Metropolitan Mobility OBSERVATORY (MMO)

Summary Report
Data 2016

The Metropolitan Mobility Observatory (MMO)

The objective of the present document is to summarize the information contained in the 2016 MMO Report, developed by TRANSyT-UPM analyzing the data provided by its members and collaborators.

The MMO is an analysis and observation initiative made up of the Public Transport Authorities (PTA) of the main Spanish metropolitan areas, the Ministry for Agriculture and Fisheries, Food and Environment, the Ministry of Public Works and Transport and the Institute of Energy Diversification and Savings. It collaborates very closely as well with the National Railway Operator (RENFE), the Association of Collective Urban Transport (ATUC), the Directorate General of Traffic, the Spanish Federation of Municipalities and Provinces (FEMP) and the CCOO Trade Union Federation.

Its main goal is to reflect the contribution of public transport to the improvement of the quality of life and sustainable development in the Spanish cities. This contribution is reflected in the analysis of the general mobility tendencies of the main metropolitan areas, which is done through the study of a set of key transport indicators including public transport supply and demand, financing and investments, quality of service and road safety.

For the 2016 MMO Report, **22 PTA*** (out of 24 included in the MMO) provided information, which represents approximately the 54% of the nation's population. The rest of the information was provided by usual collaborators of the MMO, like RENFE, the Directorate General of Traffic and the National Statistics Institute.

Main Figures

The following figures summarise some important information about the urban and metropolitan mobility in 2016 in the 22 participating metropolitan areas:

- The annual public transport demand for the areas considered in the report is **24.020 billion passenger-km** (35% for bus and 65% for rail modes).
- The **number of journeys per inhabitant per year** differs according to the size of the metropolitan area. The average is **125** journeys per inhabitant per year in large areas and **52** journeys in mid-sized and small areas.
- A total of **3.497 billion public transport journeys** were made, 1.729 billion by bus and 1.768 billion by rail modes. In spite of the similarity of both figures, it is remarkable the great difference between the lengths of the network that support these journeys: 131,151 km for bus lines and 3,210 km of rail network.
- **Investment** in public transport in 2016 was really low, reaching **165.3 million euros**. This is the first time that the amount of these investments is equally divided between rail and bus modes.
- The public transport supply is about **607 million vehicle-km for bus** services and **340 million car-km for rail modes** (not included Cercanias RENFE).
- The **average coverage ratio is 54%**. While metropolitan area transport systems which include rail modes have an average coverage ratio of 47%, those which consist exclusively of buses present an average of 58% coverage.

**Madrid, Barcelona, Valencia, Seville, Bizkaia, Asturias, Malaga, Mallorca, Saragossa, Cadiz Bay, Gipuzkoa, Camp de Tarragona, Granada, Almería, Alicante, Lleida, Pamplona, Campo de Gibraltar, Corunna, Jaen, Leon and Caceres.*

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, 2016

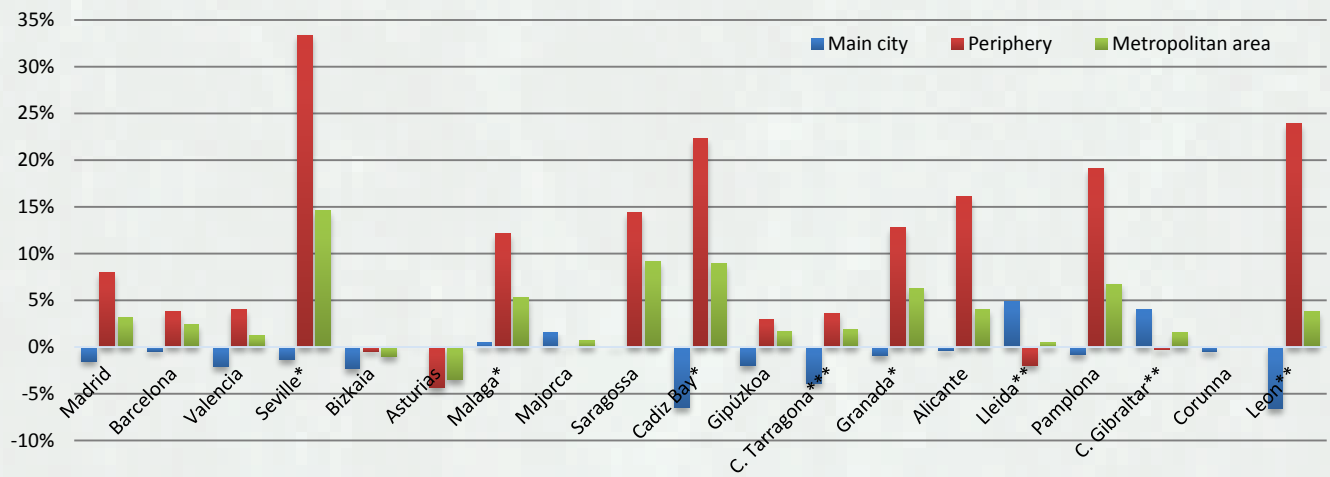
	Metropolitan area (PTA Action Sphere)					Main city			Main city/ Metropolitan area population ratio
	Surface (km^2)	Population (inhab.)	Density (inhab/km^2)	Number of municipalities	Built-up area (km^2)	Surface (km^2)	Population (inhab.)	Density (inhab/km^2)	
Madrid	8.030	6.466.996	805	179	1.039	605	3.165.541	5.232	49%
Barcelona	3.239	5.046.743[1]	1.552	164	3.242	102	1.608.746	15.850	32%
Valencia	1.551	1.797.346	1.159	60	306	138	790.201	5.706	44%
Seville	4.221	1.482.705	351	45	225	141	690.566	4.887	47%
Biscay	2.217	1.134.370[2]	512	112	241[3]	41	345.122	8.418	30%
Asturias	10.604	1.042.608	98	78	n.d.	187	220.567	1.182	21%
Malaga	1.432	1.024.599	716	15	75[4]	395	569.009	1.441	56%
Majorca	3.623	861.430	238	53	212[5]	214	402.949	1.887	47%
Cadiz Bay	3.312	820.906	248	12	n.d.	14	118.919	8.375	14%
Saragossa	2.920	764.210	262	30	2.863	938	661.108	705	87%
Gipuzkoa	1.981	712.801	360	88	n.d.	267	180.658	677	25%
Tarragona Camp	2.999	611.244	204	132	188	65	132.229	2.028	22%
Granada	861	531.965	618	33	94	88	234.758	2.667	44%
Almeria	2.154	518.017	241	9	n.d.	296	194.515	657	38%
Alicante	433	470.633	1.086	8	74	201	330.525	1.642	70%
Lleida	5.586	362.384	65	149	182	212	138.144	652	38%
Pamplona	92	340.405	3.714	18	50	25	195.650	7.798	57%
Gibraltar Camp	1.520	267.692	176	7	432[4]	86	120.601	1.402	45%
Corunna						38	243.978	6.454	100%
Jaen	1.761	220.044	125	15	n.d.	424	114.740	270	52%
Leon	913	205.895	226	16	21	39	126.192	3.233	61%
Caceres	n.d.	96.712	n.d.	1	21	1.760	95.940	55	99%

