

Milan Metro System, line 4

SUSTAINABLE
MOBILITY

2023

webuild 



DOWNLOAD
WEBUILD CORPORATE APP



SELECT THE **AUGMENTED REALITY TOOL**
AND AIM AT THE PAGES WITH OUR MARKER



DISCOVER
EXCLUSIVE CONTENTS



AIM AT THE MARKER TO DOWNLOAD
THE **DIGITAL COPY** OF THIS BROCHURE

FACTSHEET

M4–Milan: East-West The Metro Line built for Europe

2023

webuild 



CONTENTS

1.	The M4: Milan's new Metro Line	4
2.	Tricolore and San Babila stations now open: Milan is evermore in the heart of Europe	8
3.	The line running in Milan's historical centre – Safe excavations that safeguard Milan's heritage, to build a great work – Safeguarding monuments	10
4.	A sustainable metro	16
5.	The M4's technological records – Driverless and WI-FI – Safety: automatic doors opening on platforms	20
6.	Citizens' metro	24
7.	Milan's Metro: a brief history and some numbers	26
8.	The Webuild Group for sustainable mobility	28

1. THE M4: MILAN'S NEW METRO LINE

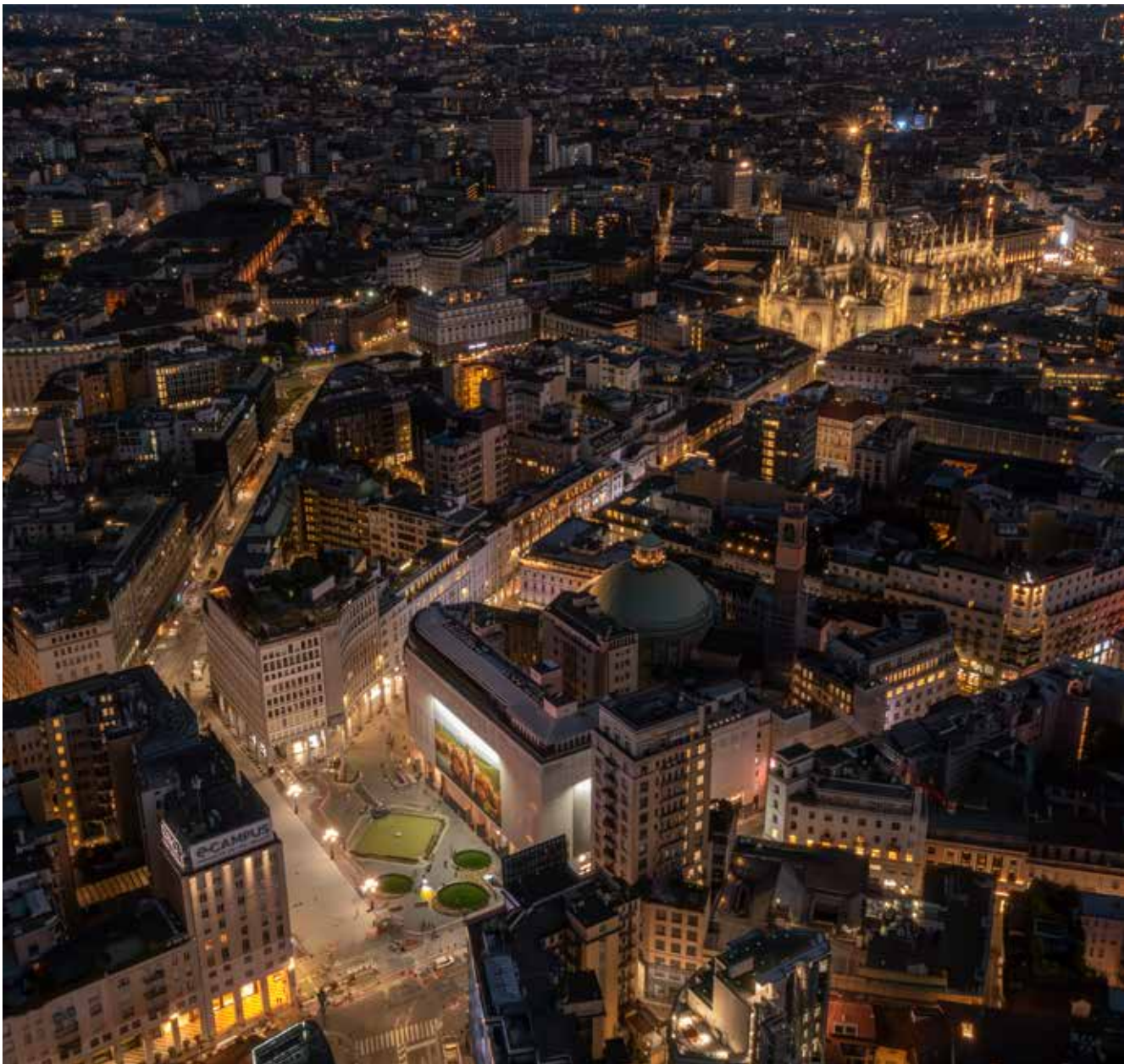
The M4 or the "Blue Line" is Milan's new metro line. It will connect the city, from West to East, passing through the historic center, to reach Linate airport.

