Urban Transport Collectives, the Spanish Federation of Municipalities and Provinces and the CCOO Trade Union Federation.

The MMO's objective is to analyse the general mobility tendencies of the main metropolitan areas of Spain by studying a set of key transport indicators, including public transport supply and demand, financing and investments, environmental aspects and road security.

This document is a summary of the 2011 MMO Report. Both the aforesaid report and this summary were compiled by TRANSyT-UPM, using the information provided by various PTAs, RENFE, the Ministry of Agriculture, Food and Environment, the Directorate General of Traffic and the National Statistics Institute.

18 PTAs contributed data for the report, though the MMO is made up of 24 PTAs in total. The population of the 18 metropolitan areas included in the 2011 report comes to 23 million inhabitants: 50 % of the nation's population.

## Main figures

Some important figures related to urban and metropolitan mobility in 2011 for the 18 participating Spanish metropolitan areas are summarised below:

- A total of **3.093 billion public transport journeys** were made, 1.545 billion by bus and 1.548 billion by rail modes. Although these figures are quite similar, the length of the networks that support these journeys are significantly different: 100,776 km of bus lines, as opposed to 3,014 km of rail network.
- The **number of journeys per inhabitant per year** differs according to the size of the metropolitan area. The average is 120 journeys per inhabitant per year in large areas, and 52 journeys in mid-sized and small areas.
- The annual public transport demand for the 18 areas considered here is **25.354 billion passenger-km** (40% for bus and 60% for rail modes).
- The public transport supply is **1.280 billion vehicle-km**: 636 million for bus services and 644 million for rail modes.
- **Investment** in public transport in 2011 came to **882 million euros**, twice the investment in 2010. 96% of these investments were dedicated to rail modes.
- The **average coverage ratio is 56%**. Metropolitan area transport systems which include rail modes have an average coverage ratio of 53%, while those which consist exclusively of buses present an average of 57% coverage.

*This summary illustrates key findings on the diversity of public transport systems and public transport policies in the largest Spanish metropolitan areas.*

*For more on previous editions, see the publications section of [www.observatoriomovilidad.es](http://www.observatoriomovilidad.es).*

# General characteristics of the metropolitan areas on 1 January 2011

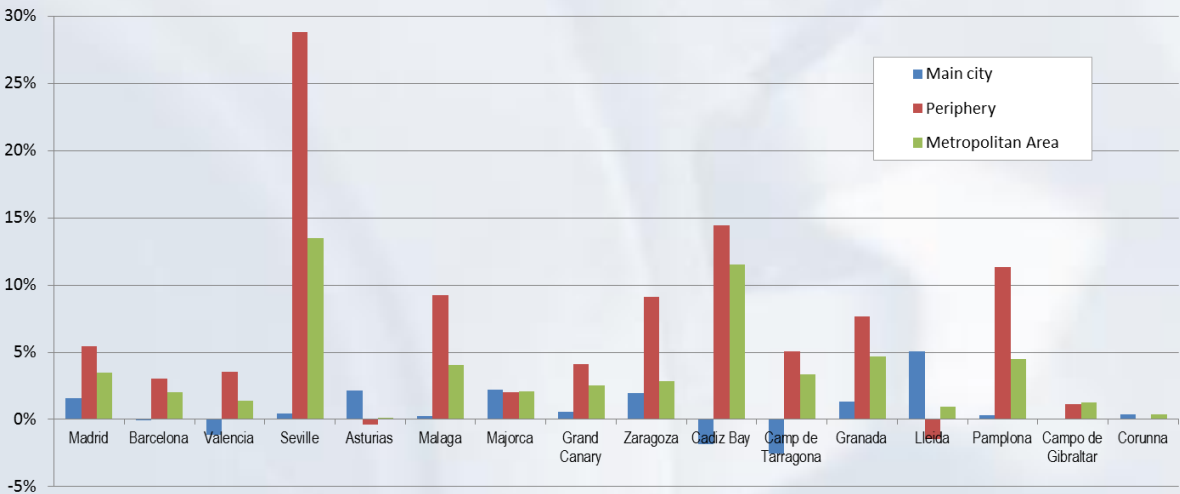
|                                 | Metropolitan area (PTA Action Sphere) |                       |                        |                             |                        | Main city     |                       |                        | Main city/<br>Metropolitan area<br>population ratio |
|---------------------------------|---------------------------------------|-----------------------|------------------------|-----------------------------|------------------------|---------------|-----------------------|------------------------|---|
|                                 | Area<br>(km²)                         | Population<br>(inhab) | Density<br>(inhab/km²) | Number of<br>municipalities | Built-up area<br>(km²) | Area<br>(km²) | Population<br>(inhab) | Density<br>(inhab/km²) |   |
| Madrid                          | 8.030                                 | 6.489.680             | 808                    | 179                         | 1.037                  | 606           | 3.265.038             | 5.384                  | 50%   |
| Barcelona                       | 3.239                                 | 5.029.000             | 1.553                  | 164                         | 597                    | 102           | 1.615.000             | 15.911                 | 32%   |
| Valencia                        | 1.415                                 | 1.800.614             | 1.273                  | 60                          | 325                    | 137           | 798.033               | 5.825                  | 44%   |
| Seville                         | 4.221                                 | 1.468.009             | 348                    | 45                          | 337                    | 141           | 703.021               | 4.975                  | 48%   |
| Asturias <sup>1</sup>           | 10.602                                | 1.081.487             | 102                    | 78                          | n.a.                   | 187           | 225.391               | 1.208                  | 21%   |
| Malaga <sup>2</sup>             | 1.432                                 | 1.012.031             | 707                    | 15                          | 75                     | 395           | 568.030               | 1.439                  | 56%   |
| Majorca                         | 3.623                                 | 873.414               | 241                    | 53                          | 212                    | 214           | 405.318               | 1.898                  | 46%   |
| Grand Canary                    | 1.560                                 | 850.391               | 545                    | 21                          | 330                    | 101           | 383.343               | 3.812                  | 45%   |
| Zaragoza                        | 2.920                                 | 773.058               | 265                    | 30                          | 258                    | 938           | 674.725               | 720                    | 87%   |
| Cadiz Bay <sup>3</sup>          | 3.072                                 | 781.892               | 255                    | 10                          | n.a.                   | 14            | 124.892               | 8.795                  | 16%   |
| Camp de Tarragona <sup>4</sup>  | 2.999                                 | 619.770               | 207                    | 132                         | n.a.                   | 65            | 134.085               | 2.056                  | 22%   |
| Granada                         | 861                                   | 523.845               | 609                    | 32                          | n.a.                   | 88            | 240.099               | 2.728                  | 46%   |
| Lleida                          | 5.586                                 | 363.900               | 65                     | 149                         | 182                    | 212           | 138.416               | 653                    | 38%   |
| Pamplona                        | 92                                    | 333.267               | 3.638                  | 18                          | 47                     | 25            | 197.932               | 7.889                  | 59%   |
| Campo de Gibraltar <sup>5</sup> | 1.520                                 | 267.062               | 176                    | 7                           | 432                    | 86            | 117.810               | 1.370                  | 44%   |
| Girona                          | 1.209                                 | 266.996               | 221                    | 47                          | 80                     | 39            | 96.236                | 2.461                  | 36%   |
| Corunna <sup>2</sup>            |                                       |                       |                        |                             |                        | 39            | 246.028               | 6.308                  | 100%  |
| Leon                            | 467                                   | 195.822               | 420                    | 11                          | n.a.                   | 39            | 132.744               | 3.386                  | 68%   |

