

# A showcase of our **large-scale projects**

— PORTFOLIOS OF EXPERTISE —



RATP  
GROUP





# Streamlining complexity

## — MILESTONES

**1956**

First MP 55 rubber-tired train deployed on metro line 11, following major infrastructure renovations that were conducted without any disruption to operations.

**1998**

Commissioning of metro line 14, the first fully automated large-capacity metro line in the world.

**2012**

Automation of metro line 1, Paris' oldest metro line, without any major traffic disruption, resulting in a 15% reduction in CO<sub>2</sub> emissions.

**2014**

Launch of the Bus2025 project, a technological and ecological breakthrough, which aims to convert bus depot energy sources by 2025.

**2021**

Opening of the first bogie maintenance and production line at the Sucy-en-Brie RER maintenance centre, the first in Europe.

**2023**

Extension and full automation of metro line 4, completed without any major traffic disruption.

**2024**

Extension and upgrading works on metro line 14, and replacement of its automated driving system without any major traffic disruption.

**The dual pressures of booming population growth and climate change have turned urban mobility into a major factor in urban resilience.**

As a long-standing reference in mass transit, RATP Group advises authorities on how to achieve their ambitions of adapting and transforming their regions. Whether as a project owner, project manager, operator or maintenance operator, the Group deploys its interconnected skills across various modes, ground conditions, and contexts, by mobilising its globally unique expertise. The Group efficiently implements projects over kilometres of tracks and in complex urban layouts, while guaranteeing pinpoint accuracy. As an integrated group, RATP Group draws its strength from pooled upstream and downstream expertise in transport systems, which enhances professional excellence. In addition, the Group benefits from built-in service quality by design and at every project stage, as well as a commitment to environmental causes, a public service culture, corporate social responsibility, high standards, innovation, and skill transfer. These are the rare qualities that enable major transportation projects to come to fruition, with the goal of serving cities and their residents.

# High stakes with major projects

The common thread in major transport network projects is the magnitude of challenges that they represent. As an integrated organisation, RATP Group rises to each challenge armed with its industry expertise and the collective commitment of its teams.



## Ensuring service continuity during ongoing works

Throughout large-scale projects such as extensions to existing lines, automations, rolling stock and driving system replacements, and infrastructure updates, service levels have to be maintained, which represents a major feat in itself. This is where the Group excels through its unique know-how. Project phases and conditions are coordinated to keep traffic disruptions to a minimum. However, when disruptions are unavoidable, alternative itineraries are implemented, or replacement bus services are provided.

# 7

**years of ongoing works in progress** with no major disruptions. Works to automate metro line 4, which began in 2016, were completed at the end of 2023

## Complying with schedules and budgets

Despite unforeseen circumstances – inflation, geopolitical tension, and a public health crisis – RATP Group has honoured its commitments, by completing projects in the agreed time frames, while keeping within a fixed budget. The Group has also made its name as a trusted partner in projects guaranteeing service quality that continuously adds value to passengers' commutes.

# 3

**line extensions,** southwards on metro line 14, on metro line 11, and on tram line T3b, completed in time for the Paris 2024 Olympic and Paralympic Games

## Adapting to various ground conditions

Both above ground and underground, RATP Group adapts to the regions that it serves. To successfully lead complex public transport engineering projects in dense and confined environments, the Group leverages its highly specialised expertise in civil engineering, geotechnics and public transport systems. The Group is also ideally positioned to identify and manage additional areas of expertise that its pool of partners can fulfil.

# 1st

**viaduct built on the RATP network** in 120 years to accommodate Coteaux Beauclair station as part of metro line 11 extensions

## Guaranteeing safety

RATP Group considers safety a non-negotiable value, placing it at the core of daily activity. To ensure business as usual during works, meticulous adaptation is required across safety systems. The Group mobilises in-house expertise to guarantee the safety of its employees, passengers, and service providers at various work sites.