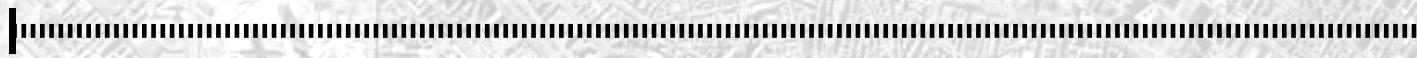
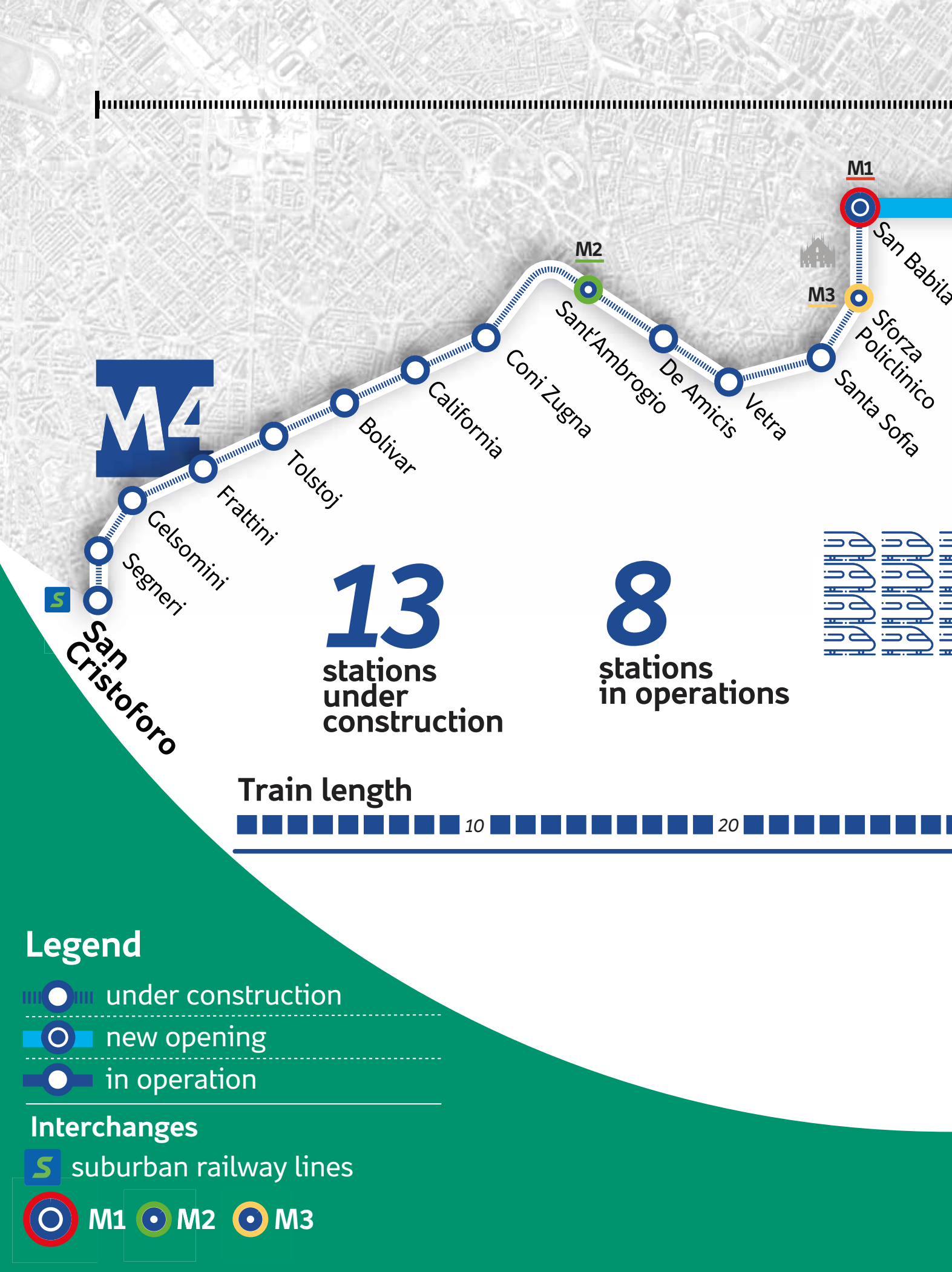
The line, with its 21 stations, measures 15 km in length, from the two terminals, Linate and San Cristoforo. Travelling between these two stations will only take 30 minutes.

