UITP ADVANCING PUBLIC TRANSPORT

STATISTICS BRIEF

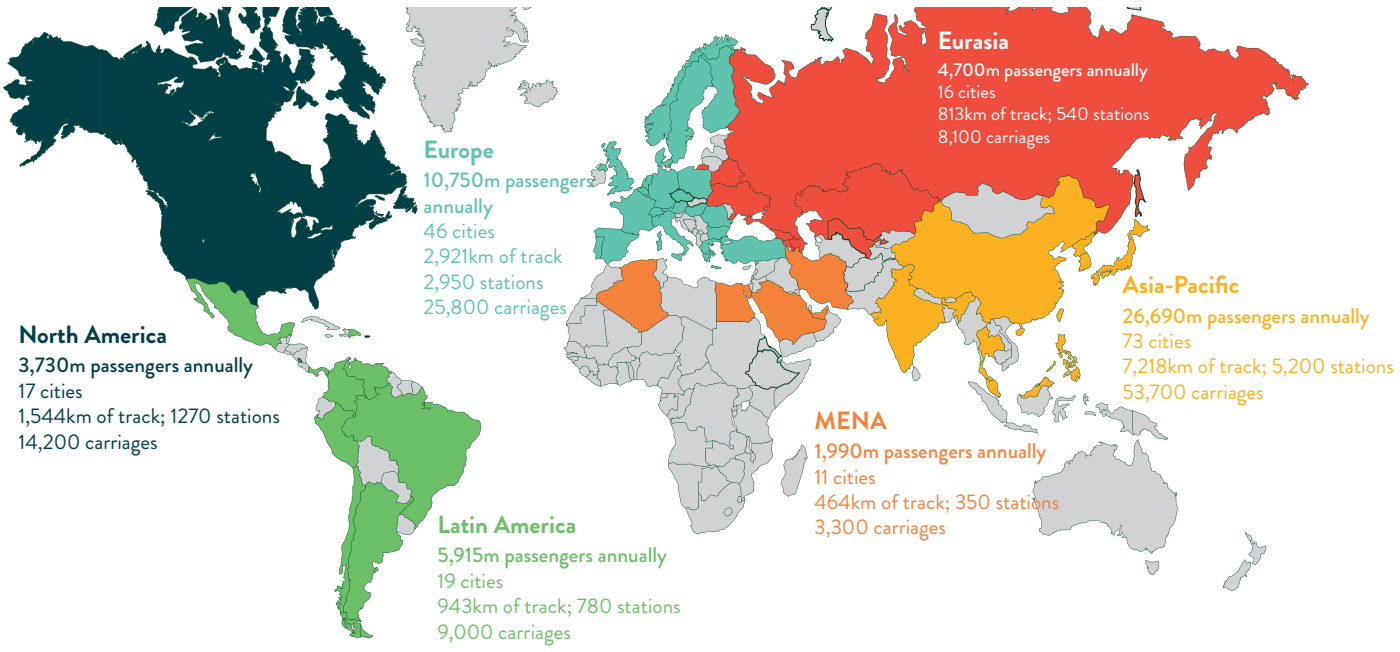
WORLD METRO FIGURES 2018

INTRODUCTION

Metros are of critical importance for mobility, as societies are becoming ever more urbanised. At the end of 2017, there were metros in 182 cities in 56 countries, carrying on average a total of 168 million passengers per day. 75 new metros have opened since the year 2000 (+70%). This massive growth is to be credited largely to developments in a few countries in Asia.

For this new metro Statistics Brief UITP has collected exhaustive data for a series of key indicators for all metros in the world including ridership, number of lines, network length, number of stations and – new for this edition – fleet size. Extensive data was also collected for another new field: infrastructure construction model (underground, elevated, at grade or in trench).

