

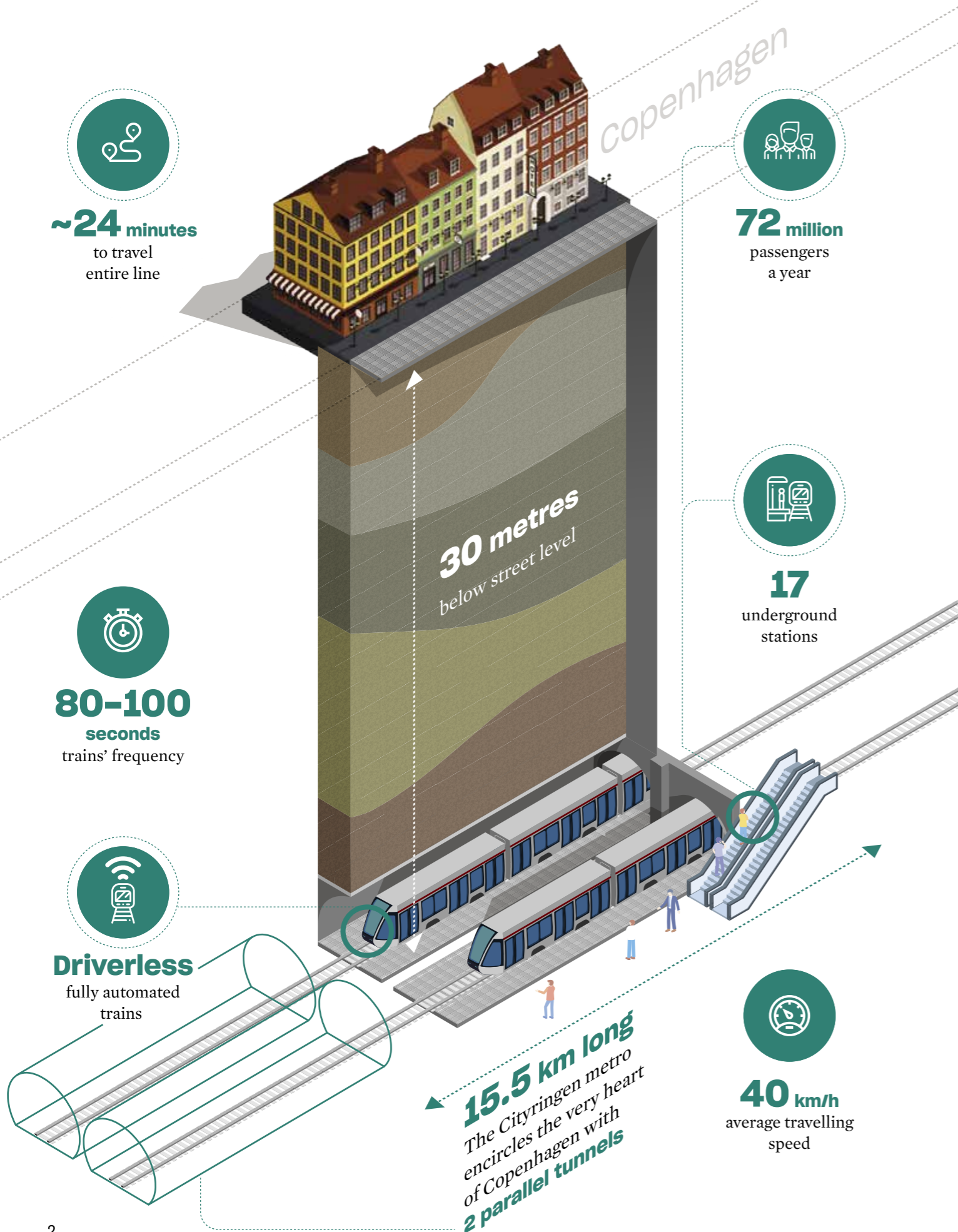


CITYRINGEN FACT SHEET

salini
impregilo



PROJECT OVERVIEW



ONE OF EUROPE'S BIGGEST METRO PROJECTS

Four hundred years after Christian IV ordered the construction of Christianshavn to extend the fortifications of the city, Copenhagen has overseen another mega infrastructure project which reshapes the urban space: Cityringen, the new metro line that will help it in its bid to become the greenest capital in the world. The project, commissioned by Metroselskabet, the public entity responsible for the metro network, was designed and built by Salini Impregilo via a local entity called CMT.