The line, when operational, will transport 24,000 people per hour, per travel direction. It is expected to be used by **86 million passengers per year**, also due

to the train frequency: every 90 seconds during peak hours.

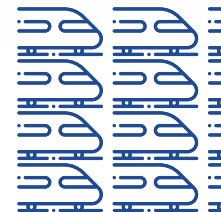
In mobility terms, the M4 will significantly impact the city: when it starts to function, Milan's total metro network will **reach 118 kilometres, becoming the 6th in Europe, by extension.**





13
stations
under
construction

8
stations
in operations



Train length



Legend

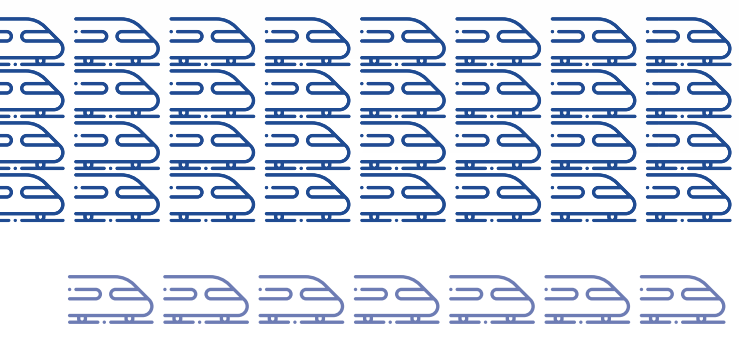
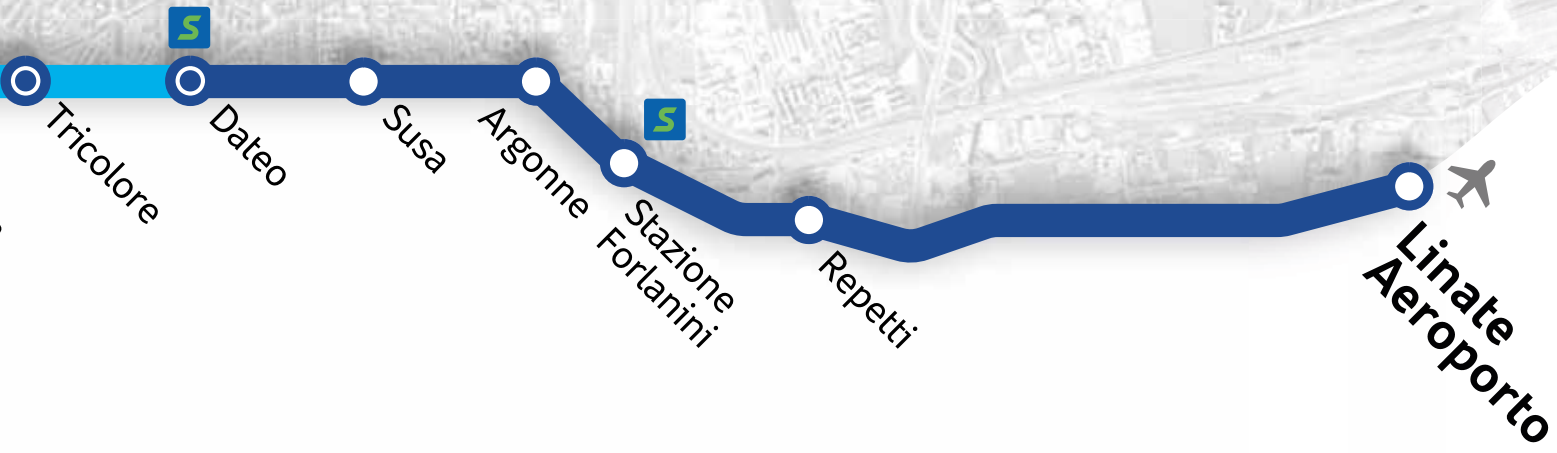
- under construction
- new opening
- in operation

Interchanges

suburban railway lines

- M1
- M2
- M3

Overall length **15km**



40
in function

7
reserve

47
Trains



Every hour

24,000

passengers
in each travel
direction

2.
TRICOLORE AND
SAN BABILA
STATIONS NOW
OPEN:
MILAN IS
EVERMORE IN
THE HEART OF
EUROPE

Following the opening of the Linate-Dateo section, after a few months, the Tricolore and San Babila stations are now also open, bringing the M4 project closer to a number that just by itself tells partly of the huge positive impact brought about by this work on Milan.

Twelve minutes, the time that takes to connect the airport to Milan's city centre, with the new "Blue Line" trains, now that the Linate-San Babila section is fully completed.

