

ferrovial

Metro Dossier
2022

Introduction

Ferrovial Construction is the business unit that designs and builds civil works, buildings, water treatment plants and industrial projects. It is recognized internationally for its abilities in landmark and sustainable projects, mainly large transport infrastructures.

Construction is a core activity in Ferrovial's strategy and it maintains its firm commitment to introducing innovation and technology to minimize its environmental footprint, generate a positive impact on society and minimize risks for users and workers. In addition to its own profitability and cash generation capacity, it adds value by coordinating the design and construction of infrastructure concessions in which other Ferrovial divisions are invested.

It is currently an international leader in the design and construction of large transport infrastructure, having built close to 550 kilometers of tunnels, more than 15,800 kilometers of highways and toll roads, and 5,500 kilometers of railway line.

One area of construction in which Ferrovial is involved is underground railways, also called subways or metros. The company has built over 190 km of tunnels and 158 stations in cities around the globe, including Madrid, Lisbon, London and Santiago de Chile.

Madrid: 84.56 kilometers and 88 stations

Barcelona: 43.28 kilometers and 20 stations

Valencia: 7.51 kilometers and 7 stations

Bilbao: 7.50 kilometers and 11 stations

Granada: 3.50 kilometers and 6 stations

Santiago de Chile: 11.96 kilometers and 17 stations

Oporto: 6.2 kilometers and 7 stations

Lisbon: 5.66 kilometers and 5 stations

London: 2.00 kilometers and 4 stations

Sydney: 23.00 kilometers and 5 stations

METRO STATIONS

165

METRO LINES

>190 KM

RAILWAY LINES

5,500 KM

TOLL ROADS

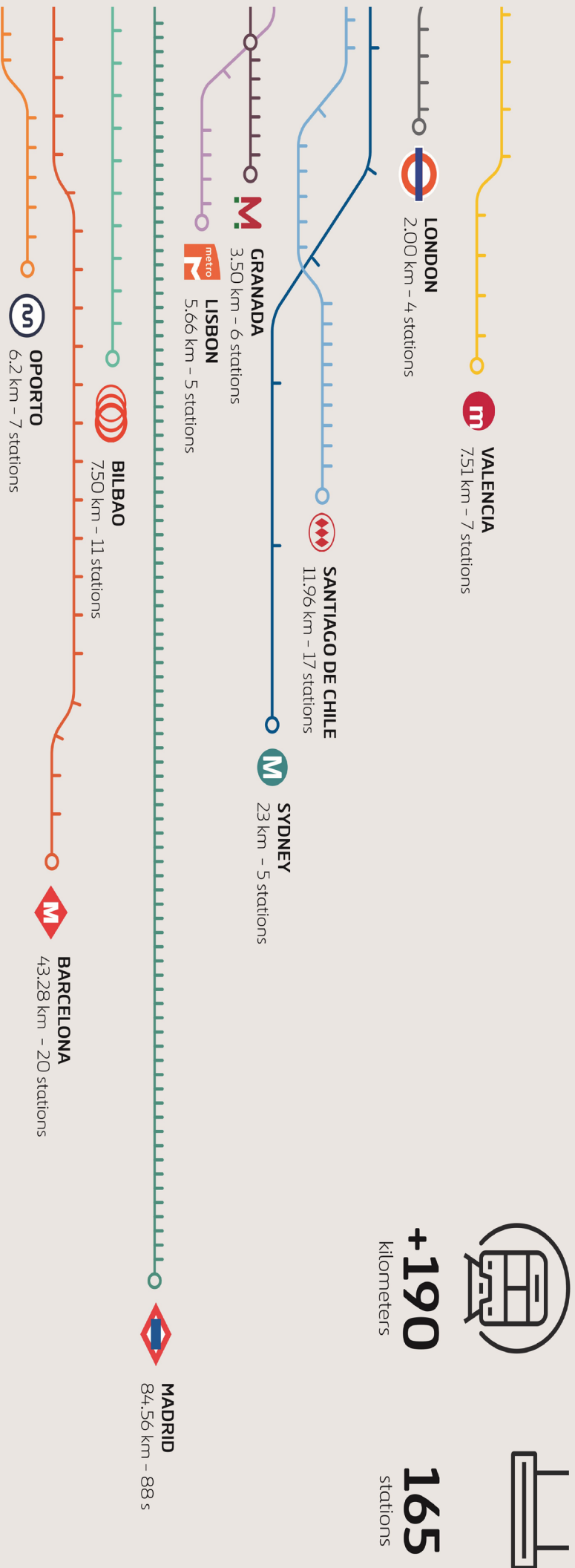
>15,800 KM

TUNNELS

550 KM

METRO / SUBWAYS:

Our experience worldwide since 1927





1. Madrid Metro

Line 9 extension

Dating back more than 100 years, Madrid Metro has a total length of 294 kilometers and 302 stations. That means it is one of the largest subways in the world: it ranks #5 in terms of the number of stations.