# Over 1,000

**platform screen doors** installed on metro line 4 during its automation, reducing the main causes of incidents, and facilitating post-incident traffic recovery through automated regulation measures





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## Carrying out large-scale public transport projects: strength through integration

To lead projects that are exceptional in magnitude and technical complexity, numerous fields of expertise are required, which only an integrated group can deftly coordinate. This is how transport authorities and regional councils can be reassured that sustainably efficient networks will be built within budget and schedule. Our thorough knowledge of project life cycles, equipment and infrastructure, as well as operational agility across transport modes, and our demanding project-oriented, socially responsible culture are qualities that have enabled the Group to rise up to major challenges, and to redefine urban mobility in the Île-de-France region over the past fifteen years.

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## Maintaining and upgrading existing assets, a unique set of skills

Be it extensions to the transport network, the construction of new lines, or the upkeep of existing lines, the Group adopts its distinctive approach. By operating as an integrated organisation, RATP Group develops the sustainable solutions that are deployed to retrofit maintenance centre and information systems, and successfully converts the way the Île-de-France regional bus network is powered. The Group also optimises major projects to transform its industrial assets, thereby providing added technological, operational, and environmental value.



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## Engaging with our stakeholders

As a trusted partner, the Group seamlessly fills its role in various project formats to contribute its expertise, providing insight and experience in operations and maintenance to offer cutting-edge rolling stock technology alongside its industrial partners. RATP Group partners with regional authorities in projects by minimising their impact on passengers' and residents' daily routines and environment. The company also relies on external expertise to enhance its solutions, with the goal of raising quality standards, and ensuring project sustainability.



**Sylvie Buglioni,**  
Director, Technical and Industrial Projects division and member of the RATP Group Executive Committee

INSIGHT FROM THE EXPERT

“To successfully execute projects of such scale, being an integrated organisation is not merely an asset, but an imperative! This approach enables the Group to share its experience in maintenance, operations, and engineering, to provide safer and more efficient service. Our dynamics are equally unique, resulting from the combination of our long-term industrial vision, privileged engagement with our stakeholders (funding organisations, suppliers, industrial players, passengers, and others), and our CSR ambitions. Our employees take immense pride in these large-scale projects, regardless of whether they are located in our historic heartland in the Île-de-France region, or across the globe.”

# Carrying out large-scale public transport projects: strength through integration

## An integrated and expert approach

RATP Group's key quality strength lies in centralizing its areas of expertise required for the design, construction, operation, and maintenance of transport systems, which it mobilises to complete large-scale projects. This integrated approach combines a global vision with professional expertise that guarantees project consistency and sustainability.

In its multiple roles as designer, project owner, project manager, transport operator and maintenance operator, RATP Group boasts the full range of skills and expertise required in running public transport systems. The Group is one of the rare few operators with extensive multi-modal experience, ranging from the RER to metros, trams, and buses. Such broad expertise, spanning transport modes and life cycle stages, has proven invaluable in meeting the specific challenges of major projects. Project managers, who oversee the coordination of these projects, have proven field knowledge in operating and maintaining public transport systems, and in the essential professions involved in infrastructure construction. This allows project managers to anticipate future requirements, and to factor them into specifications and programme schedules. The Group is also adept at operating in complex environments that include other stakeholders and project owners. This area of expertise allows the Group to consolidate projects, by optimising and efficiently coordinating stakeholders who operate in the same scopes, with varying stakes and schedules.



**Igow René,**  
Tram line T3b Project Manager

"The extension of tram line T3b is truly a source of pride. In terms of quality, cost, duration, and collaboration with regional authorities, we have once again proven that we are a trusted brand. The new segment, which was completed in five years, stretches over 3.2 kilometres and 7 new stations. In order to accommodate the new platform, parts of the city underwent restructuring, resulting in the construction of 18 permanent structures built. At Porte de Champerret, we built a new bridge over metro line 3 to integrate the platform seamlessly. Together with SNCF Réseau teams, we carried out thorough rail safety studies to ensure that tram installations and earthworks would not weigh on RER line C arches or destabilise its tracks."



