ROMA

ROMA METROPOLITANE

Rome Metro - Line C

Project profile

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MetroC
La storia costruisce futuro

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Partecipazioni Italia

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An achievement that makes history

Rome's Metro **Line C brings cutting-edge mobility infrastructure to the Eternal City**. Along this line travel countless stories, those of its conception, the many phases of construction, the people who built it, and those who use it every day. Small stories that **together shape the future of Rome.**

It's the story of a project, but also the story of Rome—its enduring spirit and the vision shaping its future. Line C is a **modern metro** designed to serve a city that is more than just a city: it is the Urbe, the **Capital of Italy**, a place that demands strategic, world-class infrastructure.

Building such a system is an extraordinary engineering challenge. **The ground beneath Rome is unlike any other in the world**: shaped by more than 3,000 years of continuous life and activity. Every **layer holds traces of civilizations, eras, and generations** that form part of our history and heritage. Creating Line C means **delivering an essential work for the present and the future, while honoring and preserving the past**.

The Line and its stations

Line C runs across Rome, connecting the city from southeast to northwest and linking the suburbs to the historic center. It passes through iconic neighborhoods such as Centocelle, Pigneto, Appio Latino, and the Centro Storico, before reaching the Della Vittoria district near the Farnesina. The line **stretches for about 29 km**, roughly 20 km underground and 9 km at surface level, with **a total of 31 stations**, from Monte Compatri/Pantano to Farnesina.

The project is being delivered in functional sections. Currently, **the segment from Pantano in Monte Compatri to San Giovanni is operational**: 19 km of track, **22 stations and 1 depot** already in service.

The stations **Porta Metronia and Colosseo–Fori Imperiali** have also been completed, while work is underway on Venezia station. Executive design is in progress for Chiesa Nuova, San Pietro, Ottaviano, and Clodio/Mazzini, while preliminary design is ongoing for Auditorium and Farnesina. The project includes **4 interchange stations**: with **Line A** at San Giovanni and Ottaviano, with **Line B** at Colosseo, and with **local rail lines FL1/FL3** at Pigneto.

Project Figures

From Monte Compatri/Pantano to Farnesina

Approx.
29 Km of line

~20 km underground
~9 km at surface level

31
stations

22
currently in operation

2
completed

1
station
under construction | Venezia |

6
stations
in design phase

800,000 **passengers per day** (maximum capacity)

4
interconnections with existing lines
(Metro A - San Giovanni e Ottaviano | Metro B - Colosseo | FL1/FL3 - Pigneto)