Line 9, with 29 stations, links the northern part of the city with the southeast. Ferrovial extended this line to Mirasierra station. This involved building a 2.5-kilometer section in addition to upgrading the existing tunnel. The project also included the construction of the Mirasierra and Montecarmelo stations, which serve as interchanges with lines C7, C8 and C10 of Madrid's commuter rail system.

Trackbed on Line 12

The project, awarded by the Madrid Regional Government Department of Transport and Infrastructure, comprises upgrading the trackbed of Madrid Metro line 12 between Conservatorio and Los Espartaes stations.

The project extended over seven kilometers and involved seven stations (Conservatorio, Alonso de Mendoza, Getafe Central, Juan de la Cierva, El Casar and Los Espartaes). The work included reinforcing the trackbed, replacing 19,700 tie plates and waterproofing the tunnel.

MADRID METRO

LINES 9 & 12

KILOMETERS

9.5 KM

STATIONS

9





2. Barcelona Metro

Line 9 Section: Bon Pastor – Can Zam

With nearly 218 million trips, Barcelona Metro is one of the main means of transport in the city. It is 123 kilometers long, with 162 stations distributed between Barcelona and the municipalities in the Greater Barcelona area.

Line 9 is an automatic subway line that currently has 24 stations in operation. In 2001, Ferrovial was awarded the Bon Pastor-Can Zam section for more than €430M. The work was carried out in two phases: the first consisted of building the infrastructure and stations on the Bon Pastor-Can Zam section, and the second consisted of the tunnel between La Sagrera and Zona Universitària stations.

The contract also included the construction of the Can Peixauet, Santa Rosa, Fondo, Església Major and Singuerlín stations, as well as building track superstructure and rigid catenary.

BARCELONA METRO

LINE 9

BUDGET

433 M€

KILOMETERS

43 KM

STATIONS

20





3. Valencia Metro

Line 5: Ayora-Marítim section

With a total of 138 stations, Valencia Metro consists of six lines and two networks (North and South), in addition to two terminal stations. In 2004, Ferrovial was awarded the contract to build part of Line 5, between Ayora and Marítim stations.

The project consisted of extending the T5 Light Rail line eastwards to connect Avenida del Mediterráneo with the Jerónimo Monsoriú stop. This consisted of approximately 1,665 meters of double track with four overground stations (Aragón, Amistad-Casa de la Salud, Ayora and Marítim-Serrería). The project significantly improves public transport links between the Maritime districts and the rest of the city.

Railway spur to Torrent and new station

Awarded in 2002, the project consisted of building a meter-gage, electrified, double-track railway spur line for train access from Line 1 to the center of Torrent, one of the main cities in the province of Valencia. It also included building a new underground station at the end of the line.

VALENCIA METRO

LINES 5, T2 AND SPUR

KILOMETERS

7 KM

STATIONS

7

The Valencia Regional Government chose Ferrovial to carry out the work, which consisted of a 2,284-meter section starting at Torrent station. The contract included the construction of a three-span overpass with a box girder deck, a 10-meter wide reinforced concrete caisson underpass and a 3-meter wide pedestrian underpass. In addition, ventilation, communications, fire detection and extinguishing, electricity and lighting, plumbing and other installations were executed.



Line T2: Xàtiva-Natzaret section

The T2 tramway line is an extension of the Valencia Metro and Tramway network designed to cut across the network diametrically to enhance overall connectivity by linking the north and south via the historic downtown area. It also provides access to major facilities, such as the City of Arts and Sciences and the courthouse complex. In 2005, the company obtained its first commission from the Valencia Regional Government to extend this line. The design included an 80-meter section of underground tramway infrastructure beneath a parking lot.



Line T2: Alacant-Russafa section

Continuing with the extension of Line T2, in 2007 and with a budget of more than €45 million, Ferrovial built a 1.2-kilometer section of underground Metro line in a built-up area. This section was built using the cut-and-cover method: first installing concrete curtain walls, followed by a concrete roof, then excavation, and finally restoration of services and road links and reopening to traffic.

Work by ADIF at the station involved two platforms, track and catenary, and the demolition and relocation of an ancillary services building. Additionally, the company assisted with uprooting and replanting a group of palm trees that are of great symbolic importance to Valencia City Government.





