Metropolitan Mobility OBSERVATORY (MMO)

Summary Report
Data 2012

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, the Ministry of Public Works and Transport, the Institute for Energy Diversification and Savings and the Directorate General of Traffic. Its aim is to reflect the contribution of public transport to the improvement of the quality of life and sustainable development in cities. Other collaborators include RENFE, the Association of Urban Transport Collectives, the Spanish Federation of Municipalities and Provinces, the Spanish Railway Foundation 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 2012 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.

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 2012 report comes to 24,2 million inhabitants: more than the 50 % of the nation's population.

Main Figures

Some important figures related to urban and metropolitan mobility in 2012 for the 20 participating Spanish metropolitan areas are summarised below:

- A total of **3.081 billion public transport journeys** were made, 1.503 billion by bus and 1.578 billion by rail modes. Although these figures are quite similar, the length of the networks that support these journeys are significantly different: 97,168 km of bus lines, as opposed to 3,211 km of rail network.
- The **number of journeys per inhabitant per year** differs according to the size of the metropolitan area. The average is 129 journeys per inhabitant per year in large areas, and 52 journeys in mid-sized and small areas.
- The annual public transport demand for the 20 areas considered here is **25.138 billion passenger-km** (40% for bus and 60% for rail modes).
- The public transport supply is **1.300 billion vehicle-km**: 657 million for bus services and 643 million for rail modes.
- **Investment** in public transport in 2012 came to **131 million euros**, a decrease of 85% over 2011. 57% of these investments were dedicated to rail modes.
- The **average coverage ratio is 53%**. Metropolitan area transport systems which include rail modes have an average coverage ratio of 45%, while those which consist exclusively of buses present an average of 58% coverage.

**Madrid, Barcelona, Valencia, Seville, Asturias, Malaga, Mallorca, Grand Canary, Saragossa, Cadiz Bay, Gipuzkoa, Camp de Tarragona, Granada, Alicante, Pamplona, Corunna, Lleida, León and Girona.*

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.

General characteristics of the metropolitan areas on January 1st, 2012

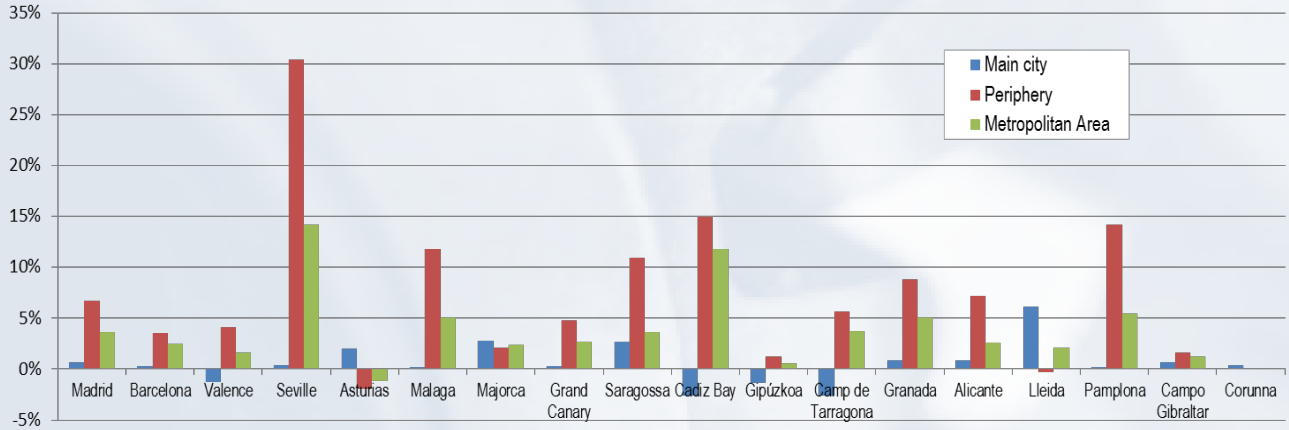
	Metropolitan area (PTA Action Sphere)					Main city			Main city/ Metropolitan area population ratio
	Area (km²)	Population (inhab)	Density (inhab/km²)	Number of municipalities	Built-up area (km²)	Area (km²)	Population (inhab)	Density (inhab/km²)	
Madrid	8.030	6.498.560	809	179	1.037	606	3.233.527	5.332	50%
Barcelona	3.239	5.052.000	1.560	164	597	102	1.621.000	15.970	32%
Valencia	1.415	1.805.115	1.276	60	325	137	797.028	5.824	44%
Sevilla	4.221	1.476.929	350	45	337	141	702.355	4.970	48%
Asturias[1]	10.602	1.067.802	101	78	n.d.	187	225.005	1.205	21%
Málaga[2]	1.432	1.021.755	714	15	75	395	567.433	1.437	56%
Mallorca	3.623	876.147	242	53	212	214	407.648	1.909	47%
Gran Canaria	1.560	852.225	546	21	330	101	382.296	3.802	45%
Zaragoza	2.920	779.607	267	30	258	938	679.624	725	87%
Gipuzkoa	1.981	705.210	356	88	n.d.	267	181.788	681	26%
Bahía de Cádiz[3]	3.072	783.847	255	10	n.d.	14	123.948	8.729	16%
Camp de Tarragona[4]	2.999	622.373	208	132	n.d.	65	133.954	2.054	22%
Granada	861	525.813	611	32	n.d.	88	239.017	2.715	45%
Alicante	354	464.061	1.310	5	74	201	334.678	1.663	72%
Lleida	5.586	367.984	66	149	182	212	139.809	659	38%
Pamplona	92	336.410	3.671	18	47	25	197.604	7.876	59%
Campo de Gibraltar[5]	1.520	266.922	176	7	432	86	116.957	1.360	44%
Girona	1.122	255.292	227	44	80	39	97.198	2.486	38%
A Coruña	-	-	-	-	-	39	246.146	6.311	-
León	467	197.760	424	11	n.d.	39	131.680	3.359	67%

