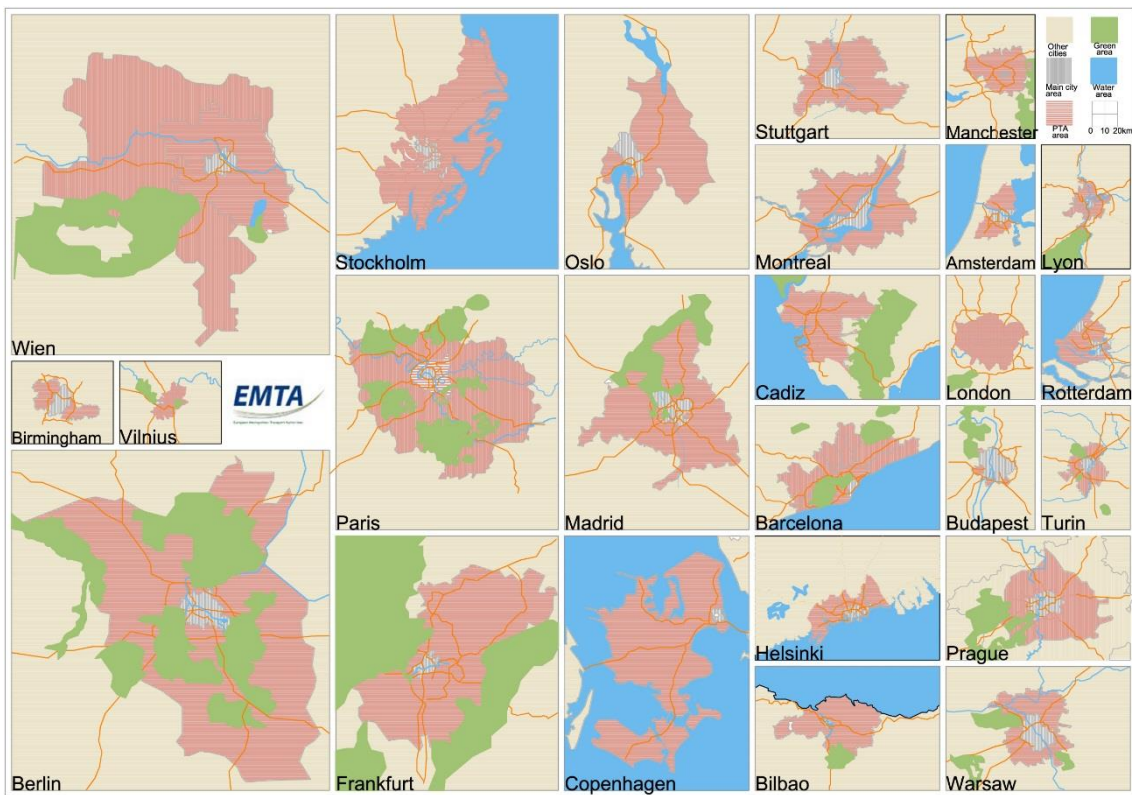


# 2014 Barometer



The barometer is produced by CRTM Madrid

## Foreword

It is a great privilege to present you the EMTA Barometer 2014 that celebrates its tenth edition. Since 2004 this Barometer has been shaped into an easy accessible overview of key figures, performances and mobility indicators of EMTA's transport authorities in 24 larger cities and metropolitan areas in Europe and one valued partner (Montreal, Canada). For over more than a decade the EMTA Barometer is meticulously produced by Madrid's Regional Public Transport Authority (CRTM) into a trusted observatory of performance to the composition of this leaflet. Adding value to this 2014 Barometer are new features such as the key missions and policy objectives of EMTA-members and the mapping of the core of the transport area set off against the actual inner city perimeters.

EMTA members once more have outdone themselves to collect harmonised data on supply and demand on 2014 in compliance with the indicators defined. An exhaustive collation of unified data of the network in term of demand, supply and costs and revenues may sometimes be constraint by regulations aimed at protecting sensitive business data from stakeholders and their businesses, to avoid business development data to be unduly compromised. Nevertheless, authorities showed perseverance to acquire the scaled indicators to the best of their abilities, making this edition a fine tool to monitor basic figures and review the comparative progress of mobility in their areas. To compare authorities on a consistent range of key indicators is often a demanding exercise.

Data displayed are prone to be misperceived so they need to be verified and well accounted for. As collection methods do differ from one authority to another, all figures are double checked with the providers. I am sure that also looking at other data surveys the EMTA Barometer on its own merits provides a consistent tool, as it derives from original data sources, hence providing for a trustworthy profile of metropolitan public transport features.

Hopefully the 2014 Barometer provides you with a comprehensive overview of main performance indicators from EMTA's authorities. May the information be useful to your needs! I wish you lots of pleasure reading this publication.

**Ruud van der Ploeg**  
EMTA Secretary general



Albert Einstein:

*“Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted.”*

## URBAN INFORMATION

### Description of the PTA <sup>(1)</sup> area surveyed

Authority responsible	Main city population	PTA area population	PTA surface (km <sup>2</sup> )	PTA urbanised surface (km <sup>2</sup> )	PTA density (inhab./urb. surface)	Annual PTA GDP per capita (€)	
Stadsregio Amsterdam	<i>Amsterdam</i>	822,272	1,464,578	1,004	807	1,815	34,000 €
ATM	<i>Barcelona</i>	1,620,386	5,026,709	3,239	634	7,929	29,671 €
VBB	<i>Berlin</i>	3.469.849	5,927,721	30,546	3,419	1,734	30,517 €
WMITA	<i>Birmingham</i>	1,101,400	2,808,400	902	498	5,642	27,833 €
BKK	<i>Budapest</i>		1,757,618	525	358	4,910	20,798 €
CMTBC	<i>Cádiz</i>	333,344	822,792	3,191			
MOVIA	<i>Copenhagen</i>	683,376	1,768,125	2,559			56,160 €
RMV	<i>Frankfurt</i>	717,624	5,003,889	14,000	12,342	405	41,106 €
HSL-HRT	<i>Helsinki</i>	620,715	1,198,989	1,558	411	2,919	56,467 €
TfL	<i>London</i>	8,600,000	8,600,000	1,572	1,042	8,253	55,598 €
SYTRAL	<i>Lyon</i>	636,302	1,300,000	613	360	3,611	42,830 €
CRTM	<i>Madrid</i>	3,165,235	6,454,440	8,028	1,043	6,188	31,004 €
TFGM	<i>Manchester</i>	517,000	2,724,000	1,272	959	2,840	24,454 €
AMT	<i>Montreal</i>	1,988,243	3,975,711	3,980	1,624	2,448	31,279 €
RUTER	<i>Oslo</i>	647,676	1,232,575	5,005	208	5,926	61,200 €
STIF	<i>Paris</i>	2,266,000	12,014,814	12,000	2,530	4,749	52,298 €
RODIP	<i>Prague</i>	1,259,000	1,912,000	3,100	644	2,969	23,662 €
MRDH	<i>Rotterdam</i>	1,135,759	2,250,000	990	440	5,114	36,500 €
SL	<i>Stockholm</i>	911,989	2,198,044	6,524	880	2,498	60,517 €
VRS	<i>Stuttgart</i>	612,441	2,443,892	3,011	722	3,385	43,771 €
AMMT	<i>Torino</i>	898,714	1,550,216	838	233	6,668	21,399 €
VOR	<i>Wien</i>	1,797,337	3,722,471	23,563	14,438	258	
MESP	<i>Vilnius</i>	529,022	529,022	401	148	3,574	17,000 €
ZTM	<i>Warsaw</i>	1,735,442	2,507,382	2,429	385	6,513	16,329 €

(1) PTA: Public Transport Authority (2) GDP: Growth Domestic Product

The EMTA Barometer periodically allows a comparison of the public transport system between 24 different metropolitan areas. From the results of this survey, various geographical, demographical, spatial and socio-economic ratios can be drawn that allow us to frame what features of the area might have impacted the mobility in an urban territory. A quick look to authorities as diverse as TfL (Greater London area) and CMTBC (Cadiz Bay), showcase the extremes of the smallest and largest of cities features, without any assessment as to the significance of each urban transport network.

