



STATISTICS BRIEF

URBAN PUBLIC TRANSPORT IN THE 21ST CENTURY

This Statistics Brief is an **abridged version of the extensive report**, "Urban Public Transport in the 21st Century", available on the UITP MyLibrary (my.uitp.org/mylibrary). You also can access data on all studied countries through the **dataset**.

INTRODUCTION

In 2015, 243 billion public transport journeys were made in 39 countries around the world. This figure represents an 18% increase compared to 2000.

This study details the different public transport trends occurring in selected countries, and finds that though the paths of evolution differ, the common factor between all of the countries is increasing ridership for public transport.

Twenty-four of the 39 countries involved in the study experienced an increase or at least maintained a stable rate of public transport use (journeys per capita) over the past 15 years. This shows the growing role that public transport plays on the world stage.

COMPREHENSIVE AND GLOBAL STUDY

In order to comprehensively analyse the current state of urban public transport around the world, 39 countries from different regions were studied, including 27 European countries; US and Canada (North America); Brazil (Latin America); Ukraine and Russia (Eurasia); China, Singapore, South Korea and Japan (Asia); Australia and New Zealand (Oceania); and Turkey.

The criteria for selection of countries was size of population and/ or development of public transport systems. In 2015, the urban population of these countries (roughly 2 billion, equal to half of the world's urban population) made, on average, 121 journeys per capita. Of course, this number varies significantly from one country to another.





SITUATION IN 2015

In order to better understand the global scope of the project, a map is provided with the countries involved in the study highlighted in green:



Countries involved in study

In terms of total journeys, there is a significant variation between the selected countries. The data collected show that the largest market for public transport is China, with 85 billion total journeys in 2015. If Europe is treated as a whole (27 European countries were involved in the study), it ranks second, followed by Japan; however, if only singular countries are considered, Japan and Brazil have the largest number of public transport journeys following China.

To further explain the data: due to the fact that the 'total number of public transport journeys' figure is a function of 'journeys per capita' and 'urban population', it is possible to see similar values of total journeys in countries with different patterns of public transport use. For example, a country with a large urban population but low public transport journeys per person will sit alongside a country that is small in terms of population, but high in terms of public transport use.

The following graph illustrates the total number of journeys in the countries/regions that were studied. The size of the bubble corresponding to each country/region is an indicator of total number of journeys; the value, in billions. By looking at each axis, we can identify the impact of urban population and journeys per capita on total journeys for each country/region involved.



Different levels of demand per capita (2015)

Focusing on journeys per capita, it is evident that an average resident of the selected countries made 121 journeys in 2015 (almost one journey every three days). This figure differs in each country, ranging from 37 to a value 12 times larger.

	HIGHER DEMAND	MEDIUM DEMAND	LOWER DEMAND
GROUP	AT LEAST 10% LARGER THAN AVERAGE OF COUNTRIES	LESS THAN 10% LARGER OR SMALLER THAN AVERAGE OF COUNTRIES	AT LEAST 10% SMALLER THAN AVERAGE OF COUNTRIES
COUNTRIES	Singapore, Czech Republic, Hungary, Austria, Luxembourg, Japan, Republic of Korea, Estonia, Switzerland, Lithuania, Germany, Sweden, Poland, Latvia, Romania, Croatia, Ukraine, France, Slovakia, UK, Norway	Italy, Turkey, Belgium, Bulgaria, Russia, Finland, Brazil, China	Denmark, Portugal, Canada, Spain, Malta, Australia, Ireland, Slovenia, US, New Zealand

Different levels of demand per capita (2015)

In the table above, the countries involved in the study are clustered in different groups based on number of journeys per capita. It should be noted that countries in each group are ordered from largest value to smallest.

Most of the countries in the **'higher demand'** category are post-industrial nations from Eastern Asia, as well as countries in Eastern Europe. The fact that many Eastern European countries are included in this category is interesting, since most experienced decreasing trajectories over the last 15 years.

The 'medium demand' category finds countries with very different backgrounds of public transport use on equal footing when it comes to current situation. For example, Russia and Brazil have more or less equal public transport use in 2015, even though in the beginning of the period, Russia had the highest number of journeys, far above Brazil, which had a value below medium. Comparing Belgium and Italy, we find that the relative equality of public transport use today is due to tremendous growth of public transport use in Belgium, and a decreasing trajectory of public transport use in Italy during the timeframe of the study (details on different trajectories will be discussed in Chapter 3).

In the group with **lower demand**, we find North American countries, Australia and New Zealand, together with some European countries.

Analysis of the regional and national data shows massive demand for public transport in post-industrial Eastern Asia, while on the other hand, low demand for North America and Oceania. Treating Europe as a whole, we see that there were 155 journeys per capita in 2015. While this is not a large number, it is still in the area of countries with high demand.

