



Metropolitan Mobility OBSERVATORY (MMO)

Summary Report Data 2010



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 the National Rail Board 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 such as public transport supply and demand, financing and investments, environmental aspects, and road security.

This document is a summary of the 2010 MMO Report. Both said 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.

20 PTAs contributed data for the report, though the MMO is made up of 23 PTAs in total. The population of the 20 metropolitan areas included in the 2010 report comes to 26 million inhabitants: 54.6% of the nation's population.

This summary illustrates key findings on the diversity of public transport systems and public transport policies in the Spanish largest metropolitan areas. For more on previous editions see www.observatoriomovilidad.es publication section.

Main Figures

The main figures related to urban and metropolitan mobility in Spain in 2010 for 20 Spanish metropolitan areas are the following:

- > A total of **3.100 billion public transport journeys** were made, 1.582 billion by bus and 1.518 billion by rail modes. Although these figures are quite similar, the length of the networks that support these journeys are significantly different: 95,644 km of bus lines, as opposed to 2,902 km of rail networks.
- > These journeys suppose an **average of 127 journeys per inhabitant per year**, though this figure differs according to the size of the area: 166.7 journeys in large areas, 74.4 journeys in mid-sized areas and 58.7 journeys per inhabitant per year in small areas.
- > The annual demand for the 20 areas considered is **25.854 billion passenger-km** (40.1% for bus and 59.9% for rail modes).
- > The public transport supply is **1.298 billion vehicle-km**: 657 million for bus services and 641 million for rail modes.
- > **Investments** made in public transport in 2010 has been reduced drastically, being of about 404 billion euro. The 89% of these investments were dedicated to rail modes.
- > The **average coverage ratio is 53%**: the areas with rail modes in its transport systems have an average ratio of 48% and those with only buses present an average of 62% coverage.

General characteristics of the metropolitan areas on January 1st, 2010

	Metropolitan area (PTA Action Sphere)					Main city			Main city/ Metropolitan Area Population Ratio
	Extension (km ²)	Population (inhab)	Density (inhab/km ²)	Number of Municipalities	Built-up extension (km ²)	Extension (km ²)	Population (inhab)	Density (inhab/km ²)	
Madrid	8,030	6,458,684	804	179	1,053	606	3,273,049	5,398	51%
Barcelona	3,239	5,013,000	1,548	164	597	102	1,619,000	15,951	32%
Valencia	1,415	1,805,942	1,276	60	325	137	809,267	5,914	45%
Murcia	11,313	1,461,979	129	45	n.d.	886	441,345	498	30%
Seville	4,221	1,457,428	345	45	337	141	704,198	4,983	48%
Asturias ¹	10,604	1,084,341	102	78	n.d.	187	225,155	1,206	21%
Malaga ²	1,432	1,001,287	699	15	75	395	568,507	1,440	57%
Majorca	3,623	869,067	240	53	212	214	404,681	1,895	47%
Grand Canary	1,560	845,676	542	21	330	101	383,308	3,812	45%
Zaragoza	2,920	773,569	265	30	258	974	675,121	720	87%
Gipuzkoa	1,980	707,263	357	88	n.d.	267	185,506	695	26%
Cadiz Bay ³	3,072	777,807	227	10	n.d.	14	145,595	10,253	21%
Camp de Tarragona ⁴	2,999	616,852	206	132	157	65	140,184	2,150	23%
Granada	861	517,923	602	32	n.d.	88	239,154	2,717	46%
Alicante	355	460,651	1,298	5	74	201	334,757	1,665	73%
Lleida	5,586	363,900	65	149	182	212	137,387	648	38%
Pamplona	92	328,540	3,587	18	47	25	197,488	7,900	60%
Campo de Gibraltar ⁵	1,520	264,620	174	7	432	86	116,417	1,354	44%
Corunna						39	246,047	6,388	100%
Leon						39	134,012	3,419	68%