- 1: The main city is Oviedo, as it is the capital of the region of Asturias  
2: Built-up area only takes into account the main city  
3: The main city is Cadiz, as it is the capital of the province  
4: The main city is Tarragona, as it is the capital of the province  
5: There is no main city. The bay area could be considered the origin and destination of journeys  
n.a: not available  
Source: compiled by authors based on data provided by the PTAs

## Evolution of population and other socioeconomic indicators

In general, the population in the periphery has increased between 2008 and 2011 at a higher rate than in the entire metropolitan area. This is especially true in the case of Seville, Cadiz Bay and Pamplona, in which the population has increased in this period over a 10%. However, in main cities the increase in population is very modest, 0.2% on average, compared with 2.3% increases in the periphery.

### Variation of population in metropolitan areas between 2008 and 2011



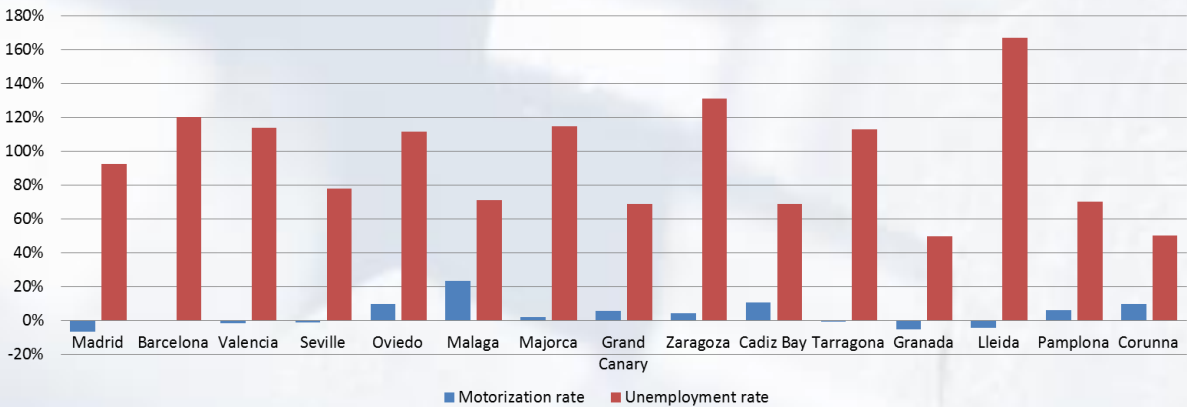
\*Seville, Malaga, Cadiz Bay and Granada have incorporated other municipalities into their jurisdiction over the years, which has caused major population variations.  
\*\*Lleida and Campo de Gibraltar, variation between 2009 and 2011.  
Source: compiled by authors based on data provided by the PTAs.