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
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 2012 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 14%. However, in main cities the increase in population is very modest, 0.6% on average, compared with 7.4% increases in the periphery.

Variation of population in metropolitan areas between 2008 and 2012

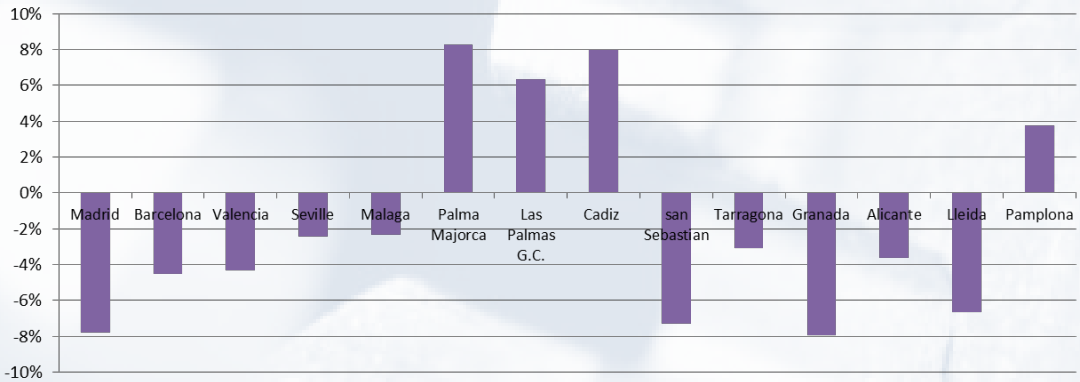


**Seville, Malaga, Cadiz Bay and Granada have incorporated other municipalities into their jurisdiction over the years, which has caused major population variations.*
***Lleida and Campo de Gibraltar, variation between 2009 and 2012.*
****The loss of population in Tarragona is due to segregation of Canonja township in 2010.*
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. In 2012 the average unemployment rate in the areas considered is about 23.7 %, higher than in 2011, but lower than the national average -25%.

The **motorisation rate** has been declining slightly since 2008, and it is related to car use.
Inside the cities, the number of cars per 1,000 inhabitants is lower than in the metropolitan areas (4.6% less). By contrast, in the cities the number of motorcycles per capita is higher than in the metropolitan areas (6.4% higher).

Variation of the motorisation rate (2008-2012)