4. Bilbao Metro

Section: Santa Teresa-Urbinaga

Established in 1995, Bilbao Metro is currently the third-largest railway network in Spain in terms of passenger numbers. Extending over 50 kilometers, it comprises three lines and 49 stations.

Awarded by the Basque Government Department of Transport and Public Works, the project consisted of building a section of Line 2 of Bilbao Metro in the municipality of Sestao, including a 766-meter viaduct along the banks of the Galindo River. The line currently has 25 stations in operation. Bagatza underground station, on Line 2, with multiple accesses, is located in Santa Teresa, in the municipality of Baracaldo. It was inaugurated in 2002.

The section built by Ferrovial ends at Urbinaga station, in the municipality of Sestao. This station has a revolutionary design adapted to a difficult terrain: in the open air, located above the Renfe C-1 commuter line tracks, on a curve and a slope. The location was chosen to create an interconnector with the Renfe commuter rail network, as the Metro viaduct sits atop commuter lines C-1 and C-2.

BILBAO METRO

KILOMETERS

7.5

STATIONS

11



5. Metro de Santiago de Chile

Line 3: Section 4

Line 3 is one of the seven lines that currently make up the Santiago de Chile Metro network. Its 18 stations, distributed along 22 kilometers of line, carried close to 28 million passengers last year, making it the third-busiest line of this subway system.

Awarded in 2012, the project consisted of building 4,050 meters of interstation tunnels, six access shafts, 182 meters of access galleries, 610 meters of pedestrian tunnels and 656 meters of tunnels in four of its five stations (Plaza de Armas, Universidad de Chile, Almagro Park and Matta Station). The work also included incorporating new features such as automated trains, security cameras in the cars, platform screen doors and self-service ticketing machinery.

Line 4: Grecia-La Cisterna, Rotonda de Grecia, Los Orientales and Vicente Valdés stations

With 23 stations and 24.7 kilometers in eight districts, it is one of the seven lines that make up the Santiago de Chile Metro. Line 4 was the biggest expansion of this network, the aim being to serve the mobility needs of the 1.5 residents of the eastern and southern districts of the city. The project also enhanced the network structure by improving the distribution of passenger flows.

SANTIAGO DE CHILE METRO

LINES 3, 4 & 6

KILOMETERS

12 KM

STATIONS

17

Ferrovial also undertook construction of the Rotonda Grecia and Los Orientales stations and the line between them. Measuring 1,595 meters in length, this section was executed in three parts, including reinforcement of the viaduct foundations and construction of ventilation shafts.

The company also built La Granja, Santa Julia and San Ramón stations and six sections of at-grade line. The project also included construction of a spur to the depot that departs from Line 4 between Quilín and Las Torres stations, as well as a guardhouse, lighting and paving, among others.

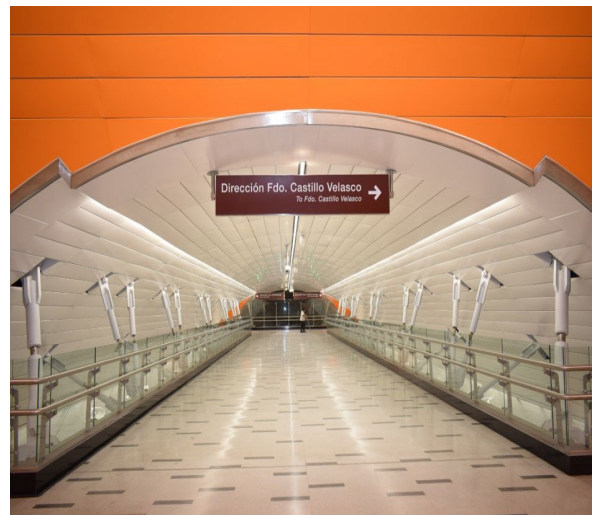


Line 6: Ñuble and Ñuñoa stations

Line 6 of Santiago de Chile Metro, inaugurated in 2017, comprises 10 stations along 15 kilometers of line. Last year it carried more than 16 million passengers and it was the first line in the network to use driverless trains and platform screen doors.

Ferrovial was selected in 2015 to build the Ñuble and Ñuñoa stations, both of which are interconnectors between metro lines. The work also included two shafts between stations, six ventilation shafts and tunnel between the stations, measuring approximately 3,000 meters.

The bulk of the civil work in the project related to building the tunnel between stations, which was complicated by the characteristics of the route. Ferrovial adopted the New Austrian Method (NATM) to build this tunnel, consisting of a cyclical and sequential process of conventional digging and simultaneous installation of primary lining to stabilize the surrounding rock.