Tunnel boring machine (TBM) launching shaft in L'Hajj-les-Roses, metro line 14 southern extension work site.

**9,000**

**soldered joints** were required on the metro line 14 southward extension

**4,544**

**metric tonnes** and **100 metres high**, one of the largest cranes in the world was used for the replacement of the Chartres and Gallardon bridges



Tram line T3b extension work site.



**Claire-Hélène Coux,**  
Deputy Director,  
Project Management division

"Our specific expertise in mass transit allows us to reconcile the needs expressed by customers, the infrastructure manager, maintenance operator and transport operator. As one of our qualities, it enables us to chart realistic, yet ambitious roadmaps for the projects that we lead. Furthermore, we benefit from the diversity of transport modes that we operate. Feedback obtained from one mode can benefit others. Project diversity (extensions, upgrades, and automation of transport lines, station renovations, and others) reflects the rich array of our professions: project management, railway engineering, expertise in

railway and fire safety, traffic assessment, architecture and design, among others. From the moment a project is designed, our teams are attentive to its various stages, and its sustainability, as RATP manages its assets from the design stage to their commissioning, and thereafter for their full life cycle. When works are conducted, our project-oriented culture allows us to overcome the obstacles that arise. We deploy our state-of-the-art engineering prowess, while continuously adapting and mobilising the array of expertise that we and our partners offer. This allows us to carry out truly technical feats, such as the simultaneous extension and automation of metro line 4, while maintaining normal line operations, a world first!"

INSIGHT FROM THE EXPERT



Works to replace the Chartres and Gallardon bridges, led by SNCF Réseau and RATP to improve efficiency on RER lines B and C.



## Extending a long-standing network involves rare expertise

RATP Group's comprehensive understanding of what it takes to run a public transport system, and how to manage its entire life cycle, is the key to the successful implementation of ambitious projects that contribute to the expansion of the Île-de-France regional network. Such prowess combines both the creation of new lines, and extensions to existing lines in operation.

RATP Group is equally at ease in conducting both brownfield and greenfield<sup>(1)</sup> operations. As part of metro line 14 extensions, the new segments and the existing line had to be on the same page. This is why the automation system had to be fully replaced by a next-generation system in an unprecedented technical feat. A key to the success of the operation was the way in which trials were carried out: transport operators and maintenance operators were mobilised, thereby raising standards and efficiency. The Group's extensive expertise in metro operations was also instrumental in extending metro line 11, showcasing its ability to design and execute highly complex projects. Civil engineering, railway systems, energy, and public transport systems, as well as station design, equipment, lift pumps and ventilation systems formed various components of the Group's excellent project management. Leveraging its metro operations expertise, the Group effectively coordinated various industrial contributors to meet project deadlines. Another challenge was ensuring seamless integration between rolling stock upgrades, and the connection and construction of a new maintenance centre at Rosny-sous-Bois. The Île-de-France regional network is just as efficient in greenfield projects, as illustrated by the tram network making its comeback in Paris in stages since 2006. In under twenty years, RATP Group has built an almost complete loop around the capital, with radial lines serving areas that the metro has yet to reach.

(1) Brownfield: projects on existing networks. Greenfield: new network projects.



Metro line 11 tunnel excavation and sliding works under national highway A86.



Metro line 14 extension works.



**Florent Nicolas,**  
Project Manager, Technical and Industrial Projects division

INSIGHT FROM THE EXPERT

"The Group pledges to honour its commitments to quality, cost, and schedule, in an unprecedented drive to upgrade networks across the Île-de-France region. To achieve this, the Group employs a multidisciplinary project management approach. Our objective is to foster a shared culture among clients, project owners, project managers, and contractors, based on established methods and standards."



Metro line 4 central command post.