The project supports the aim to achieve carbon neutrality by 2025 as part of the CPH Climate Plan.

Thanks to the new line and its connections to the existing network, residents will be able to move by foot, bike or public transport for 75 percent of their trips.

The line is to provide a round-the-clock service for a potential of up to 72 million passengers a year.

Cityringen encircles the heart of Copenhagen with two parallel 15.5-kilometre-long tunnels. It passes under the historic centre, the so-called “bridge quarters”, as well as the independent municipality of Frederiksberg, which is located within Copenhagen’s borders. The line has 17 underground stations situated an average 30 metres below street level. Driverless and completely automatic trains pass every 100 seconds and as little as 80 seconds at rush hour.



The underground race of the 4 TBM

Works carried out in a **densely populated area**, near **historical buildings**

Excavation challenges under the **Magasin du Nord** in **Kongens Nytorv** and **Marmorkirken**, an 18th century iconic church



Kongens Nytorv



Marmorkirken

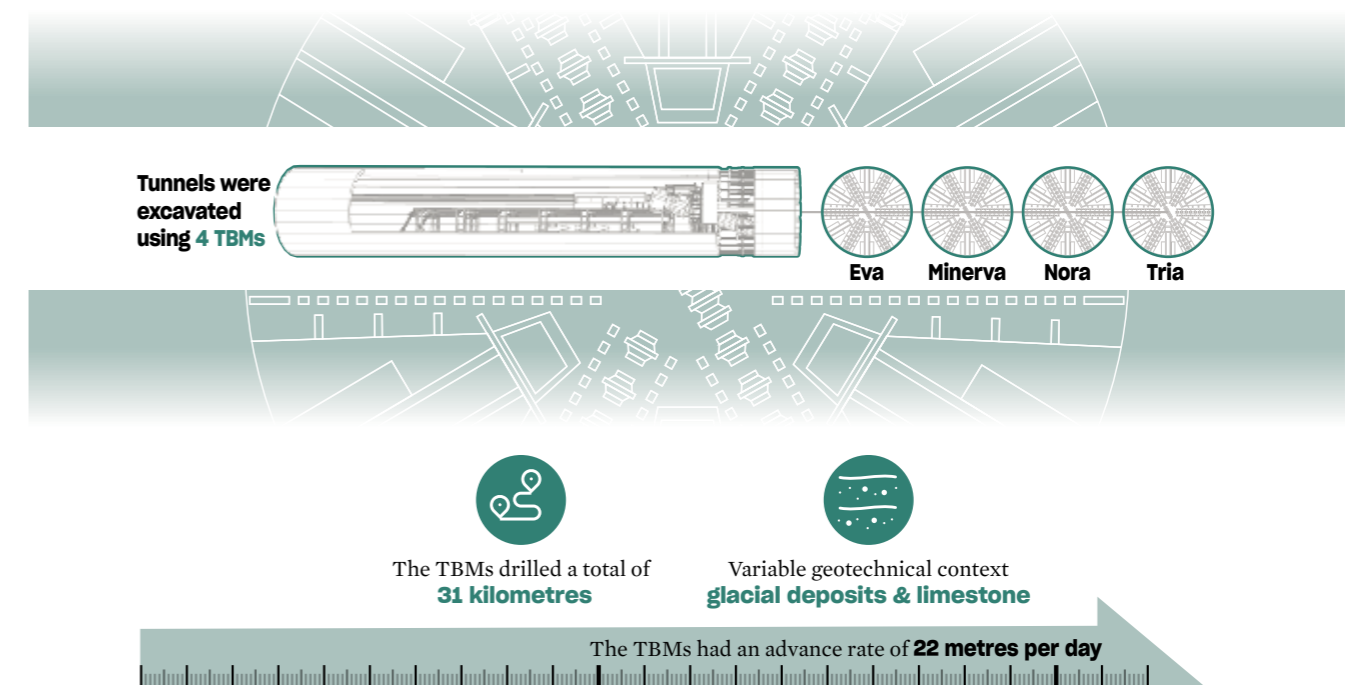
INNOVATION AND TECHNICAL HIGHLIGHTS

One of the greatest challenges of building Cityringen was having to do it in **highly urbanised areas where historic buildings were located.**