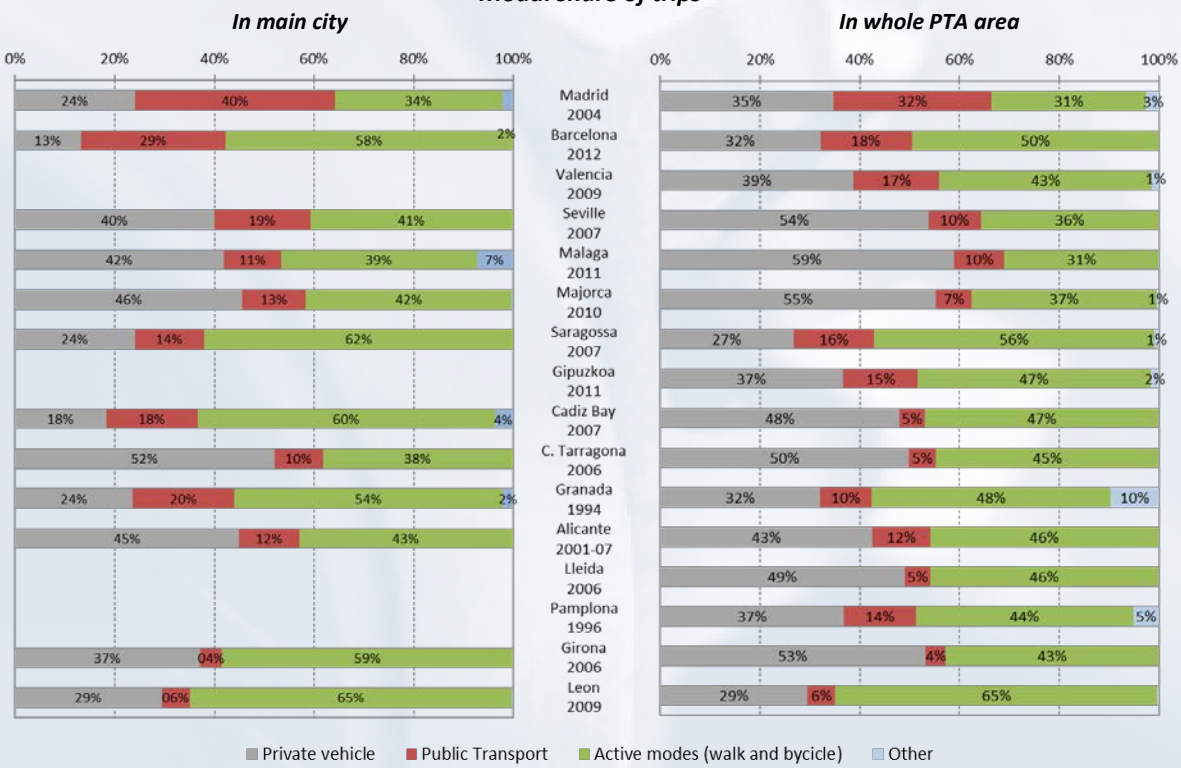


Modal Split

On average, public transport accounts for more than 11% of all trips in the Spanish **metropolitan areas**, varying from 32% in Madrid to 4% in Girona. Active modes (walking and cycling) account for 45% and private cars and motorcycles for 42%. However, this situation changes very much in the **main cities**, which achieve, on average, more than 66% of modal share for what we can consider as "sustainable mobility" (as sum of public transport and active modes).

It is very remarkable the case of Barcelona which stands out with a rate of 58% in active modes, illustrating the deep-rooted habit of walking and/or biking in this Mediterranean city, and also the case of Madrid, accounting for a 40% of public transport trips, highlighting the very dense public transport system irrigating the heart of this city.