**€2.4 billion**

invested in 2023, with funding from Île-de-France Mobilités, to conduct line upgrades and extensions in the Île-de-France region (including investments on behalf of Société des Grands Projets to extend metro line 14 southwards)

# Unprecedented extension of the Île-de-France regional network

In the span of fifteen years, the construction and extension of public transport network lines have proceeded at a pace that had not been witnessed since the beginning of the 20th century. The scale of these projects raised numerous technical challenges in the form of soil conditions, urban density, and compatibility between different generations of rolling stock, among others.



**Metro line 4:** extension and automation of century-old infrastructure, without major disruptions.



**Metro line 14:** northward and southward extensions to metro line 14, backbone of the future Grand Paris Express network. Another challenge entailed the integration of metro line 14 close to Orly Airport infrastructure, and its connection to tram line T7.



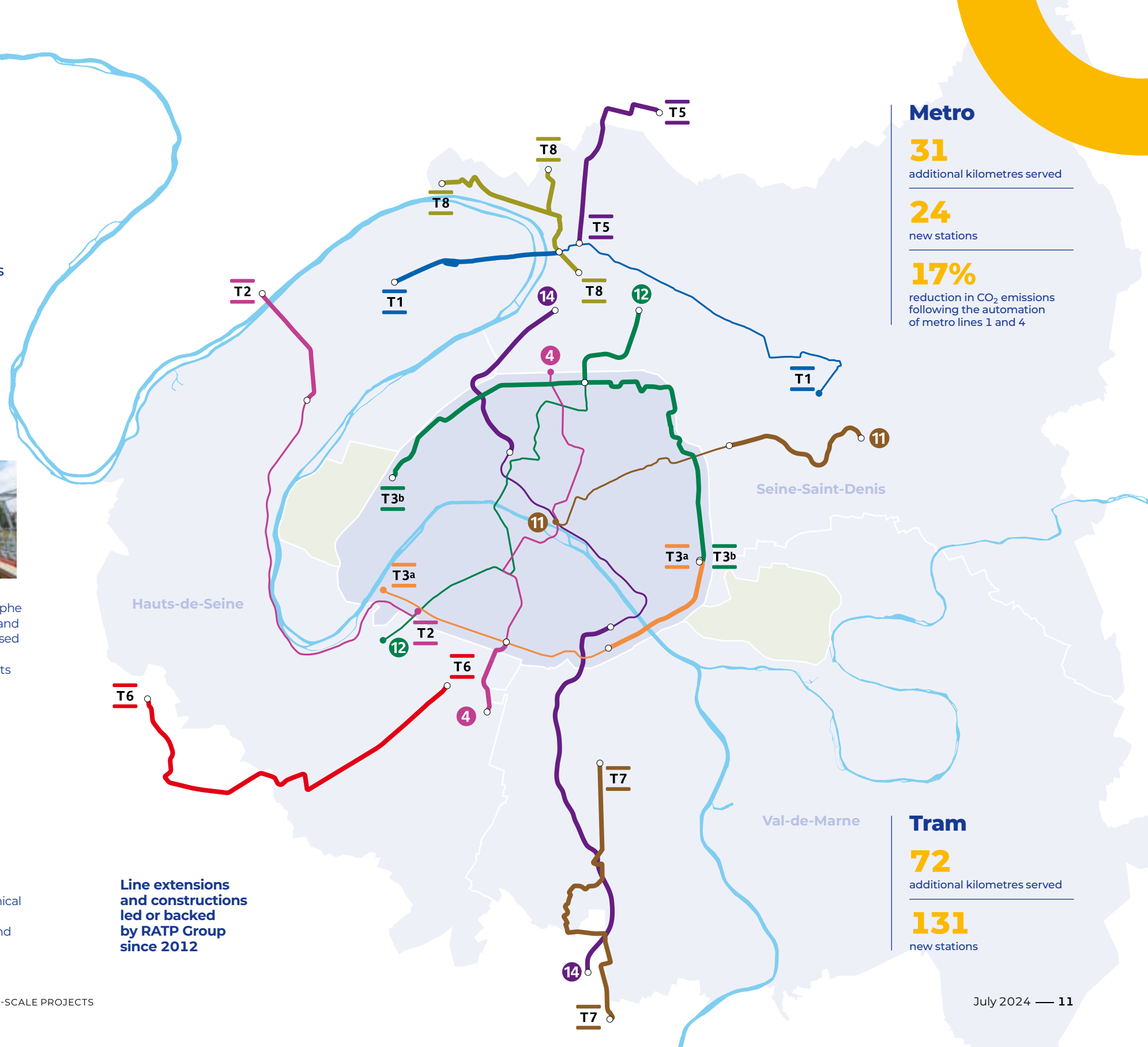
Coteaux Beauclair station, metro line 11