Linate is one of the two metro terminals along Milan's east-west line, with its 21 stations, where those 15 kilometres end, on one side, the other being San Cristoforo.

The M4, therefore, also candidates itself as being known as **the airport's metro line**. This strategic infrastructure reduces distances in Milan, taking the city closer to the rest of Italy and to Europe.

With the new Tricolore (in Corso Concordia) and San Babila (piazza San Babila-Corso Europa) stops, the new M4 line adds two new important stops to its race towards the San Cristoforo terminal, passing through the heart of the city where it intersects with existing M1 line.

This important transport milestone is followed by an as-much-important change on the surface, according to an important **sustainability** concept that must also include a better way of using urban spaces. Both of the access areas of the two new stations have been completely revised, prioritizing making the new spaces **pedestrian** ones, and by using elegant materials in natural rock and glass, new furnishings and green areas. San Babila square will be completely closed to traffic, so that it will become a place in Milan where people can get together, adding to the already existing space created by Architect Luigi Caccia Dominioni.

Please note that from a technical point of view, starting from Tricolore station, the tunnels that reach San Babila station have been excavated with **TBM**s with a large diameter (9.15m) that excavated at a depth of -20 metres from the road paving, nearing important buildings like Villa Necchi, Case Silvestri in Corso Venezia 10, Colonna del Leone and the nearby San Babila church.

3. THE LINE RUNNING IN MILAN'S HISTORICAL CENTRE

- Safe excavations that safeguard Milan's heritage, to build a great work
- Safeguarding monuments

The M4 has written an important historical chapter inside the circle of Milan's Navigli. It is here, in fact, that the **TBM** excavated, passing under these buildings: the **Waldensian Evangelical Church, in "via Francesco Sforza", the Churchyard of the Basilica of Sant'Ambrogio, in piazza Sant'Ambrogio, the Ca 'Granda, the Columns of San Lorenzo, the Torre Merlata, between via di San Vittore and "via Carducci"**.

Safe excavations that safeguard Milan's heritage, to build a great work

To protect Milan's historical and artistic heritage above-ground, CMM4, the Consortium led by Webuild, provided for a technical control procedure that combined preventive analyses with continuous monitoring activities.

This procedure was already used by Webuild to build its driverless metro, in Copenhagen, and for its Metro C, in Rome. To build stations and structures, archaeological assistance was also provided for preventive checks, prior to

excavating. Works could only continue after the Superintendency gave its permission. In short, passing inside a highly populated urban centre involved an exceptional commitment, during the control and analysis phase, both for design purposes and for actually executing the works. Furthermore, in Milan, the M4 tunnels were built to an even greater depth than the standard.

All geometric and structural data of the buildings affected by tunnel excavation works was collected. Eventual critical issues were also identified, to plan for preventive interventions. This was also possible through technical inspections, which led to interventions concerning, among others, **Casa Silvestri** and **Palazzo Serbelloni, but also Villa Necchi Campiglio**, which houses an important collection of valuable objects.