6. Oporto Metro

Pink Line and Yellow Line

Created in 2003, Oporto Metro is a light rail network linking the city center of Oporto with its suburbs and metropolitan area. It consists of seven lines totaling 70 kilometers.

Ferrovial is expanding this infrastructure under a €288 million project awarded in 2020. The project is divided into two contracts: extension of the Yellow Line, and construction of a new circular line: the Pink Line.

The Yellow Line extension, consisting of 3.15 kilometers of dual-track light railway, will run from Santo Olvido station to serve the districts of Vila Nova de Gaia, Mafamude e Vilar do Paraiso, Oliveira do Douro and Vilar do Andorinho. It also includes the construction of a viaduct, a 770-meter tunnel, and three stations.

The second contract refers to the construction of a new circular line, the Pink Line, measuring 3.1 kilometers, between Praça da Liberdade and Casa da Música. This new line involves the construction of four new stations and three ventilation shafts, as well as installing the line and catenary.

OPORTO METRO

PINK & YELLOW LINES

YEAR

2020

KILOMETERS

6 KM

STATIONS

7

BUDGET

288 M€



7. Lisbon Metro

Blue Line and Green Line

Portugal's first metropolitan railway, serving the city of Lisbon, was inaugurated in 1959. It now comprises four lines with 56 stations and a total of 44 kilometers of track. In addition to the subway, Lisbon is served by commuter rail and tramlines.

Ferrovial was commissioned to build a 4,459-meter double-track tunnel linking Restauradores and Baixa-Chiado stations, and Rossio station with Baixa-Chiado and Cais do Sodré, all of them in the southern part of the city. The work also included building the new Cais do Sodré and Baixa-Chiado stations, in addition to upgrading the Rossio and Restauradores stations.

The Baixa-Chiado station, located 45 below street level, connects the Blue and Green lines and is the deepest station in the entire Lisbon Metro network.

LISBON METRO

BLUE AND GREEN LINES

KILOMETERS

5 KM

STATIONS

5



8. London Underground

Northern Line Extension

Created in 1863, London Underground is the oldest subway system in the world. With 274 stations and more than 408 kilometers of active lines, and it carries more than three million passengers every day. In 2014, Ferrovial was selected to design and build the Northern Line extension. Worth €628 million, it was the largest restructuring project in London in the last 300 years.

The work consisted of extending the Northern Line southward from Kennington station. The project included the construction of two new stations, Nine Elms and Battersea, with two additional ventilation shafts, and a 2-kilometre tunnel with an internal diameter of 5.1 meters.

Crossrail Tunnels

Crossrail is one of the largest transport infrastructure projects in Europe. It opened last year to transform London's rail transport and increase transit capacity in the city center by 10%, reducing journey times. The work included building two 6.2-kilometer tunnels running between Royal Oak and Farringdon stations, as well as construction of Farringdon station itself and the accesses and caverns for the Bond Street and Tottenham Court Road stations. Measuring 118 kilometers, Crossrail connects Maidenhead, in the west of the city, with Shenfield and Abbey Wood, in the east, passing through Heathrow.

LONDON UNDERGROUND

NORTHERN LINE
& CROSSRAIL

KILOMETERS

8 KM

STATIONS

4





9. Sydney Metro

Metro West

Inaugurated in 2019, Sydney Metro is Australia's largest infrastructure project, comprising 13 stations along 36 kilometers of line. The network is undertaking an ambitious expansion project with plans to have 31 stations along 66 kilometers of line by the end of 2024.

Ferrovial was picked to undertake this project, one of the largest in New South Wales. Valued at €1,240 million, the project consists of building the central section of Sydney Metro West. The contract covers the construction of two 11-kilometer tunnels to connect The Bays station with Sydney Olympic Park station, which was built for the 2000 Olympic Games.

Scheduled to be completed in 2025, the work also includes building five stations and the associated services. When completed, Sydney Metro West line will measure 24 kilometers, connecting Greater Parramatta with Sydney's financial district. In addition to linking new communities, this infrastructure will generate job opportunities in the area.