The effects of the economic crisis in recent years can be seen in the **growing unemployment rate** in almost all metropolitan areas since 2008. The average unemployment rate in the areas in 2011 was lower than the national average; only in the Andalusian areas and in Grand Canary this rate is close to 30%, while Pamplona, Girona and Corunna present rates lower than 15%.

The **motorisation rate** shows an unpredictable behaviour. Some areas present an increase in motorisation, as Malaga, Corunna, Cadiz Bay and Oviedo. On the other hand, other cities, such as Madrid, Granada and Lleida, experience a fall in their motorisation rates, with 6%, 5% and 4%, respectively.



Variation of unemployment and motorisation rates (2008-2011)

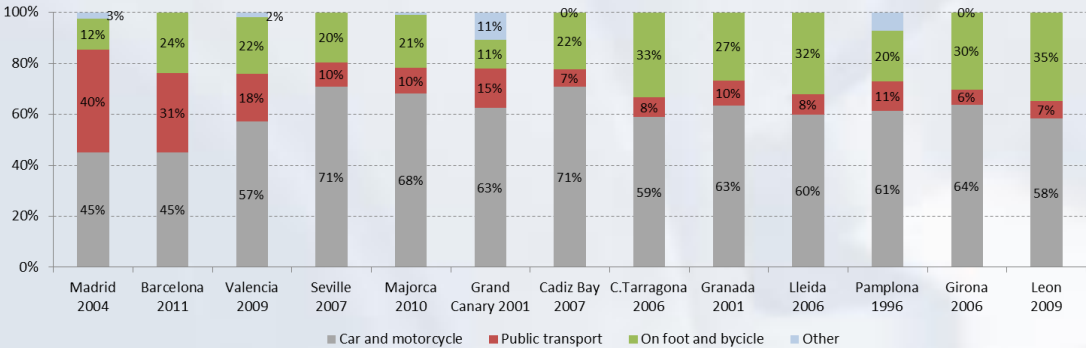


Modal split

The primary modes for **work-related journeys** in all of the metropolitan areas are car and motorcycle, varying from 45% in Madrid to 71% in Seville and Cadiz Bay. Public transport is of great importance in the two largest metropolitan areas, accounting for percentages of modal share similar to those of private vehicles: 40% in Madrid and 31% in Barcelona. Journeys made on foot and by bicycle are more common in small and mid-sized metropolitan areas, with a participation rate of 20-35%, especially for journeys on foot, which are indeed a viable alternative to public transport where there are smaller distances to be covered.

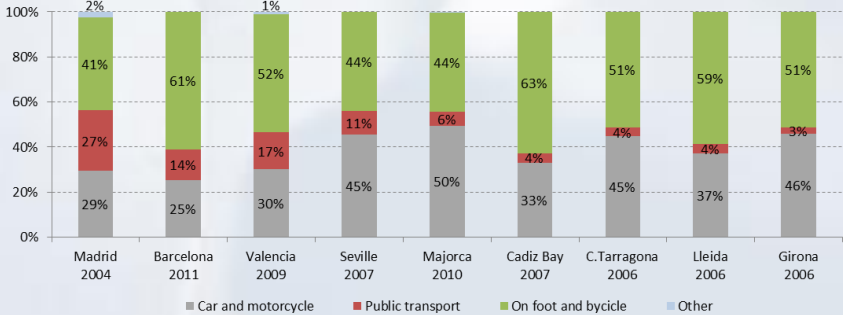
When journeys are made for **non work-related motives** (studies, shopping, medical reasons, leisure, etc.), the use of private modes decreases in favour of non-motorised modes, which reach participation rates of 41-63%. This is fundamentally due to the fact that there is no hurry to reach the destination and the duration of the journey ceases to be as important. The percentage of journeys made using public transport varies from 3% in Girona to 27% in Madrid.

Modal split for work-related motives



Source: compiled by authors based on data provided by the PTAs.