**Metro line 11:** at Télégraphe station, small equipment and low-tech methods were used to excavate the extension in 80-centimetre segments per day, to accommodate ground conditions.

**Tram line T1:** stations across the line were fully refurbished to guarantee wheelchair accessibility, and to improve passenger comfort.

**Tram line T3b:** at Porte Maillot station, project owners had to agree on solutions to coordinate schedules, and ease technical constraints between the tram line T3b extension and works on RER line E.

**Line extensions and constructions led or backed by RATP Group since 2012**



## Metro

**31**  
additional kilometres served

**24**  
new stations

**17%**  
reduction in CO<sub>2</sub> emissions following the automation of metro lines 1 and 4

## Tram

**72**  
additional kilometres served

**131**  
new stations



## Our projects



**Lionel Benharous,**  
Lilas Mayor

“Our city is fortunate to now have two metro stations, which have considerably improved the public transport service in the municipality, and are easing our inclusion as part of the city. The new station in the Sentes neighbourhood will provide an alternative to individual car use, and constitutes an efficient solution for residents living the farthest away from public transport networks. This will reduce traffic congestion in our region. We have also restructured urban facilities around the station. Public areas around the metro station will be completely remodelled, with repaved roads, greenery, artwork installations, and the development of new activities in the neighbourhood.”



Metro line 11 train maintenance centre at Rosny-sous-Bois.



## Extending

and automating a century-old line

Metro line 4 was extended in 2022. From north to south, it serves major SNCF train stations, and strategic hubs, while carrying 700,000 passengers daily. Alongside the line's extension, automation works were launched in 2016. The decision was made following the successful automation of metro line 1, with the goal of improving service quality and transport capacity. The transformation was completed as planned in January 2024.



## Balancing three complex projects

The complex nature of the metro line 11 extension project stems from the plan to simultaneously double its distance, upgrade its stations, and replace its rolling stock. New trains could only be commissioned after finalising the line extension, completing the new maintenance centre, and upgrading the existing line. Despite the requirement to excavate parts of the tunnel gradually using small equipment to maintain ground stability, the project progressed according to schedule.

T3b

## Keeping Paris in the loop

From the time its first segment was commissioned in 2006, T3b has been the busiest tram line, carrying 500,000 passengers daily. After reaching Porte d'Asnières in 2018, tram line T3b has since been extended to Porte Dauphine. Passengers can now cover 75% of Paris' circumference by tram. Wide-scale coordination was required during the works. At Porte Maillot, urban planning works, and the integration of the tram line T3b platform had to be coordinated with RER line E extension works, by setting up a technical coordination unit between the various project owners, local authorities, fire brigades, and major local activity hubs.



## Exceptional sliding operation at Arcueil-Cachan station

To allow Société des Grands Projets to build and connect its new metro line 15 Sud (south) station to Arcueil-Cachan station on RER line B, RATP Group conducted a series of works that were exceptional in many ways. Exceptional in terms of technical complexity, with the installation of a 3,000-tonne slab bridge measuring 40 metres. Exceptional by its speed, as the bridge sliding operation was completed in seven hours, before the teams connected platforms, laid tracks, restarted equipment, and performed safety tests.