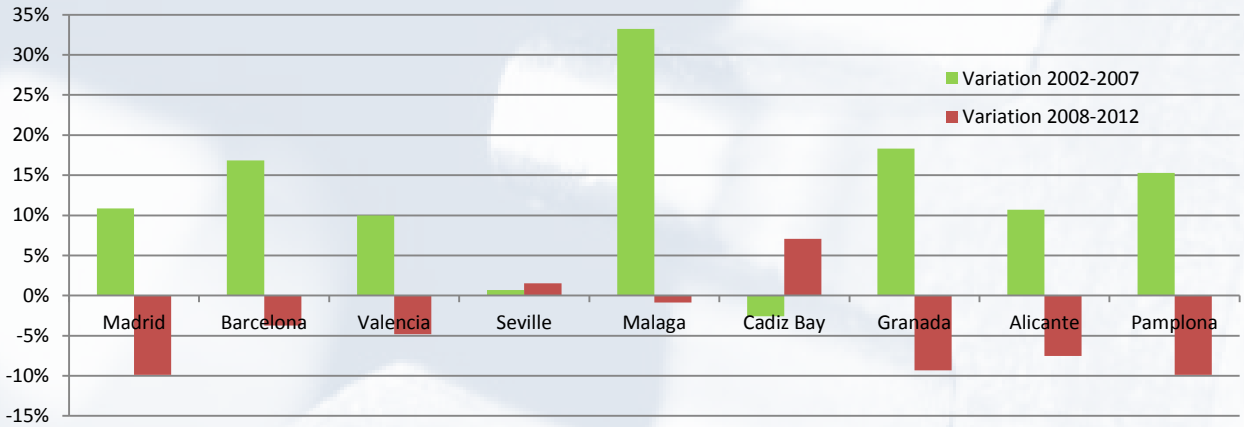
Modal share of trips



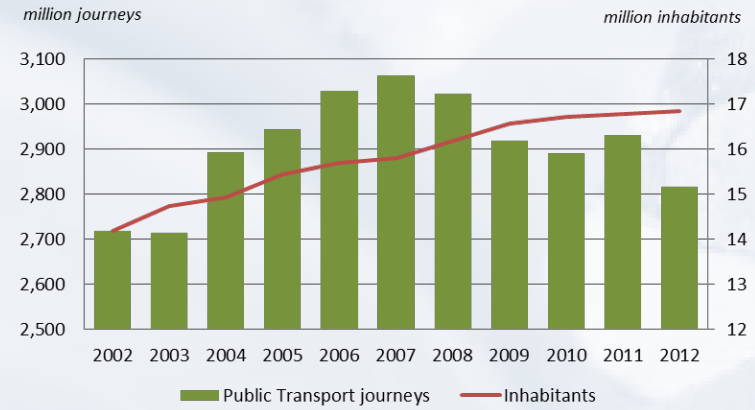
Public Transport Demand

Regarding the variation of the demand for public transport between 2002 and 2012, 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 2012**, there was an overall **decrease of 7.1%** in public transport demand.

Variation of public transport journeys between 2002 and 2012



Evolution of public transport journeys as compared to population



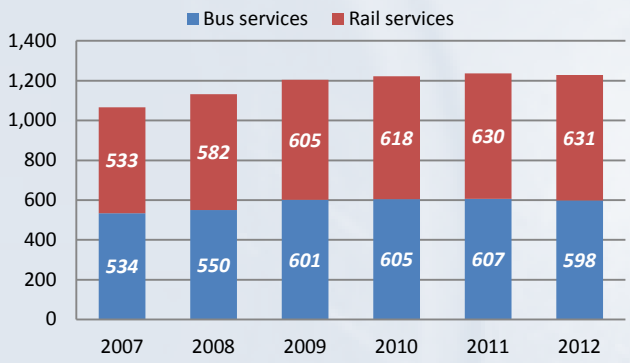
There has been a **clear decrease in demand for public transport since 2007,** especially in bus services.

The **supply** of PT services **has remained steady until 2011** despite the decline in demand, but in 2012 it begins to decrease in bus services.

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). However, in 2012 the bus services begins to decrease.

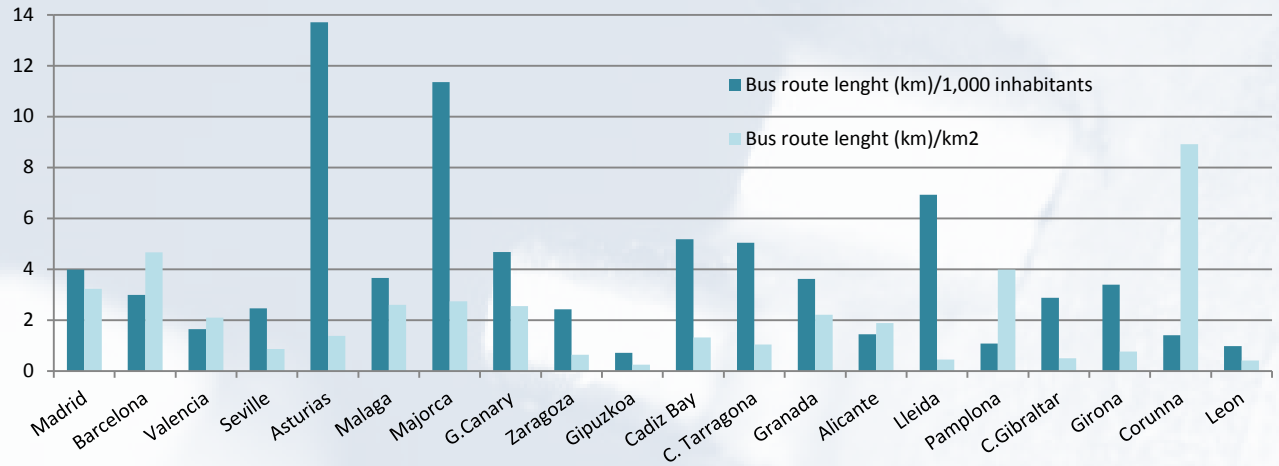
Public Transport supply (vehicles-km)



The **bus networks density** in the majority of the metropolitan areas is between 2 and 5 km per 1,000 inhabitants. Asturias and Mallorca present much higher values, exceeding 10 km per 1,000 inhabitants. In relation to the route density per surface area, the highest figures are reached by Corunna (9 km/km^2), Barcelona (4.5 km/km^2), and Pamplona (4 km/km^2), .