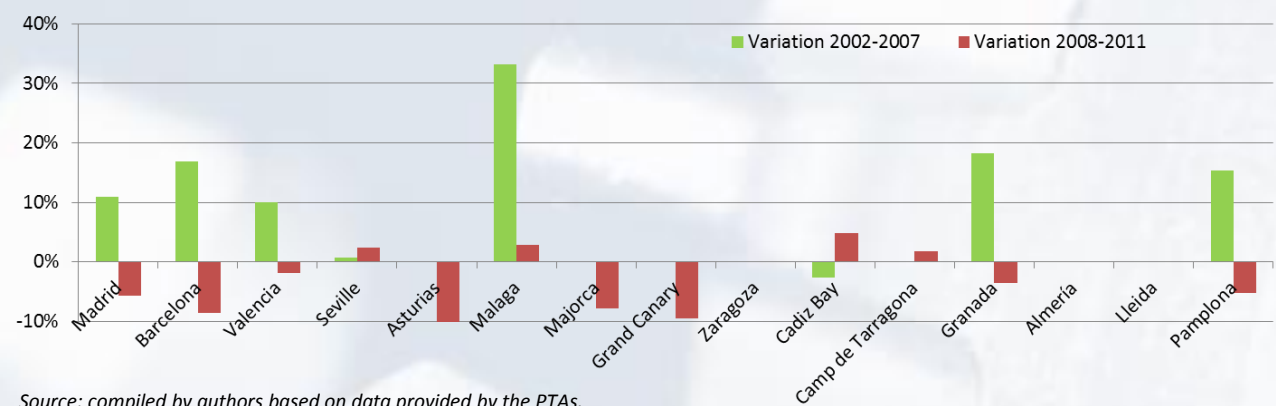
Modal split for non work-related motives



## Public transport demand

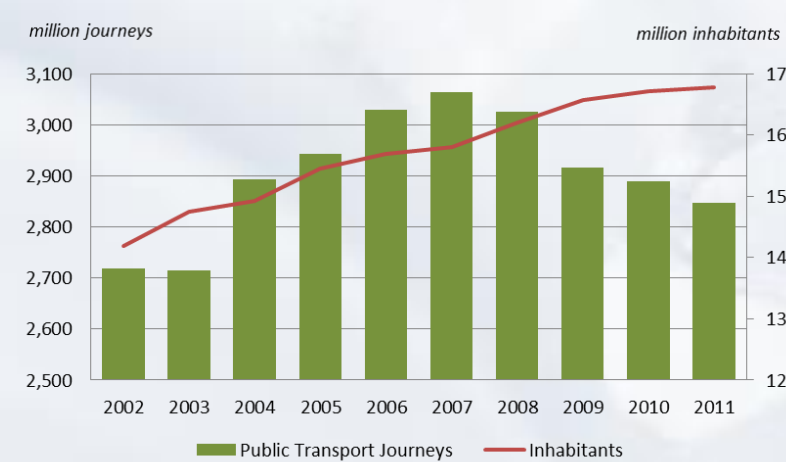
Regarding the variation of the demand for public transport between 2002 and 2011, two stages can be distinguished. In the first one, between 2002 and 2007, public transport demand increased by 12.7%, with a larger increase in rail modes' journeys (22.6%) than in bus journeys (3.3%). In the second stage, **between 2008 and 2011**, there was an overall **decrease of 3.4%** in public transport demand.

Variation of public transport journeys between 2002 and 2011



Source: compiled by authors based on data provided by the PTAs.

Evolution of public transport journeys as compared to population



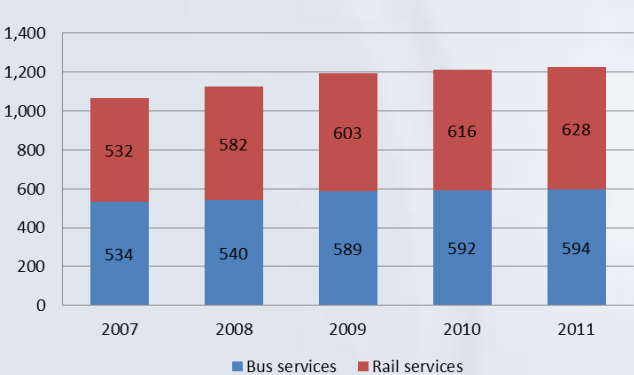
There has been a **clear decrease in demand for public transport since 2007**, especially in bus services.

The **supply** of public transport services **has remained steady** despite the decline in demand in this period of economic crisis.

## Public transport supply

The supply of bus and rail services has increased over the years in most metropolitan areas, with rail services seeing the largest increase in vehicles-km (18% between 2007 and 2011).

Public Transport supply (vehicles-km)