1: Data corresponding to the Metropolitan Region of Barcelona
2: Data according to INE 2015.
3: Data of the Provincial Council of Biscay for 2015.
4: Data 2007. Estimate based on the progress of the Metropolitan Transport Plan for metropolitan data.
5: Data of 2009
Source: compiled by authors based on data provided by the PTAs

Evolution of population and other socioeconomic indicators

The population in the period 2008-2016 grows by 3.8% in all the whole metropolitan areas; however the population is concentrated in the periphery (+ 9%), while in the main cities the population decreases by 1%. The peripheries of Seville, Leon and Cadiz Bay have increased their population the most since 2008, with increases of over 20%. As for the cities, Leon, Cadiz and Tarragona are the ones are the ones with the sharpest decreases in population in this period, with values close to 5%.

Variation of population in metropolitan areas between 2008 and 2016

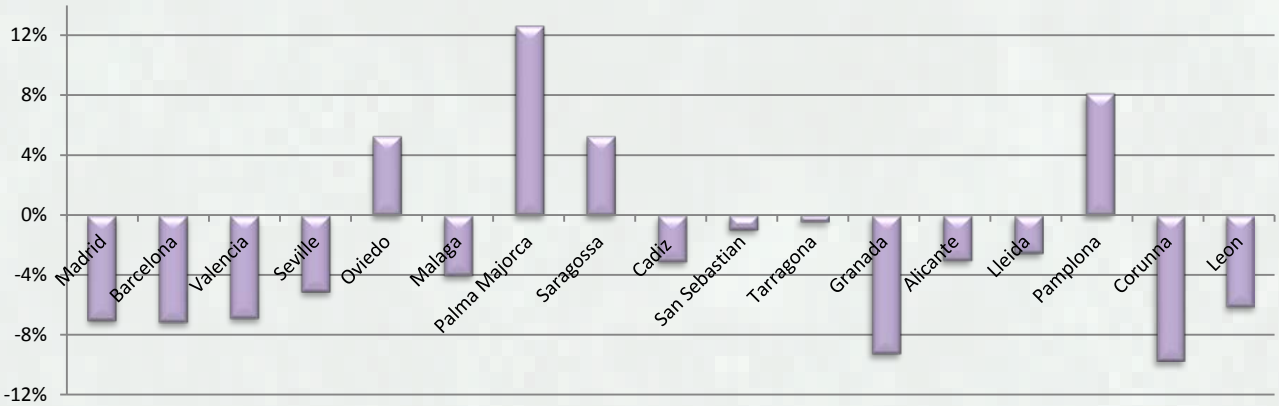


**Seville, Malaga, Cadiz Bay and Granada have incorporated other municipalities into their jurisdiction over the years, which has caused major population variations.*
***Lleida and Campo de Gibraltar, variation between 2009 and 2016.*
****The loss of population in Tarragona is due to segregation of Canonja township in 2010.*
***** Leon, variation between 2010 and 2016.*
Source: compiled by authors based on data provided by the PTAs.