**Stéphane Garreau,**  
Operations Director,  
Metro line 14 extension

INSIGHT FROM THE EXPERT

“As part of extending the line both to the north and the south, the automated driving system had to be fully replaced. To preserve service levels, we arranged for the new system to be trialled at night, and during line closures on weekends, eventually making the permanent switch in only two weeks. This is a world first!”



## Doubling

the length of a running line

With over 14 additional kilometres served, eight stations, and a new maintenance centre and depot, not only did the metro line 14 extension defy all norms, it was also completed in record time. Among its multiple challenges, the project had to meet a tight schedule, simultaneously operate three tunnel boring machines (TBM), accommodate new rolling stock, and integrate a new automated driving system. In addition, it had to be coordinated with the region's industrial players and stakeholders (Société des Grands Projets, Île-de-France Mobilités, Aéroports de Paris).

Construction of L'Haj-les-Roses station on metro line 14.





# Maintaining and upgrading existing assets, a unique skill set

## Upgrading projects designed to last

Whether optimizing the life cycle of rolling stock or undertaking a large-scale energy transition, these industrial decisions aim to meet environmental goals.

### OPTIMISING THE LIFE CYCLE OF ROLLING STOCK

Equipment durability significantly contributes to RATP Group's efficiency. The life cycle of rolling stock is optimised across the Île-de-France regional network, as the Trains Pneu (rubber-tired trains) programme illustrates. Initially, the goal was to replace metro line 14 trains with next-generation MP14 rolling stock, as part of the metro line upgrading plan led with Île-de-France Mobilités. What followed was a large-scale programme involving the transfer of rolling stock from one line to another, a win-win situation with both lines enjoying higher service quality. To curb the environmental impact of its rolling stock, RATP Group repairs and retrofits older equipment to optimise its life cycle. As such, with the arrival of the new MP 14 trains deployed on metro line 14, the Group seized the opportunity to repurpose rolling stock that had been replaced on metro line 1, removing the automated MP 89 trains from circulation on metro line 1 to deploy them on metro line 4, which at the time was undergoing automation. MP 89 trains with a driver's cabin, which had been running on metro line 4 until its full automation, were subsequently reassigned to metro line 6. What made the redeployment exceptional was the successful switch while ensuring the compatibility of the rolling stock in question with each line's infrastructure and systems.



MP05 and MP14 trains at the metro line 14 maintenance and depot site at Saint-Ouen Docks.

**17**

bus depots converted to NG or electricity, with 8 under renovation (July 2024)

**50%**

reduction in CO<sub>2</sub> emissions from bus operations by the end of 2024, compared to 2015



INSIGHT FROM THE EXPERT

**Stéphane Garreau,**  
Operations Director,  
Metro line 14 extension

"Projects to introduce new rolling stock actually involve a succession of complementary stages! The Group has to either build new maintenance centre for extended lines, or upgrade existing ones. And then there is the infrastructure to retrofit. For example, when we switch from six-carriage trains to eight-carriage trains in line with the metro line 14 extension, we have to adapt tunnels, platforms, stations, as well as driving, signalling and power supply systems."



Lagny bus depot.

INSIGHT FROM THE EXPERT



**François Warnier de Wailly,**  
Director, Bus2025 programme

"To ensure the success of the Bus2025 project, we had to retrofit our 25 active bus depots, while keeping them operational. The programme actually relied on RATP's three areas of in-house expertise: engineering, operations, and maintenance. Coordinating them was a feat in itself! Simultaneously, infrastructure had to be modified so that vehicles could be charged with either electricity or biomethane, the new

rolling stock acquired by Île-de-France Mobilités had to be deployed, and the new combined system had to be used in a production environment. To ensure efficient interaction between the relevant professions, a dedicated change management process was established. The process oversaw and coordinated operations, maintenance, and engineering. We have also organised upskilling courses for maintenance staff, to familiarise them with new equipment."