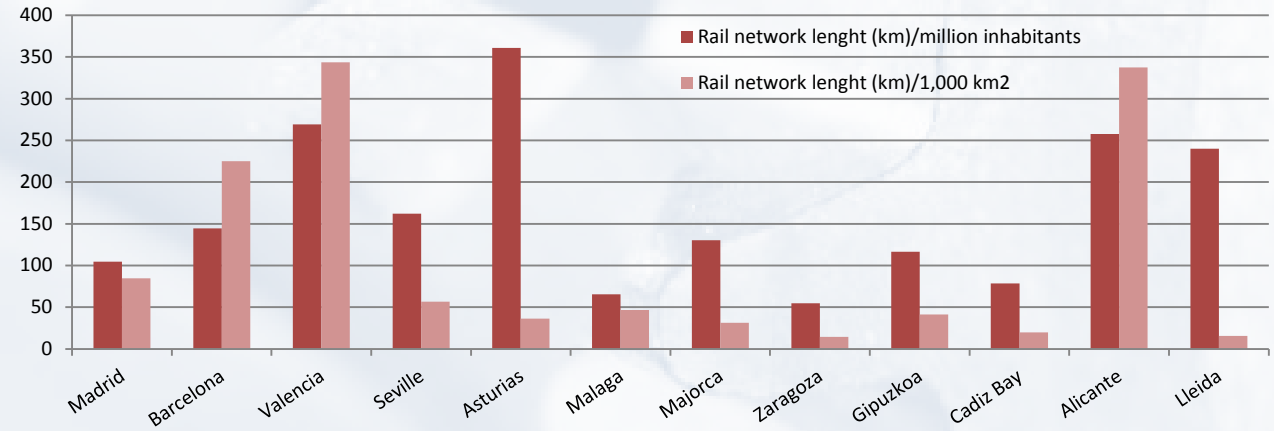
Usually **rail network density** is higher for larger population areas where these modes are more efficient, with an average of 165 km length per million inhabitants and 104 km per 1,000 km^2. However, some areas exceed these averages, as Asturias, with a density of 361 km per million inhabitants, due to the great length of FEVE commuter lines, or Alicante, with 337 km per 1,000 km^2.

Bus network density (2012)



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

Rail network density (2012)

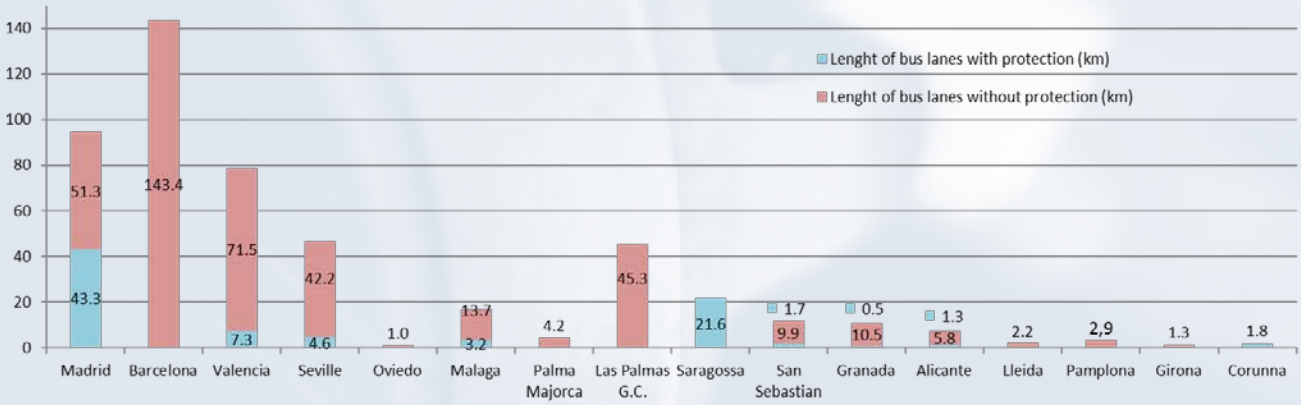


Valencia and Gipuzkoa: the rail network managed by the regional government is not considered
Source: compiled by authors based on data provided by the PTAs and the RENFE Directorate General of Passengers.

• Bus Lanes

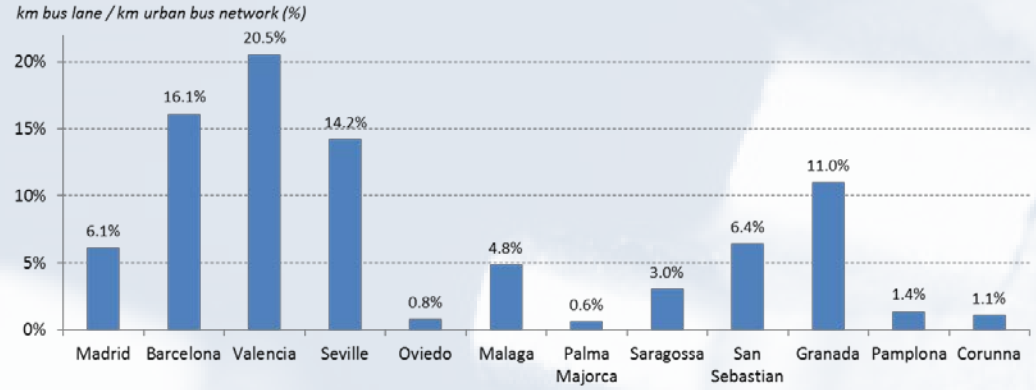
Reserving space for the exclusive use of buses is essential to make public transport competitive with respect to cars. They improve traffic flow in the main access to cities, thus reducing emissions of pollutants, travel time, etc. The effectiveness of these bus lanes is more evident when they have a physical protection. In 2012, Barcelona presents the highest length of bus lanes in its road network (143.4 km), but without any protection (non-segregated bus lanes). Valencia shows the highest ratio of bus lanes with respect to its total bus network, 20.5%.