The economic crisis in recent years influenced very strongly the **unemployment rate** between 2008-2013. Since then, it has been recovering year by year, and in 2016 the average unemployment rate in the areas considered is about 19.6 %, lower than the national average (20.5%).

The effects and consequences of this economic crisis could be seen in the slight decline of the **motorisation rate** since 2008. The next figure shows that all cities have reduced the motorisation rate between 2008-2016, except for Palma Majorca, Pamplona, Oviedo and Saragossa. In 2016, the number of cars per 1,000 inhabitants, on average, was 448 in the main cities; whereas it was 468 in the metropolitan areas.

Variation of the motorisation rate in cities (2008-2016)

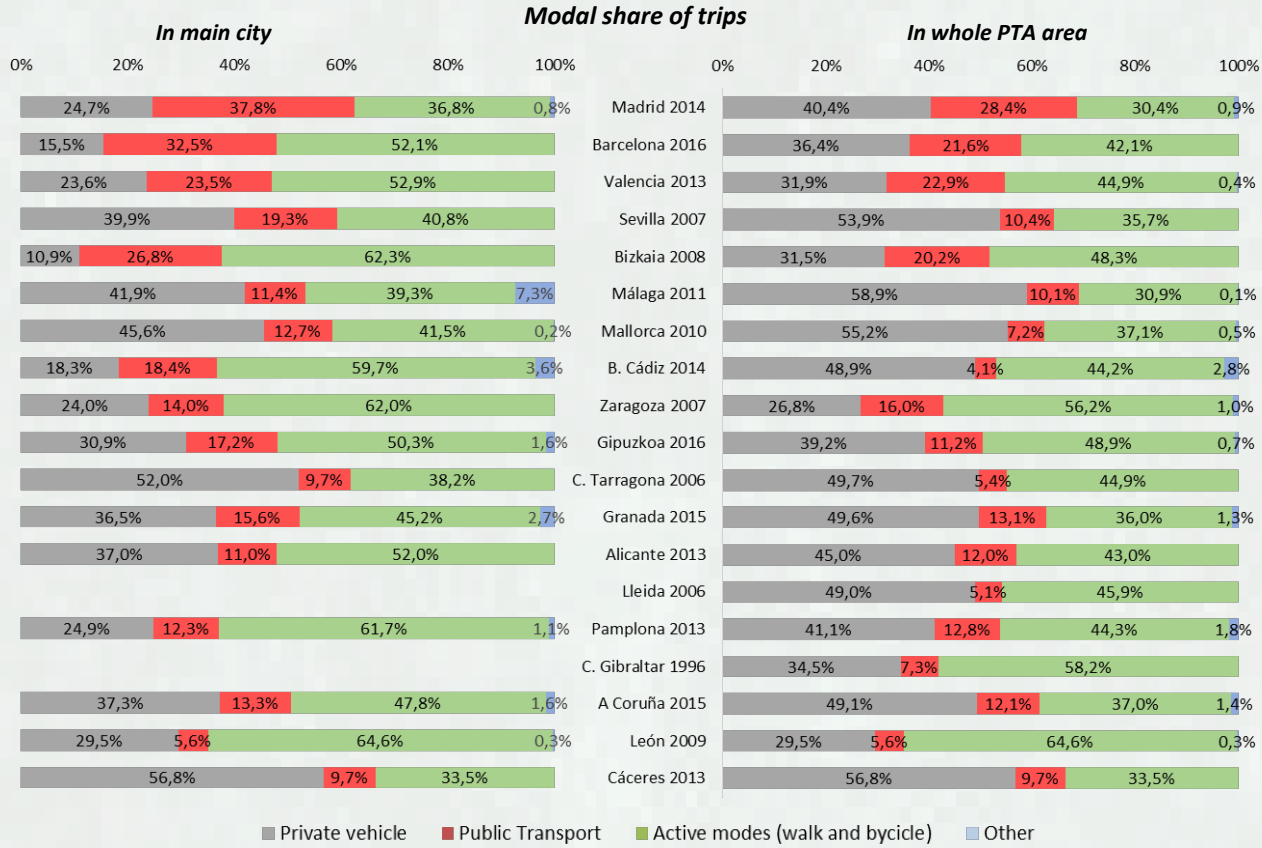


Modal Split

For all motives, the average modal share for **public transport** in the metropolitan areas is more than 13%; however, in Madrid, it reaches a 28.4% while in Cadiz Bay it is 4.1%.

On average, active modes (walking and cycling) account for 44% of the trips and private cars and motorcycles for 43%. It is remarkable the case of the two main big cities, since Barcelona has a rate of 56.1% in active modes and Madrid accounts for a 37.8% of public transport trips. Those two cities show two different characteristics, while in the first one exists a deep-rooted habit of walking/biking, in the second one it is highlighted the high use of the public transport system.