### BUS2025, A MAJOR TECHNOLOGICAL AND ECOLOGICAL SHIFT

The Bus2025 programme is a standard-bearer in Europe. Consisting of a wide-scale technological and ecological conversion drive, the programme aims to convert the RATP-operated bus fleet to electricity and gas by 2025. Spearheaded by RATP Group and Île-de-France Mobilités, and backed by the European Commission, Bus2025 is an industry pioneer. From its launch in 2015, the programme has mobilised various professions across the Group, as infrastructure had to be retrofitted to accommodate new rolling stock, while maintaining regular operations. Out of the numerous technical feats that the Group has accomplished is the interoperability between different charging terminals and bus models – the five electric bus models that RATP operates on behalf of Île-de-France Mobilités can now be charged at various charging terminals, regardless of their model.

## Projects to drive change

Extending and upgrading the Île-de-France regional public transport network entails numerous modifications, particularly in maintenance centre. The Group approaches the situation as an opportunity to restructure its industrial equipment, deploy ambitious real estate programmes, and renovate stations. In the process, the Group enhances its efficiency, while guaranteeing better city living.



Ateliers d'Italie maintenance centre project.

How does one even begin renovating a maintenance centre in the heart of the city? In Paris' 13<sup>th</sup> arrondissement, restructuring works at the Ateliers d'Italie maintenance centre, which was built in 1906, were launched in 2018. A hall had to be rebuilt at the centre to maintain rolling stock that used to service metro line 4, and which has been repurposed to run on metro line 6. Representative of RATP Group's real estate policy, this project has made it possible to develop the Group's industrial assets for the benefit of the city and its residents, by building 52 social housing units, and office buildings, including the metro line 6 operations control center (OCC). In the span of a few years, a 12,000-m<sup>2</sup> renovation project was completed, ensuring that it is architecturally aesthetic and incorporates greenery, to make the environment more pleasant for residents. These large-scale works were conducted while adapting to the constraints imposed by urban density, and by complying with the requirement to operate the metro line 6 maintenance center under normal conditions.



**Éric Fresquet,**  
Manager, Industrial  
Maintenance and  
Engineering Technical Unit

INSIGHT FROM THE EXPERT

"When new metro, tram, and RER rolling stock is delivered, and when transport lines are extended, RATP Group sees these events as opportunities to upgrade its industrial equipment. New maintenance centre have been built, in Mitry to cater to RER line B, in the Italie neighbourhood for metro line 6, at Saint-Ouen Docks and Morangis for metro line 14, and in Rosny – Bois-Perrier for metro line 11. Others are currently under construction in Massy for metro lines 12 and 13, and RER line B. They provide all our cutting-edge expertise and technologies: ergonomic workstations with height-adjustable walkways, maintenance operations using tablets and digital tools, among others. Legacy maintenance centre have also been upgraded. At our RER maintenance centre in Sucy-en-Brie, we have deployed bogie maintenance and production lines, and will proceed with a modern, innovative maintenance line for axles at a rate of six axles per round. A European first!"

## Our projects

Over  
**1 million**

square metres of commuter space in RATP-operated metro and RER stations in the Île-de-France region



## Renovating

high-ridership stations

The RER network, which comprises several lines that are major hubs in the Paris region, has seen a considerable increase in passenger volumes over the past few decades, notably on lines A and B. To guarantee optimal service quality, the Group has launched a station renovation programme designed to improve comfort, reception, accessibility, and safety. Following the example of Châtelet – Les Halles, the world's busiest underground station accommodating over 750,000 passengers daily, Auber and Charles de Gaulle – Étoile stations have been fully renovated. These works include waterproofing, new technical equipment, replacement of escalators, and the renovation of walls, floors and ceilings. Vincennes, Nanterre – Ville, La Croix de Berny and Robinson stations are also part of this programme.