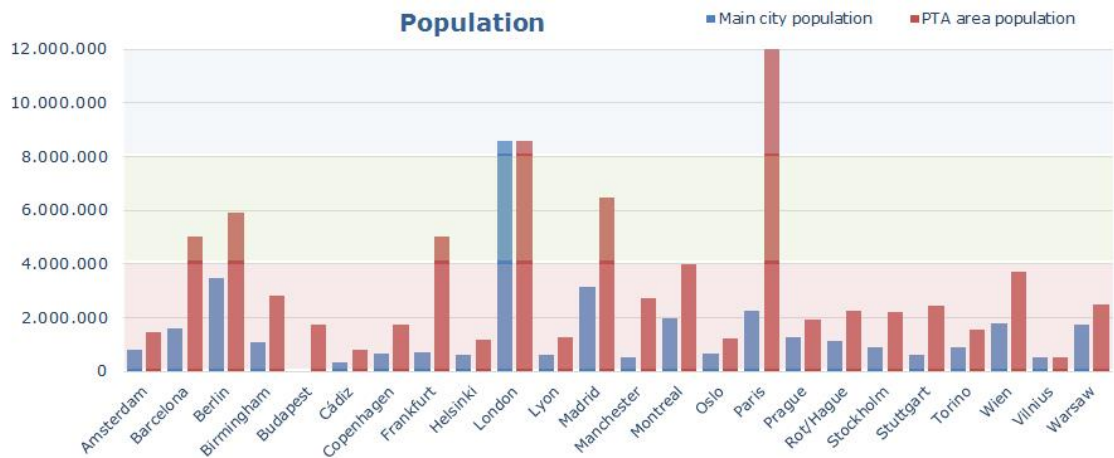
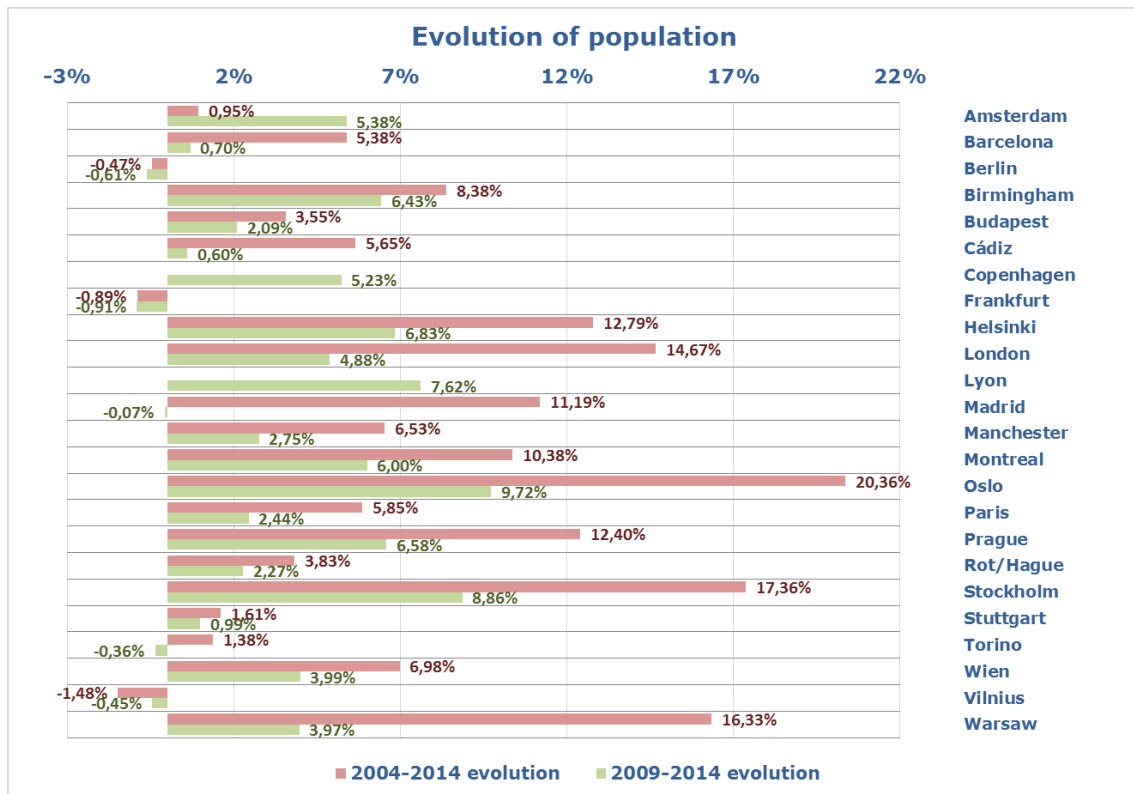
PTA	PTA area (km <sup>2</sup> )	Population	Demand/year (million)	Annual operation cost/inhabitant (€)
<i>Greater London</i>	1,572	8,600,000	3,721	1,154
<i>Cadiz Bay</i>	3,191	822,792	5.09	14
<i>Barometer average</i>	5,452	3,295,458	1,092	405

The following maps represent main cities limits and the total administrative area of each PTA, in order to be able to locate and understand the values expressed in the current 2014 Barometer.

# URBAN INFORMATION

## Evolution of population

The average population of cities is about 1.56 million inhabitants and 3.3 million for the PTA area. The average for the PTA population increased in the last five years in 2.75% and in 2.16% for the last 10 years. Regarding the average area for the main cities is 409 km<sup>2</sup> and 5,452 km<sup>2</sup> for the PTA area, with an urbanized area of 2,024 km<sup>2</sup> that represents a 37% of the total PTA surface. In the case of the main cities this percentage rise up to 56%. Finally, the average GDP in PTA area have increased from 32,169 € in 2013 to 36,952 € in 2014. It should be highlighted the increase of population that has occurred in cities such Oslo, Stockholm and Warsaw. Contrary to the loss of population over the years is taking place in Berlin, Frankfurt or Vilnius.

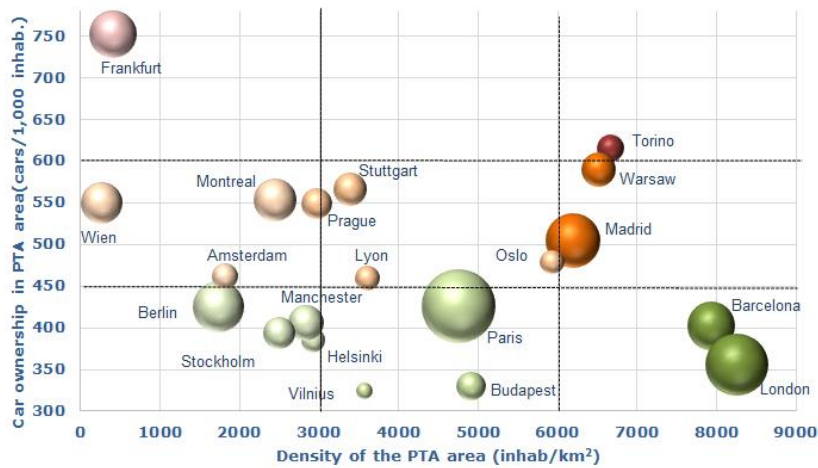


# MOBILITY

## Car ownership rate

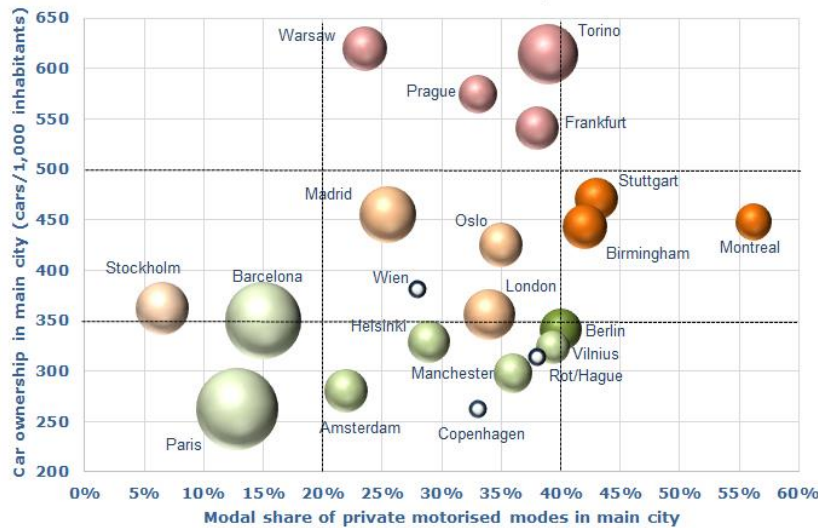
The first image represents the relation between car ownership expressed as cars per 1,000 inhabitants and urbanized PTA area density. The size of the balls represent the population in the PTA area. The average density of cities is 4,175 inhabitants/km<sup>2</sup>, but two cities (Barcelona and London) have more than 8,000 inhabitants/km<sup>2</sup> (urbanized area/population), having double density than the average PTA density (4,175 inhabitants/km<sup>2</sup>). For most cities the car ownership rate its between 350 and 550 cars / 1,000 inhabitants.