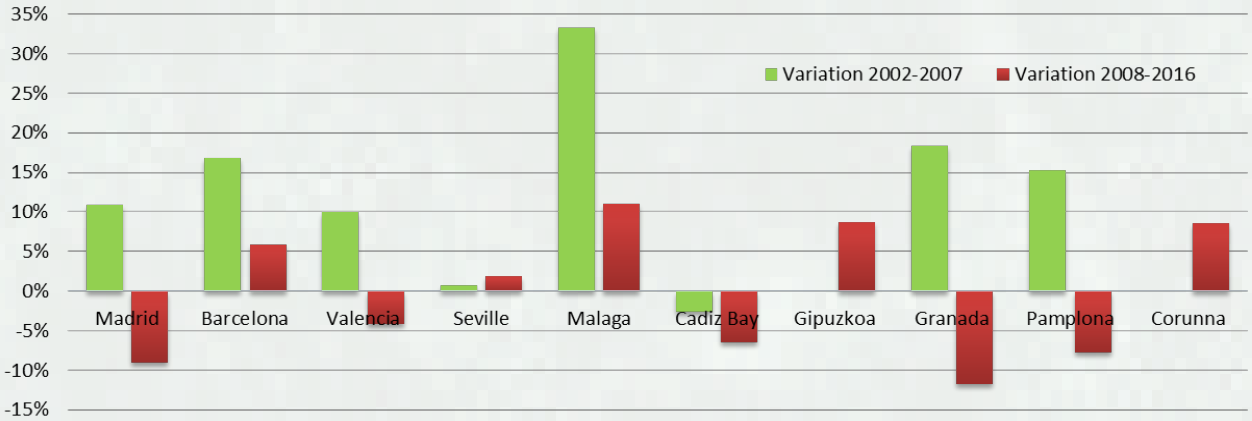
Modal share of trips



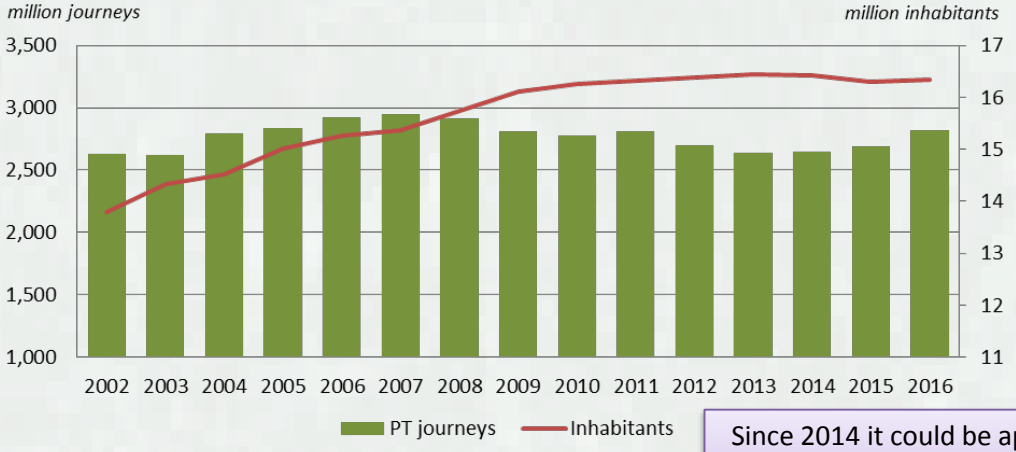
Demand for Public Transport

Two phases can be distinguished in the variation of the public transport demand between 2002 and 2016. First, on between 2002 and 2007 there is a general growth of a 12.7% in public transport demand, specially in rail modes journeys (22.6%) against the bus journeys (3.3%). And, second, between 2008 and 2016, where there is **an overall decrease of 3.3% in the number of public transport trips;** however, since 2013 there is an increase of 6.9 % in the PT journeys. Areas like Malaga, Barcelona or Seville show increase of PT demand in the two periods.

Variation of public transport journeys between 2002 and 2016



Evolution of public transport journeys as compared to population



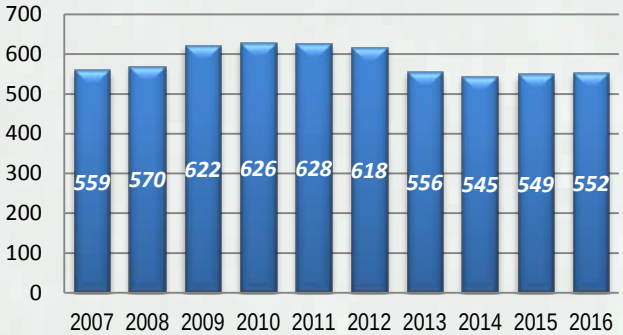
Only considered Madrid, Barcelona, Seville, Malaga and Granada.
Source: compiled by authors based on data provided by the PTAs.

Since 2014 it could be appreciated a **recovery of the PT demand**, after the strong decrease suffered during the economic crisis.

Public Transport Supply

The supply of bus services (in terms of vehicles-km) has decreased between 2012 and 2014, when it stabilizes o increases slightly.