Although the number of public transport journeys per person is an indicator of the prevalence of public transport worldwide, paying attention to the share of public transport journeys out of total journeys from all transport modes provides a better vision on the state of public transport in a certain country. Considering the public transport share in a country can tell us whether public transport is dominant or marginal, which discloses part of the situation that is currently hidden; understanding this helps to optimise transport planning in general, and also with predicting the most efficient public transport development in a given area. While this topic extends beyond the scope of the present report, bearing the modal share of public transport in mind is useful for the interpretation of public transport figures in each country.



LARGE COUNTRIES

For the purpose of this study, 'large countries' were considered to be any with more than 30 million urban residents. Considering a greater proportion of the urban population lives in larger countries, they have the potential of being big markets for public transport. The following graph illustrates annual journeys per capita in large countries:



Annual journeys per capita in large countries (2015)

Looking at this sample reveals that Japan and Korea have the highest values, and the European country with the largest ridership (among large countries) is Germany.

MODAL DISTRIBUTION

This section illustrates the modal breakdown of total journeys in 2015. Insignificant inconsistencies among similar modes (in terms of name or how they serve people in different countries) were clustered as the same. For instance, what is called 'heavy rail' in the US includes suburban railway and metro; separate data are not available on any of the modes. Considering that there is another mode, commuter railway, which serves suburban areas and goes beyond areas covered by heavy rail, we clustered heavy rail as metro and commuter rail as suburban railway.

The following chart presents the modal distribution of journeys for all countries¹:



Average modal distribution of all public transport journeys (2015)

The chart illustrates that, on average, bus is the dominant mode of transport overall; with a 63% share, it is higher than the sum of all other modes combined. Following bus, metro and suburban rail are the most popular modes with a 16% share each. It is important to note that distribution of journeys between modes has disparate patterns in different countries; the chart reflects the average.

With that said, there are a number of countries where rail is the dominant public transport mode. In Japan, suburban rail is the dominant mode, and in Switzerland, suburban rail and tram together are more popular than bus. In Australia too, the total share of heavy rail and tram systems is higher than that of bus.

1. Due to insufficient data on Turkey, it was not included in the modal distribution chart.

PUBLIC TRANSPORT SUPPLY

This study also included data on public transport supply. As vehicle fleet size is one of the most important variables of supply, it was selected as an indicator of supply for the study; for rail systems, carriages were used as an indicator, and not trains.

The following table details the vehicle fleet size per million urban inhabitants of each country where data was available:

COUNTRY	VEHICLES/MILLION INHABITANTS	
Singapore	3,452	
Norway	1,782	
Italy	1,353	
Austria	1,164	
Switzerland	1,082	
Germany	1,025	
UK	945	
Denmark	886	
Croatia	866	
Slovakia	861	
Ireland	857	
Australia	825	
Belgium	768	
Poland	766	
Brazil	704	
New Zealand	691	
Canada	661	
U.S.	635	
China	611	

Vehicle feet size per million urban inhabitants (2015)

EVOLUTION

This section discusses the evolution of public transport journeys over the past 15 years. It should be noted that for most European countries, it was not possible to find data on suburban railway for the first few years excluded of the study's timeframe. Because of this, suburban railway was excluded in the analysis of evolution in these countries.

TRAJECTORIES

Diverse trajectories were discovered throughout the countries involved in the study. Dividing the countries into groups based on demand in the beginning of the period, and their trajectories during the next 15 years, allows for comparison and analysis. We clustered our countries to six groups considering journeys per capita².

- Countries in Group 1 are those with journeys per capita at least 10% above the average value of all countries in 2000, and a growth rate of at least 10% more than the average growth rate until 2015. Norway is the only member of this group with a starting point slightly lower than minimum.
- Countries in Group 2 are those with journeys per capita at least 10% above the average value of all countries in 2000, which featured a moderate increase in value (less than the pace of countries in Group 1).
- Countries in Group 3 are those with journeys per capita at least 10% above the average value of all countries in 2000 (and much more for many countries in the group), which featured a decreasing trajectory afterwards. Most Eastern European countries are found here. Nevertheless, among these Eastern European countries, the Czech Republic and Hungary experienced a milder decreasing trend from a high rate of public transport use. A point to note is that Latvia is slightly different from the other countries of this group due to its fluctuating trajectory.
- ▶ Group 4 includes counties that, at the beginning of the study, featured a low level of public transport use (more than 10% below the average), but showed a significant increase by the end (at least 10% higher than average). Also included are countries with a medium level of public transport use in 2000 and/or mild increase rates throughout the 15-year time period.
- Group 5 features countries with a rate of public transport use far below average (minimum 10% below the average) in 2000, and a reduction of use larger than 10% below average during the time period. Here, Ireland and Spain have an interesting trajectory, beginning from a low level, and enhancing public transport use during the first eight years of the period (until 2008). The global financial crisis caused a severe decrease in demand of public transport for the remaining period of the study in these countries.
- Group 6 is comprised of countries that do not show a pattern or evident trajectory over the 15-year period, or feature a singular trajectory that has no similar case in the rest of the countries.