SYDNEY METRO

METRO WEST

YEAR

2021

KILOMETERS

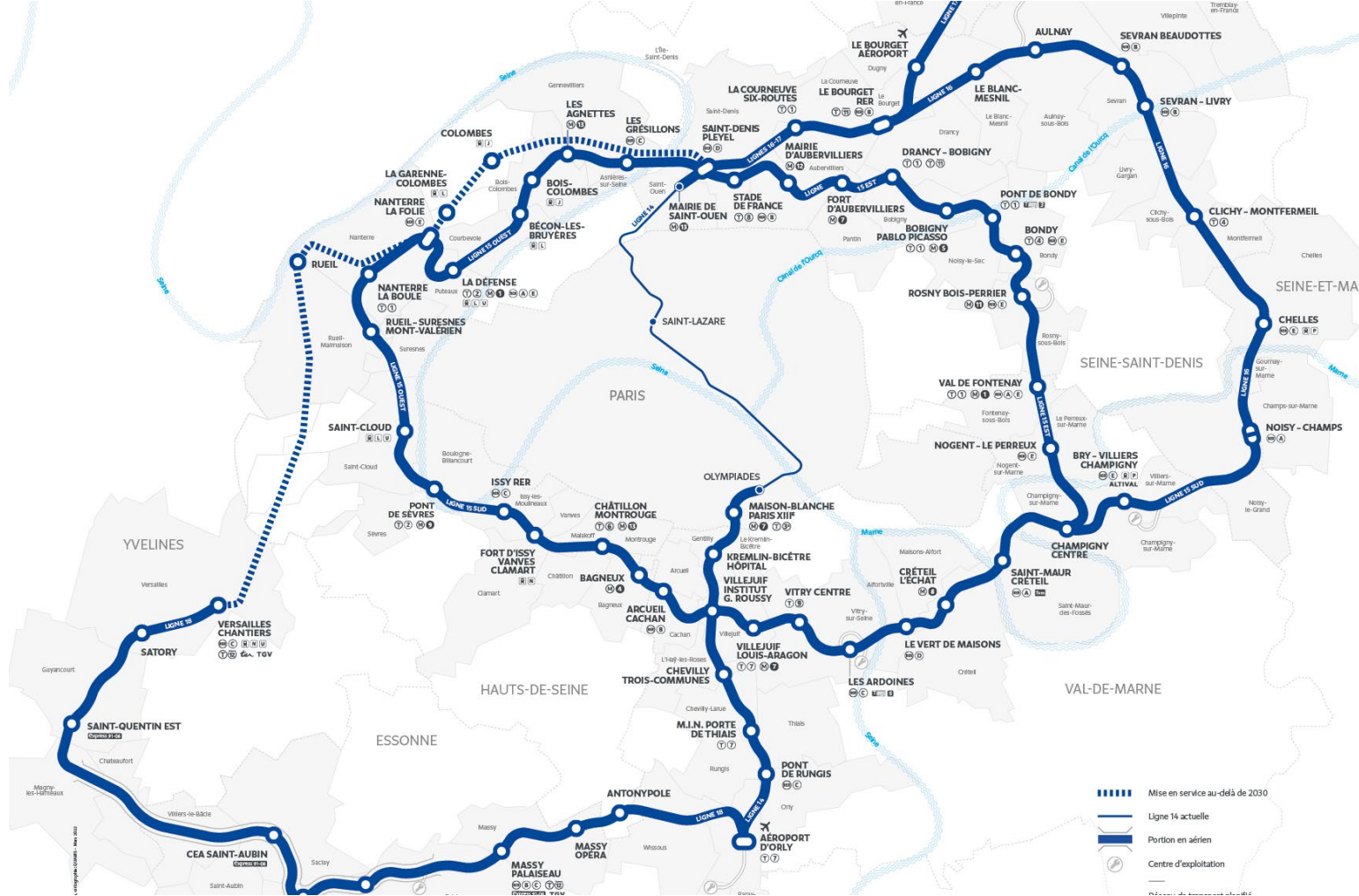
23 KM

STATIONS

5

BUDGET

1,240 M€



10. Paris Metro

Line 18

Dating from 1900, when the line connecting Porte de Vincennes and Porte Maillot was inaugurated, Paris Metro has 303 stations along nearly 220 kilometers of line. As a result of the city's increasing population density and the saturation of the Metro, a plan was designed to expand the system to carry two million passengers per day.

Called Grand Paris Express, it is Europe's largest infrastructure project and includes adding 68 new stations and 200 kilometers of track to the Paris subway.

As part of this initiative, Ferrovial has been awarded the construction of a section of line 18 for €440 million. The work comprises digging a 6.7-kilometer tunnel between the Saint-Quentin Est and Versailles-Chantiers stations, in western Paris, together with building three stations and eight ancillary ventilation structures.

PARIS METRO

LINE 18

YEAR

2022

KILOMETERS

6.7 KM

BUDGET

438 M€

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