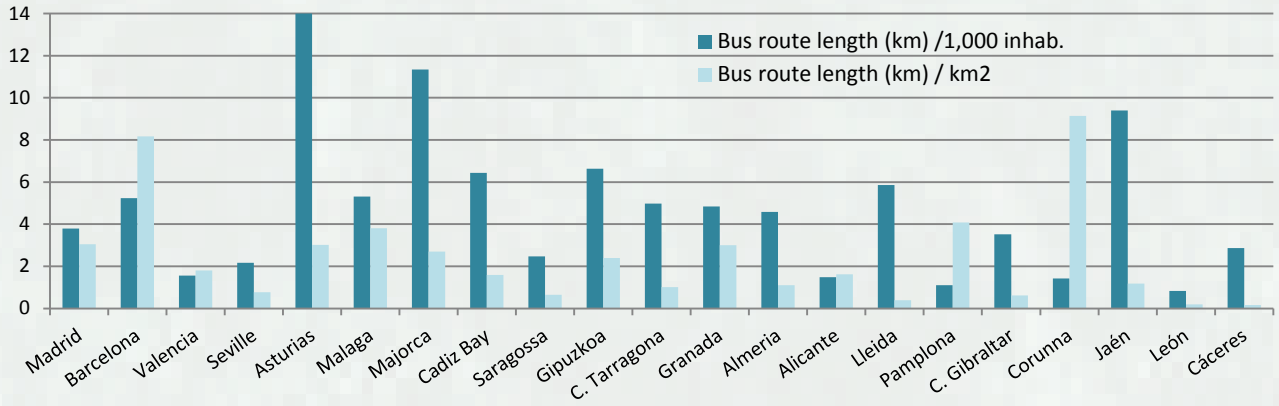
Public Transport supply of bus services (million vehicles-km)



Concerning the **bus networks density**, the average is 5.4 km per 1,000 inhabitants, being Asturias and Majorca much above this value, with more than 10 km per 1,000 inhabitants. Relating route density with surface area, Corunna and Barcelona reach the highest figures, with 9 km/km^2 and 8.1 km/km^2, respectively, being 2.1 km/km^2 the average.

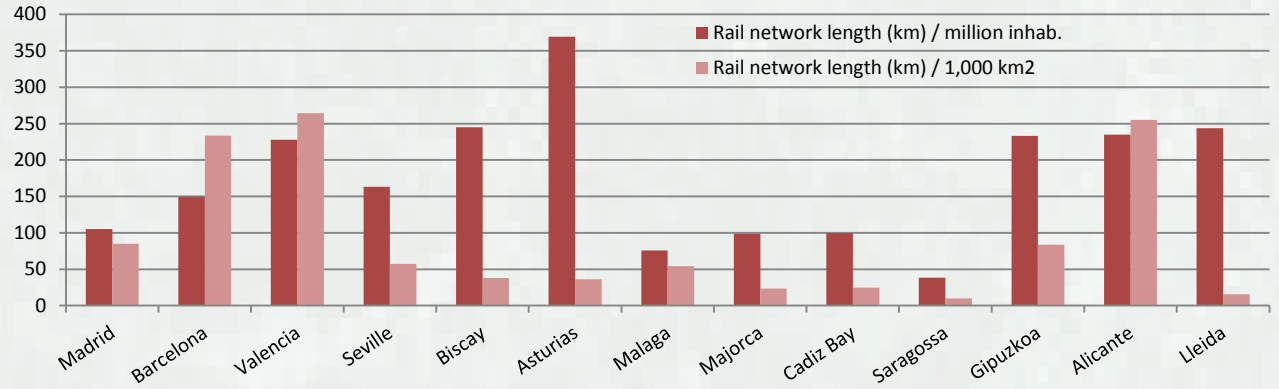
Since rail transports cover long distances as they are more efficient, the **rail network density** is higher for larger population's areas. The average in Spain is 141 km length per million inhabitants and 78 km per 1,000 km^2, an average which is exceed in the case of Asturias due to the great length of FEVE commuter lines with a density of 366 km per million inhabitants, or in Valencia, with 264 km per 1,000 km^2.

Bus network density (2016)



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

Rail network density (2016)

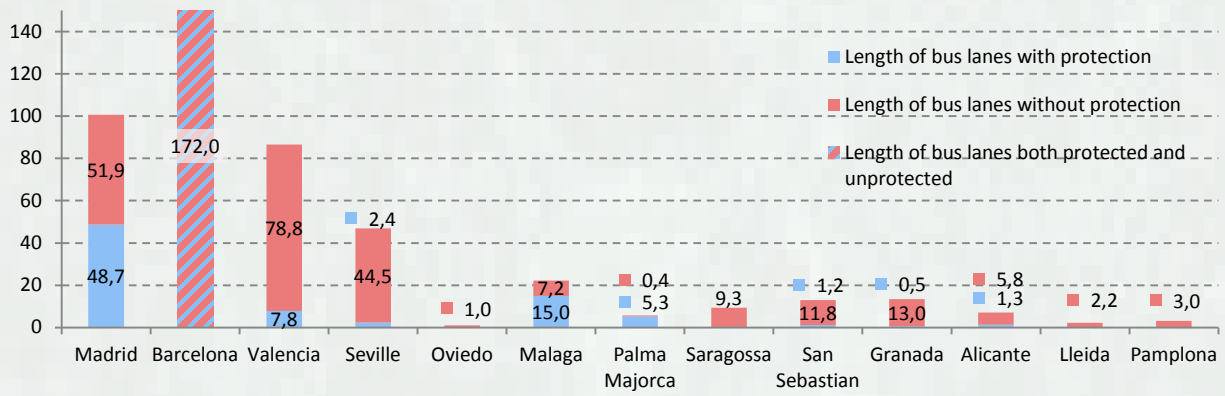


Gipuzkoa: the rail network managed by the regional government is not considered
Source: compiled by authors based on data provided by the PTAs and the RENFE Directorate General of Passengers.