1: The main city is Oviedo, as it is the capital of the province

2: Built-up area is only Malaga capital

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

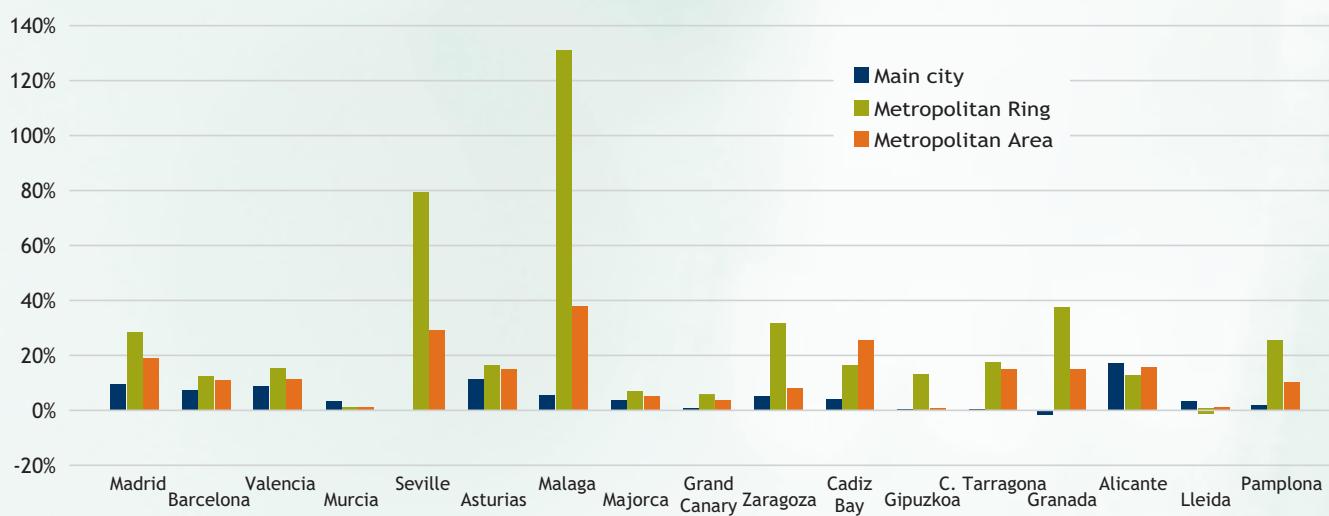
5: There is no main city. The bay area could be considered the main nucleus of attractions and journey generation

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

Evolution of population and other socioeconomic indicators

In general, the population in the metropolitan rings increases more than in the entire metropolitan area. The metropolitan rings attract the population in almost all areas, especially in Seville, Malaga, Gipuzkoa, Granada and Pamplona. The increase of population in main cities is very modest, 5% on average, compared with 24.5% increases in the metropolitan rings.

