



Railway projects

bringing people closer

he construction area of the FCC Group has executed more than **2,600 kilometers** of railway, with both civil infrastructure and superstructure, in any of the modes of this means of transport, from the high rail speed to the subway or new trams, including maintenance and renovation of existing lines and the construction of new stations

and terminals in large cities. The construction arm of the FCC Group has built more than 900 kilometers of High Speed rail lines, more than 326 kilometers of subway and 65 kilometers of tramway. FCC Construcción has experience of maintaining 11,000 kilometers of railway.



Railway Romania
IV Corridor
Pan european

Section 2: Km 614-Gurasada, consisting of sub-section 2a: Km 614-Cap and Bârzava and sub-section 2b: Cap Y Bârzava-Cap Y Ilteu.

Section 3: Gurasada - Simeria. The set of the three works consists in the execution and modernization of 121.62 kilometers of railway track; 47 bridges; eight overbridge and seven underbridge; a tunnel of 659 meters in length; 19 stations and five outlets, as well as electrification works and the implementation of the ERTMS system (European Rail Traffic Management System).



Rail access to the bridge Vidin - Calafat

The accesses to the bridge consist of 17 kilometers of simple, electrified railway and industrial branches. The construction of a new international freight railway station and the renovation of the existing passenger station were also integral to the project.

The bridge links the towns of Vidin (Bulgaria) and Calafat (Romania). The bridge crosses the Danube, becoming the second link on this river between both countries.



High Velocidad "Eje Atlántico"

- Length of infrastructure and superstructure built: 46 kilometers.
 - Tunnels length: 27.6 kilometers. Double tube.
- Viaduct length: 7.1 kilometers.
- **Singular projects:** Vigo Tunnel Das Maceiras, AVE Vacariza Rialiño and Padrón Santiago.



Madrid - Galicia High Speed Line

- Length of civil infrastructure executed: 18 kilometers.
- Length of superstructure executed: 104.8 kilometers.
- Tunnels length: 15.4 kilometers.
- Singular projects: Civil lots: Vilariño-Campobecerros and Amoeiro-Carballiño.
- Track assembly: Campobecerros-Taboadela and O Irixo- Santiago.



Railway line New access to Asturias

- Length of civil infrastructure executed: 37 kilometers.
- Tunnels length: 36.7 kilometers. Double tube.
- Viaduct length: 0.3 kilometers.
- Individual Projects: Pajares Tunnels Lot 1 and Pajares Tunnels Lot 5.
- Track assembly contract between La Robla and Campomanes was added to the Pajares tunnels project: Eighty-two kilometers of different track typologies: ballasted track, slab track, precast slab track...



High Speed Line
Madrid - Barcelona
French border

- Length of infrastructure executed: 202.9 kilometers.
- Length of superstructure executed: 174.7 kilometers.
- Tunnels length: 16.6 kilometers.
- Total length of viaducts: 11.6 kilometers.
- Length of track assembly: 174.7 kilometers.
- Individual Projects: Civil and tracks of urban tunnels and Girona Station; Sub-sections II, IX-X and XIV of Madrid -Zaragoza; Ricla (execution of the longest tunnel on the entire line); Sub-section IVb of the Lleida-Martorell section; track assembly between Calatayud and Zaragoza.



Corredor Mediterráneo Railway line

- Length of infrastructure executed: 13,2 kilometers
- Length of superstructure executed: 79,38 kilometers
- Length of Tunnels: 3,9 kilometers
- Length of Viaducts: 0,725 kilometers.
- Individual Projects: Benicassim Oropesa civils (15 kilometers), Vandellós Tarragona track assembly (70 kilometers).



Arterial railway to Palencia

- Length of civils infrastructure and superstructure executed: 10.1 kilometers.
- Total length of viaducts: 0.1 kilometers.
- Length of track assembly: 13.5 kilometers.
- Improves the Palencia rail connection, creating links with the north and centre of the country.



Madrid - Valladolid High Speed Line

- Length of infrastructure and superstructure executed:
 99 kilometers.
- Tunnels length: 38.5 kilometers. Double tube.
- Viaduct length: 2 kilometers.
- Singular projects: Guadarrama Boca Norte Tunnel.
- The Guadarrama tunnel Project is remarkable. It is the eighth longest tunnel in the world and the fourth in Europe.



Zaragoza - Huesca Railway Line

- Length of civil infrastructure and superstructure built: 34.5 kilometers.
- Viaduct length: 1.5 kilometers.
- Individual Projects: Complete railway section Zaragoza -Huesca.



Zaragoza -Teruel Railway Line

The project consisted of the line upgrading between the Villafranca del Campo abd Cella stations with a length of 27 kilometers.

It included the execution of a 66-meter viaduct as well as 13 overpasses and 3 underpasses, eliminating all level crossings.

Sagunto - Zaragoza line. Adaptation project for the railway line between Sagunto and Teruel for the circulation of 750 meters long freight trains.



Madrid - Levante High Speed Line

- Length of infrastructure executed: 24 kilometers of civil works.
- Length of superstructure executed: 116 kilometers.
- Tunnels length: 53.2 kilometers.
- Total length of viaducts: 3.4 kilometers.
- Length of road mounted: 116 kilometers.
- Individual projects: Siete Aguas Buñol; section Villena Sax stretch, and Alquerías - Cartagena section. The Siete Aguas-Buñol stretch was bored with TBM, beating several times the excavation world record.



Madrid - Extremadura High Speed Line

- Length of infrastructure and superstructure executed: 12.67 kilometers.
- Total length of viaducts: 3.05 kilometers.
- Individual Projects: Alcántara Reservoir Garrovillas and Arroyo de la Charca - Grimaldo sections.
- The Alcantara Garrovillas section presents the Almonte viaduct. Once built, it became the largest concrete arch railway viaduct, and the third largest bridge (for railway and roads) worldwide, with a lower concrete arch of 384 meters long spam.