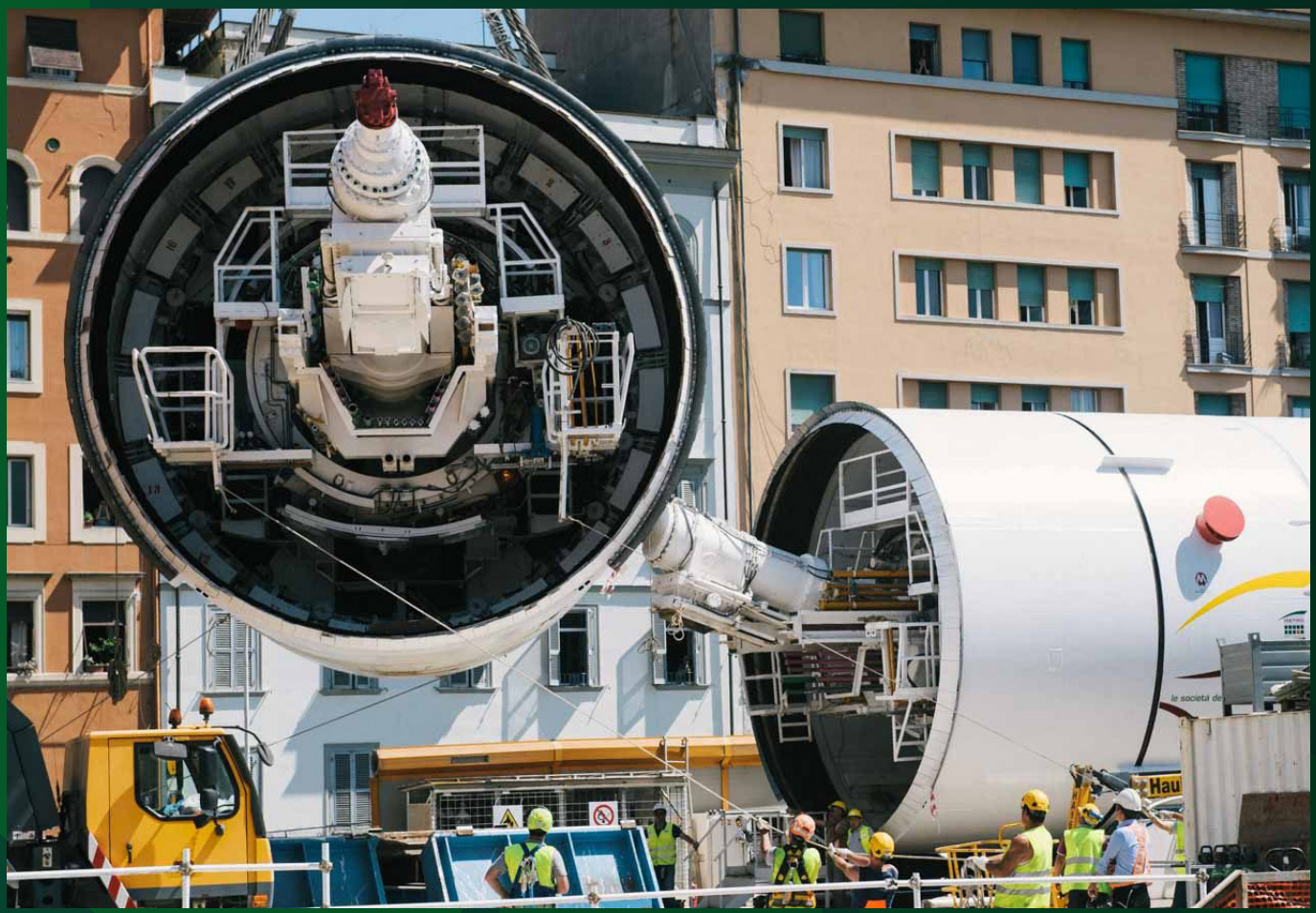
How the future is built

Delivering such a complex project in a unique setting required **careful planning and the selection of excavation and construction techniques best suited to the context**.

Different excavation lines

Tunnel excavation was carried out using **two methods: traditional digging and mechanized excavation with TBMs** (Tunnel Boring Machines). Given the historical and structural constraints of the area, the choice of technique was based on detailed engineering assessments and soil conditions.

The TBMs used (EPB – Earth Pressure Balance type) are state-of-the-art machines that support the excavation face and install the tunnel lining as they advance, making the tunnel ready for outfitting and operation while significantly reducing construction time.