Variation of population in different areas between 2002 and 2010

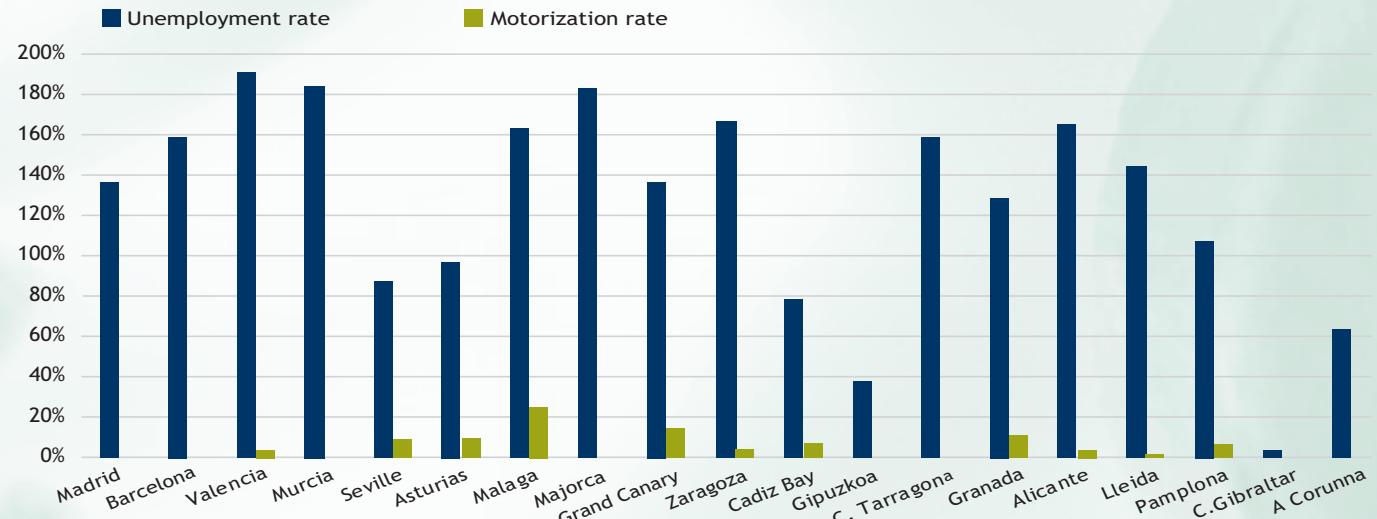


* Seville, Malaga, Cadiz Bay, and Granada have incorporated other municipalities into their jurisdiction over the years which have caused major population variations.
Source: compiled by authors based on data provided by the PTAs.

With regard to socioeconomic data, in these last years we can see the effects of the economic crisis in the increasing of the unemployment rate in almost all metropolitan areas. The motorization rate in major cities is fairly stable and even decreased in some cases, being Malaga the city recording the largest increase, with 23%.



Variation of unemployment and motorization rates (2005-2010)



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

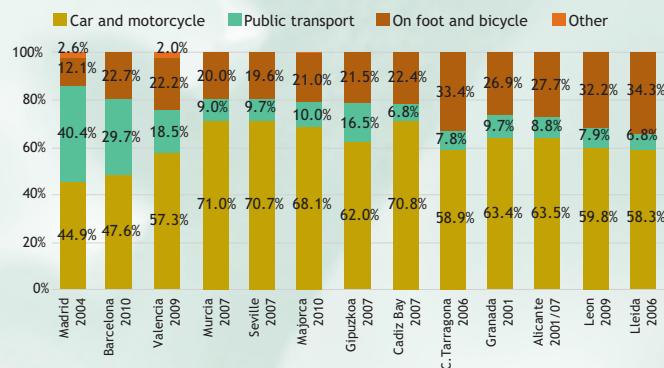
Modal Split

The primary modes for work-related journeys in all of the metropolitan areas are the car and motorcycle, varying from 44.9% in Madrid to more than 70% in Murcia, Seville and Cadiz Bay. Public transport is of great importance in the two largest metropolitan areas, as it reaches values of the same order of magnitude as the private vehicle: 40.4% in Madrid and 31.4% in Barcelona. Journeys made on foot and by bicycle are most common in the small and mid-sized areas, with a participation rate of 20-33%, especially for journeys on foot, which are indeed a viable alternative to public transport due to the smaller distances to be covered. The exception to this is found in Barcelona (20.2%), mainly due to bicycle

journeys, which are beginning to have a more and more important role in the city's mobility patterns.

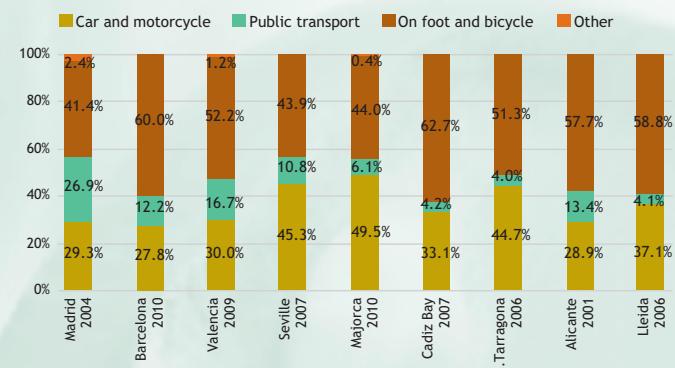
When journeys are made for non work-related motives (studies, shopping, medical reasons, leisure, etc.), the use of private modes decreases in favour of non-motorised modes, which reach participation rates of 41-63%. This is fundamentally due to the fact that there is no hurry to reach the destination and the duration of the journey ceases to be as important. The quota of journeys by public transport varies greatly between metropolitan areas, oscillating between 26.9% in Madrid and 4.0% in Camp de Tarragona.