Madrid - Sevilla High Speed Line

- Length constructed: 80.8 kilometers.
- Individual Projects: Ciudad Real Brazatortas. FCC executed four sections: Alcodea - Adamuz, Guadajoz -Majarique, Ciudad Real - Puertollano and Almodóvar - Lora del Río.
- It constitutes the first high-speed line built in Spain.



Sevilla - Cádiz
Railway Line

- Length of civil infrastructure executed: 17.5 kilometers.
- Length of superstructure executed: 17.5 kilometers.
- Viaduct length: 0.8 kilometers.
- Individual Projects: Jerez Norte.
- It is a key railway line in the connections and railway network of Andalucia (Spain).



Córdoba - Málaga High Speed Line

Length of Civils infrastructure: 2.66 kilometers.

• Tunnels length: 2.43 kilometers.

Individual projects: Cártama tunnel.



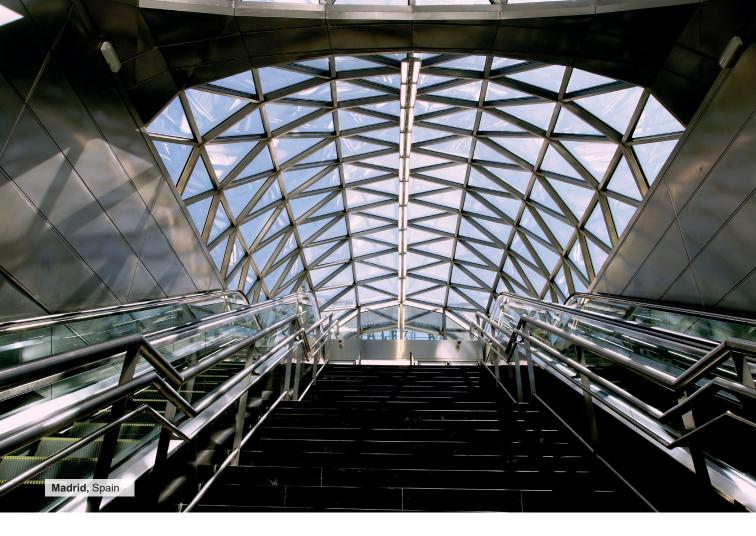
Murcia - Almería Railway Line

- Length of civil infrastructure and superstructure: 46.97 kilometers.
- Tunnels length: 15.74 kilometers.
- Viaduct length: 5.14 kilometers. 16 viaducts stand out on the Nijar - Andarax River section (5 kilometers of viaducts).
- Individual projects: Alhama Totana; Sorbas -Barranco de los Gafarillos; Totana - Lorca and Nijar -Andarax River. The Sorbas tunnel has become the longest in Andalusia.



Atocha Station

The work consisted of the demolition of the old building and the subsequent construction of the Atocha Station. This included the new High Speed lines, which made it the first station in Spain to be constructed on a live line. The project also included rail assembly works for the 15 existing tracks.



Puerta del Sol - Gran Vía Station

It is a multimodal station, designed by architect Antonio Fernández Alba, located under the central Puerta del Sol in Madrid.

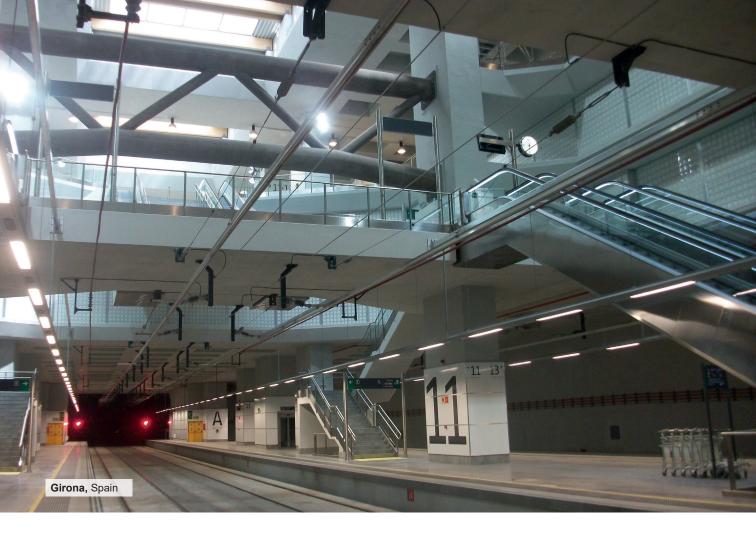
At this station, lines 1, 2 and 3 are for the Madrid Metro and C-3 and C-4 for the Cercanías Madrid network converge.



Transport interchange station Moncloa

The station compose both lines 3 and 6 of Madrid Metro and proximity bus terminal creating a transport communications node.

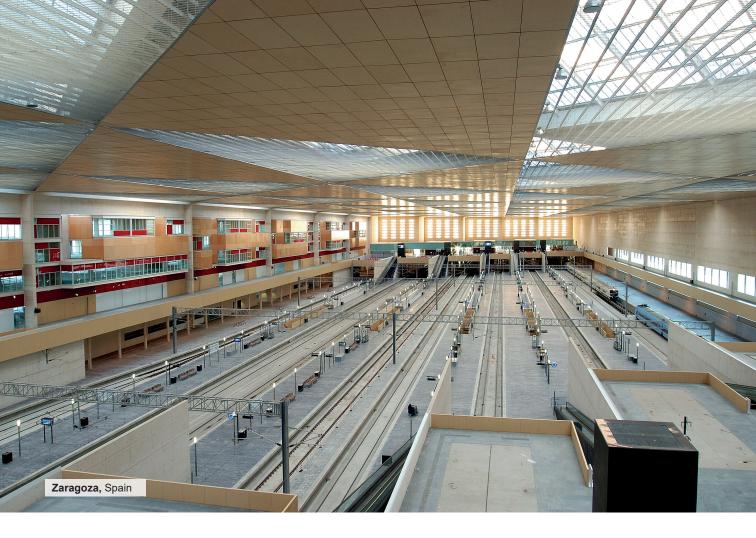
This station hosts much of the interurban transport in the northwest area of Madrid.