• Bus Lanes

Lanes reserved for exclusive or preferential use of public transport are essential to be competitive with respect to cars. These lanes are more effective if they have some type of protection. In 2016, Barcelona shows the highest length of bus lanes in its network (172 km), although Valencia is the city showing the highest ratio of bus lanes respect to its total bus network (21.1%). They are followed by Seville, with a 12.7% of bus lanes on its bus network, mostly with protection.

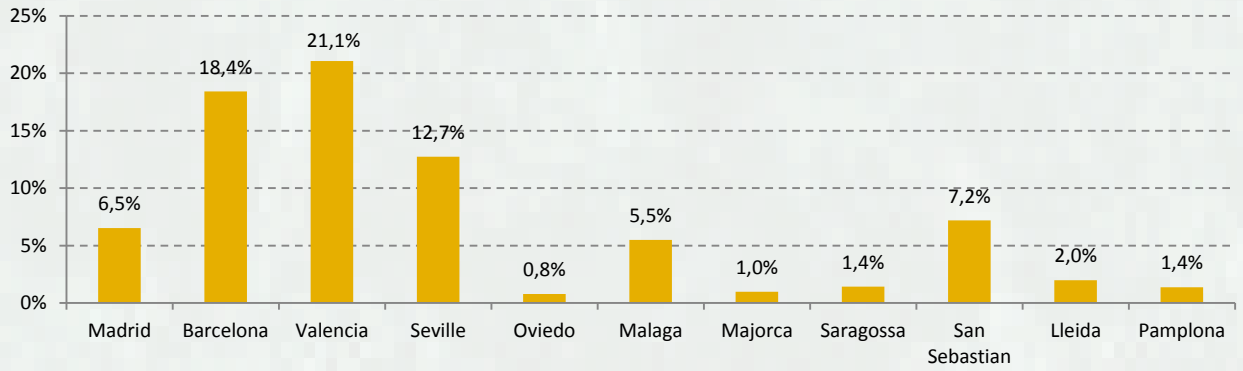
Length of bus lanes in main city (2016)



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

Percentage of bus network with bus lanes in main city (2016)

km bus lane / km urban bus network (%)

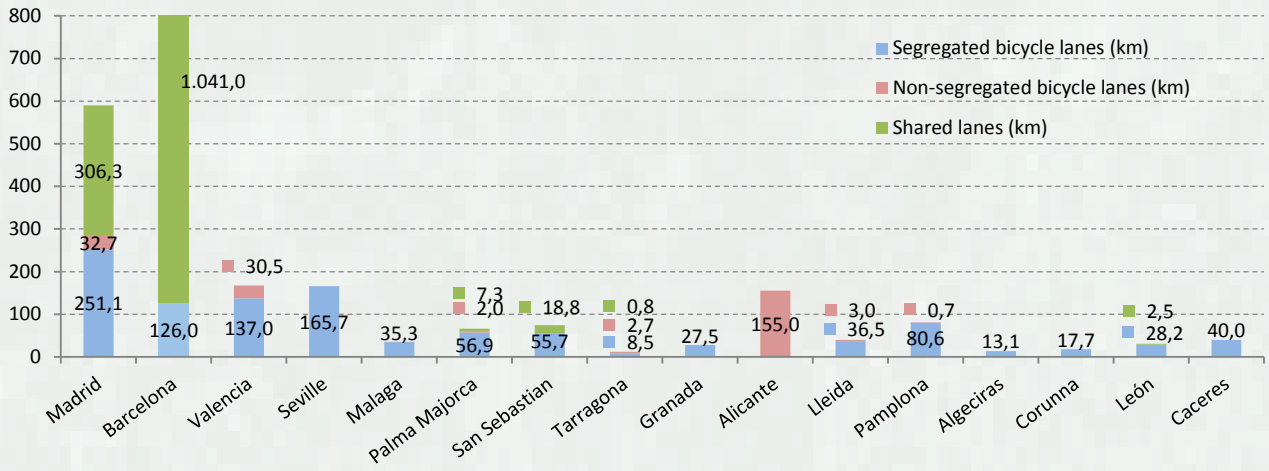


Source: compiled by authors based on data provided by the PTAs.

• Bicycle Lanes

The promotion of the use of bicycles in cities begins by having a reserved space for the circulation of cyclists, being adequate, safe and efficient. Next figure shows the length of three different types of bicycle lanes in Spanish cities: segregated and non-segregated bicycles lanes, and mixed traffic streets, where cycling is allowed but it is not as safe as in the previous ones. In most cases, the length of these lanes remains stable with respect to 2015. However, there are some cases that bicycle lanes have increased significantly, mainly due to the development of public bicycle sharing systems. These are Madrid and Barcelona.