**Car ownership versus density in PTA area**



The second image represents the relation between car ownership and modal share of private motorized mode in main city. The size of the balls represents the density of the main cities. We can appreciate two tendencies. On the one hand, the higher is the car ownership in the city, the higher is the use of private car. On the other hand, the greater the density is, the less use of private car.

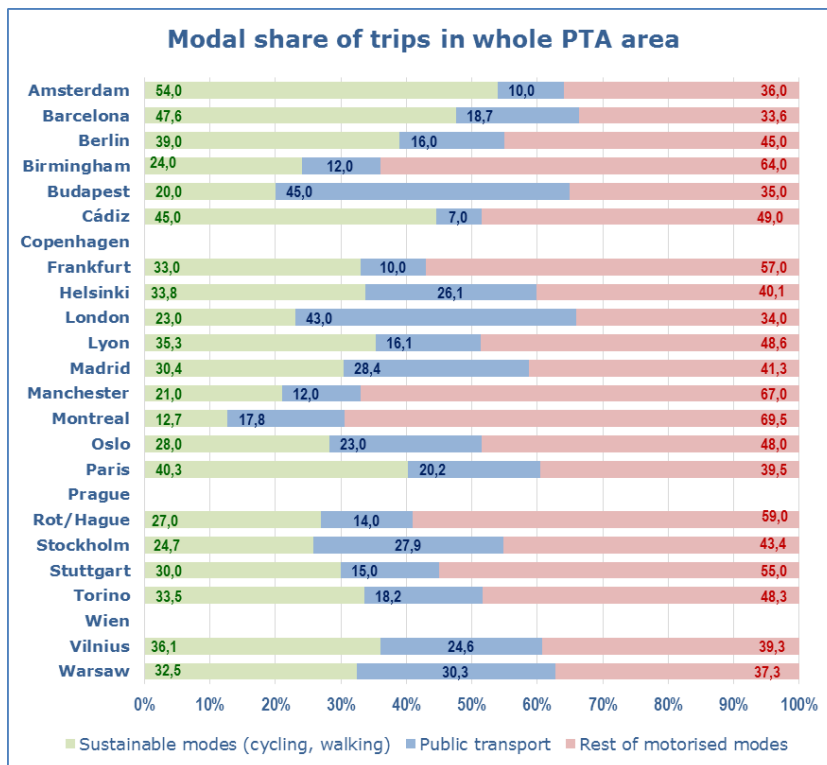
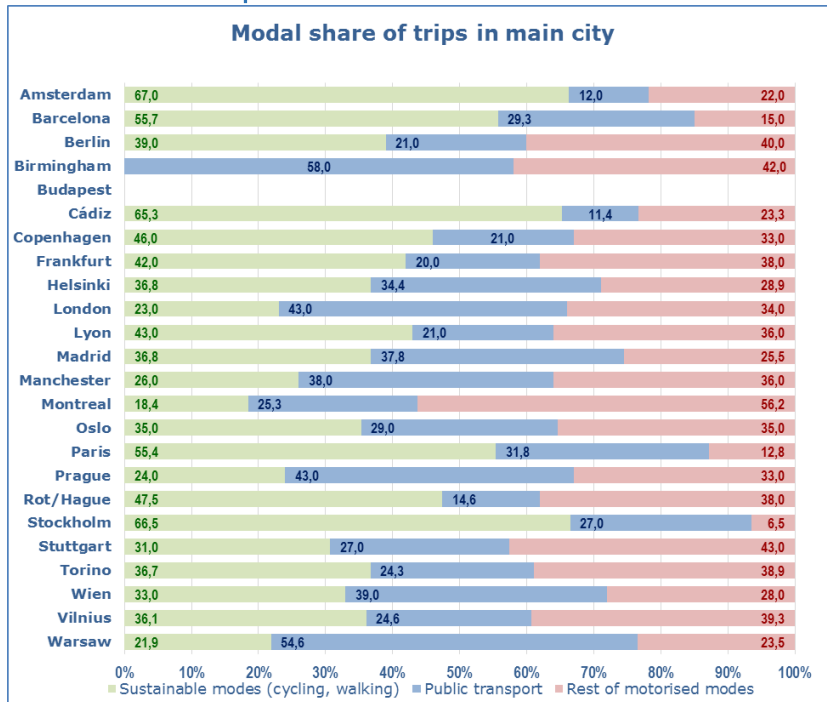
**Car ownership rate vs modal share in private motorised in main city**



The colours of the graphics represents three levels of cars ownership rate (cars/1,000 inhabitants). (Wien, Copenhagen and Rotterdam-De Hague are not been represented by their density).

# MOBILITY

## Modal share of trips in whole PTA & main cities



The number of trips average per capita and day in selected cities and PTA areas is of 2.9 and 2.8 respectively (higher than in 2013, 2.7 main city and 2.8 PTA area). Of the latter, 31.9% is made in sustainable modes (cycling, walking,...), 19.9% in public transport and 44.1% by private transport. But in the main cities, public transport raises the average to 28.8% over other motorized modes that gets down to 32.8%. (Birmingham only represents the value for private or public transport, is not included sustainable modes in the total average in main city, and the value of Stockholm in the main city is referred exclusively to the inner city).

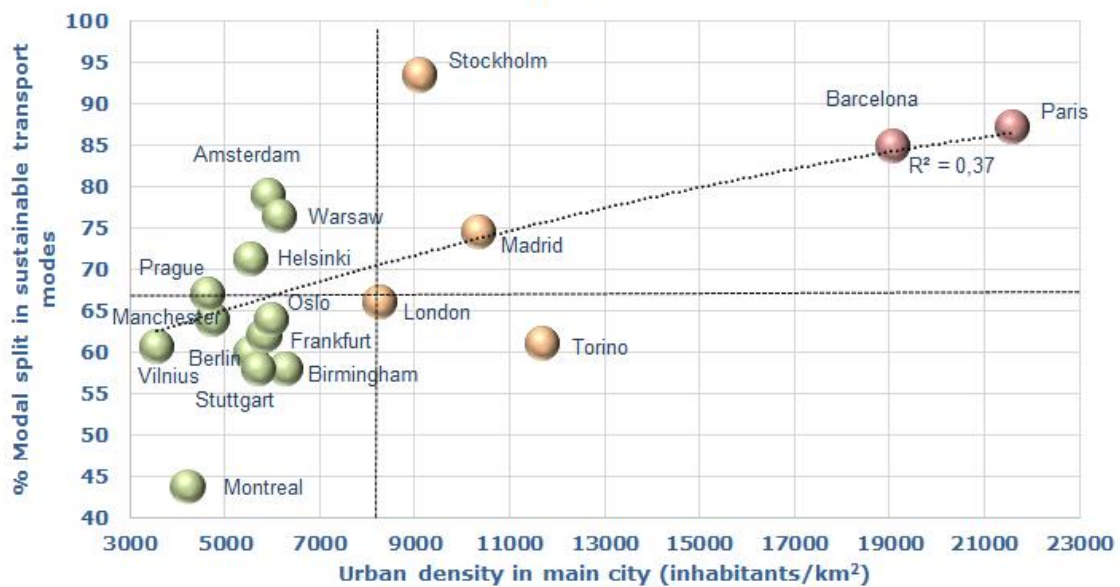
The PTA areas of Amsterdam, Barcelona, Berlin, Helsinki, London, Lyon, Madrid, Oslo, Paris, Stockholm, Turin, Vilnius and Warsaw are above average with respect to the use of alternative transport to the car and on the other hand, cities as Birmingham, Frankfurt, Manchester and Montreal use motorized modes above the average in the PTA area.

# MOBILITY

## Urban density and modal split in sustainable transport modes in main city

The following graphic displays the share of total daily trips by sustainable modes –walking, cycling and public transport- explained by urban population density in the main city. The average of the modal share of sustainable transport modes in main cities is 68% and the average of urban density (population/urbanized area) in main cities is 8,012 inhabitants/km<sup>2</sup> of urbanized area. London with a value of 66.00% and 8,253, respectively, represents the medium city for this concept. Only five cities have an upper limits density higher than average, i.e. Stockholm, Madrid, Turin, Barcelona and Paris. This last one and Barcelona are in the upper urban density score with 21,581 and 19,063 inhabitants/km<sup>2</sup> respectively. On the other hand, Stockholm represents the upper limit in modal split in sustainable transport modes with a 93% and Montreal the lower with a 43%. The rest of PTA are between 60% and 80% of sustainable transport modes share.