Modal split for work-related motives



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

Modal split for non work-related motives

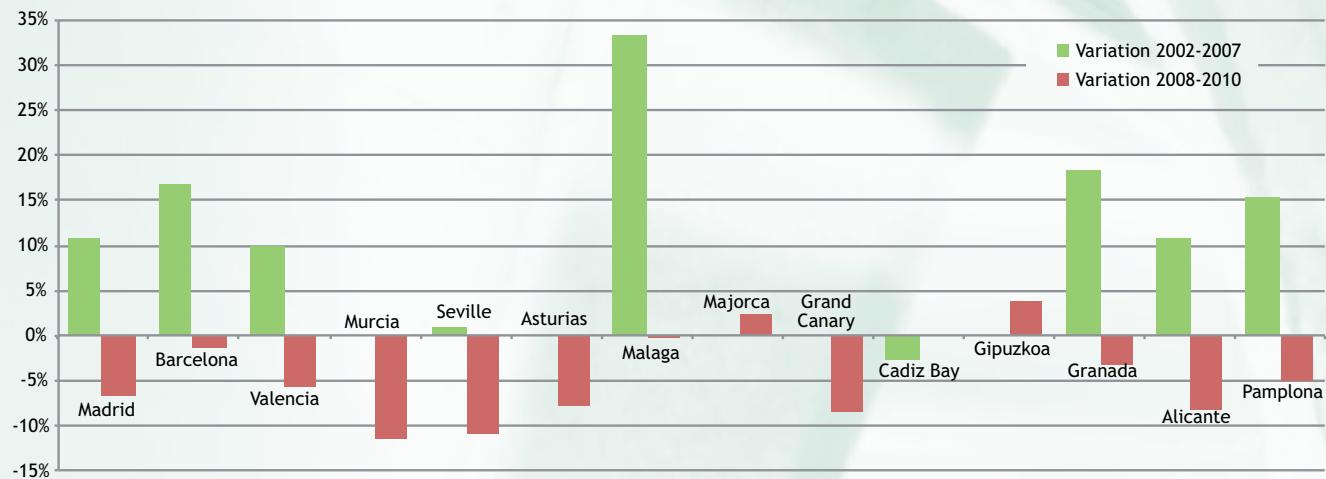


Source: compiled by authors based on data provided by the PTAs.

Public Transport Demand

Regarding the variation of the public transport demand of journeys between 2002 and 2010, it can be distinguished two stages: the first one, between 2002 and 2007, in which the PT demand increases by 12.7%, being lower the increase in bus journeys (3.3%), and higher the increase in rail modes' journeys (22.6%); the second stage is between 2008-2010, in which there is a decrease of the public transport demand of journeys by 4.8%.

Variation of public transport journeys between 2002 and 2010



Evolution of public transport journeys compared with the population



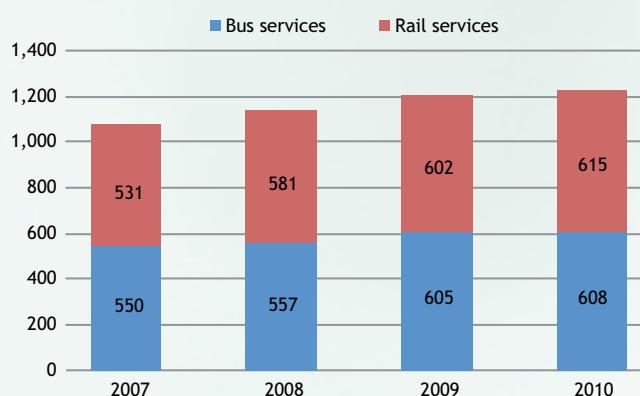
There has been a **clear decrease in demand for public transport since 2007**, especially in bus services.

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 of the metropolitan areas, with rail services seeing the largest increase in vehicle-km (16% between 2007 and 2010).