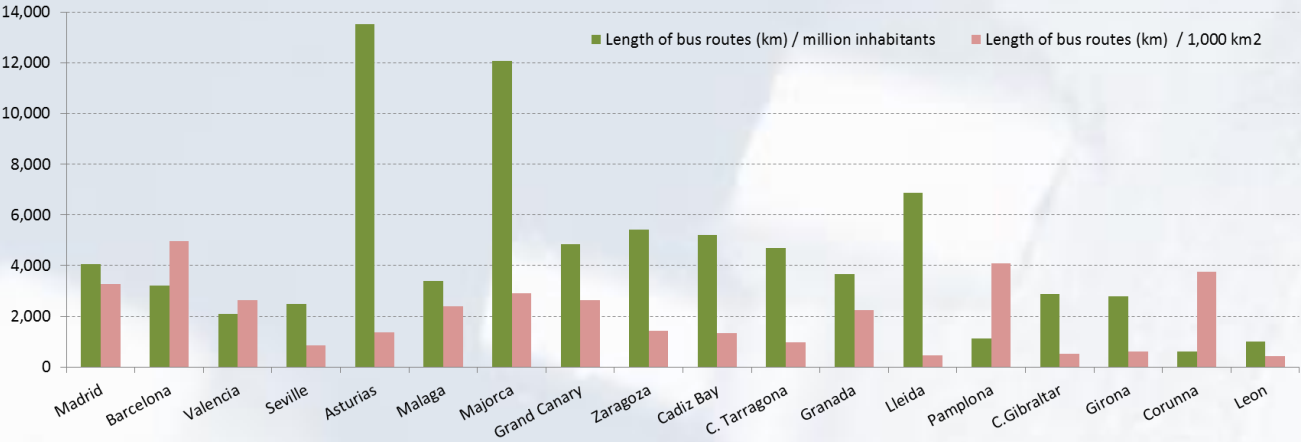


The route density of **bus services** in the majority of the metropolitan areas is between 2,000 and 5,000 km per 1 million inhabitants. Asturias, Mallorca and Lleida present much higher values, reaching 13,000 km per 1 million inhabitants in Asturias. In relation to the route density per surface area, the highest figures (over 3,500 km/1,000 km<sup>2</sup>) are reached by Barcelona, Pamplona and Corunna.

The density of **rail services** in reference to population and surface area shows smaller ranges than the density of bus services. Valencia and Asturias stand out with the highest rail network density per surface area (340 km of network per 1,000 km<sup>2</sup>) and the highest rail network density per person (356 km of network per million inhabitants), respectively. The high ratio reached by Asturias is due to the great length of FEVE lines (metre gauge network) in this region .

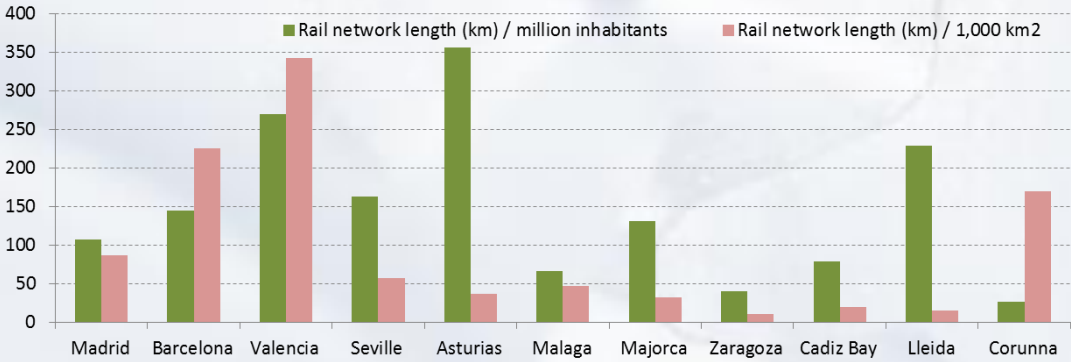


Density of bus supply (2011)



Granada: only urban and metropolitan buses.  
Campo de Gibraltar: only metropolitan buses.  
Source: compiled by authors based on data provided by the PTAs.

Rail network density (2010)

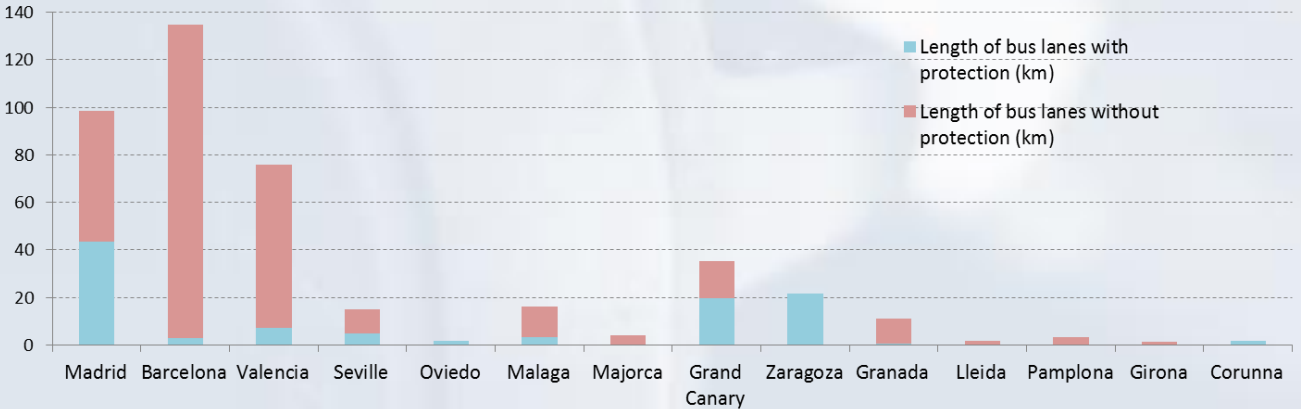


Valencia: the rail network managed by the regional government is not considered  
Source: compiled by authors based on data provided by the PTAs and the RENFE Directorate General of Passengers.