Metro networks worldwide 2017



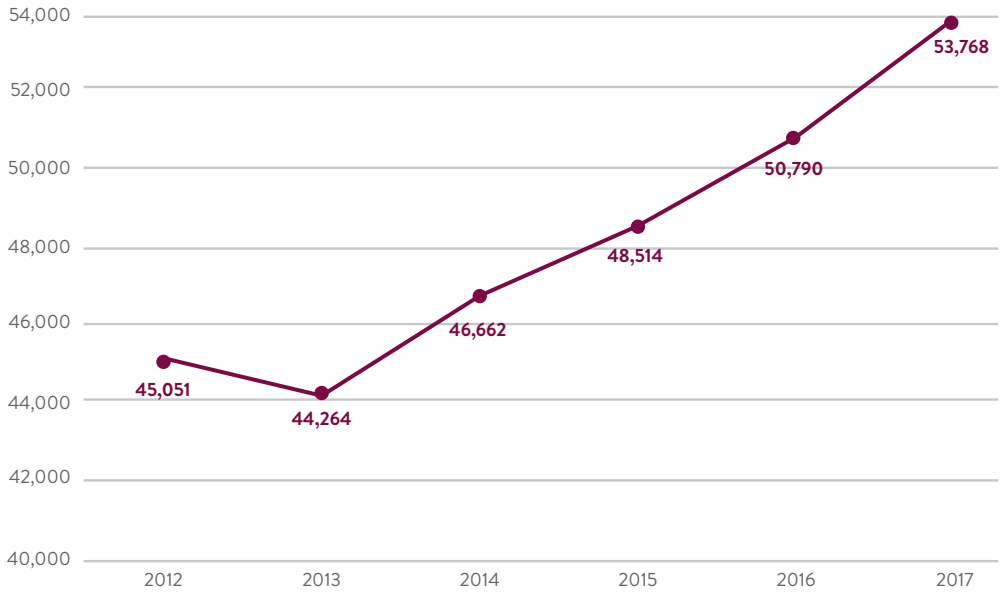
RIDERSHIP

In 2017, the 182 metro systems accounted for a total annual ridership[1] of 53,768 million passengers. In the last six years, annual metro ridership grew globally by 8,716 million passengers (+19.5%).

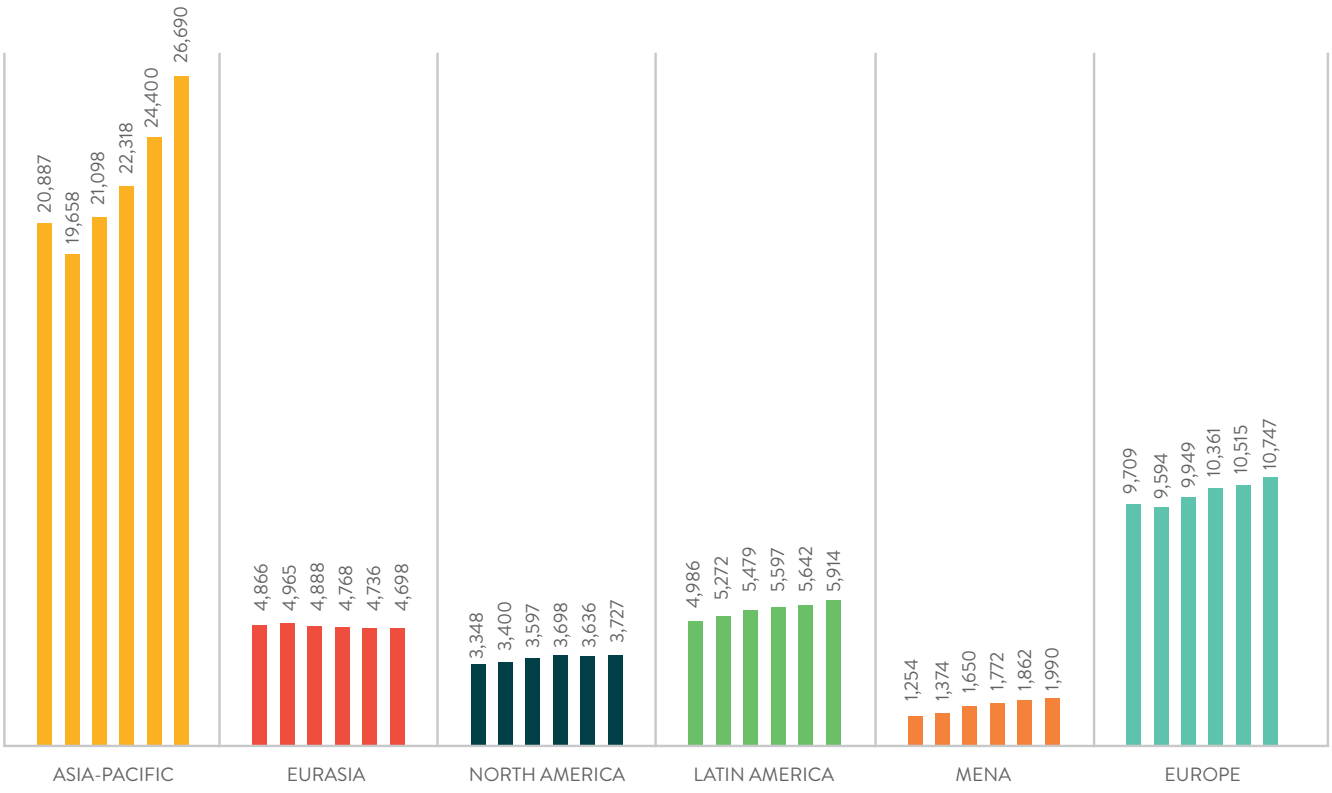
Broken down by continent, the ridership growth rate between 2012 and 2017 was the most robust in the MENA region (+58%), followed by Asia (+28%) and Latin America (+20%). North America and Europe recorded a 10% increase, while Eurasia lost 3% of passengers.