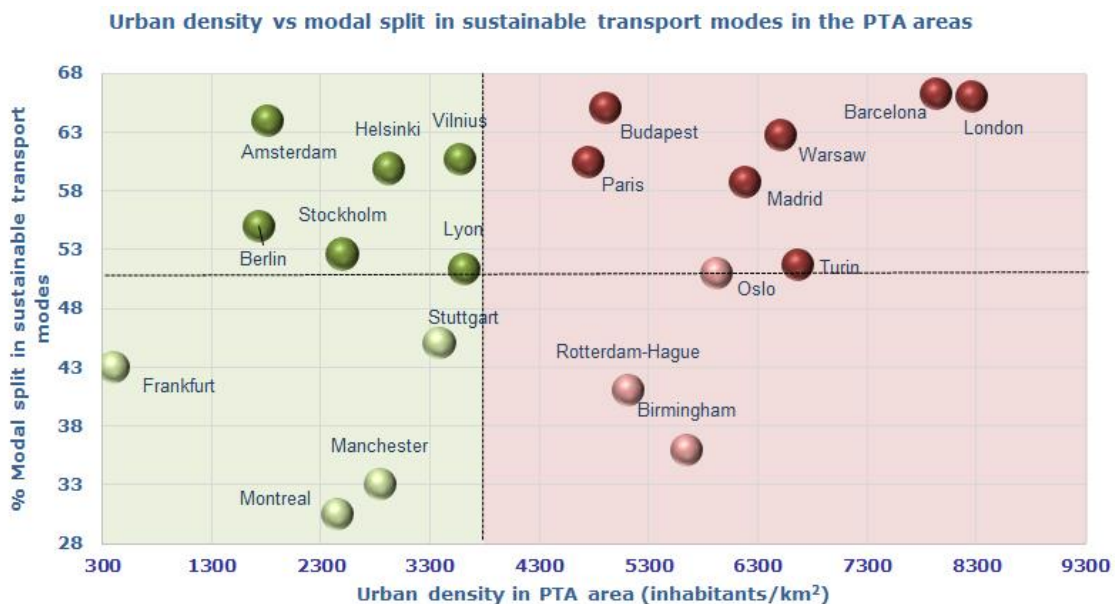
Urban density vs modal split in sustainable transport modes in the main cities



# MOBILITY

## Urban density vs modal split in sustainable transport modes in the PTA areas

If we analyze the PTA areas for the same concept the outcome is quite different. Urban density (population/urbanized area) in PTA areas is understandably much lower than the main cities and consequently the use of motorized modes is common and more necessary to the detriment of the use of sustainable modes. In this sense the average of urban density in the PTA areas is 4,185 inhabitants/km<sup>2</sup> (50% approximately of the ratio in the main cities) and the share of use of sustainable transport modes (walking, cycling and public transport) is 52.7%. Barcelona and London have highest urban PTA area density (population/urbanized PTA area), and a high rate of sustainable modes. A particularly significant case is displayed in Amsterdam, where we see almost a two-third use of sustainable modes with a very low urban density, whilst Frankfurt, Greater Manchester, Rotterdam-The Hague, Montreal, Stuttgart and Birmingham account for low rate of use of sustainable transport modes in comparison with the average.

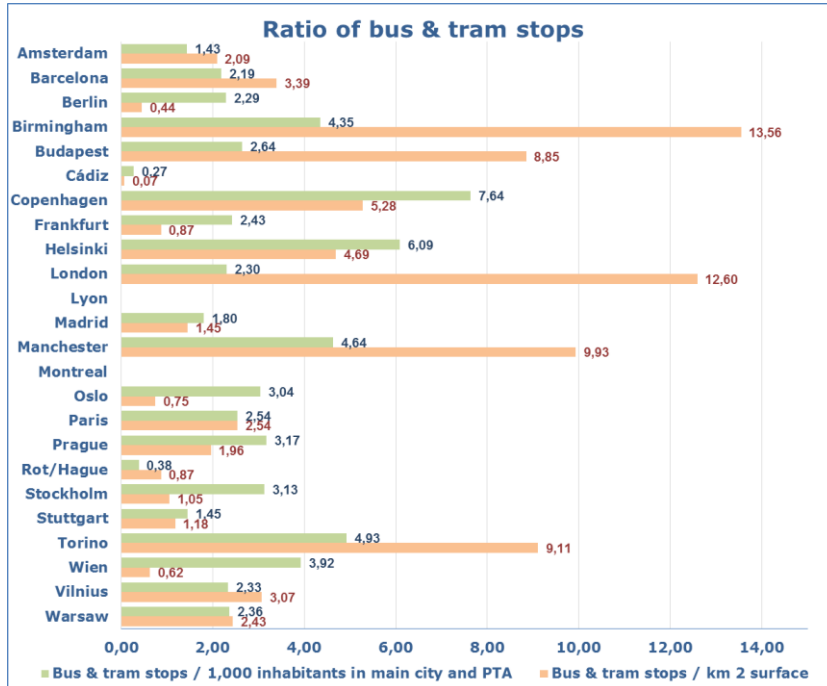


The colours use in the graphic represent the cities that are below or above average (4,185 inhabitants/km<sup>2</sup> of urbanized area and 52.7% of sustainable modes).



# SUPPLY

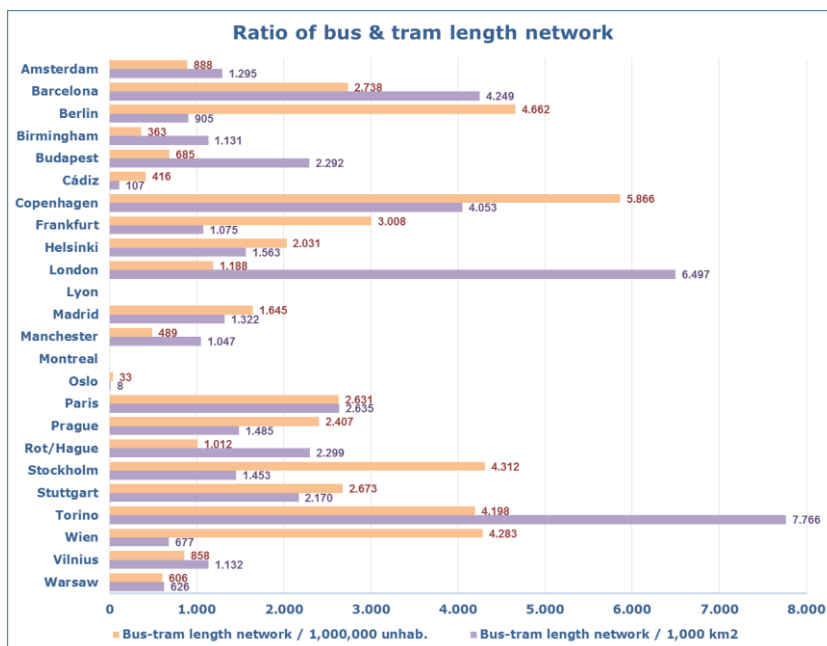
## Ratio of bus and tram stops and length network



It is important when a planner is designing to know the average ratio of number of bus and tram stops or number of railway stations per network length or surface of the affected territory. Among the cities studied, we can conclude that the average ratio of bus stops per 1,000 inhabitants has increased from 2.6 in 2013 to 2.8 in 2014 and from 3.2 (2013) to 3.9 (2014) in the case of km<sup>2</sup>.

Copenhagen has the highest number of bus and tram stops per 1,000 inhabitants (7.6) and Birmingham, London, Manchester and Turin have a density of stops per km<sup>2</sup> well above the average (13.5; 12.6; 9.9; 9.1; respectively).