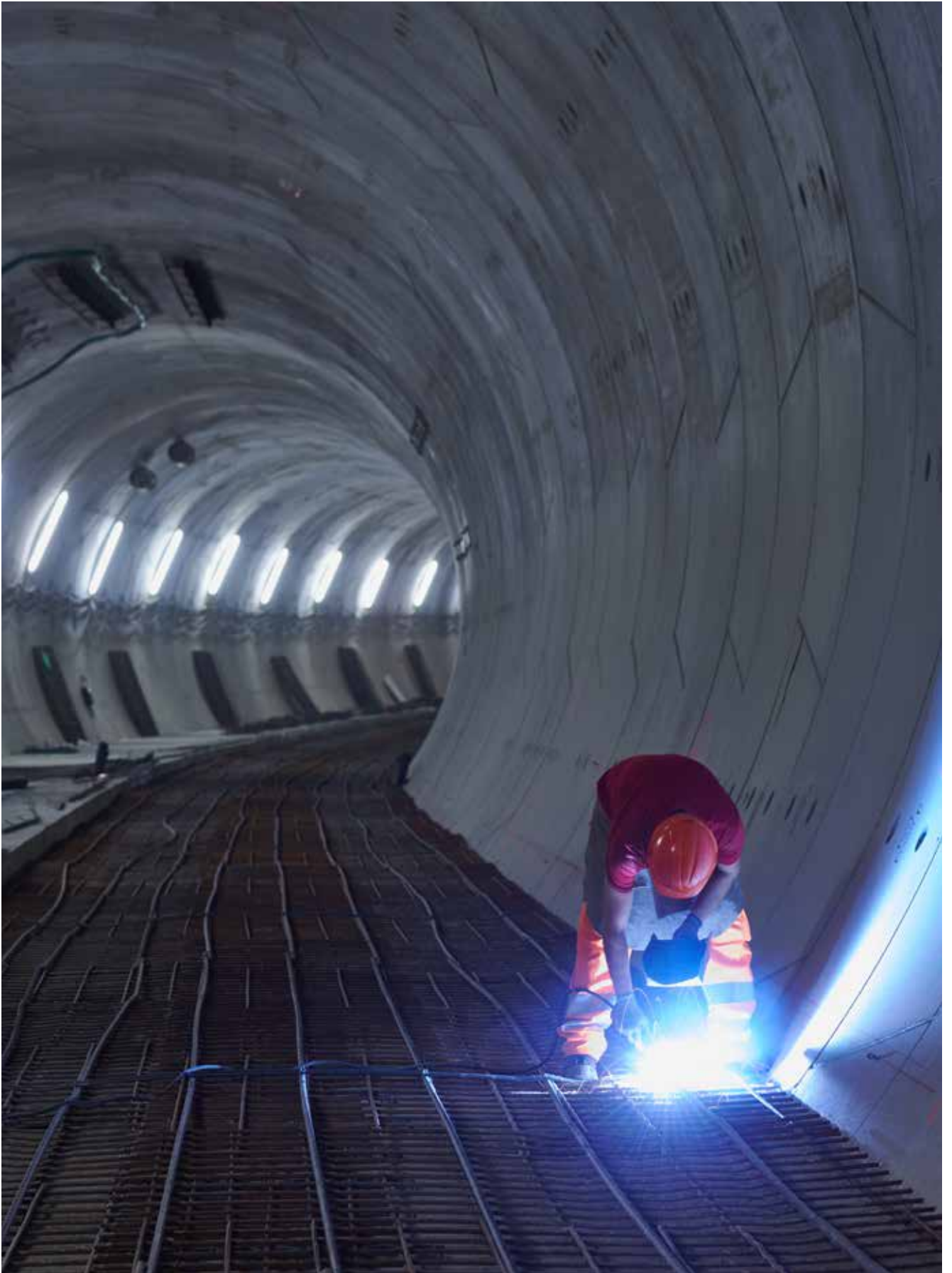
Safeguarding monuments

With the analyses aimed at protecting the heritage on Milan's surface, interventions were also launched to protect historical buildings, particularly their monumental heritage.

Some monuments were moved to avoid risks caused by the passage of the TBM. Just like the **Verziere Column, with the Statue of the Redeemer, in Largo Augusto; the bust of Cesare Correnti, in Piazza della Resistenza Partigiana; the medieval wall in via Francesco Sforza; and the Monument of Our Lady of Resignation.** These monuments will be relocated to their original position, after they have been cleaned and restored, as

requested by the Superintendency. While excavating the stations and structures, there also were numerous finds of great historical and scientific value for archaeologists and the Superintendency: i.e. the necropolis, rich in Roman remains, near the **Basilica of Sant'Ambrogio.**

The operations to safeguard the artistic heritage were carried out with the collaboration of institutions, the Client and the Italian Superintendency of Cultural Heritage. But were also possible, thanks to Webuild's know-how and long-lasting expertise, gained over the years in building metro lines and underground works, in large complex cities.



THE CONSTRUCTION SITE

241,590 m²

bulkheads

950,851 m³

concrete cast on site

1,490,850 m³

open pit excavations

25,509 m

TBM excavation length

3,427,762 m³

total excavated land (heap)

172,841 m³

precast tunnel segments

4.

A SUSTAINABLE METRO



Milan's mobility will be significantly improved by the M4. When the new line, will start to function, it will in fact reduce Milan's traffic by about 180,000 daily vehicles, with an annual CO₂ reduction that will reach 75,000 tonnes.

And this will not be the only benefit that the new line will bring to protect the environment. The "Blue Line" construction sites were designed to allow the conservation of **169 trees**, **while also reducing felling by 24%**, **compared to the initial design ideas.**

And not merely that: once the works were completed, in fact, the Municipality of Milan undertook to plant 1,900 new trees, along the line, connecting many green areas on the route: from Forlanini Park to the Idroscalo, to the "Parco delle Risaie". But even during the construction phase, activities were carried out to try to minimize the environmental impact.

Decisions were in fact made to minimize the impact of the construction site on citizens: i.e. disposing of excavated tunnel earth with underground conveyor belts, instead of **trucks driven in the city centre**.

This system has allowed a significant reduction of urban traffic. The outdoor urban route was, in fact, limited to just a few hundred metres: i.e. from the unloading points of the conveyor belts in Forlanini and Ronchetto, to the ring roads, in the immediate vicinity. Approximately 75,000 truck trips were required to transport the excavated earth (a long column from Milan to Naples!). But these were "avoided" in the historical centre.