Closer analysis of North American data reveals that the moderate growth apparent at the regional level hides a contrasting situation, with Canadian metros and New York growing significantly (in a range of 5-46%), while the other 13 metros showing a decrease in passengers.

Global ridership evolution (m.)



Ridership 2012-2017



1 Ridership data are *trips*, as opposed to *boardings*

Asia is home to no less than seven of the top 10 busiest metros. Compared to the 2015 UITP Metro Statistics Brief, New Delhi joined the Top 10 group, replacing Paris. Beijing, Shanghai, Seoul, Guangzhou and Mexico moved down in the ranking while Moscow climbed up to number two.

Top 10 busiest Metros (annual ridership in millions)

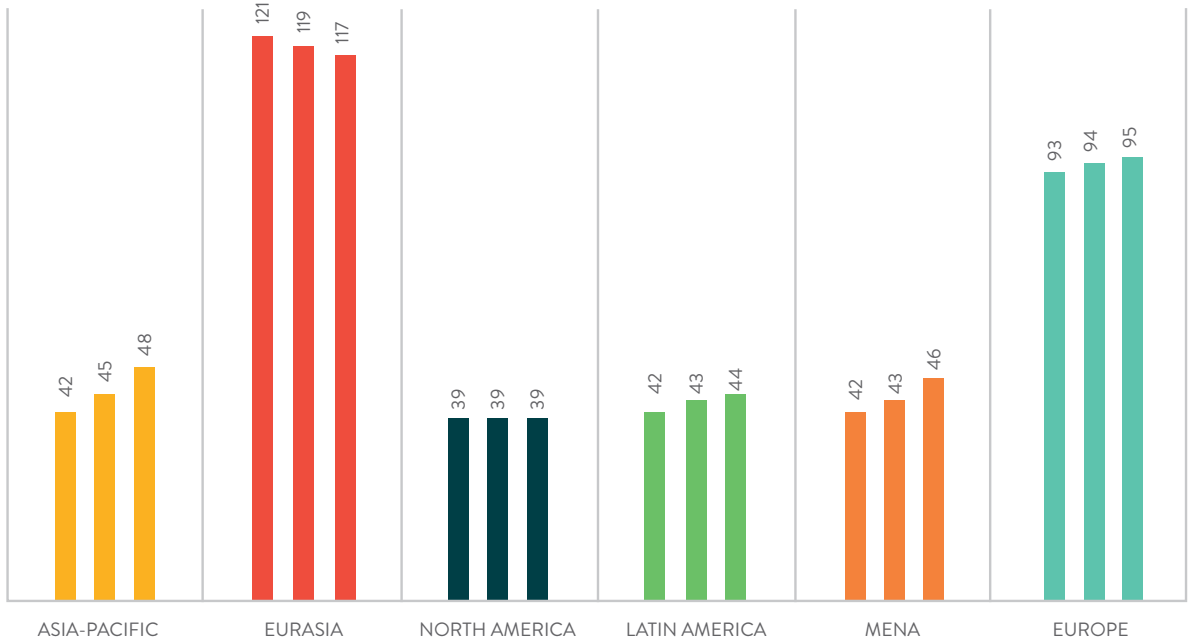
1	TOKYO	3,463
2	MOSCOW	2,369
3	SHANGHAI	2,044
4	BEIJING	1,988
5	SEOUL	1,885
6	NEW YORK CITY	1,806
7	NEW DELHI	1,789
8	GUANGZHOU	1,730
9	MEXICO CITY	1,678
10	HONG KONG	1,600

Ridership evolution was also analysed compared to the population in the served urban areas[2]. Eurasia and Europe are the regions where metro services are most used "per capita". All other regions are at a comparable level. Metros gained popularity in all regions except in North America (stable) and Eurasia (declined).

NEW METRO CITIES

Looking at the history of metro development, there has never been such strong development since Asia started to massively invest in metros in the 1970s (see graph next page). There has been a significant surge in the current decade, which is not even finished, largely due to China and India.