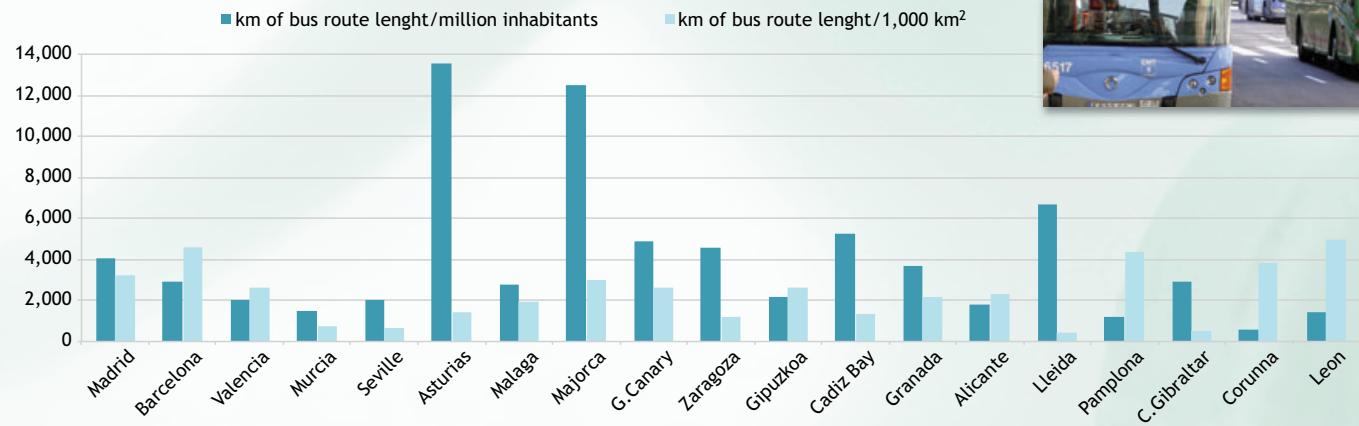
Public Transport supply (vehicles-km)



The route density in **bus services** in the majority of the metropolitan areas is between 2,000 and 5,000 km per 1 million inhabitants. Asturias, Majorca and Lleida surpass these values of route density, reaching the 13,000 km per 1 million inhabitants in Asturias. The route density per surface area is a lower figure in almost all cases, reaching a maximum in Leon (5,000 km per 1,000 km²), followed closely by Barcelona and Pamplona.

The density of **rail service supply**, in reference to population and surface area, shows smaller ranges than the density of bus services. Valencia stands out with the highest rail network density both per person and per surface area (270 km of network per 1 million inhabitants and 340 km of network per 1,000 km²).

Density of bus supply (2010)



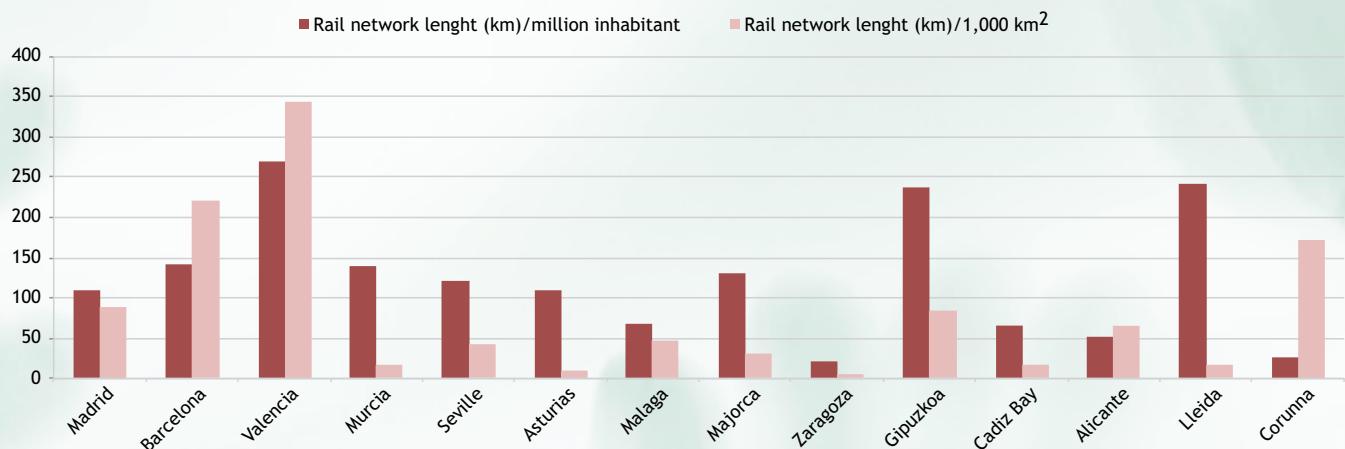
Murcia and Gipuzkoa: only urban buses.

Granada: only urban and metropolitan buses.

Zaragoza and Campo de Gibraltar: only metropolitan buses.