Length of the bicycle lanes in the main city (2016)



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

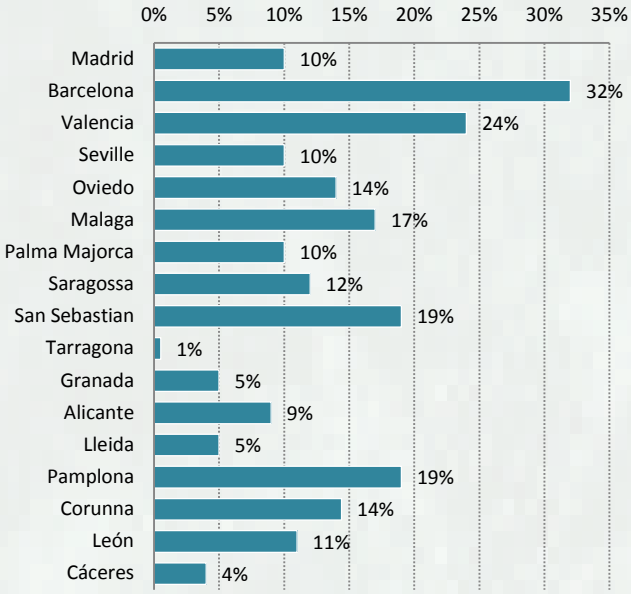
Segregated bicycle lane in Pamplona

Base of Public bicycle service in Malaga (Source: Authentic Malaga)

• ITS and users' information

Intelligent Transport Systems (ITS) in recent years has allowed an increase in the quality, efficiency, sustainability and safety of public transport. An example is the use of **smart cards**, which have proved to be an useful way to reduce the boarding time, thus decreasing the total travel time. Another key aspect to improve users' satisfaction with the PT services is the information provided to them. The provision of **real-time information at bus stops** has been proved to be very demanded by PT users, especially those do not use smartphones too much. Recently, many **mobile applications** (apps) have emerged in the public transport arena with different functionalities: maps and routes, travel planning, waiting time, real-time disruptions, users' opinion. The first three are available in the different areas and for the majority of transport modes. The last two options are available only in Madrid, Barcelona, Zaragoza and Caceres.

% bus stops provided with real-time information screens (buses in main city, 2016)

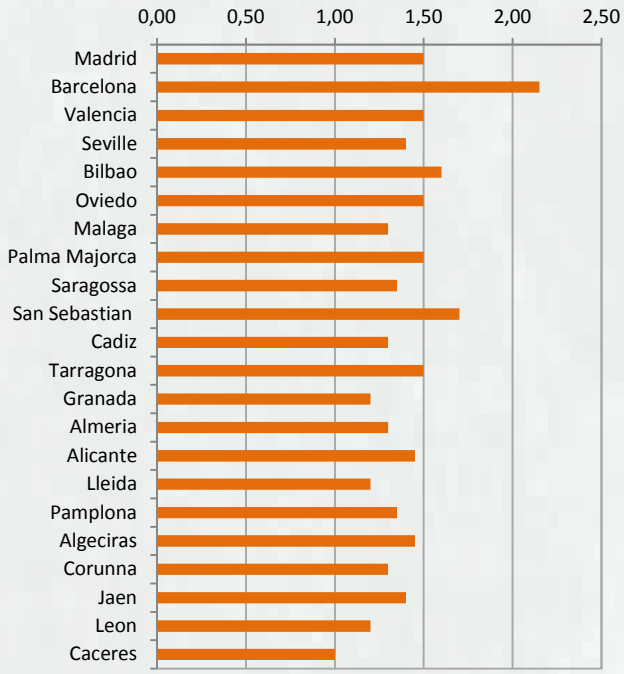


Economic and fare-based aspects

• Ticket and fare types

There are many transport tickets in the different fare systems of the metropolitan areas. Some have wallet cards and others have temporary passes. Some areas have tariff integration, while in others there is not. The only common transport ticket in all areas is the single ticket in the main city, although the co-existence of different transport modes makes their fares different within the same city. In Madrid, the ticket most used is the monthly pass, by a 75% of the users. The wallet cards are the favourite transport pass in Pamplona, Corunna, Jaen and Gipuzkoa, used by more than 70% of the users. Barcelona is the city with the highest tariff for the single ticket (2.15 €).