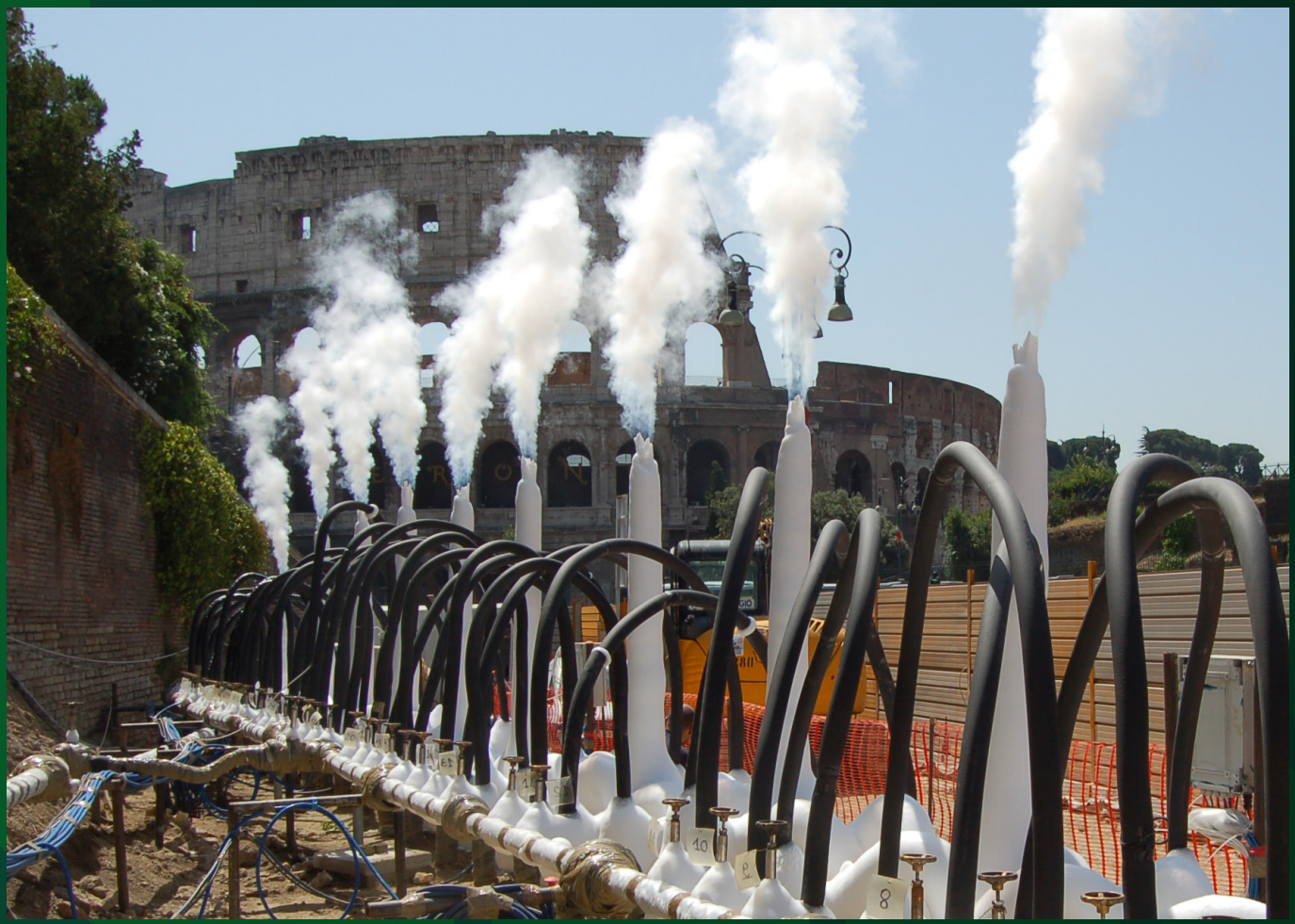


Sacrificial diaphragms and ground freezing

Throughout the works, advanced techniques were employed to combine excavation efficiency and safety with the need to protect Rome's historical and monumental heritage.

One notable example is the use of sacrificial diaphragms, applied for the first time in Rome and in Italy. This innovative solution allows excavation to proceed safely while safeguarding the city's artistic and archaeological treasures. These diaphragms are unreinforced concrete walls set perpendicular to the perimeter walls; once they have fulfilled their support function, they are demolished as station excavation advances.

Another technique adopted was ground freezing, a soil stabilization method that creates a **protective barrier of frozen earth within which tunnel excavation and lining installation can be carried out.** This approach is particularly suitable for urban environments with highly permeable soils, as it ensures the highest possible level of safety.



Building the future, honoring the past

The engineering challenge of constructing Rome Metro Line C runs parallel to another equally important mission: **preserving and enhancing the city's cultural heritage**. Rome's historic center has been recognized as a **UNESCO World Heritage Site since 1980**.

This project **redefines the paradigm often associated with construction in Rome: the past is not an obstacle but a value**. The creation of Line C becomes a unique opportunity to protect and showcase extraordinary archaeological finds.

Studies for the protection of archaeological heritage

The construction of Line C stations was carried out in **close collaboration with the relevant Superintendencies**. This ongoing and productive exchange led to an **extensive program of investigations**, enabling the discovery of numerous artifacts and updating archaeological maps in areas that had previously been little explored.