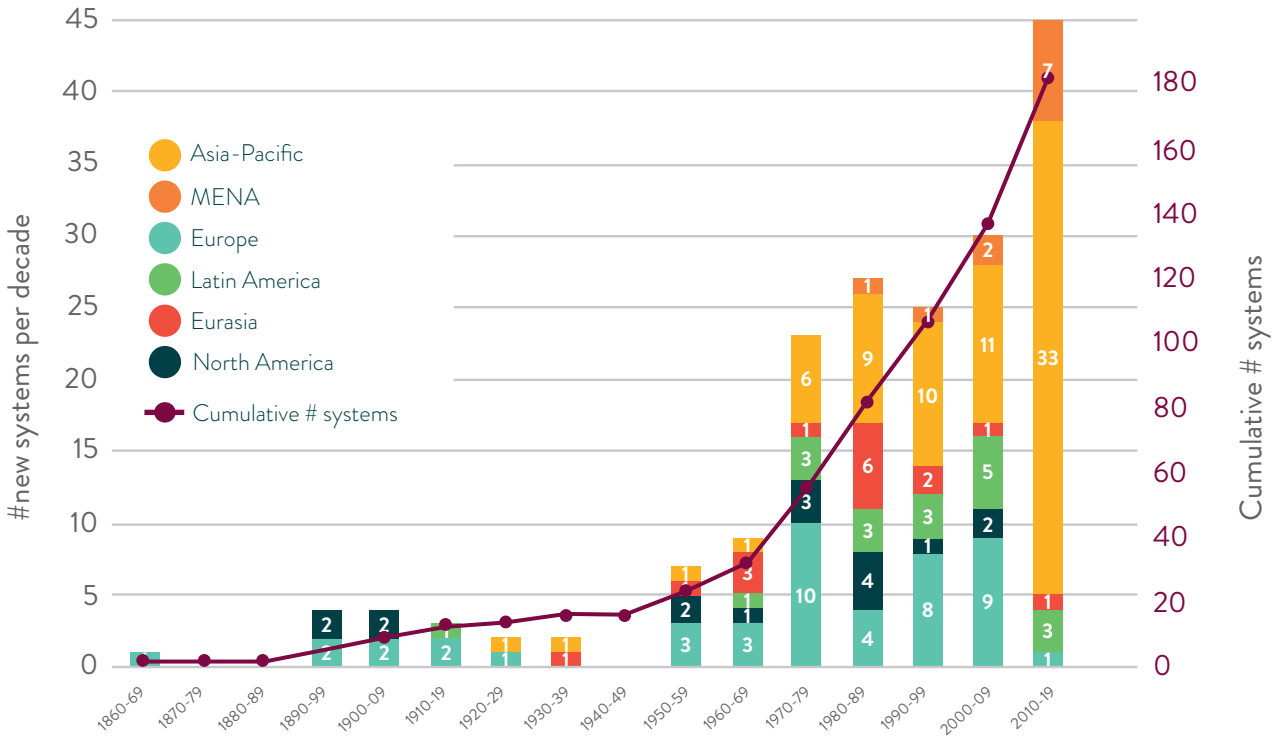
Trips per capita 2015-2017



Evolution of annual trips in metro cities per inhabitant per region (2015-2016-2017).

2 The latest edition (2017) of the UN DESA World Urbanisation Prospects was used for nearly all the cities with a metro system. As data is provided for years 2005, 2010 and 2015, the average annual population growth rate in these cities was used to calculate the population between these years.