Length of bus lanes in main city (2012)



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

Percentage of bus network with bus lanes in main city (2012)



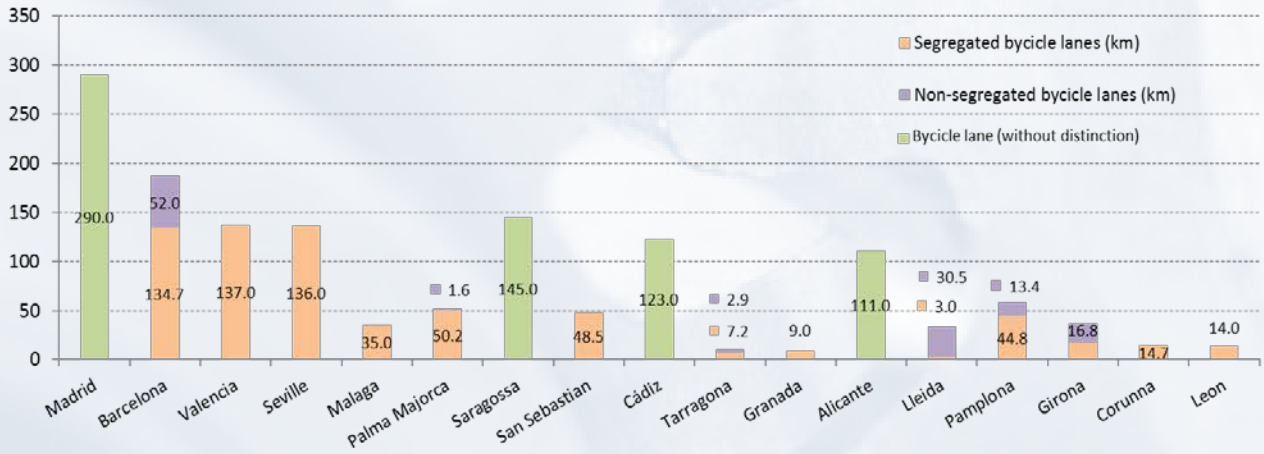
Source: compiled by authors based on data provided by the PTAs.

• Bicycle Lanes

To promote the use of bicycles in cities, it is important to create bicycle lanes on roads where traffic is heavy and the speed of vehicles is high. Bicycle lanes are categorised as segregated or non-segregated, although in the last years is very common to provide cities with some streets allowing mixed traffic. The existence of these streets is positive for cyclists, but they are not as safe as bicycle lanes.

The length of bicycle lanes has been improved in the last years in most of the Spanish cities mainly due to the growing development of different public bicycle sharing systems.

Length of the bicycle lanes in the main city (2012)



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

Double bus lane in Barcelona

Bicycle lane and public bike service Sevici (Seville)

• Quality of the PT Services

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

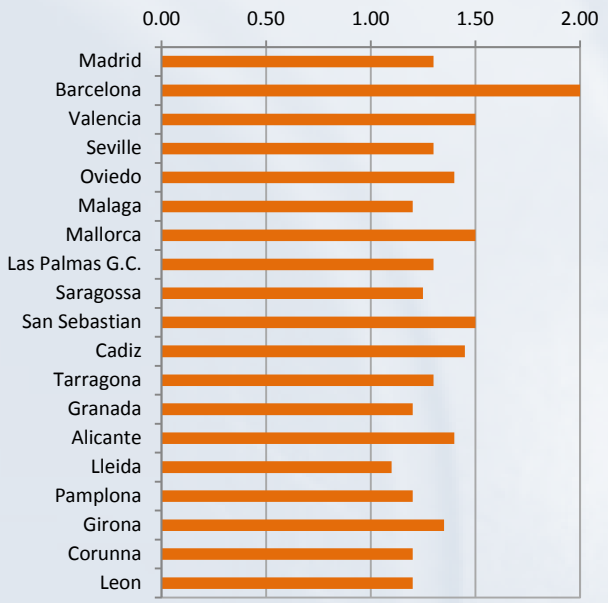
- **Frequency** at peak times – metro: 3-5 minutes; urban bus: 9-15 minutes; metropolitan bus: 15-20 minutes; suburban railways: 5-7 minutes in Madrid and Barcelona, and 30 minutes in other cities.
- **Night services** – in most cities, night bus services are available at weekends and the larger cities also offer night services on week days.
- **Accessibility** for 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.