Along the route from the Pantano terminus to San Giovanni station, **29 sites were excavated using archaeological methods**. The first major find emerged near Monte Compatri/Pantano: the remains of a Neolithic village. In the central section, from Via Sannio to Piazza Venezia and from Piazza Venezia to Piazzale Clodio/Mazzini, 22 additional sites were opened for preventive archaeological investigations, some of which yielded significant results.

History and future often met in the same excavation. This process carried a dual meaning: it was essential for building a modern infrastructure while offering a unique opportunity to explore the richness of the past. **In agreement with the Special Superintendency of Rome, a dedicated document and procedure** were developed to align construction progress with the protection of buried archaeological assets. This document, known as the "Guidelines for Second-Phase Archaeological Investigations" **is the first of its kind ever produced in Italy**.

Archaeological top-down method

As part of this successful collaboration, an innovative excavation technique was refined: the **archaeological "top-down" method**. This approach was designed to reconcile two needs: **open-air archaeological digs** reaching depths of 18–20 meters below ground level, and the **practical requirement to minimize the footprint of construction sites**.

The top-down method involves building intermediate slabs as excavation progresses downward, allowing archaeological work to continue alongside structural construction. This dual process optimizes timelines and reduces the space occupied by the site.

During these excavations, more than **500,000 artifacts** were recovered—4,000 from San Giovanni station alone, which has been transformed into an **"archeostation": a true station-museum** featuring display cases and wall-mounted information panels. This concept has become a model for other stations, including the recently completed Colosseo–Fori Imperiali and Porta Metronia.

Venezia station: a new cultural hub

The first-phase archaeological investigations carried out in Piazza della Madonna di Loreto **uncovered a monumental complex of exceptional importance: Hadrian's Auditoria**, a series of grand halls once used for philosophical debates and public readings of literary works. In response, **the station design has been completely reimagined to incorporate these remains with a dedicated exhibition space**.

Excavations also revealed the **masonry structures of ancient *tabernae***, commercial buildings that once lined the Via Lata, the ancient Via Flaminia. These will be carefully relocated and displayed to visitors once construction is complete.

The station will become a true cultural hub, offering a journey through history. Plans include an underground **connection from the station's first basement level to the museums of Palazzo Venezia, the Vittoriano, and Trajan's Forum**.

Colosseo - Fori Imperiali, at the heart of history

Located in the UNESCO World Heritage historic center, the Colosseo–Fori Imperiali station **blends seamlessly into its monumental surroundings**. Inside, the spaces evoke the grandeur of Ancient Rome: **a vast colonnaded atrium, a striking golden structure** enveloping the staircase, and **dedicated areas for museum-style** and multimedia displays of archaeological finds.

Excavations uncovered **28 Republican-era wells**, now **integrated into the station's design**, along with a ***laconicum***—a small thermal bath—restored to its original location.

Beyond its cultural significance, the station is a key mobility hub, serving as an **interchange between Line B and Line C**. This connection makes Colosseo–Fori Imperiali the centerpiece of a true "network effect" in Rome's urban transport system.

A museum for Porta Metronia

During excavation, the **remains of a military barracks dating back to the reign of Emperor Trajan were uncovered**. Nearby, an elegant residential space was found, the so-called ***"Commander's House"*, adorned with mosaics and frescoes** in excellent condition.

To safeguard these discoveries, the **structures were carefully removed, restored, and relocated** at the end of the works into a **dedicated museum space**, seamlessly integrated with the station. This gave rise to a **new museum- the Porta Metronia Museum** - where visitors can view the remains from an elevated walkway.

Outside, a **new underground piazza** has been created, blending harmoniously with the surrounding context and the nearby Aurelian Walls. **Four travertine-clad volumes** emerge from the pavement, acting as light wells for the spaces below while creating a new meeting place and social hub.

Constant monitoring

Along its route, **Line C interacts with historic buildings and monuments** of great value on the surface, such as the Colosseum, the Basilica of Maxentius, and the Vittoriano. **To ensure their protection**, a **Technical-Scientific Committee** was established, followed by a **four-year Line-Monument Interaction study covering 14 sites and 40 historic buildings and churches along the entire Line C**.