Metro system opening (per decade) 1860-2017



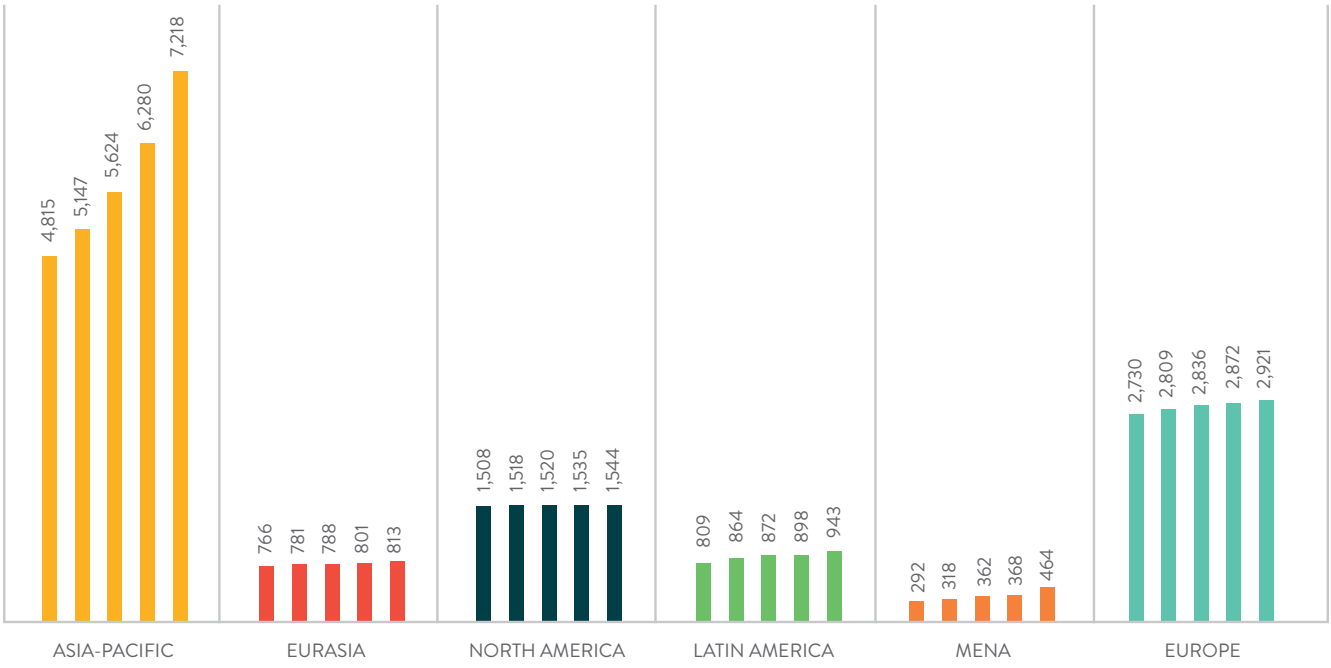
Total number of metro systems and the location of systems inaugurated each decade (bar).

INFRASTRUCTURE

As of 31 December 2017, the 182 metro systems[3] together made up an installed asset base of 642 lines for a total length of 13,903km and 11,084 stations (see distribution per region on map, page one).

1,901km of new infrastructure was put in revenue service between the start of 2015 and the end of 2017. This includes the new lines that opened in the 19 new metro cities in China, India and Iran (577km), but also new lines in already established metro cities (820km) as well as line extensions (504km).

Total line length evolution (km) per region 2013-2017

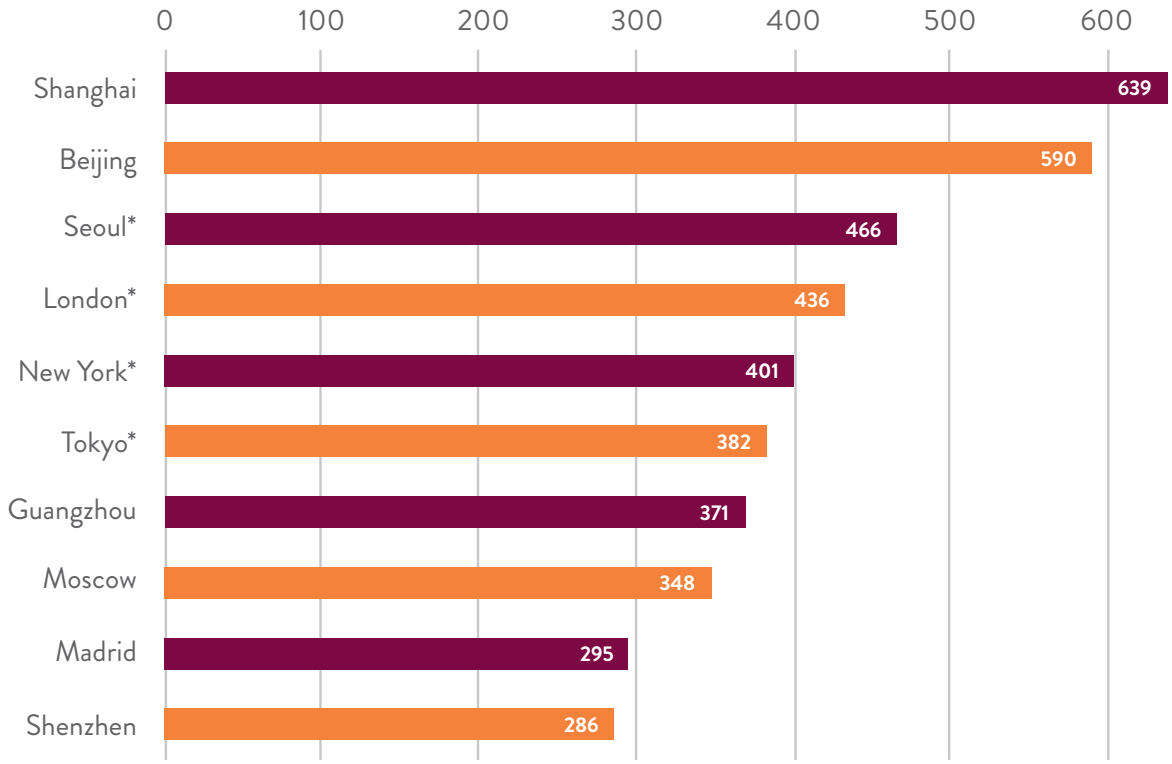


3 A system is a network available to passengers in a specific city / metropolitan area, and not necessarily an operator, as some systems are run by multiple operators.