A SUSTAINABLE PROJECT

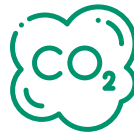
WITH THE LINE IN FUNCTION



VEHICLES

-180
thousand

per day



CO₂ EMISSIONS

-75
thousand

tonnes
per year



NEW TREES

1,900

planted along
the line

DURING WORKS

Underground
conveyor belts
for excavated
earth disposal

Reduced
truck use in
the city centre

Unloading
point

CITY CENTRE

Ronchetto

Forlanini

RING ROAD
a few
hundred
metres



169

PRESERVED
TREES

-24%
FELLINGS

(compared to the initial project)



-75
thousand

trips with
trucks avoided
in the historic
centre



5. THE M4'S TECHNOLOGICAL RECORDS, THE INTELLIGENT LINE

- Driverless and WI-FI
- Safety: automatic doors opening at the platforms

Driverless e WI-FI

Milan's new metro line is built with "**driverless**" technology. It does not, in fact, require a driver on board.

This innovative transport model has already been used in very significant projects. The driverless lines built and under construction by the Webuild Group include Copenhagen's **Cityringen**; **Rome's line C**; **Riyadh's** new metro; and Paris' **Grand Paris Express**.

The main benefit of the new driverless lines is to vary the operating programme, i.e. change the number of operating trains according to public demand. This naturally entails greater operating efficiency linked to the frequency variation in passages, greater safety at stations, and lower operating costs, being that there is no driver.

The high train frequency for the M4 is possible thanks to the driverless technology, which allows trains to communicate with each other through a **Wi-Fi network**. Each train knows exactly how far the previous one or the next one is. It can, therefore, approach it without risking accidents. This system will allow the line to transport 24,000 passengers, per hour, in each travel direction.

Safety: automatic doors opening at the platforms

The new line has **doors that open automatically at platforms**, guaranteeing top quality passenger safety. The doors consist of a fixed frame, sliding doors and emergency exit doors.

The sliding doors are equipped with an emergency opening mechanism, which also allows manual opening from the platform. Passengers can exit from a vehicle in case of an emergency directly to the platform, if the vehicle is aligned within normal stopping tolerances.

SAN BABILA

Uscita Exit



Us



Line 1

scita Exit

Non salire e non
lasciare la stazione



6. CITIZENS' METRO

The M4 has been financed with public-private participation funds and built by a consortium of companies led by the Webuild Group. Since its initial design phase, it has been conceived to promote citizens' constant participation.

Tens of thousands of people, in fact, participated in the numerous **open days** organized to "open the doors of the future stations" to citizens. From neighbourhood committees to representatives of the production industries, to individual citizens, the M4 project remained available to anyone who wished to have their say, or to present a proposal, raise a criticism or a personal concern.

Just like the decisions made, in collaboration with the Archaeological,

Fine Arts and Landscape Superintendence, to enhance the finds found during the excavation phase, and then put on display at Milan's Archaeological Museum.

These distinctive features, not surprisingly, have made the M4 known and become "**the citizens' metro**": a project that values citizenship, and not only during the project's inauguration, but also in every construction phase.



7.

MILAN'S METRO: A BRIEF HISTORY AND SOME NUMBERS

The Milan metro network currently consists of four lines (M1, M2, M3, and the M5) and a railway link, where 5 suburban lines circulate. In total, the overall length reaches 94.5 kilometres.



The network is managed by ATM (Azienda Trasporti Milanese - the Milan Transport Company), owned by the Municipality of Milan, in charge of managing transport in Lombardy's capital and in 51 Municipalities of the Province, serving an area with a total population of 2.4 million citizens.

ATM was founded on **May 22, 1931**; in the first thirty years of its history, it invested heavily in road transport development activities. In, **1964** the first underground line in the city was inaugurated, the M1 (the "**Red Line**") on the Lotto-Sesto

Marelli route. In October **1969**, the M2, the "**Green Line**" was inaugurated. The M3, the "**Yellow Line**", opened in **1990**. And the M5, the "**Lilac Line**", was inaugurated in 2013, being Milan's first fully automated driver-less line.

In 2014, new stations of the M5 line (Isola and Garibaldi FS) were opened. The M5 was then completed in 2015.

8. THE WEBUILD GROUP FOR SUSTAINABLE MOBILITY

Webuild is one of the top ten global groups in the sustainable mobility sector. It has built and is currently building some of the most modern and complex metro lines, globally.

These include Paris' **Grand Paris Express**; Cityringen, the metro ring circling **Copenhagen**, with its 240,000 daily passengers; Line 3 of the new **Riyadh** metro network, the world's longest, currently under construction for a total of 176 kilometres; and the **Doha**, **Lima** and **Sydney** metros.

The Group has built over **13,000 kilometres of railways and metro lines**.