Single ticket price for the main city (Euro, 2016)

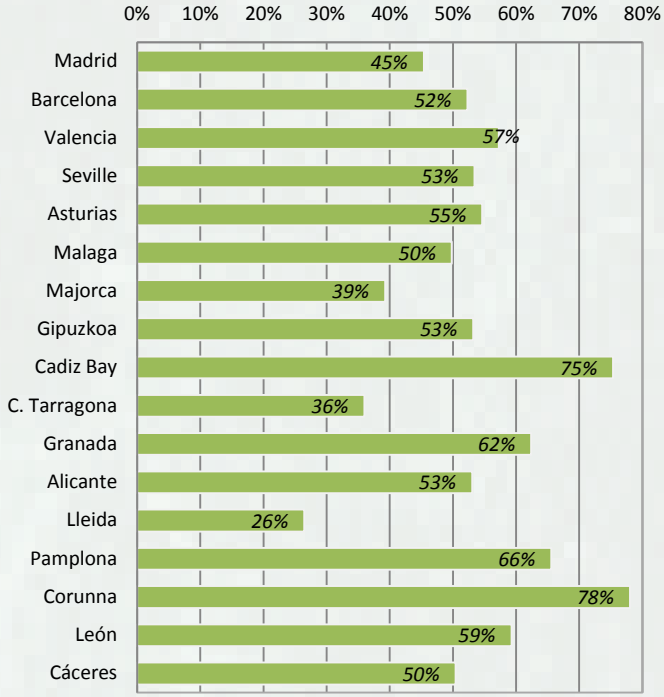


Source: data provided by the PTAs.

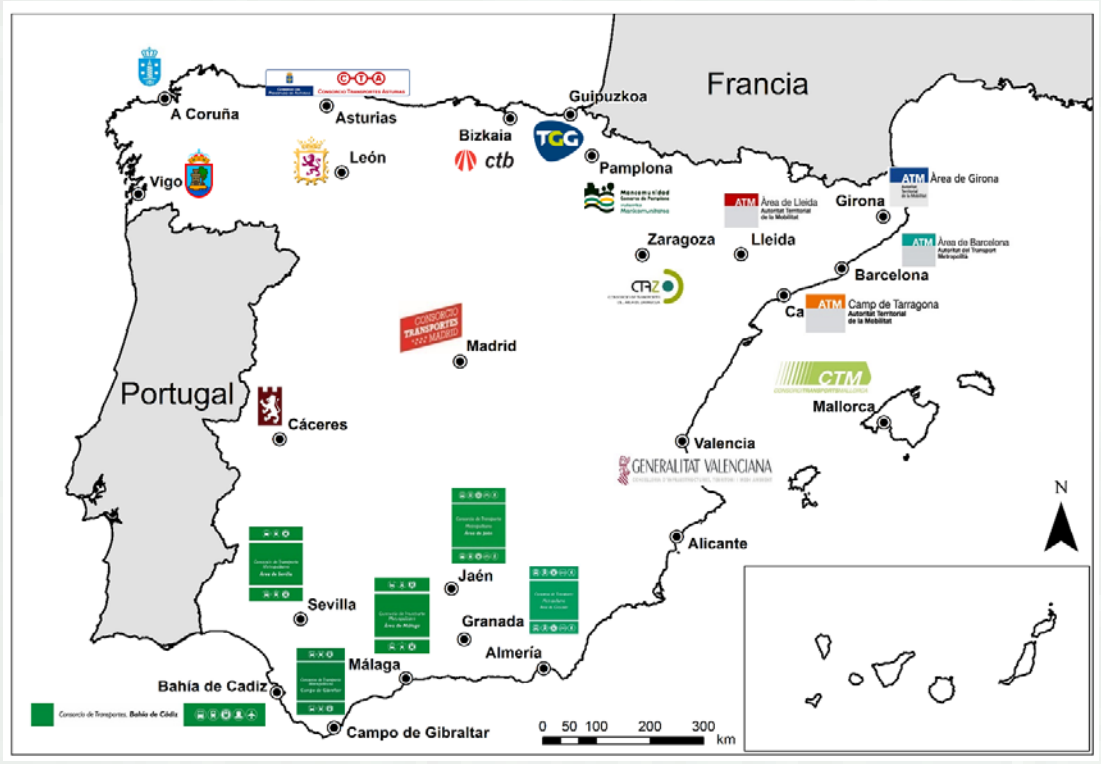
• Coverage ratio

The percentage of operating costs covered by fare revenue (coverage ratio) reached on **average a 53.6%** in 2016. In general, metropolitan areas with rail modes present lower ratios (47%) than those without rail modes (58%). The outstanding cases are in the one hand, Corunna and Cadiz Bay, with ratios of 78% and 75%, respectively, and in the other hand, Lleida with a ratio of 26%. Finally, it is remarkable that Spanish results are better than European results, where the coverage ratio is on average 45% according to the EMTA Barometer.

Coverage ratio for PT systems in metropolitan areas (2016)



Not included data from Renfe services. Asturias, Malaga, Gipuzkoa, Lleida only urban bus. Saragossa and Cadiz Bay only metropolitan bus. Source: data provided by the PTAs.



MEMBERS AS OF 1 JANUARY 2016

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 Vivienda, Obras Públicas y Vertebración del Territorio	Metropolitan Area of Valencia	http://www.habitatge.gva.es/es
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
Ayuntamiento 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
Ayuntamiento de A Coruña	Municipality of Corunna	www.coruna.es
Autoritat Territorial de la Mobilitat Àrea de Lleida	Municipality of Lleida	www.atmlleida.cat
Ayuntamiento de León	Municipality of Leon	www.aytoleon.es
Consorcio de Transporte Metropolitano del Área de Jaén	Jaen Metropolitan Area	www.ctja.es
Ayuntamiento de Cáceres	Municipality of Caceres	www.ayto-caceres.es

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