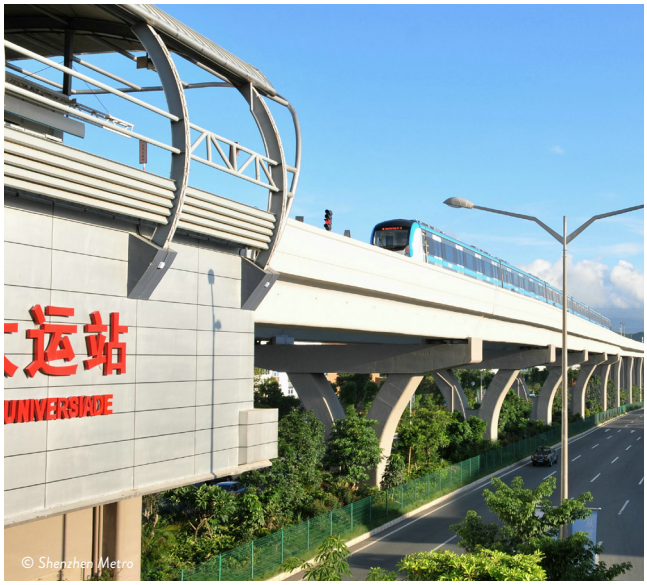
At the level of individual metros, compared to the situation at the end of 2014, Shenzhen joined the Top 10 of the longest metro systems, replacing Mexico City. Seoul climbed up one position to number three and Guangzhou climbed from number nine to number seven in the ranking. London, Moscow and Madrid all moved down one position.

Asia is home to no less than six of the top 10 longest metros.

Top 10 longest metro systems (km)[4]



*The 10 longest metro systems at the end of 2017. * indicates cities with multiple operators' infrastructure aggregated.*



Six more metros have a length exceeding 200km: Singapore (265km), Chongqing (260km), Mexico City (226km), Tehran (221 km), New Delhi (220km), Paris (215km) and Wuhan (204km). New Delhi is likely to enter the Top 10 in 2018.

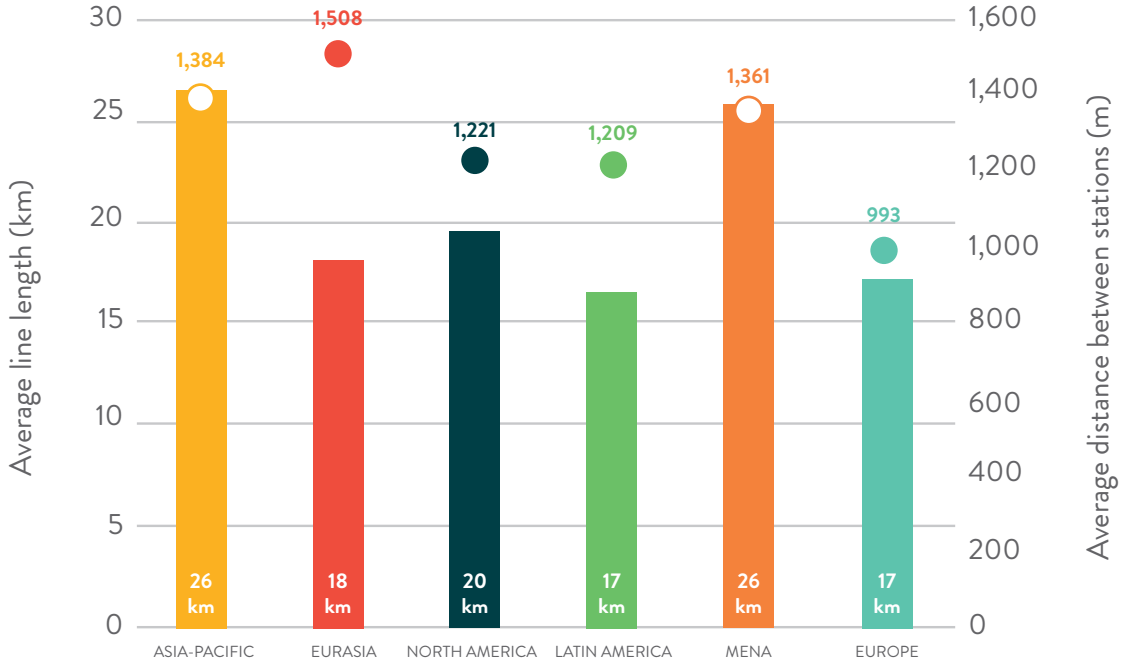
Shenzhen Metro entered the Top 10 longest metro networks.