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

Rail network density (2010)



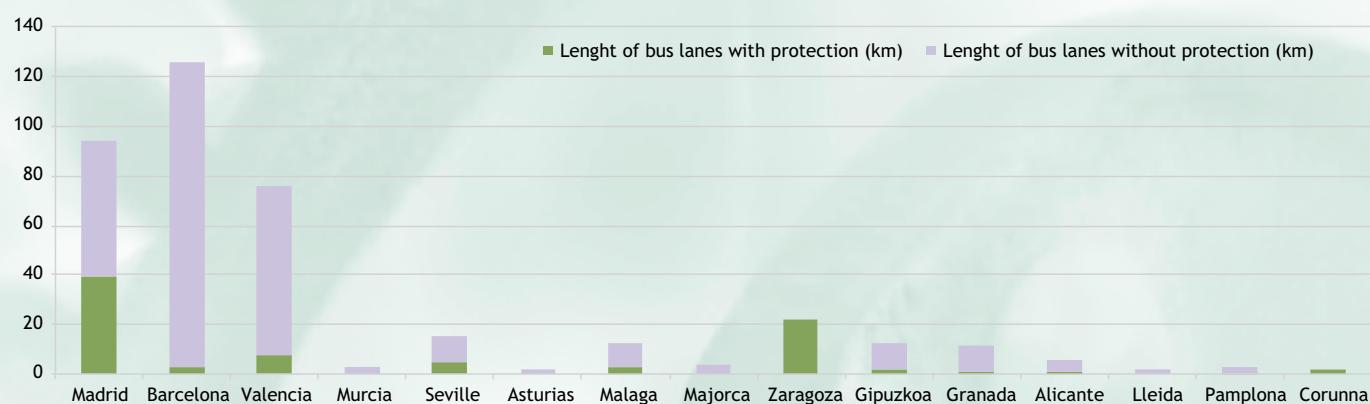
Asturias: only RENFE (FEVE is not included).

Source: compiled by authors based on data provided by the PTAs and the RENFE Directorate General of Passengers.

• Bus Lanes

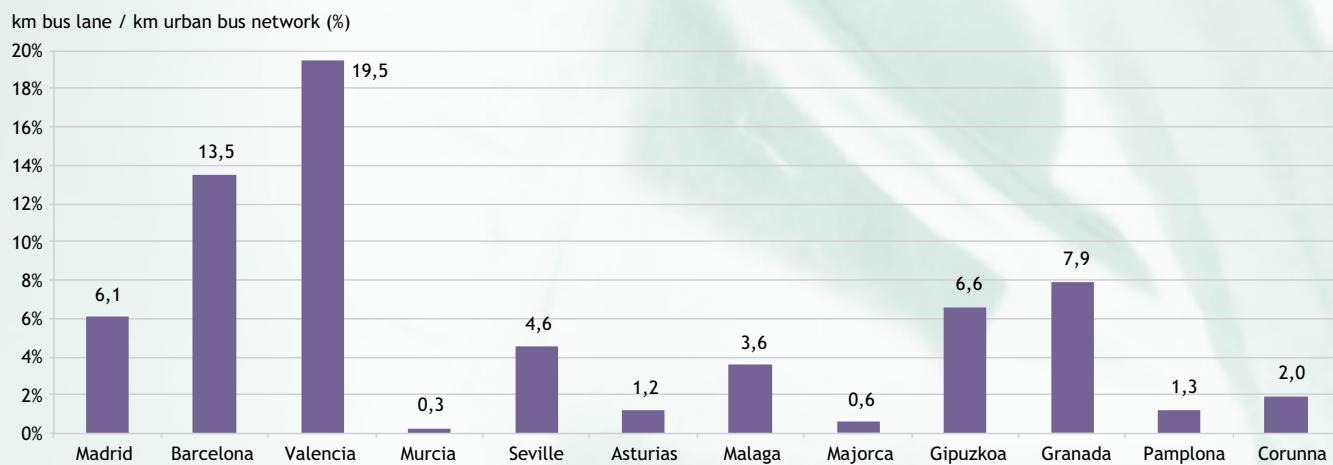
Reserving space exclusively for buses considerably improves journey time and the regularity of bus services, making them more competitive with respect to cars. Barcelona is the city that in 2010 had the most kilometers of bus lanes in its road network, with 126 km, although Madrid and Zaragoza are the cities with the largest networks of segregated bus lanes, with 39 and 22 km respectively. Valencia presents the highest ratio of bus lanes with respect to its total bus network, with 19.8%.