2. In calculating average growth rate of countries, Russia is not taken into account (due to its massive decreasing rate)



CASES OF UNEXPECTED GROWTH/DECLINE

This section discusses the unexpected increases or decreases observed in the annual number of journeys in some countries, and attempts to uncover the driving forces behind them.

▶ Brazil (declining journeys per capita from 2013 to 2014):

The main factors causing this decline seems to be economic issues and lengthy strikes during 2014 which affected mobility and public transport use.

▶ Australia (large growth from 2008 to 2009):

This growth appears to be linked to a number of new systems established across the country in that year (e.g. a new rail line in Perth). Plus the financial crisis did not affect the use of public transport as much as car travel, particularly in areas with new public transport systems/lines.

• Singapore (after steady decrease from 2000 to 2005, the rate began to increase):

In addition to improvements made to heavy and light rail services, a key change to the congestion charge scheme in 2005 played a crucial role in increasing the use of public transport. In 2005, the coverage of ERP (Electronic Road Pricing) expanded the gantries around Singapore's centre and on major arterials and expressways. This was done to ensure optimal use of road space and to maintain optimal speeds. Since 2008, in an attempt to make using private vehicles less attractive during peak hours, it has been official policy to adjust fee rates at each of the 70 charging points to ensure traffic moves at uncongested target speeds, at least 85% of the time. For example, when average travel speed on highways is observed below 45 kilometres per hour (kph) or above 65 kph, the rates are increased or decreased respectively.

South Korea (after decreasing from 2000 to 2002, public transport use began to increase): Among all, there are two main factors to account for this: 1) reform of the public transportation system (especially bus reform in 2003); and 2) incentives to decrease the use of private cars in Seoul. The latter was a scheme introduced in 2003 which offered a range of incentives (from monetary gifts to free services) for not using a private car on a specific day of the week.

· Clustering countries based on their starting point and trajectories

EVOLUTION OF LARGE COUNTRIES

The following graph details the growth rates of large countries³:



This graph reveals interesting insights. Countries such as Turkey and China, which did not show significant figures for 2015, had the largest growth in the timeframe. This reflects tangible actions taken to enhance public transport ridership from a low prevalence in the beginning of the period. France also experienced a sizeable rise, which is much larger when compared to the growth rate in other European countries. This is in spite of the demand in France being around average level in 2000, unlike Turkey and China. It is also important to note that Japan, which has the highest value in 2015 (among larger countries), experienced a reduction of its ridership per capita over the last 15 years.

METHODOLOGY AND LIMITATIONS

Data were mainly compiled through national public transport organisations and/or national statistical offices; annual reports or yearbooks were the major data sources. Following this, the concern was checking the quality of the data collected. This included identifying urban (and suburban) data, clarifying the precise definition of journeys in each case, discovering if data were compiled for the entire country or for a number of urban areas, and verifying other facts depending on the exclusive situation in each country.

In some countries, for various reasons, it was necessary to extrapolate on the collected data. The most common reason for this was the lack of data on the whole urban population or on certain years.

Therefore, total figures on a number of countries are the result of adding figures as the outcome of extrapolation to the actual figures that were compiled. Wherever this is the case, it is specified in the dataset.

As with any study of this magnitude, certain limitations were encountered during the course of this project. Even though these limitations were different from one country to another, some were shared: not being able to access reliable or accurate data, a lack of aggregate data on fleet size or indicators of public transport supply, only having access to data from certain cities in a country or from certain years. In addition to this, for the first few years of the study, it was not feasible to access data on suburban railway for most European countries.

It should also be noted that while earlier on this Statistic Brief we offered explanations on the unexpected increase or decrease of public transport journeys in certain counties, there were some changes in use due to the changing methodology of journey calculation. For instance, the reduction of journeys in Canada over the past 3-4 years, or the sudden decrease in China from 2005-2006 or in Russia from 2004-2005 seems to be due to this.



CONCLUSION

Most selected countries experienced an increase in public transport use, or at least a steady rate of use. However, it is important to remember that the selection of countries is not a homogenous group, and different countries show a variety of trajectories and paths of evolution.



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