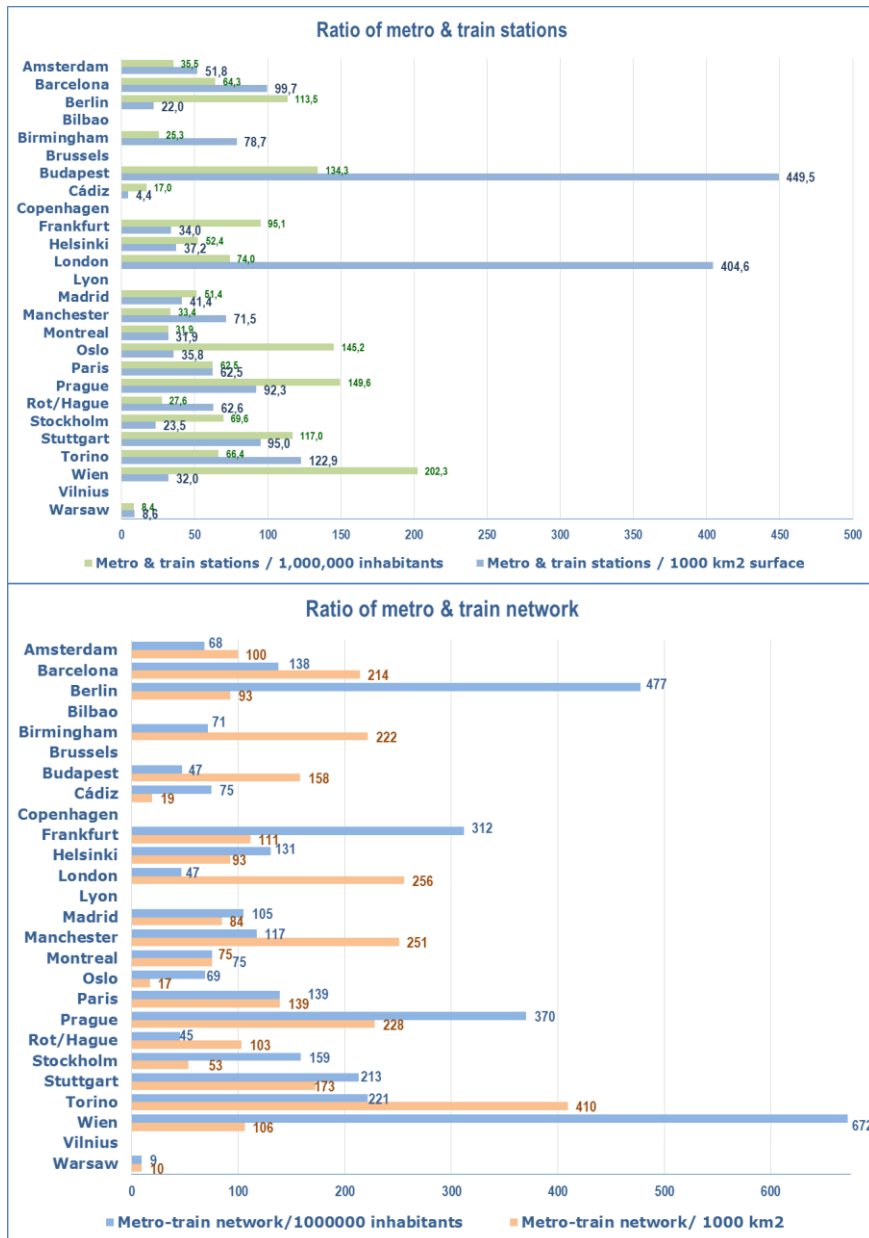
Regarding the length of bus network, the average is 2,155 km per million inhabitants and 2,353 in the case of 1,000 km<sup>2</sup>.



# SUPPLY

## Ratio of metro and train stations and length network

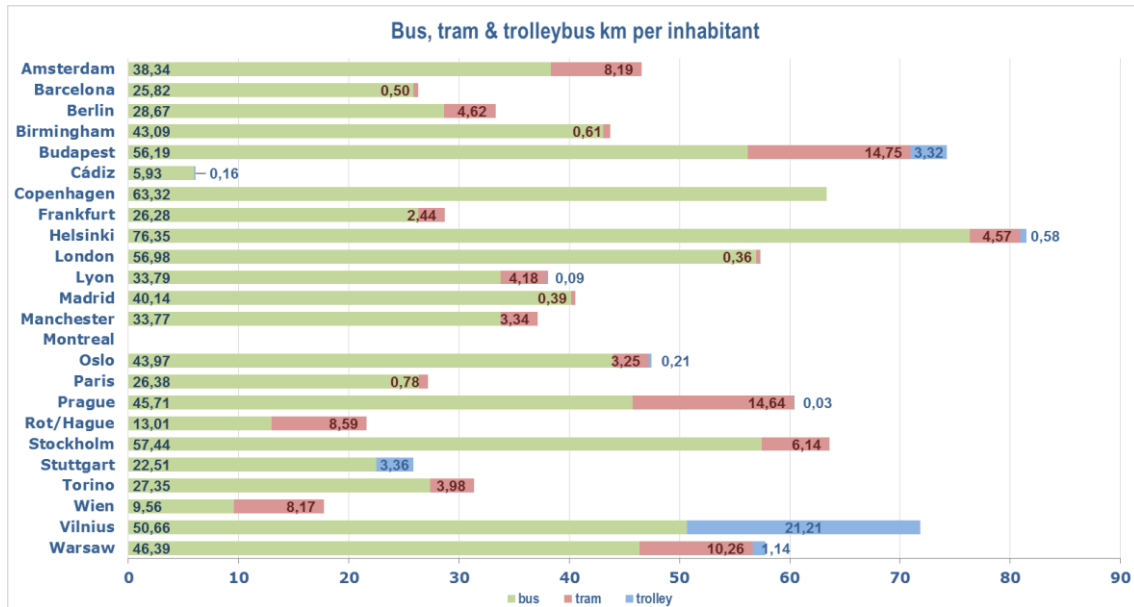
Railway systems are quite different. As average rate, they have 75 stations per million inhabitants and 88.6 stations per 1,000 km<sup>2</sup> of surface. Budapest and London stands out in terms of number of stations per 1,000 km<sup>2</sup> of surface with more than 400. In relation to the number of stations per million inhabitants, there are six cities that are above 100. In contrast to the bus network, the average length of metro and commuter train network per million inhabitants gets down to a tenth, 75, and the same applies per 1,000 km<sup>2</sup> of surface that goes down to 88 stations.



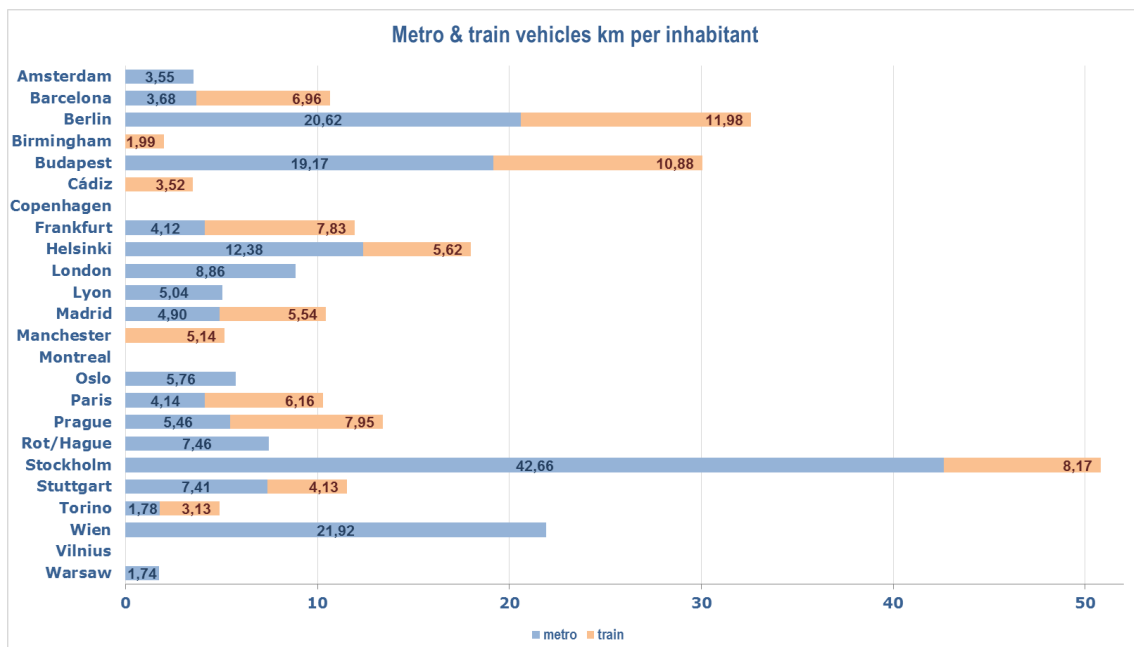
# SUPPLY

## Vehicles-km per inhabitant and PTA area

The average number of bus-km per inhabitants is 38, seven times more than the number of trams-km per inhabitant that it is 5. Just Budapest, Copenhagen, Helsinki, London and Stockholm are above 55 bus-km per inhabitant.