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 the huge range of existing tickets. The single ticket is the only common ticket for all Spanish cities. Monthly passes are becoming more and more used by passengers. The use of these passes – and of other multiple journey tickets – allows for significant savings over the use of single fare tickets. Seville is the area in which the use of the transport card is greatest (71%), indicating an important level of fidelity among users; Madrid follows with a 70% of passes use.

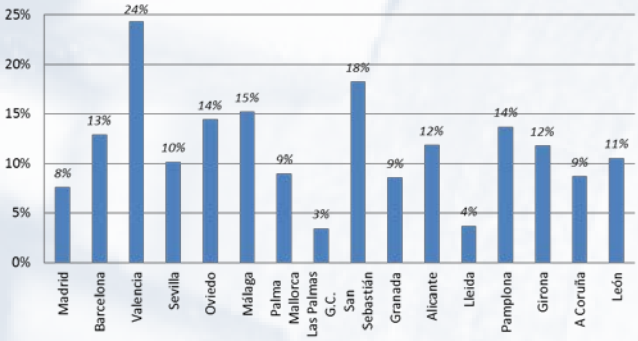
Single ticket price for the main city (Euro, 2012)



Source: data provided by the PTAs.

- **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 97% in Pamplona.

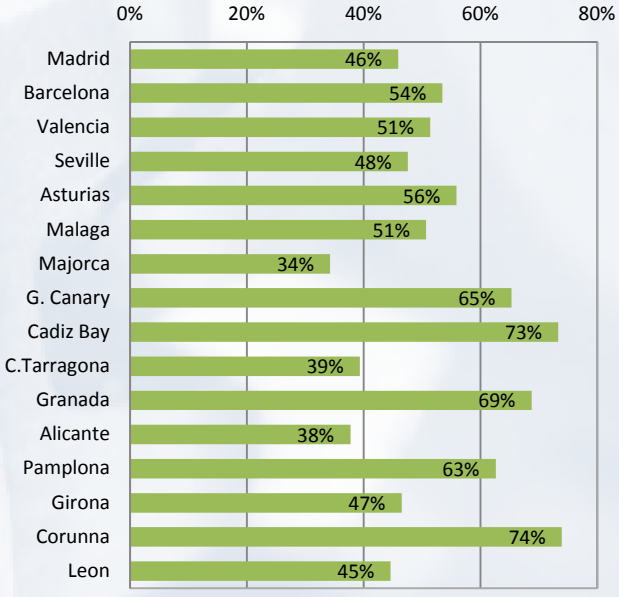
% bus stops provided with real-time information screens (urban buses in main city)