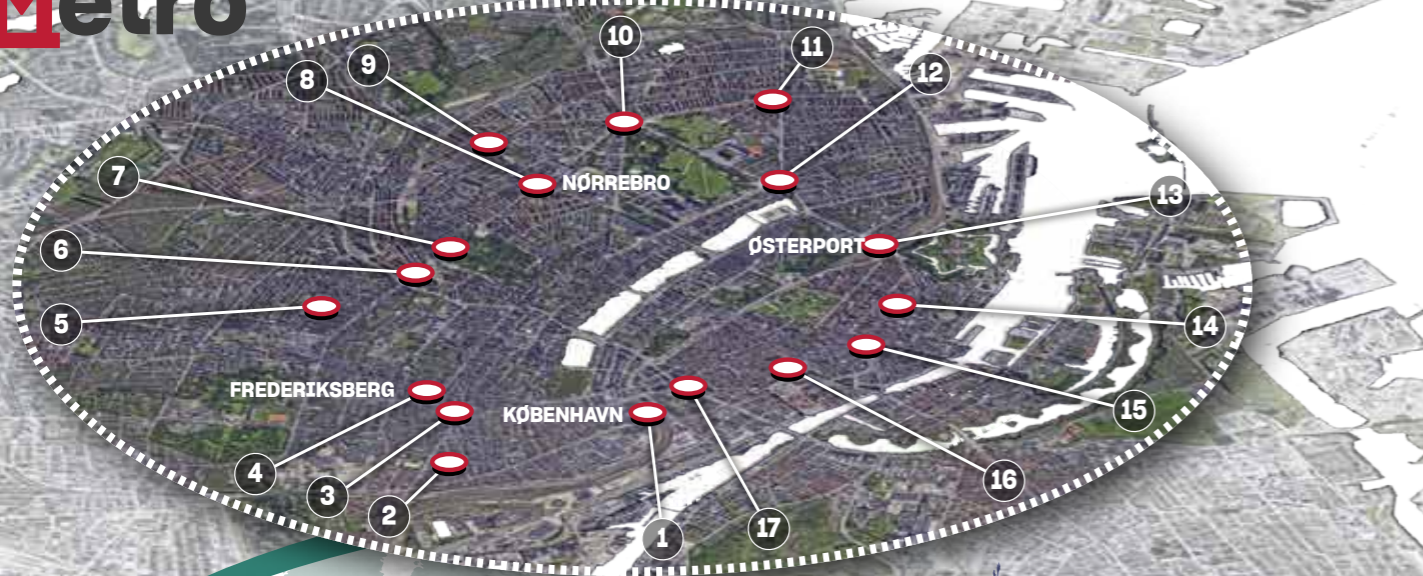
Since the line crosses some of the Danish capital's most densely populated neighbourhoods with commercial and historic areas, great effort was made to carry out the work without disrupting people's lives or damaging any buildings.

The TBMs - tunnel boring machines - excavated 31 kilometres under the streets through different and, at times, difficult geology. They even managed to pass within **1.5 metres of the foundations of the Magasin du Nord, one of the city's landmark buildings.**

The excavation was carried out using innovative techniques. The TBMs did the tunnels 4.9 metres in diameter at an average depth ranging from 20 to 35 metres.