GironaHigh Speed Station

This station that stands out for its dimensions; designed with 450 meters long and double composition platforms.

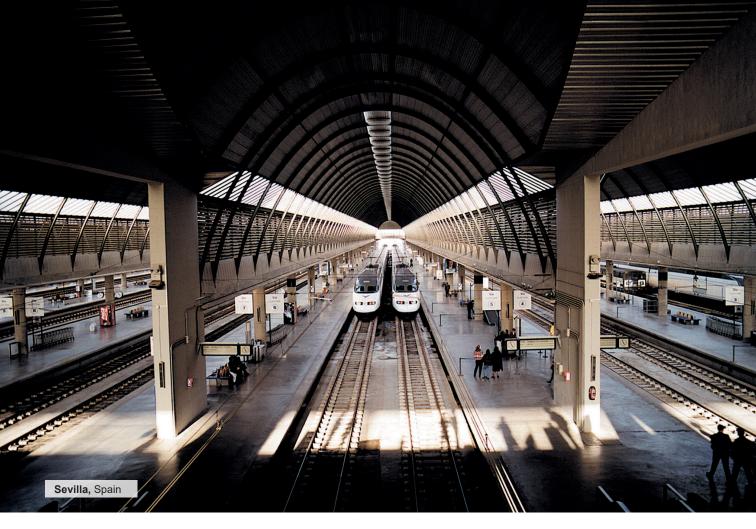
It includes two underground levels in anticipation of future station development.



Delicias

High Speed Station

It is the sixth busiest station in Spain for number of travellers. The station has become an important connection node within the Madrid - Barcelona High Speed Line. This station constitutes the largest covered space without piers in Spain.



Santa
Justa
High speed station

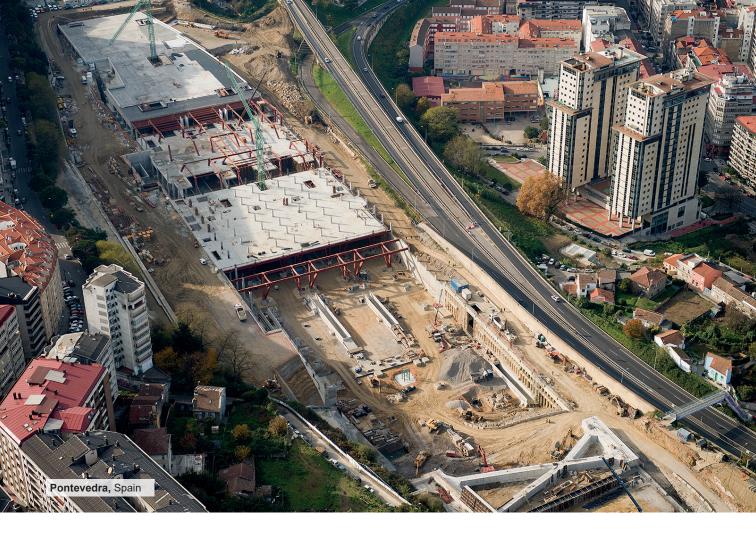
The station, opened in 1992; consists of 12 tracks to serve the Madrid - Seville high-speed line. The Santa Justa station is the first passenger terminal built for the first high-speed line in Spain



Access to the Station La Sagrera

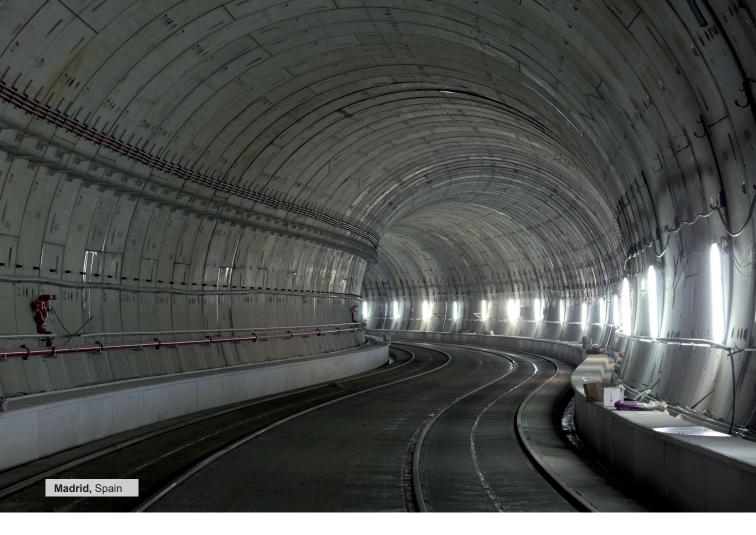
This project is developed in two sections, one at the entrance of the future AVE station and another at the station exit.

The total length covered by this is 2,500 meters. The platforms for all the routes that enter and leave the station were constructed, as well as the railway superstructure for the conventional width tracks.



Vigo - Urzaiz
High speed station

The new station is in the same location as the old station. This project included the execution of civil works at the railway yard level of roads, building, urbanization and the railway superstructure.



Connection between stations
Atocha Chamartín

Connection between Atocha and Chamartín stations, to service High Speed trains. This stretch of new dual track iberian and international width track, has a mined tunnel 6,900 meters long executed with an EPB TBM and cut and cover 120 meters long tunnel executed with diaphragm walls. The project also includes the execution of the road and the remodeling of teh new tracks layout of the Southern head of Chamartin station.