• Bus Lanes

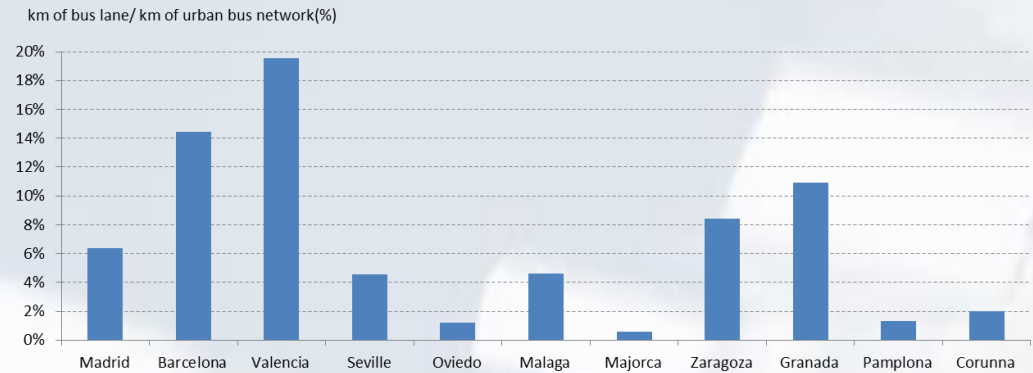
Reserving space exclusively for buses considerably improves journey time and regularity of bus services, making them more competitive with respect to cars. In 2011, Barcelona presents the most kilometres of bus lanes in its road network (134.9 km), although Madrid and Zaragoza are the cities with the largest networks of segregated bus lanes, with 43.4 and 21.6 km respectively. Valencia shows the highest ratio of bus lanes with respect to its total bus network, with 19.5%.

Length of bus lanes in main city (2011)



Source: compiled by authors based on data provided by the PTAs.

Percentage of bus network with bus lanes in main city (2011)



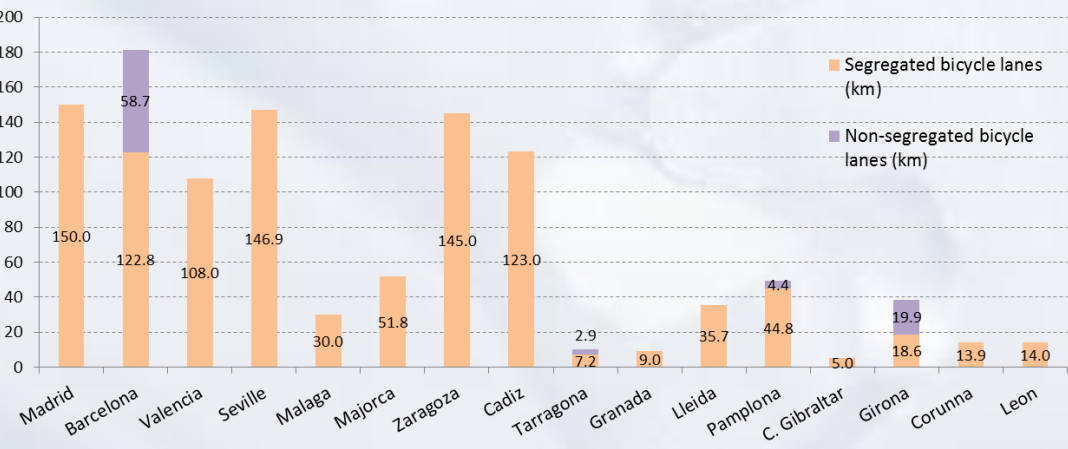
Source: compiled by authors based on data provided by the PTAs.

Bicycle Lanes

Bicycles can travel on roads together with other vehicles, but in order to safely promote their use, it is important to create an adequately articulated network of exclusive bicycle lanes. The proliferation of public bicycle rental services in Spanish cities has encouraged infrastructure improvements for use by cyclists. Bicycle lanes are categorised as segregated or non-segregated.

Measures such as fixing a maximum speed of 30 km/h or allowing mixed traffic (vehicles and bicycles) on some streets were implemented in a lot of cities in 2011. The existence of these streets is positive for cyclists, but they are not as safe as bicycle lanes. That is why they were not included in the following picture.

Length of the bicycle lanes in the main city (2011)



Source: compiled by authors based on data provided by the PTAs.



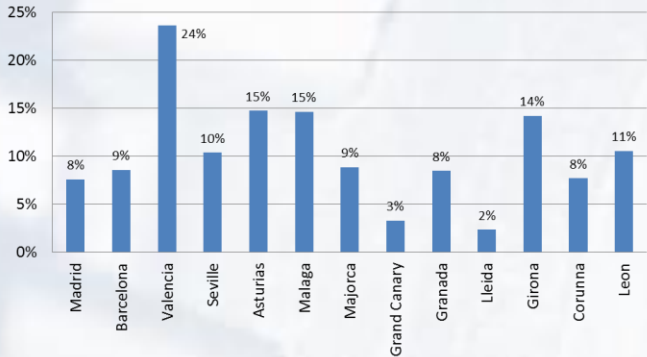
• **Quality of the supply**

To achieve an increase in demand for public transport, the quality of service must not be neglected. Many factors are involved, such as:

- **Frequency** at peak times – metro: 3-5 minutes; urban bus: 9-15 minutes; metropolitan bus: 15-20 minutes; suburban railways: 5-7 minutes in Madrid and Barcelona, and 30 minutes in other cities.
- **Night services** – in most cities, night bus services are available at weekends and the larger cities also offer night services on week days.
- **Accessibility** for the disabled – very good in urban buses (100% of the fleet has low floors in a lot of cities) and improving in metropolitan buses and rail modes. Tram services offer 100% accessibility.