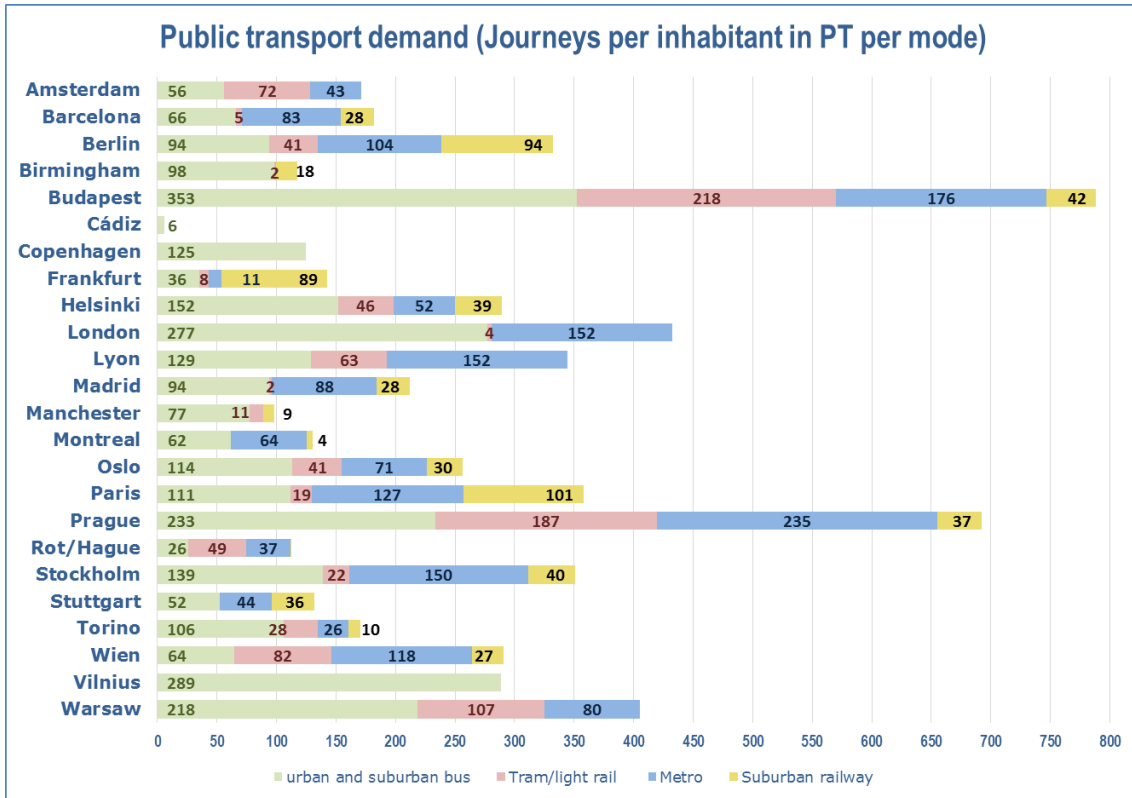
In relation with rail services, metro has an average of 10 vehicles-km per inhabitants, higher than the ratio for commuter train that goes down to 6 vehicles-km per inhabitants. Remarkable is the high ratio of train that Berlin, Budapest, Stockholm and Wien have.



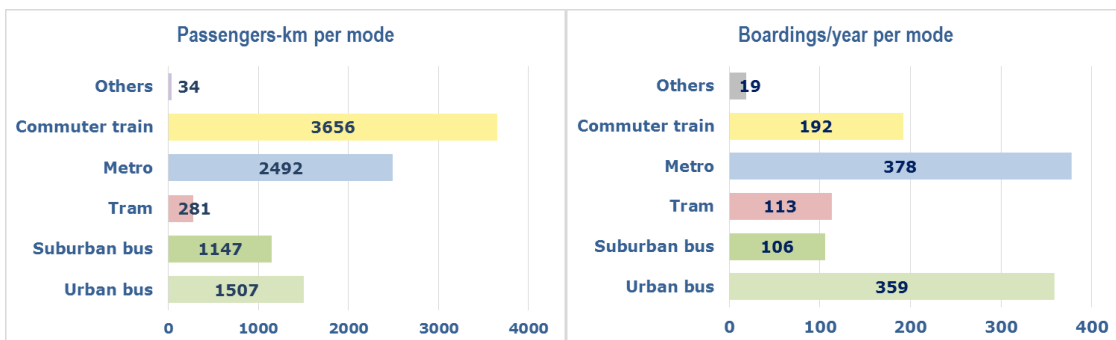
# DEMAND

## Public transport demand per inhabitant in PTA areas

Regarding the public transport demand, the trend continues to go upward in the use of PT. In 2011 on average 244 journeys per inhabitant; 262 in 2013; and 276 journeys per inhabitant in 2014 were made, the bus being the most used transport mode (124 journeys per inhabitant, 120 in 2013) followed by the metro (95 journeys per inhabitant, 83 in 2013).



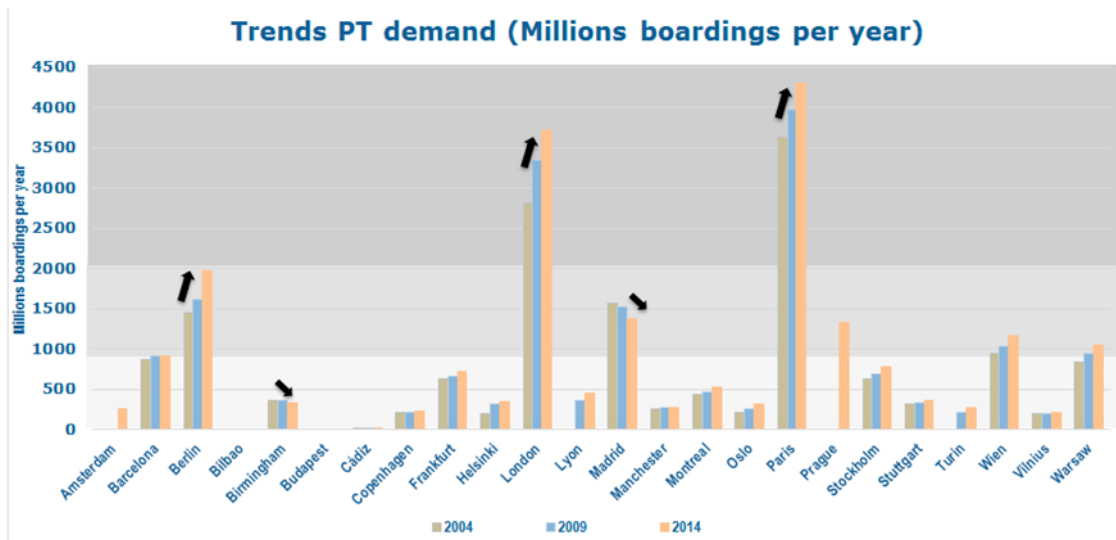
The average of passengers-km and boardings/year per mode is as we can see in the next figures:



# DEMAND

## Public transport demand trends

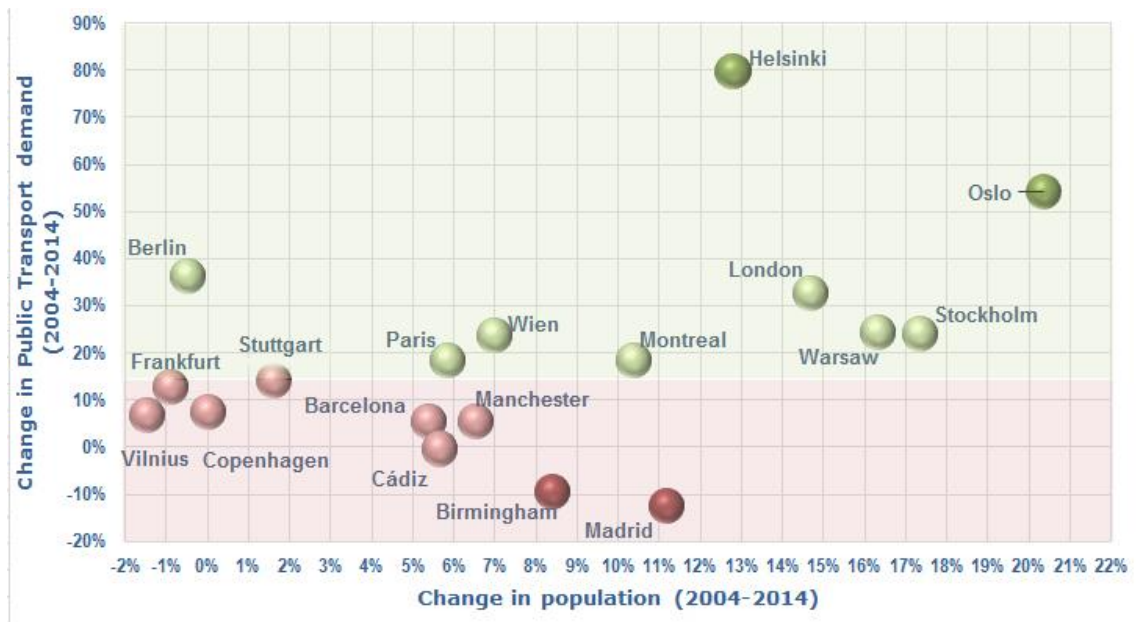
Public transport demand trends have evolved differently over the last ten years. The average of 2004 was 938 million of boardings in public transport, in 2009 the PT system lost 5,8% of boardings (884 million of total demand) and in 2014 it has recovered with +7%, rising to 947 million, 19 million more than ten years ago. The PTA of Greater London and Paris Île-de-France represent the 43% (2004), 41% (2009) and 38% (2014) of the total public transport demand in the studied PTA areas, whilst they represent only 26% of the total inhabitants in 2014. From 2009 to 2014, 50% of the PTAs experienced an increased demand in the public transport system over a 10%. On the contrary, Birmingham and Madrid continue a declining demand in their public transport system. In terms of demand we can distinguish three main groups: a first one that moves between 0 and 1,000 million boardings (with 15 PTAs); a second one from 1,000 to 2,000 million boardings (with 5 cities); and more than 2,000 million that accounts for two of the largest PTA areas (Greater London and Paris Île-de-France).