OUR METROS, GLOBALLY: MAIN COMPLETED AND ONGOING PROJECTS

Canada

- Montreal Line 1
1975
- Hurontario Light Rail Transit Project

France

- Paris Subway Eole and Meteor Line
1998
- Grand Paris Metro, Line 16 Lot 2
- Extension of Line 14 South to Orly Airport within Grand Paris Express Project Lot 4

United States

- San Francisco Central Subway
2015
- New York Subway
1984
- LYNX Blue Line Extension, North Carolina
2017
- Metromover Extension Project
Miami, Florida
1993

Portugal

- Porto Light Subway
2006

Venezuela

- Metro De Caracas, Line 3 Plaza Venezuela el Valle Section
1995

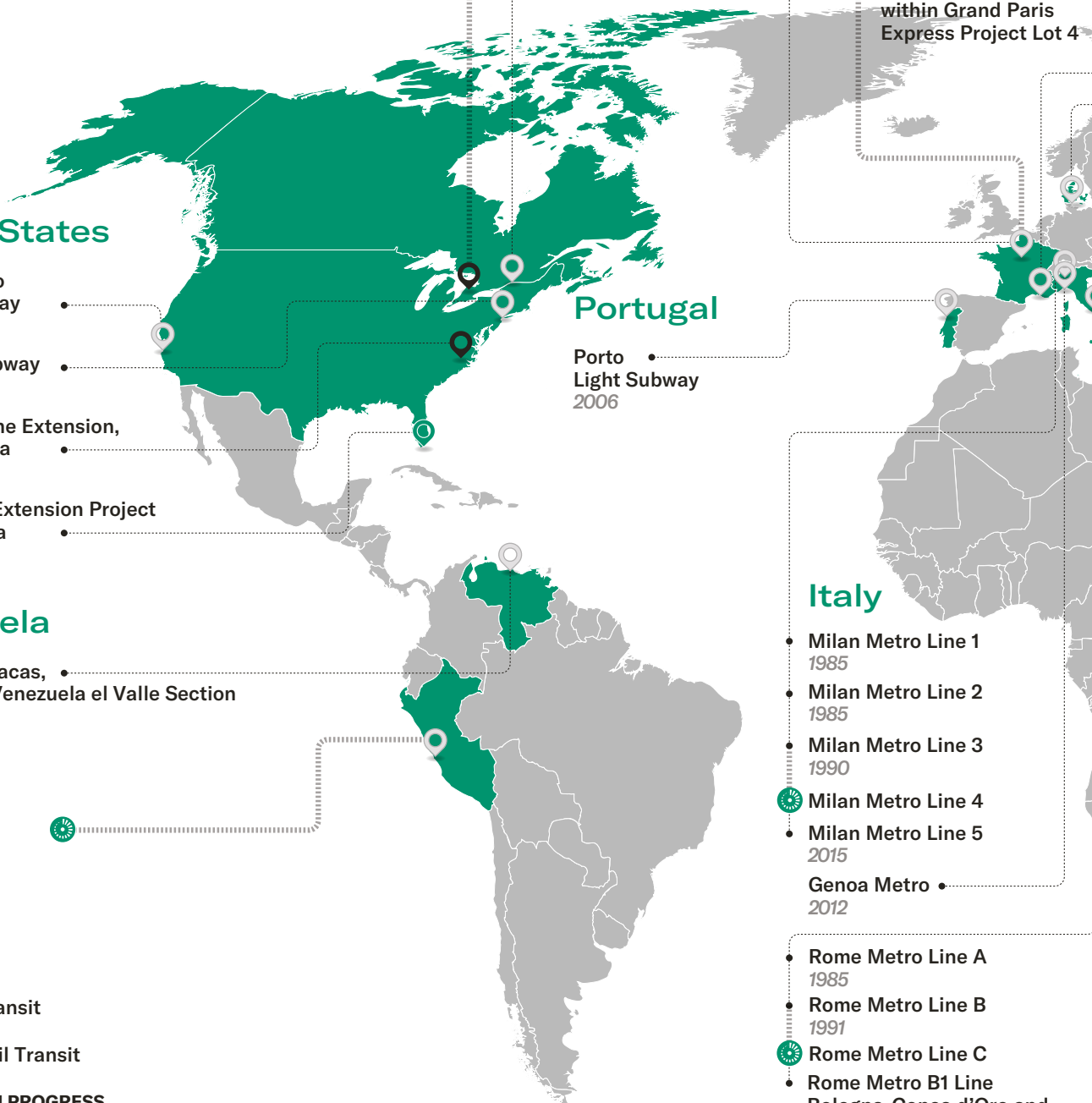
Peru

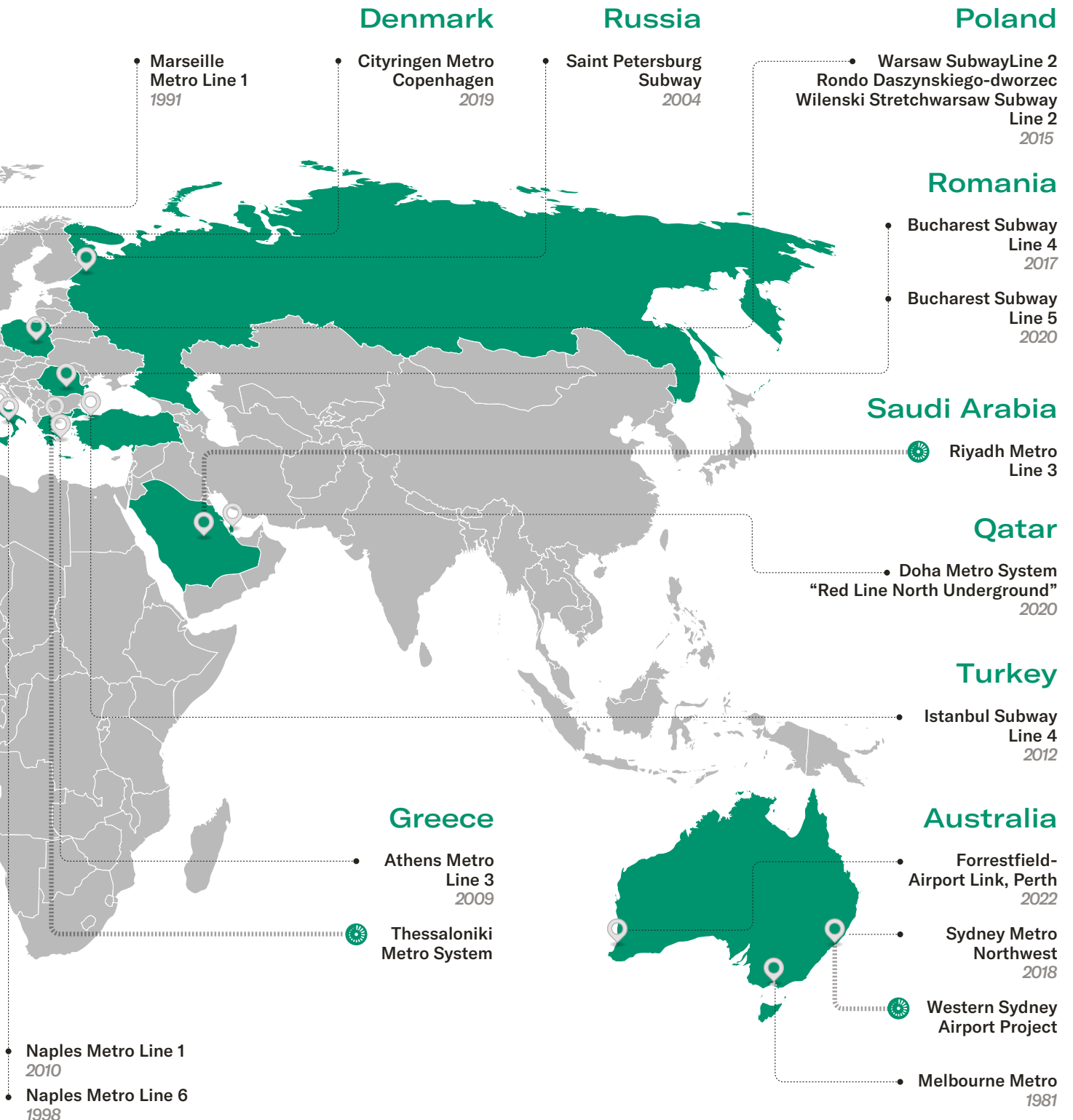
- Lima Metro

Italy

- Milan Metro Line 1
1985
- Milan Metro Line 2
1985
- Milan Metro Line 3
1990
- Milan Metro Line 4
- Milan Metro Line 5
2015
- Genoa Metro
2012
- Rome Metro Line A
1985
- Rome Metro Line B
1991
- Rome Metro Line C
- Rome Metro B1 Line Bologna-Conca d'Oro and Conca d'Oro-Jonio Sections
2015

- Metros
- Mass Transit
- Light Rail Transit
- IN PROGRESS
- XXXX COMPLETION DATE





Webuild S.p.A.
www.webuildgroup.com
www.webuildvalue.com

Project coordination

Webuild Corporate Identity and Communication

Credits

Webuild Image Library

Photos by

Moreno Maggi for Webuild

Edoardo Montaina for Webuild

Graphic concept

Leftloft, Milan

Data Visualization and Augmented Reality

Viewtoo, Milan

Edition

July 2023

Follow us