4 Cities marked by an asterisk in the table are multiple operator systems with aggregated system length values.

NETWORK CHARACTERISTICS

The average line length globally is 20km and the average distance between stations is 1.25km. There are substantial variations between the longest and shortest line: 82.4km (line 11 Shanghai) and 1.8km (line U55 Berlin) respectively. Detailed regional characteristics are depicted in the chart below.

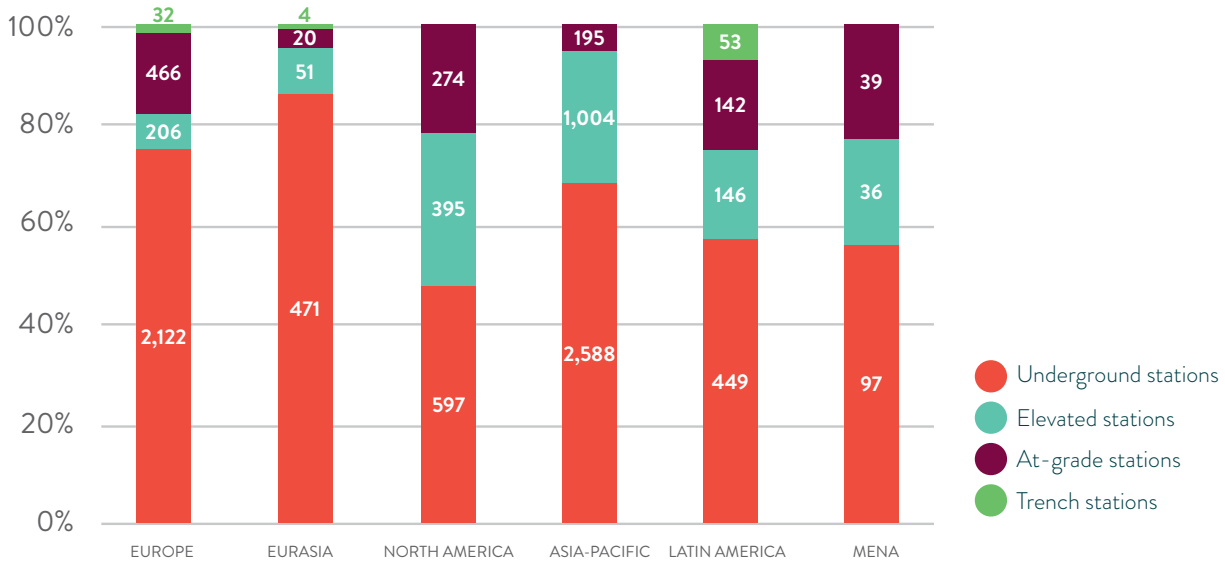
Metro network characteristics



The type of metro infrastructure was further studied and analysed in a sample of 143 out of 182 metros covering 85% of all stations. Stations were clustered according to their design features (underground, at-grade, elevated or in-trench).

Aggregated construction model data shows some variations per region, with underground metro design remaining the dominant model in every region.

Metro construction models per region



Distribution of construction models for metro stations, according to world region.

ROLLING STOCK

For this report, UITP collected rolling stock data for all metros in the world for the first time. The chosen unit is the "metro carriage (or car)", as this allows for better comparison than "train" or "vehicle" (a train can be made up of between two and 12 carriages).

For 2017, the total operational fleet consisted of over 114,000 carriages (see map on page one for figures per region).

THE RISE OF FAO

In March 2018 the total line length of operational fully automated (FAO) metros reached the milestone of 1,000km with the opening of the Pujiang Line in Shanghai. Fully automated metros currently represent 7% of the total length of installed metro assets. However modest it may seem, it should be kept in mind that fully automated metros (Grade of Automation 4[5]) emerged in the 1980s and 1990s, compared to 150 years of conventional metro history.

Over the period 2015-17, ten new metro lines designed to run with fully automated operation (FAO/GOA4) entered in service in ten cities, with a total length of 157km. Together with nine line extensions, new GOA4 totals 274km and represents 12% of total of the metro infrastructure installed in 2015-17.

If we exclude China, which is only starting FAO metro and is disproportionately affecting the growth figures, new GOA4 metros represent 32% of all new metros opened over the same period.

The strong "mainstreaming" of GOA4 metros worldwide will be confirmed in the next years, now that China has resolutely embraced the fully automated metro approach.