# DEMAND

## Change in population vs transport demand in PTA area

The following graphic represents the change in the number of inhabitants in the PTA areas between 2004 and 2014 with respect to the change in the number of total journeys undertaken by public transport. As we have seen before, the trend continues upward, most of the PTAs have increased the public transport demand in the last 10 years and Helsinki and Oslo have done over a 50%. In this last ten years, the PTA areas studied have increased an average of 17% in public transport demand with only an average of 7% more inhabitants. This means that the number of journeys by public transport increased as faster rate than the population in PTA areas. It is significant that Berlin, that continue loosing inhabitants, has increased a 36% the number of journeys in public transport.

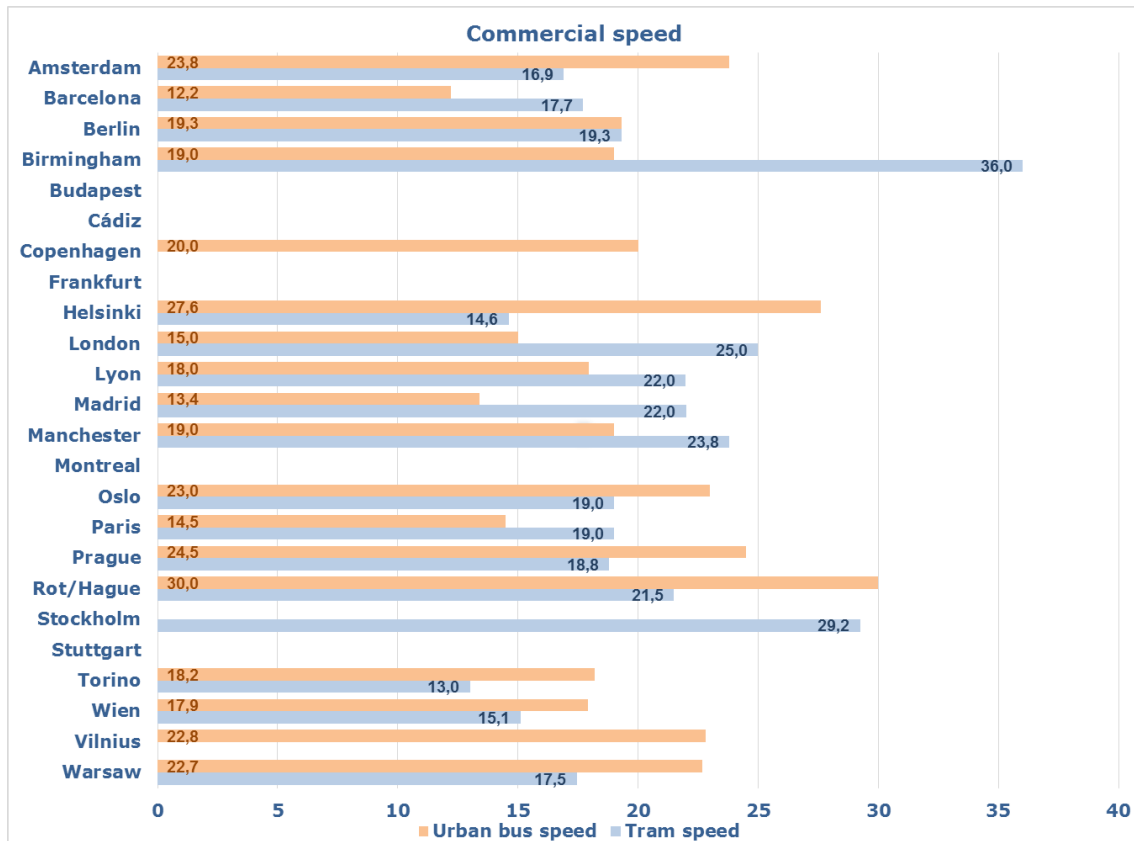


# SERVICE QUALITY

## Commercial speed

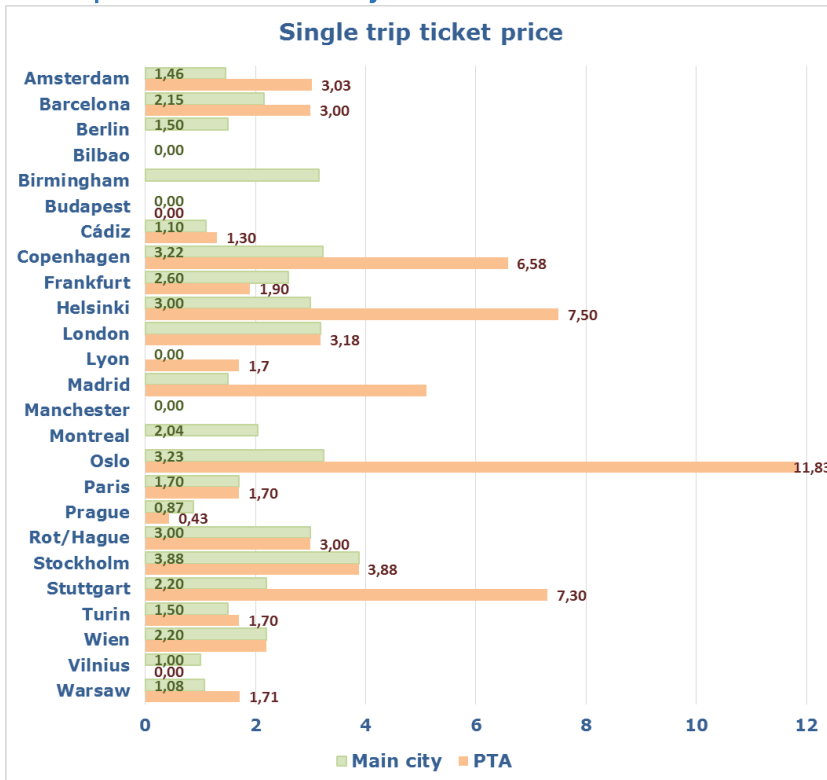
The commercial speed for the public transport is one of the main issues that the planners have to deal with it in the urban areas. The average speed for the urban bus and the tram is about 20 km/h and for the suburban buses the average rise up to 30 km/h. The same happens with the metro and the commuter train. The metro runs at 36 km/h in average and the commuter train rises up to 50 km/h.

It is important the use of bus lanes for the public transport in order to increase the commercial speed of the urban or suburban buses.