Metro de Marid renovation Line 1

Sol - Atocha

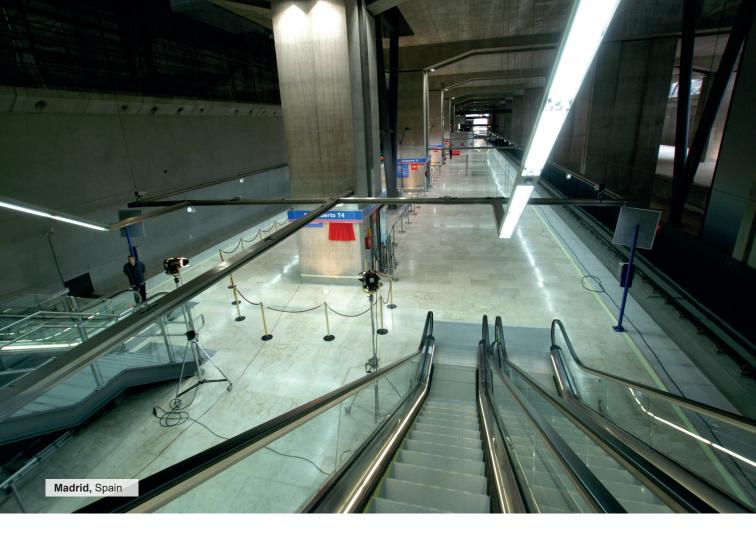
Sustitución de la superestructura de vía actual de balasto y traviesas, y de plataforma de hormigón con taco elástico y rígido, por vía en placa, optimizando el trazado y la geometría y mejorando el sistema de drenaje y los sistemas de atenuación de ruido y vibraciones.



Stations Metro Madrid

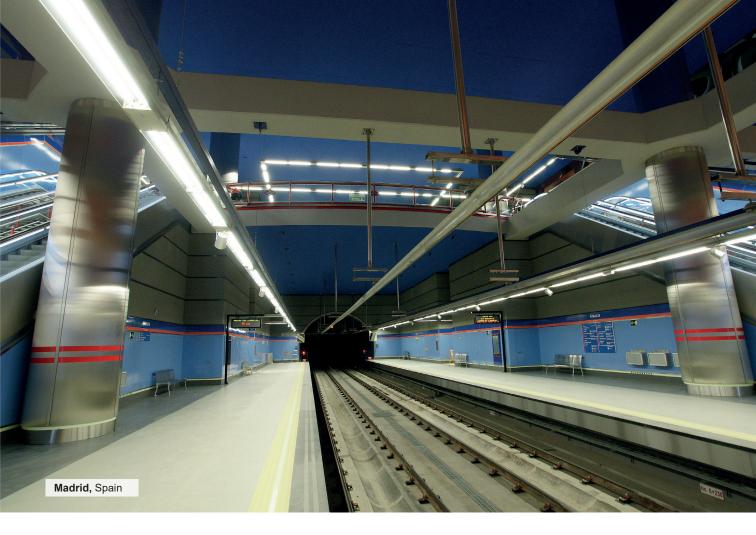
The renewing of the Madrid Metro stations in Suanzes (Line 5), Pavones (Line 9) has been carried out and the remodeling of the Prosperidad, Esperanza and Arturo Soria stations on line 4 is currently underway.

These works consist of the modernization of the architecture and facilities of the stations.



Barajas - **Terminal 4**

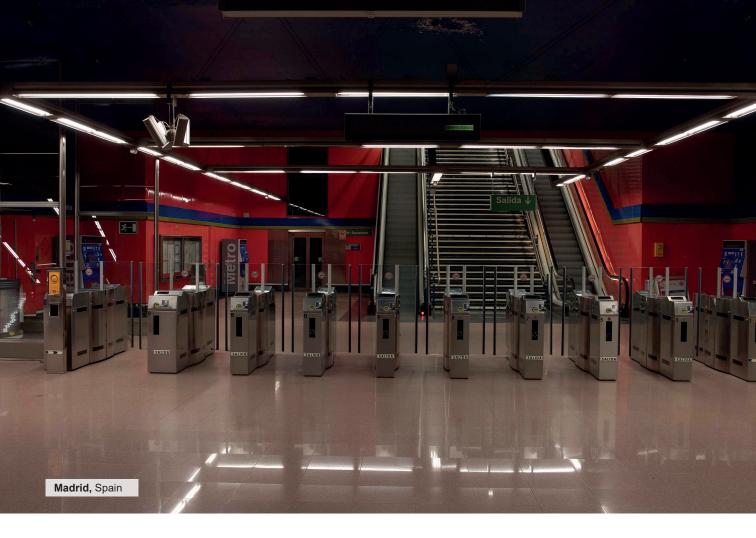
The works consisted of the extension of metro line 8 from the Barajas station to the new T-4 airport terminal. For this purpose, 2 tunnel sections with a total length of 2.5 kilometers were constructed next to the terminal building.



Line 2 Las Rosas Madrid Metro

Design and construction of the extension of the new section of line 2 of the Madrid Metro, with a total length of 4,107 meters and in which 4 stations were built.

This infrastructure resulted in an improvement of the connections serving a population of over 65,000 inhabitants.



Extension Line 10
Metro Madrid
to Metrosur

Modernization of line 10 in Madrid Metro. The project involves the modernization of the existing line to adapt it for the circulation of longer, wider trains, in order to achieve an increase in transport capacity.

Extension of line 10 of the Madrid Metro to Metrosur. Section 1A: Colonia Jardin y Cuatro Vientos. The extension of Line 10 is planned to connect the first and second metropolitan crowns of the Southwest of Madrid with the centre and north of the capital. The layout has a total length of 3.130 meters.



Extension to the Campo de las Naciones
Line 8
Metro Madrid

Extension of line 8, Mar de Cristal - Campo de las Naciones to Barajas airport and Barajas neighbourhood. A double track tunnel has been built, with a total length of 5,347 meters. This tunnel has been constructed with two earth pressure balance machines (EPB). The machines, in their excavation, passed under an artificial lake and some building, without settements being produced.

The project also included the construction of two new stations, Barajas and Aeropuerto.