Length of bus lanes in the main city (2010)



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

Percentage of bus network with bus lanes in the main city (2010)

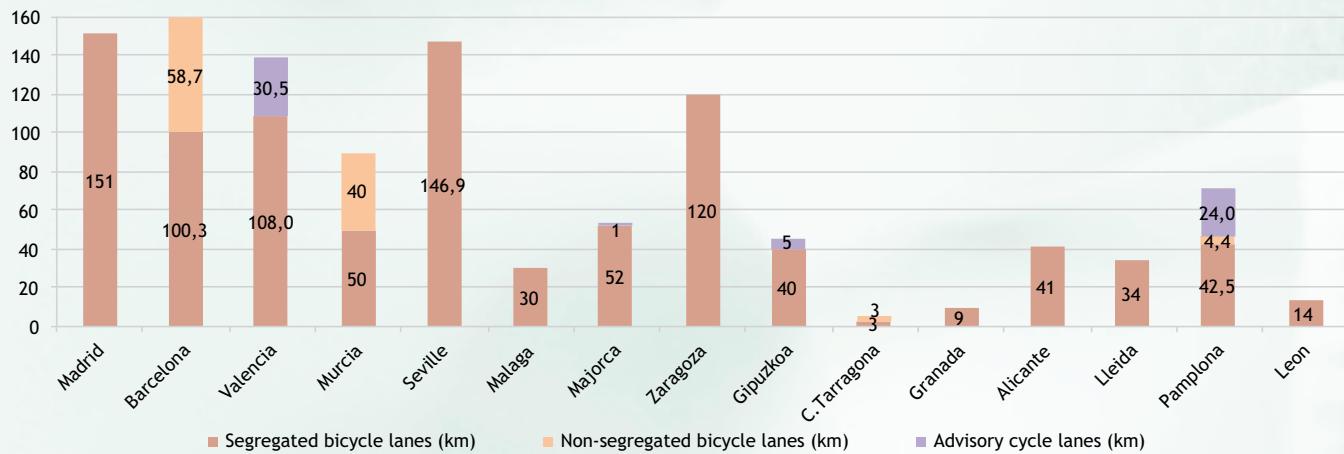


Source: compiled by authors based on data provided by the PTAs.

• Bicycle Lanes

Bicycles can travel on roads together with other wheel 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, non-segregated and “advisory cycle lanes”¹. Barcelona shows the longest network of bicycle lanes (159 km), while Pamplona has the densest bicycle network, with 359 km per one million inhabitants.

Bicycle lanes in the main city (2010)



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



¹ Streets specially adapted for use by cyclists (i.e. speed limits of 30 km/hr, special vertical and horizontal signage).

• 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:

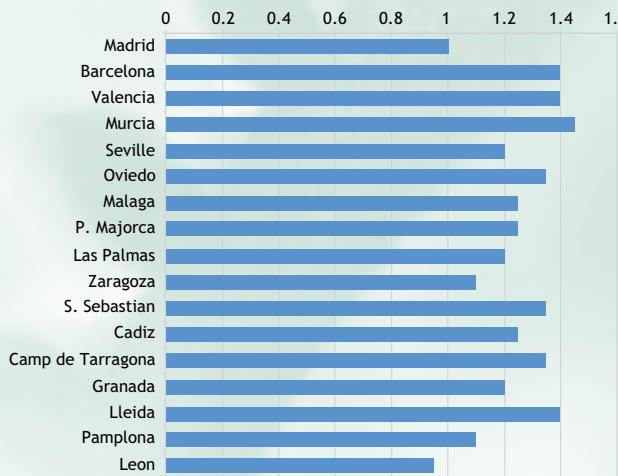
- Frequency at peak times: metro, 3-5 minutes; urban bus, 6-12 minutes in larger cities and 10-23 minutes in mid-sized cities; metropolitan bus, 11-60 minutes; suburban railways, 5-7 minutes in Madrid and Barcelona and 30 minutes in other cities.
- Night services: in most cities, night bus services are 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) and improving in metropolitan buses and rail modes. Tram services offer 100% accessibility.

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. 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, with 65%, indicating an important level of fidelity among users; Valencia has the second-highest percentage of pass use, with a mere 35%.