- **Accessibility to public transport** – in main cities, over 90% of the population lives within 300 metres from a public transport stop; this figure reaches 100% in Corunna. In the metropolitan areas, the range is wider, from 39% in Majorca to 96% in Pamplona.

**% bus stops with real-time information screens (urban buses in main city)**

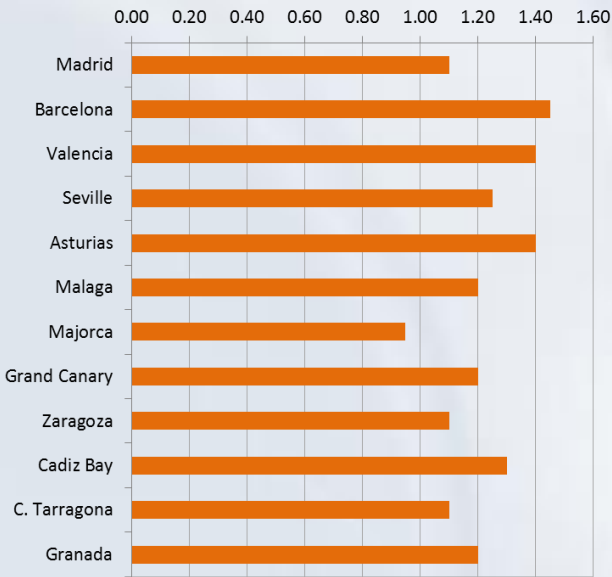


**Economic and fare-based aspects**

• **Ticket and fare types**

Fare structures differ from one metropolitan area to another. Some employ concentric ring fare systems (Madrid, Seville, Valencia and Granada) while others have fare zones dividing the region (Barcelona, Malaga, Cadiz Bay, Camp de Tarragona and Campo de Gibraltar). Ticket supply varies greatly between areas, with a variation in fares for existing tickets as well. The use of single tickets is still prevalent, although integrated passes are becoming more and more common, as one of their main objectives is to increase fidelity among users. The use of these passes – and of other multiple journey tickets – allows for significant savings over the use of single fare tickets. Madrid is the area in which the use of passes is greatest (67%), indicating an important level of fidelity among users; Valencia and Barcelona have the second-highest percentage of pass use, with a mere 33%.

**Single ticket price for the main city (Euro, 2011)**

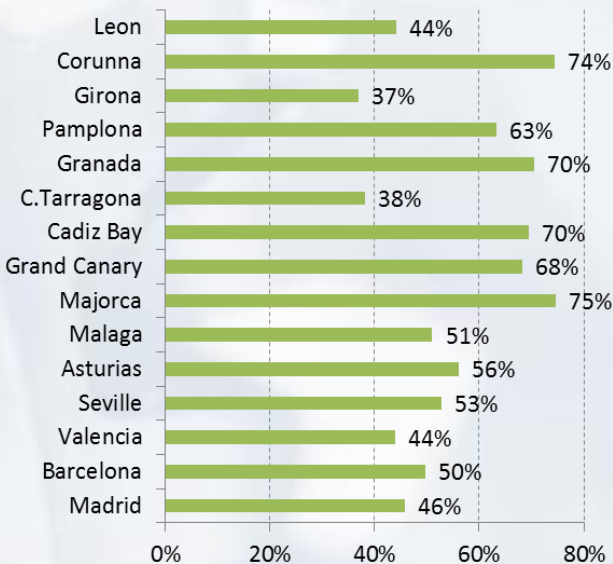


Source: data provided by the PTAs.