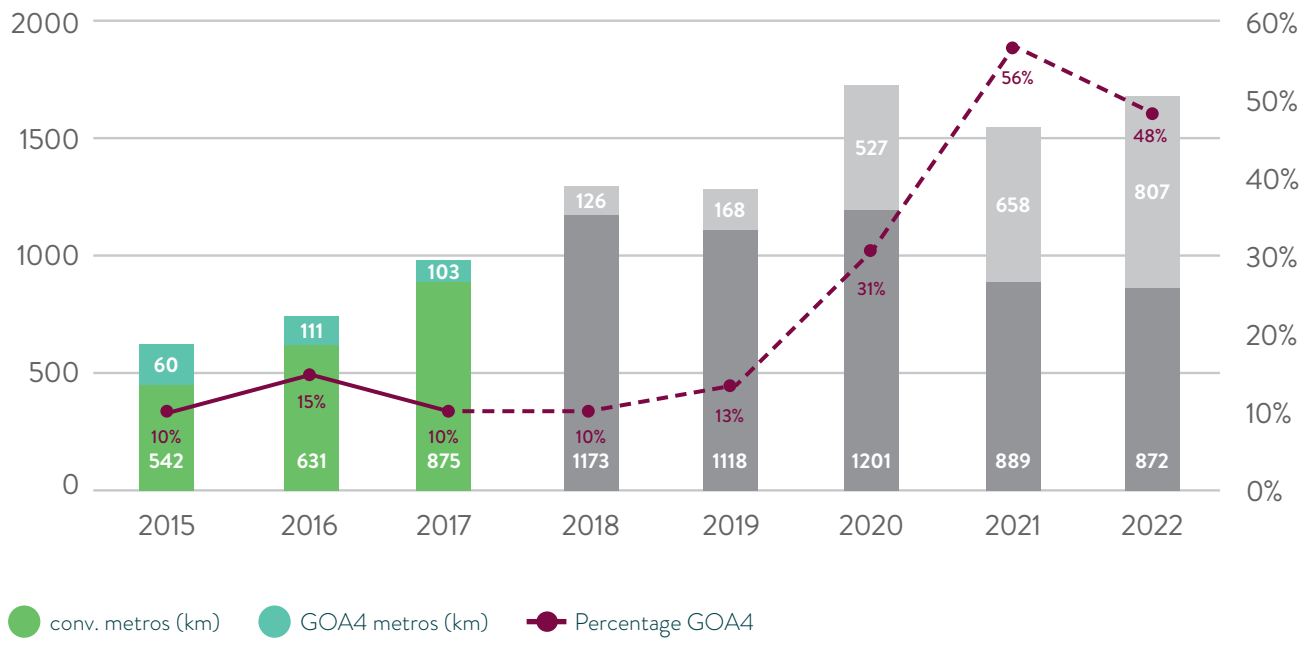
GROWTH PROJECTIONS

In the next five years, over 200 new lines (conventional and GOA4) and even more extensions are expected to open in most regions, including in Sub-Saharan Africa.

In the summer of 2018, some 5,400km were reported to be in construction or at testing stages, another 1,700km in design and tender stages.

The chart below illustrates the expected cumulative infrastructure developments over the next five years, as well as the strong mainstreaming of GOA4 metros worldwide. 32 GOA4 lines are to enter revenue service in 16 Chinese cities by 2022.

Annual metro growth & prognosis (km) 2015-22



Predicted evolution of annual metro infrastructure length per year.

5 The automation data reflected in the statistics correspond exclusively to metro lines without staff on board (GOA4 as considered in standard IEC 62267).

DEFINITION AND METHODOLOGY

The data for this document was extracted from a database compiled by UITP using official company data and other authoritative sources (national statistics office, national associations, etc.).

Metros are high capacity urban rail systems, running on an exclusive right-of-way. Metro lines included in the above statistics run with trains composed of a minimum of two cars and with a total capacity of at least 100 passengers per train. Suburban railways are not included and are available in a separate dataset. Systems that are based on light rail vehicles, monorail or magnetic levitation technology are included if they meet all other criteria above. Suspended systems are not included.

Infrastructure predictions are based on scenarios developed from UITP's rail project database.

This Statistics Brief is based on the full Metro Statistics Report 2018 which includes further details and analysis. The extensive report is available, together with the full dataset, on request from UITP.

This is an official Statistics Brief of UITP, the International Association of Public Transport. UITP has over 1,500 member companies in 96 countries throughout the world and represents the interests of key players in this sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport worldwide.

Data for the section of this report on fully automated metros was collected by the UITP Observatory of Automated Metros.

SEPTEMBER | 2018

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