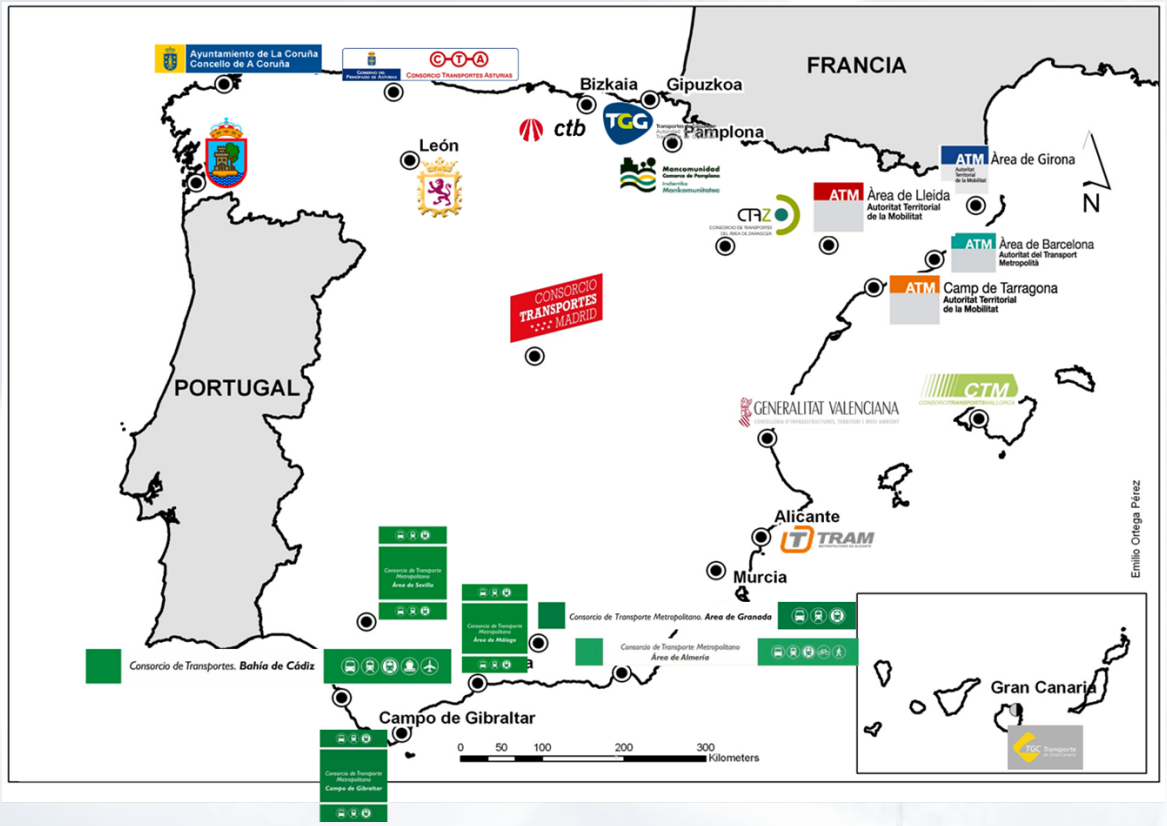
• Coverage ratio

The coverage ratio – the percentage of operating costs covered by fare revenue – for all public transport in Spain is, on average, **53%**, varying from one area to another. The areas with rail services have an average of 45%, while coverage areas without rail services in their PT systems reaches an average of 58%. Corunna and Cadiz Bay stand out, with ratios of 74% and 73%, respectively. According to the EMTA Barometer 2012, the average coverage ratio in European metropolitan areas is 48.2%, so Spanish metropolitan areas are above this average.

Coverage ratio for public transport systems in metropolitan areas (2012)



Not included data from Renfe. Cadiz Bay only metropolitan bus.
Source: data provided by the PTAs.



MEMBERS AS OF 1 JANUARY 2014

PUBLIC TRANSPORT AUTHORITY	REGION	WEBPAGE
Consorcio Regional de Transportes de Madrid	Community of Madrid	www.ctm-madrid.es
Autoritat del Transport Metropolità de Barcelona	Barcelona Metropolitan Region	www.atm.cat
Consellería de Infraestructuras, Territorio y Medio Ambiente - S.G. de Planificación, Logística y Seguridad	Metropolitan Area of Valencia	www.cit.gva.es/cast/transportes
Consorcio de Transporte Metropolitano Área de Sevilla	Metropolitan Area of Seville	www.consorciotransportes-sevilla.com
Consorcio de Transportes de Bizkaia	Province of Bizkaia	www.cotrabi.com
Consorcio de Transportes de Asturias	Asturias Region	www.consorcioasturias.com
Consorcio de Transporte Metropolitano Área de Málaga	Malaga Metropolitan Area	www.ctmam.es
Consorci de Transports de Mallorca	Mallorca	www.consorcidetransports.org
Autoridad Única del Transporte de Gran Canaria	Gran Canaria	www.autgc.org
Consorcio de Transportes del Área de Zaragoza	Metropolitan Area of Zaragoza	www.consorciozaragoza.es
Autoridad Territorial del Transporte de Gipuzkoa	Province of Gipuzkoa	http://atgipuzkoa.com
Consorcio de Transportes de Bahía de Cádiz	Cadiz Bay	www.cmtbc.es
Autoritat Territorial de la Mobilitat Camp de Tarragona	Camp de Tarragona	www.atmcamptarragona.cat
Consorcio de Transporte Metropolitano Área de Granada	Granada Metropolitan Area	www.ctagr.com
Consorcio de Transporte Metropolitano Área de Almería	Almeria Metropolitan Area	www.ctal.almeria.es
Transporte Público del Área Metropolitana de Alicante	Alicante Metropolitan Area	www.alicante-ayto.es/trafico/tam.html
Mancomunidad de la Comarca de Pamplona	Pamplona Region	www.mcp.es
Municipio de Vigo	Municipality of Vigo	hoxe.vigo.org/
Consorcio de Transporte Metropolitano Campo de Gibraltar	Gibraltar Camp	www.ctmcg.com
Consorcio de Transporte Público del Area de Girona	Girona Metropolitan Area	www.atmgirona.cat
Municipio de A Coruña	Municipality of Corunna	www.coruna.es/
Autoritat Territorial de la Mobilitat Àrea de Lleida	Municipality of Lleida	www.atmlleida.cat
Municipio de León	Municipality of Leon	www.aytoleon.es/

Produced by

Transport Research Centre
Univerisidad Politécnica de Madrid
www.transyt.upm.es

Funding provided by

October 2014