Extension to the line 3 of Metro between

Legazpi and Villaverde

This is the first metro project in Madrid in which two TBMs begin working at the same point. The works are framed within the extension of Line 3 of the Madrid Metro with a total length of 8,704 meters.

The project also included the construction of 7 new stations, an interchange station and the reconstruction of the Legazpi station.



Barcelona Metro

Construction of a section of the Barcelona metro line 9, with a total length of 13,270 meters. Section IV, Bon Pastor to Can Zam and university area to Sagrera.

Most of the route has been built below the water table. The 120 meters long,18 meters deep section has eight stations.



Clot -La Pau Line 2 of Barcelona metro is an underground metropolitan railway line integrated into the Barcelona metro network that serves the city of Barcelona and connects it with the municipalities of San Adriá del Besós and Badalona.

FCC Construcción built 4 kilometers of line and three stations.

The layout of the line, which connects the Clot-La Pau stations, is a buried, double track



valladolid arterial rail network

- Remodelling of the existing arterial railway network through the construction of a 17.4 km bypass which serves to the projected railway complex, including electrification.
- A freight terminal at this complex will be built too.



Track duplication of the R-3
Barcelona
Vallés-La
Garriga

Duplication of a 17.44 km section to improve the local train service in the eastern Vallés area, including track assembly and electrification.

Construction of 9 viaducts, 7 overpasses, 9 subways, 28 walls, 7 sections of acoustic screens and 19 transversal drainage works.



Renewal of the line
Mérida Puerto Llano

Section Cabeza del Buey - Castuera

35 kilometers in length. The following actions have been carried out: renovation of the track superstructure, the construction of main walls, fender and reinforcement walls, improvements to the track gauges, as well as removal and replacement of affected elements in the security and communication facilities.



Renewal of

Ourense-Monforte

Complete renovation of a 46 km section.

The activities carried out include the renewal of ballast, sleepers, rails, track devices and the adaptation of the tracks at the four stations on the section.

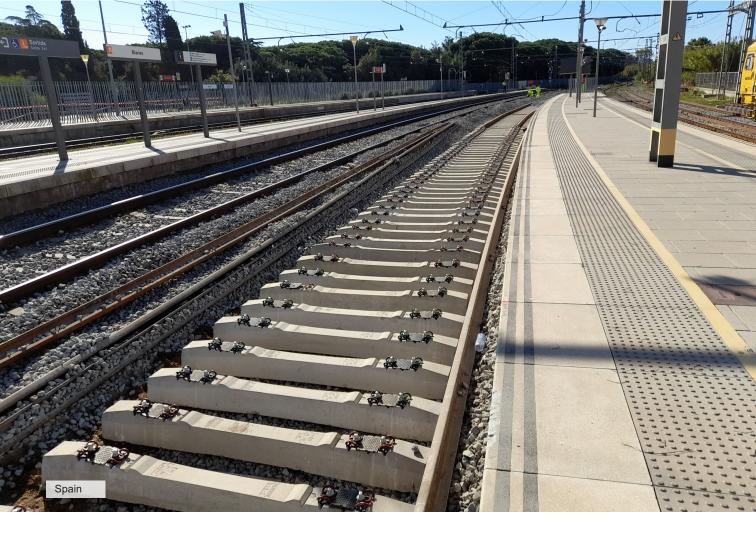


Renewal of the Asturias metric gauge network

Gijón-Laviana Section

Improvement of the existing superstructure on a stretch of 45.6 km by means of works on the platform, trenches and tunnels.

- Replacement of rail on 54 km and sleepers on 44.5 km.
- Renewal of track superstructure at line stations (5.9 km).
- Replacement of 14 track devices.



Renovation of the line Barcelona to Maçanet via Mataró

Blanes

Station

Renewal of tracks 3 and 5 and replacement of 8 turnouts at Blanes Station, including electrification.



Adaptations in the metric gauge network
Line 790 y 740

790 Line: La Asunción (León)-Guardo (Palencia) section. **740** Line: Ferrol-Ortigueira (A Coruña) section.

Adequacy of the rail yard at stations as a result of the removal of telephone blocks, including renewal and reconfiguration of tracks, track devices, platforms and drainage.



Mediterranean Corridor Roda de Bará Tunnel

Adaptation of the Roda de Bará tunnel section for the implementation of standard gauge. This includes the readjustment of the section for the new gauges and the implementation of slab track, the structural repair of the tunnel due to the significant problems of leaks, damp and existing surges, and the installation of an efficient drainage system.



Implementation of standard gauge

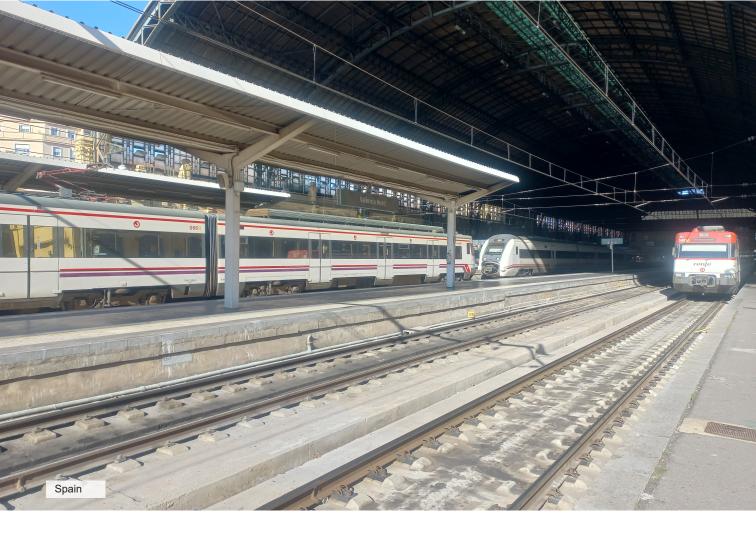
Mediterranean

Corridor

Castellbisbal-Murcia section. Castellón-Vinaroz subsection.