Cityringen Metro

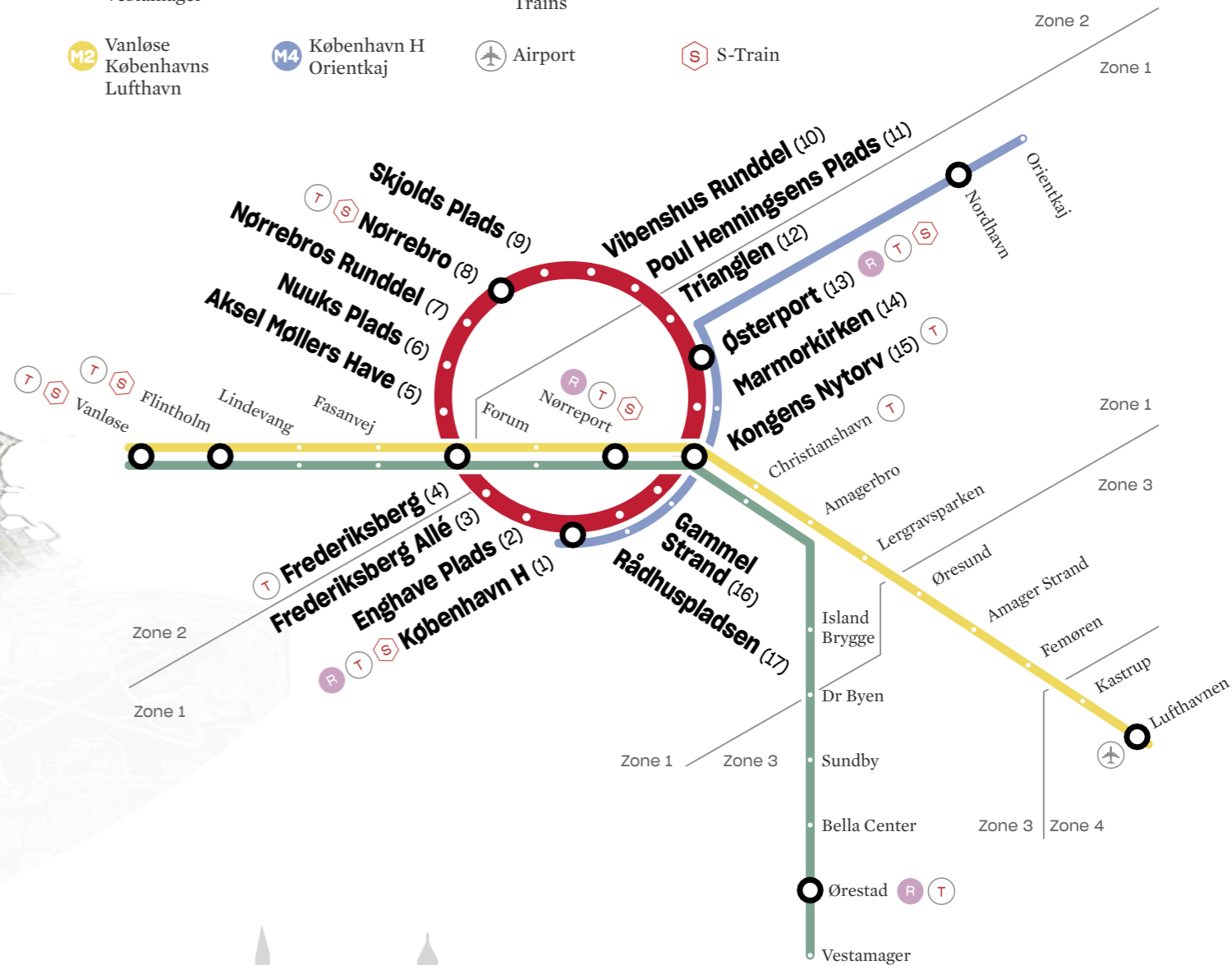


Denmark



STATIONS: THE CITY'S EXTENSIONS

- M1 Vanløse Vestamager
- M3 Cityringen
- R Regional Trains
- T Transfer Station
- M2 Vanløse Københavns Lufthavn
- M4 København H Orientkaj
- A Airport
- S S-Train



Cityringen places **85%** of residents within a maximum of **600 metres** – a 10-minute walk – to a metro or train station



THE SUSTAINABILITY CHALLENGE

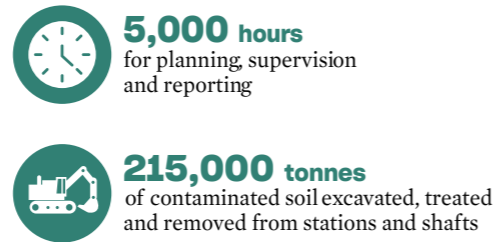
People

Cityringen was built by people from 24 countries, including England, Ireland, Romania, Italy, Bulgaria and Portugal. It was an example of multicultural Europe that not only created thousands of jobs but also displayed the highest level of technical skill in the industry.