• **Coverage ratio**

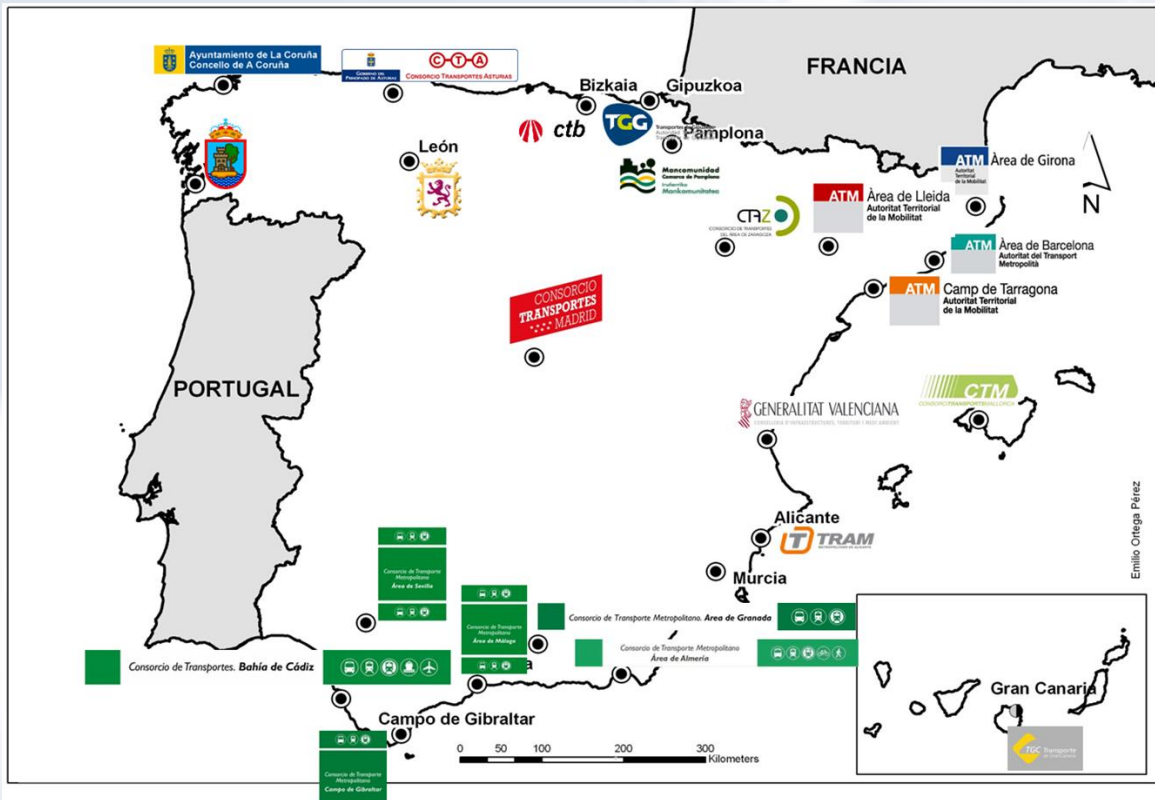
The average coverage ratio – the percentage of operating costs covered by fare revenue – for all public transport in Spain in 2011 is **56%**, but this varies from one area to another. The larger areas have an average of 50%, while coverage in small and mid-sized areas reaches an average of 60%. Majorca and Corunna stand out, with ratios of 75% and 74%, respectively. According to the EMTA (2011), the average coverage ratio in European metropolitan areas is 45,9%, so Spanish metropolitan areas are above average.

**Coverage ratio for public transport systems in metropolitan areas (2011)**



Source: data provided by the PTAs.

**The coverage ratio slightly increased in 2011: despite the decreasing demand, revenue from fares increased due to fare increases.**



## MEMBERS AS OF 1 JANUARY 2013

### PUBLIC TRANSPORT AUTHORITY

Consorcio Regional de Transportes de Madrid  
 Autoritat del Transport Metropolità de Barcelona  
 Conselleria de Infraestructuras, Territorio y Medio Ambiente -  
 S.G. de Planificación, Logística y Seguridad  
 Consorcio de Transporte Metropolitano Área de Sevilla  
 Consorcio de Transportes de Bizkaia  
 Consorcio de Transportes de Asturias  
 Consorcio de Transporte Metropolitano Área de Málaga  
 Consorci de Transports de Mallorca  
 Autoridad Única del Transporte de Gran Canaria  
 Consorcio de Transportes del Área de Zaragoza  
 Autoridad Territorial del Transporte de Gipuzkoa  
 Consorcio de Transportes de Bahía de Cádiz  
 Autoritat Territorial de la Mobilitat Camp de Tarragona  
 Consorcio de Transporte Metropolitano Área de Granada  
 Consorcio de Transporte Metropolitano Área de Almería  
 Transporte Público del Área Metropolitana de Alicante  
 Mancomunidad de la Comarca de Pamplona  
 Municipio de Vigo  
 Consorcio de Transporte Público del Área de Girona  
 Municipio de A Coruña  
 Autoritat Territorial de la Mobilitat Àrea de Lleida  
 Municipio de León

### REGION

Community of Madrid  
 Barcelona Metropolitan Region  
 Metropolitan Area of Valencia  
 Metropolitan Area of Seville  
 Province of Bizkaia  
 Asturias Region  
 Malaga Metropolitan Area  
 Mallorca  
 Gran Canaria  
 Metropolitan Area of Zaragoza  
 Province of Gipuzkoa  
 Cadiz Bay  
 Camp de Tarragona  
 Granada Metropolitan Area  
 Almeria Metropolitan Area  
 Alicante Metropolitan Area  
 Pamplona Region  
 Municipality of Vigo  
 Girona Metropolitan Area  
 Municipality of Corunna  
 Municipality of Lleida  
 Municipality of Leon

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