Installation of standard gauge double track on a 77.5 km section, as well as on the railway sidings of the 8 stations on the section.

- Replacement of 70,000 monovalent sleepers with polyvalent sleepers.
- Replacement of 85 track devices.
- Demolition of approximately 2.5 km of different types of ballastless track.



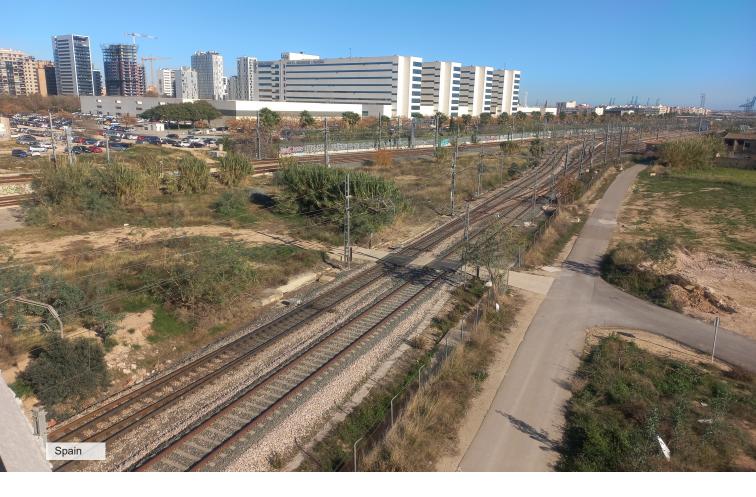
Implementation of standard gauge

Mediterranean

Corridor

Conversion to mixed or standard gauge of some tracks at Valencia Nord Station.

- Adaptation of tracks to mixed gauge and conversion of tracks to international gauge.
- Assembly of 14 track devices.
- Adaptation of drainage, electrification, railway installations, services and auxiliary installations to the new track configuration.



Integral remodelling of Fuente San Luis Station

Renewal and/or adaptation to mixed gauge of the existing track superstructure on the general track which does not yet have it and on a large part of the rail yard, and adaptation of drainage, electrification, railway installations, services and auxiliary installations to the new track configuration.



Parla Tram

It is the first infrastructure of these characteristics that is launched in the Community of Madrid.

The tramway network has a total length of 8,339 meters of electrified double track and a total of 19 stops, one of them being an interchange with the C-4 line of Renfe suburban trains. In addition to the rehabilitation of the streets through which it circulates and replacement of affected services, a series of car parks were built to facilitate mobility.



Zaragoza Tram

It is a surface urban tram line that runs in a double or single track (depending on the sections) electrified, with all signalling and safety systems and with a segregated traffic platform in almost all its route, except for crossings.

The total length is 13.40 kilometers, divided into two phases: phase 1 with a length of 5.96 kilometers and 10 stops and phase 2, which is developed later and covers a length of 7.44 kilometers and a total of 14 stops.



Baix - Llobregat

It is a key project for the linking of the Llobregat axis in Barcelona that consisted of the construction of a 14.8 kilometers tramway network, divided into a main axis and two branches, forming three lines (T1, T2 and T3), with a total of 29 stops.

The route is mostly considered as an electrified platform by means of a catenary and segregated from the rest of the road traffic.



Murcia Tram

The entire line has a length of 18 kilometers of plate track which includes the electrification systems and security and communication facilities.

The work includes 28 stops with 40 meters long platforms, and buildings to house the workshops and garages, the maintenance ship and the offices.

Section Line 5

Horta -

Vall d'Hebron

The extension from the station of Horta to Vall d'Hebron constitutes the last extension made on line 5.

It provides a service to some 30,000 users in three stations.

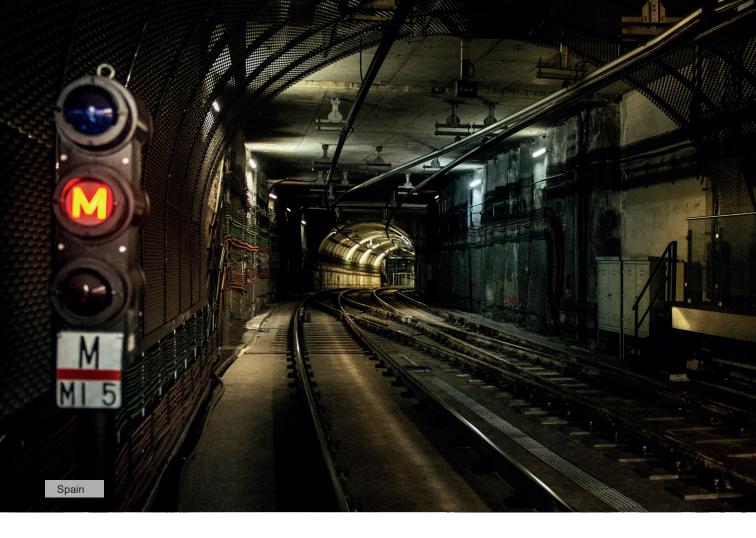




Malaga Metro

The project consisted of the construction of two metro lines in the city of Malaga, Line 1 has a total length of 7.4 kilometers and Line 2 has a length of 6.1 kilometers.

The construction of 19 stations was included in the project, 16 are underground and 3 above ground.



Railway maintenance

Convensa is currently participating in the maintenance of more than 11,000 kilometers of different types of railway lines, being able to face all the emergency actions and complementary works required by our clients.

The contracts include 8,800 km of conventional and metric gauge lines, 2,162 km of high speed lines, as well as almost 100 km of track infrastructure maintenance on the Metro de Madrid network, representing 35% of the total network.



Toronto Metro

The project consisted in the construction of an underground section 4,500 meters long, with three emergency exits, three cross galleries and intermediate stations.