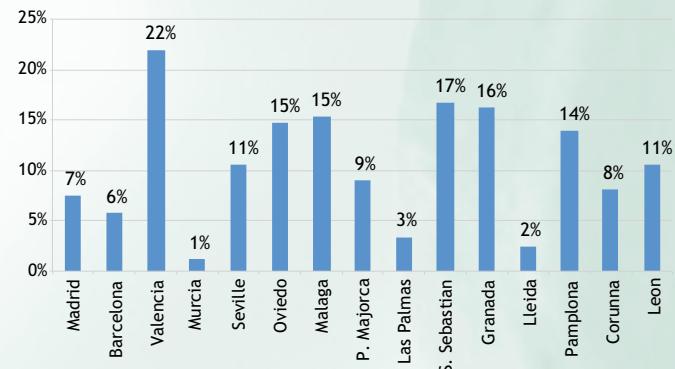
Single ticket price for the main city (euro, 2010)



Source: data provided by the PTAs.

➤ Accessibility to public transport: in city centres, over 90% of the population is located within 300 metres of a public transport stop; this figure reaches 100% in Valencia and Corunna. In the metropolitan areas, the range is wider, from 54% in Barcelona to 97% in Valencia.

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



• Coverage ratio and investments

The average coverage ratio – the percentage of operating costs covered by fare revenue – for all public transport in Spain in 2010 is 53%, 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 56%. This variation, however, does not depend on the size of a metropolitan area, but instead on whether or not there are any rail modes in its public transport system, as this increases operating costs, thereby decreasing the coverage ratio.

Coverage ratio for public transport systems in metropolitan areas (2010)



Source: data provided by the PTAs.

The coverage ratio decreased between 2008 and 2010: operating costs have remained constant, while revenue from fares has decreased due to reduced demand.

MEMBERS AS OF 1ST JANUARY 2012



Public Transport Authority

Consorcio Regional de Transportes de Madrid
 Autoritat del Transport Metropolità de Barcelona
 Agència Valenciana de Mobilitat Metropolitana
 Entidad Pública del Transporte de la Región de Murcia
 Consorcio de Transporte Metropolitano Àrea de Sevilla
 Consorcio de Transportes de Bizkaia
 Consorcio de Transportes de Asturias
 Consorcio de Transporte Metropolitano Àrea de Málaga
 Consorci de Transports de Mallorca
 Autoridad Única del Transporte de Gran Canaria
 Consorcio de Transportes del Àrea de Zaragoza
 Autoritat Territorial del Transporte de Gipuzkoa
 Consorcio de Transportes de Bahía de Cádiz
 Autoritat Territorial de la Mobilitat Camp de Tarragona
 Consorcio de Transporte Metropolitano Àrea de Granada
 Consorcio de Transporte Metropolitano Àrea de Almería
 Transporte Público del Àrea Metropolitana de Alicante
 Mancomunidad de la Comarca de Pamplona
 Municipality of Vigo
 Municipality of A Coruña
 Autoritat Territorial de la Mobilitat Àrea de Lleida
 Municipality of León

Region

Madrid Region	www.ctm-madrid.es
Metropolitan Region of Barcelona	www.atm.cat
Metropolitan Area of Valencia	www.avmm.es/web/avmm
Murcia Region	www.entidadpublicadeltransporte.com
Metropolitan Area of Seville	www.consorciotransportes-sevilla.com
Bizkaia Province	www.cotrabi.com
Asturias Region	www.consorcioasturias.com
Metropolitan Area of Malaga	www.ctmam.es
Majorca island	www.consorcidetransports.org
Grand Canaryisland	www.autgc.org
Metropolitan Area of Zaragoza	www.consorciozaragoza.es
Gipuzkoa Province	http://atgipuzkoa.com
Metropolitan Area of Cadiz	www.cmtbc.es
Camp de Tarragona Area	www.atmcampctarragona.cat
Metropolitan Area of Granada	www.ctagr.com
Metropolitan Area of Almeria	www.ctal.almeria.es
Metropolitan Area of Almeria	www.alicante-ayto.es/trafico/tam.html
Comarca de Pamplona	www.mcp.es
City of Vigo	www.vitrasa.es
City of A Coruña	www.coruna.es
Metropolitan Area of Lleida	www.atmleida.cat
City of Leon	www.aytoleon.es

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