Environment

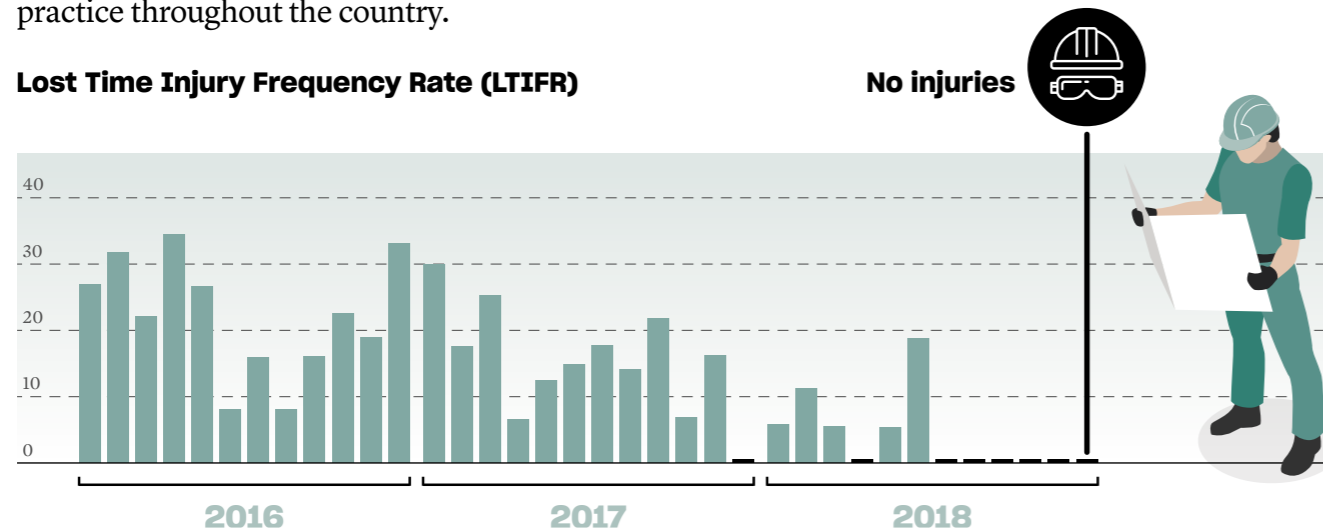
The project oversaw the clean-up of previously contaminated soil in a number of areas. A careful management of chemical substances avoided infiltrations in the water table and an advanced monitoring system ensured that materials used on the project were compliant with environmental regulation. Wherever the contaminated soil was found, a process to treat and remove it was implemented with the greatest care.



Safety

Special attention was given to health and safety on the work sites with the adoption of the best international practices and the organization of several awareness campaigns. The result was that in the end of 2018 the entire Cityringen project celebrated the achievement of one million working hours without a single accident, becoming best practice throughout the country.

Lost Time Injury Frequency Rate (LTIFR)



Local Community Engagement

Local communities were involved in every phase of the project with the aim of fomenting greater understanding of the complexity of the work and the benefits to be gained from it once completed. Many information

campaigns were organised to engage local communities, inviting members to visit the worksites to learn about the technology and techniques used and witness the progress of the project.



City's Heritage

Cityringen opened up a veritable treasure trove for researchers at the Museum of Copenhagen, enabling them to learn more about the Danish capital's past. As workers excavated tunnels and station boxes for the new metro line archeologists uncovered remnants of life dating back nearly a millennium.

The greatest archaeological excavation in Northern Europe

At the early stage of its development, Cityringen proved to be a veritable treasure trove for the Museum of Copenhagen, which described the new metro line's various work sites as the "greatest archaeological excavation in Northern Europe".

Amid the excavations at places like Gammel Strand and Radhuspladsen, they uncovered everything from **pottery** to **textiles** and **building foundations** to **bulwarks** from an **old harbour**, giving them greater understanding of the Danish capital's past.



Salini Impregilo S.p.A.
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Project coordination
Salini Impregilo Corporate Identity
and Communication

Credits
Salini Impregilo Image Library
Photo Moreno Maggi for Salini Impregilo (pag. 4)
Photo Edoardo Montaina for Salini Impregilo (cover, pag. 6, 10)

Graphic concept
Leftloft, Milan

Data visualization
Viewtoo

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