FCC built the North tunnels and Highway 407 station.



Scarborough Subway Extension

Scarborough Subway Extension stations, tracks and systems (SRS). The project extends the existing TTC Line 2 (Bloor-Danforth) underground in Toronto approximately 7.8 kilometres from the existing Kennedy Station. The project will transform and extend TTC Line 2 underground service nearly five miles from Kennedy Station northeast to McCowan Road and Sheppard Avenue. The project includes three new stations at Lawrence Avenue East and McCowan Road, Scarborough Centre and Sheppard Avenue East and McCowan Road, with connections to Line 5, Eglinton Crosstown LRT, GO bus and train services, TTC bus service and Durham Region Transit.



Pape Tunnel and

Underground Stations

Pape Tunnel and Underground Stations of the Ontario Line Metro. It aims to develop the Ontario Line, a 15.6-kilometre independent rapid transit line connecting the Eglinton Crosstown LRT (Line 5) at Don Mills Road and Eglinton Avenue in the northeast of the city to Exhibition Place in the southwest, with 15 stations along its entire route.

The contract calls for the design, construction, supply and operation of three kilometres of twin tunnels under Pape Avenue between the Gerrard Tunnel and the Don Valley Bridge, two underground stations (Pape and Cosburn), two parallel tunnels, three emergency exit buildings and a rail crossing in the tunnel section near Sammon Avenue.



Metro Rubí Line

Rubí Line of the Porto Metro. New metro line of 6.3 kilometers. It includes the construction of eight stations, a car park for 500 vehicles, connection with the Devesas railway station, the construction of several viaducts and subways, including the construction of the new "Ferreirinha" bridge over the Douro River.



Adaptation of the Mondego mobility system Mondego

Coimbra

Adaptation to a BRT solution (metrobus). Coimbra B-Portagem section.

A 1843 m long channel for the Metrobus is being built, mainly using the existing railway platform. In a parallel project, the material park and offices of the Mondego mobility system are also being built.



Track renewal between Covilhã and Guarda

de la linha da Beira Alta

Integral renovation of a 35 kilometers long track. The project included the upgrading of bridges and tunnels and the renewal of the tracks, ovrhead line and the implementation of a new signalling system.



Track renovation
between Pinhão-Tua
Pinhão-Tua
of the Douro
Line

Complete renovation of a 12.5 km long section by replacing the rail, wooden sleepers, the respective fastenings and the ballast. In addition, a new track gradient was implemented and new drainage works were carried out at several points.



Renewal of the Via the

Linha do Oeste

Two sections: Torres Vedras – Caldas da Rainha y Mira Sintra- Meleças – Torres Vedras.

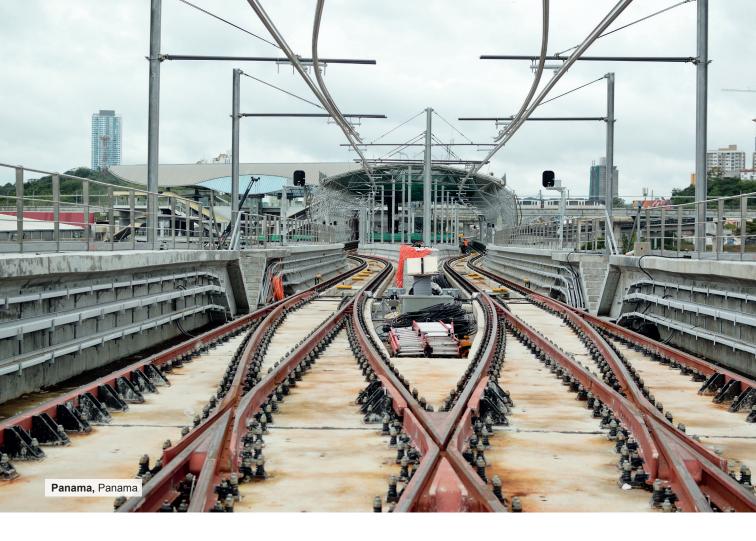
The sum of both projects means the renovation of 55.9 km. The most important activities include the rehabilitation of the platform, optimising the geometry of the layout, the reorganisation of level crossings, the creation of 16 km of active turnouts, electrification, and the installation of signalling, telecommunications and GSM-R.



Panama Metro

This is the first subway in Central America, the project involved construction of a new subway line in Panama City. Metro Line 1 runs from north to south and links the centre of the Panamanian capital with suburban neighbourhoods in the east. The new line has a capacity to transport more than 15,000 thousand people per hour.

The total length of its route is 15.8 kilometers and includes 14 new stations: six in the elevated section, seven underground and one half-buried.



Panama Metro

It has a length of 21 kilometers of elevated track and 16 stations connected to Line 1 through an exchanger in San Miguelito.

A depot area for parking and train cleaning and a workshop area for preventive and corrective maintenance have been built.

This infrastructure improves the quality of life of more than $500,\!000$ people from the eastern area of Panama .



Panama Metro

"Line 2 Connection section to Tocumen International Airport". It connects Line 2 of the Metro with the Higher Technical Institute of the East (ITSE), which will house more than 5,000 young people, and the Tocumen International Airport (AIT). The project has a 2 kilometers extension and involves the construction of two stations.