At the same time, continuous monitoring of these structures was launched to verify the alignment between design forecasts and actual data collected. A **formal agreement was signed with the Department of Geotechnical and Structural Engineering at "La Sapienza" University** for soil structural analyses, which led to the development of 2D and 3D models.

Monitoring continues throughout construction, using analytical models that allow for deeper project insights. For this purpose, a dedicated monitoring system was implemented, specifically calibrated for Line C, and supported by an SDD platform. Automating the process enables comparison with previously collected data, ensuring reliability and speed.

Building a future of innovation, growth, and sustainability

Building safely

Worker safety is a fundamental priority in the management and organization of construction sites. Metro C S.c.p.A. operates under an integrated Quality–Environment–Safety Management System, **certified by DNV Business Assurance**, one of Europe's leading certification bodies, in compliance with **ISO 9001:2015, ISO 14001:2015, and UNI ISO 45001:2018 standards**. In addition to UNI ISO 45001:2018 certification, Metro C has also obtained certification of its Health and Safety Organization and Management Model from the Formedil Roma Joint Body. To date, more than **3,200 hours of technical inspections** have been carried out by the Joint Body in Rome.

Metro C is also a **cardio-protected Company**: across its worksites and main base, there are six semi-automatic defibrillators **(AEDs)**, all officially registered with the competent health authority.

Driverless technology

Rome Metro Line C is driving innovation forward. Among its most advanced features is the **driverless system**, already in use across all operational stations. This technology, known as the Fully Automated System, **controls every function of the train remotely**, without a driver on board.

Everything is managed from the **Operations Control Center (DCO)**, the heart and brain of the system, located at the **Deposito-Officina di Graniti**, an area covering about 210,000 m^2. From the control center to the trains, there's another record: **Line C's driverless trains are the longest high-automation trains in Europe**, measuring 109.4 meters in length.

The benefits of Line C

Line C has been an **engine of development from the very start of its construction**. Beginning with economic growth: since work began, **the project has involved around 1,800 suppliers, with a supply chain deeply rooted in Italy—about 98% of the companies involved are Italian**.

The line **makes Rome more accessible, stitching the city together from the southeastern suburbs to the historic center**. It integrates seamlessly into the public transport system, creating a true **"network effect" for urban mobility. The result: a more livable, better-connected city, with frequent, well-distributed stops** that serve individual neighborhoods and are easy to reach.

In practical terms, Line C **will carry up to 800,000 passengers per day**, which means potentially **24,000 users per hour in each direction**.

-3,000 h **hours of private transport per year**

-1,800 **road accidents annually**

-4,700 h **in public transport during peak times each year**

A Line of sustainability and urban renewal

Once underground works are completed, the surface areas affected by construction are gradually returned to the city—renewed and redesigned. The external layouts of stations and shafts are conceived to create welcoming public spaces for community life.

For example, **Giardinetti station has been completely renovated above ground**. Its distinctive trapezoidal shape features large glass façades and includes a parking area with over 200 spaces. Further along, **Teano station has been equipped with a spacious atrium designed to host events, exhibitions, and cultural initiatives. Malatesta station stands out for its central open-air underground space, intended for commercial activities, cultural events, and social gatherings**: a true meeting place serving the neighborhood.

Line C is a line that builds sustainability. Even during construction, **great attention was given to green spaces: the project includes about 108,000 m^2 of landscaped areas and more than 4,300 new trees planted**.

One example is the gardens of Via Sannio, where the construction of a ventilation shaft also provided an opportunity to return a **9,500 m^2 green area** to the city, right next to the Aurelian Walls. In redeveloping the gardens, **the outline of the imposing portico built during the reign of Emperor Claudius**, discovered during excavation, **was recreated on the surface**.

The line will also have a major impact on future sustainability: **it is estimated to reduce CO_2 emissions by around 310,000 tons per year**.

Several solutions adopted in the construction of Line C may become **benchmarks** for public works engineering in complex anthropic and cultural contexts.

An achievement that, in every respect, is already shaping the future.

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