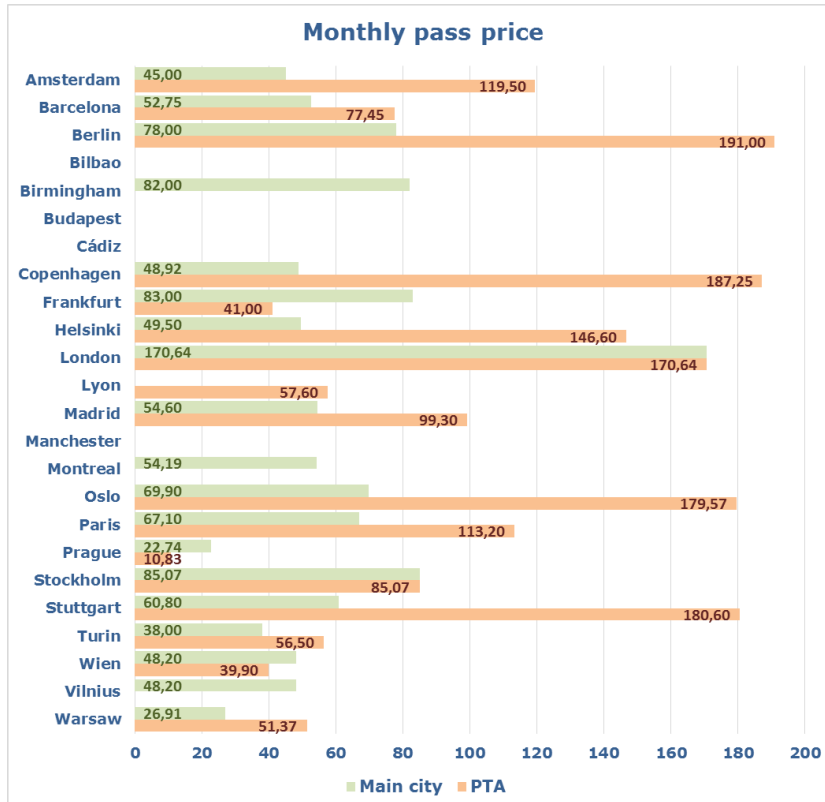


# FARES

## Ticket price for the main city & PTA area



The average price for the single ticket in 2014 has raised with respect to 2013. In the main city is 2.17 € (2.1 in 2013) and 3.05 € (2.8 in 2013) in the PTA area. For the monthly pass is 62 € and 101 € respectively. Regarding the monthly pass in the PTA area it should be noted that are eight cities that exceed 100 € without a direct relation to neither the surface nor the GDP in the PTA area.



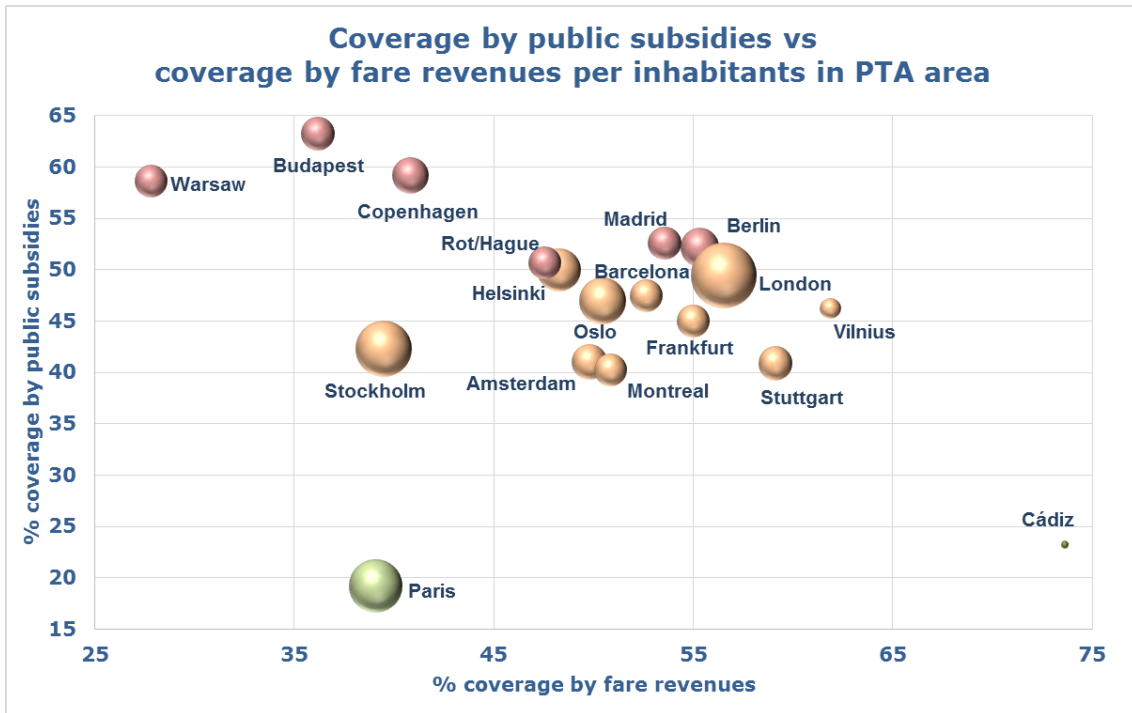
The average rate between GDP and monthly pass fare is 1.7% in main city and 3.3% for the PTA area. London continues to be the PTA with a higher rate, 3.7%, Berlin PTA with more than 7% rate and Copenhagen and Prague are in 2014 the cities and PTAs with a lower rate with respect to the monthly pass and the monthly GDP.



# FINANCIAL

## Coverage of operational costs

The size of each ball of the picture indicate the yearly cost of operations of public transport divided by the population of the PTA area (costs/inhabitants). The average ratio of yearly operational costs per inhabitant for the PTA areas amount to around 398 €. The PTAs of Paris Île-de-France, Greater London and Stockholm have the highest rate (more than 700 € per inhabitant yearly) and Cadiz Bay the lowest (14 € per inhabitant and year).

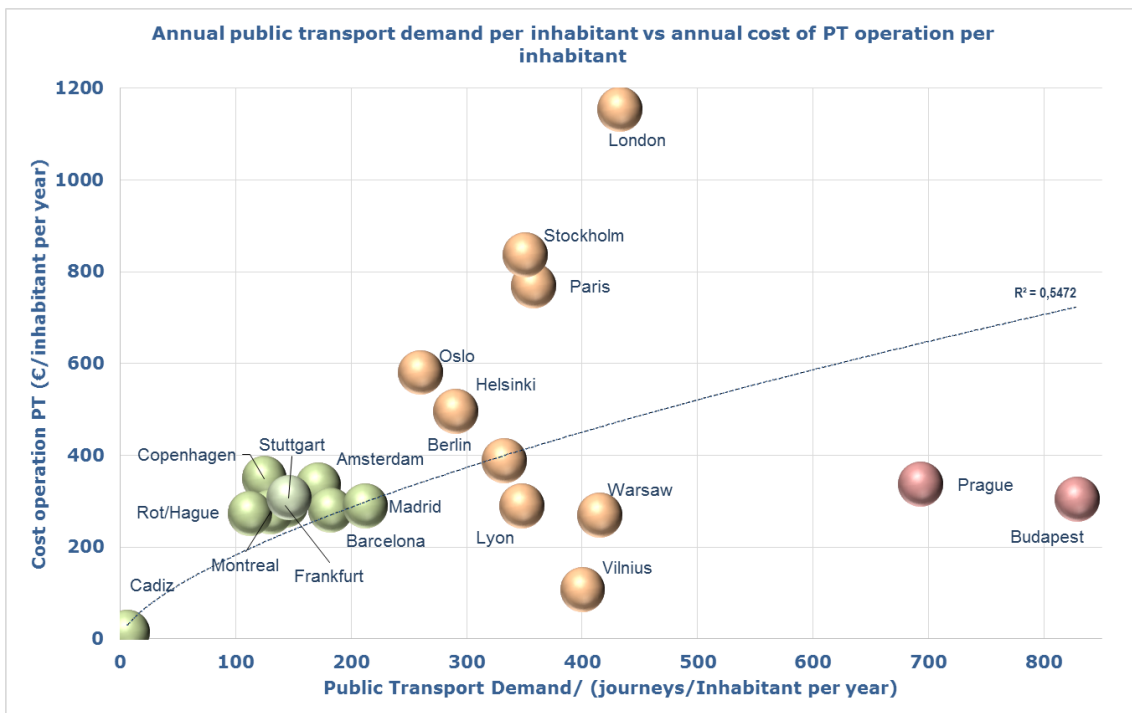


Most of the cities have a coverage of 40-60% of public subsidies with an average of 47% and 35-55% of fare revenues with an average of 48%. Paris has the minimum coverage by public subsidies (19.2%) but it has a 41.7% of coverage of operational costs that comes by other revenues (i.e. in Lyon and Paris Île-de-France “Versement Transport”). Prague has the maximum coverage by public subsidies with a 75%. We have to take into account that Prague also has the cheapest fares of all the cities so the coverage by fare revenues is only a 25%.

# FINANCIAL

## PT demand/inhabitant vs cost/operation inhabitant

As we have seen in the introduction of the 2014 Barometer, the EMTA PTAs oscillates from Bay of Cadiz with a PT operational cost of 14 € per year and inhabitant to Greater London that needs 1,154 € per year and inhabitant for support the public transport system. In the following graph, we can observe a tendency of 0.5 in which an increasing in public transport demand means an increasing of the operational costs per inhabitant. That means that, in general, the fixed costs of maintenance of the PT system does not have influence if the demand increase. We have to except the case of Greater London that is in the top position. On the other hand, Vilnius has a low rate of operation cost per inhabitant but a high rate of demand/inhabitant per year.





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