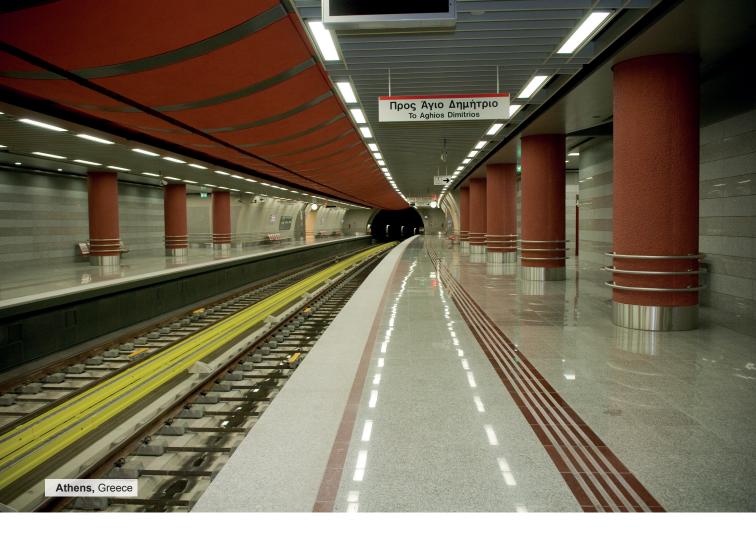
Line 2 and section line 4

Lima

Metro

The project involves the construction of 35 underground stations linked along 35 kilometers of tunnels.

- Line 2 will be almost 27 kilometers long from and it will cover the East-West axis of Lima from Ate to Callao. In operation, its 27 passenger stations will serve more than 600,000 people a day.
- The section of line 4 that will connect the Peruvian capital with the airport will run along 8 kilometers of tunnel. In this project eight stations will be built.



Athens Metro

The work consisted of the extension of Line 2 of the Athens metro by 1,380 meters. This connects the centre of Athens with the municipality of Peristeri, as well as the construction of two new stations, Peristeri and Anthopouli.

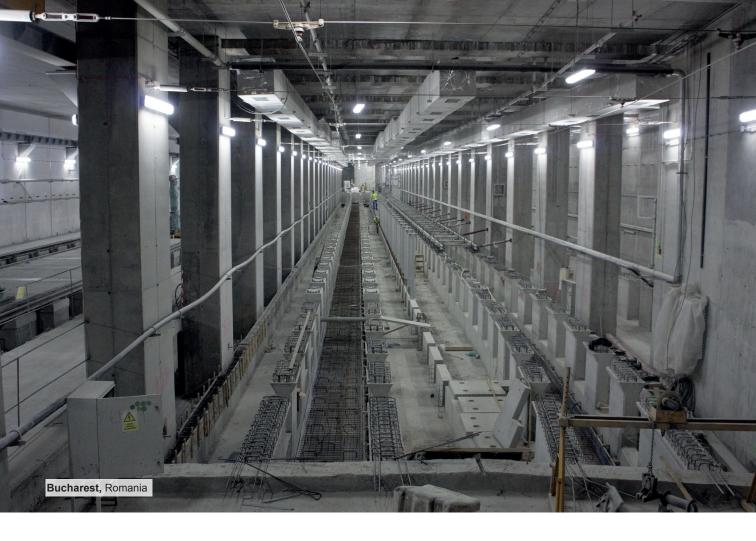
With this project, Peristeri residents can reach the center of Athens in just 10 minutes.





Design and construction of the Alameda-Expo red line (Lisbon metro).

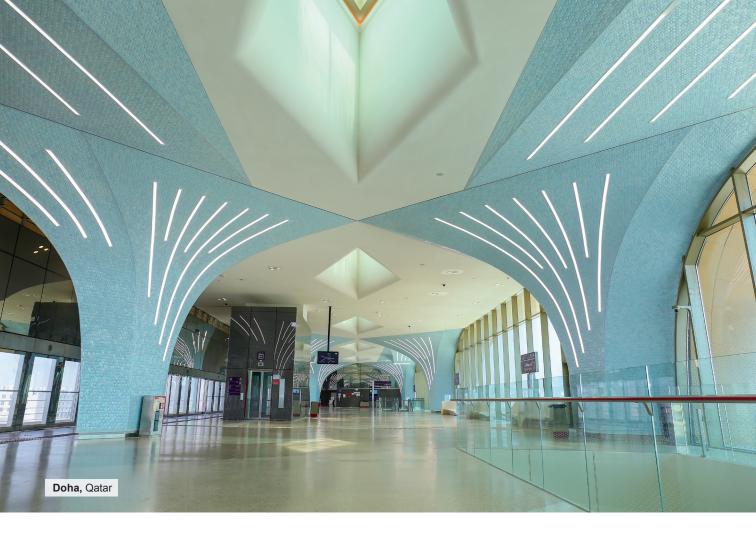
The section with a total length of 2,777 meters, required 2,105 meters of tunnel with 8.80 meters of inner diameter tunnel, excavated with tunnelling machine, and three stations: Chelas, Olivais and Cabo Ruivo.



Bucharest Metro

This is the execution of section 1 of Line 5 of the Bucharest Metro, between the Raul Doamnei and Hasdeu stations.

The project involves the renovation and improvement of the Bucharest metro network.



Doha Metro

The project, called Red Line South Elevated & At Grade, has consisted of the construction of a 6.9 kilometers viaduct and three elevated stations of approximately 12,000 square meters each. The work has also included earthworks in an a 500,000 square meters area to house the facilities of the Depot (garages).

In addition to the subway works, an underpass has been built for the Doha-Al Wakra Highway, one kilometre long



Riyadh Metro

This was globally the largest contract in the history of underground construction. The project includes the construction of three metro lines in the city of Riyadh that will consist of a total of 25 stations.

Line 4 (yellow), 5 (green) and 6 (purple) for which the construction of 65 kilometers of subway tracks, 24 viaducts, 28 underground tracks and 13 surface tracks will be necessary.

Once built it will become the largest subway in the world with six subway lines that will travel 175 kilometers.

WE ARE FCC



More than 1,000 kilometers of



60 kilometers of dykes and 50 kilometers of docks

130,000 homes built

non-residential building





More than 3,500 kilometers of railways (1,500 kilometers of high speed and 450 kilometers of metro)



More than 3,000 kilometers of gas and oil pipelines

More than 40 million square meters of



More than 5,500,000 square meters of airport runways



More than 20,000 kilometers of water pipe



More than 2,500,000 square meters of airport terminals



More than 110 water treatment plants



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