T1

## 19 stations renovated

Prior to the replacement of tram line T1 trains, the 19 original stations on the route had to be renovated, constituting the first stage in the overall transformation of the line. Platforms were enlarged to make it easier for passengers to get on and off. New access paths, equipped with ramps, were installed at street level. Waiting areas were also refurbished to provide greater comfort. To allow traffic fluidity around stations, their surroundings and some intersections needed to be modified. And to keep tram line T1 operational, works were carried out on four stations at a time, which were located far from one another.



**Claire-Hélène Coux,**  
Deputy Director,  
Project Management division

INSIGHT FROM THE EXPERT

"Renovating stations as immense as Châtelet – Les Halles, Auber, and Charles de Gaulle – Étoile underground, requires highly specific expertise. The challenge of organising such a project is exciting, because traffic and emergency evacuation readiness has to be optimal at all times, meaning most works have to be conducted at night. It also involves guiding passengers to the correct corridors and escalators during the day. This is a frequent exercise that repeats itself according to the stations that need to be closed for works. Being able to renovate existing stations, yet maintaining service levels and guaranteeing overall safety, is rare expertise, given the traffic conditions and passenger volumes that we handle in the Île-de-France region."



# Guaranteeing a constant flow of information

Behind the scenes, information and driving systems are essential in keeping the network operational. As part of major projects to extend, automate or construct lines, RATP Group's expertise in information systems and telecommunications networks plays a crucial role.

As the nerve centre of metro lines, operations control centers (OCC) also have to be renovated. The metro line 14 OCC at Bercy station was restructured in 2016. Enhancements, such as the replacement of a video wall, upgraded operator equipment, and additional workstations, have improved service quality. The metro line 4 OCC was also renovated in preparation for the line's automation, while the metro line 11 extension called for the construction of a new OCC. The goal was to centralise the command and control of trains, shuttles, stations, terminuses, and in the case of metro line 14, maintenance. By coordinating teams and state-of-the-art technologies more efficiently, the network is able to broadcast more responsive passenger information, and improve incident management.



**Bertrand Lenoir,**  
Managing Director,  
RATP Connect

"Twenty-five years ago, the Group decided to promote its physical infrastructure, and expertise in fibre optics. The underground network, which was initially designed to enable the transmission of data that is essential to our role as a transport operator, very efficiently covers the regions through which it passes. One of our specific qualities is our ability to maintain this immense network. As an RATP Solutions Ville subsidiary, we open up 170,000 kilometres of optical fibre to operators, guaranteeing high-quality Internet access to their clients, who include our passengers, as well as organisations and local authorities."

INSIGHT FROM THE EXPERT



## INFORMATION, KEY TO HIGH SERVICE QUALITY

What passengers see: platform screen doors showing real-time traffic information, rolling stock with built-in digital displays to keep passengers informed at all times, and audiovisual systems along platforms,

and at various locations in stations. What they don't see: behind the custom-designed screens that meet the Group's requirements, lies the full potential of the fibre-optic networks and information systems that, together, provide passengers with dynamic, live information daily.



**Michel Cordival,**  
Director, Digital Technology  
and Industrial Systems,  
Digital and Innovation division

"When lines are undergoing extensions, or new rolling stock is set for commissioning, low-voltage operations such as ticket gates, ticket machines, surveillance cameras, telephone lines and intercoms, as well as telecommunications and industrial systems, have to be installed in advance and operational. Without them, no services could run! We are responsible for setting up Tetra, the radio network, which allows station staff and on-board staff to communicate with central command posts. We fit antennas in tunnels, connect cables, and install ergonomic workstations in OCCs, to ensure that communications regarding operations, which are essential for the staff involved, can be transmitted effectively."

INSIGHT FROM THE EXPERT



Regulation Supervisor, metro line 14 OCC.

# Engaging with our stakeholders

## Building together with local authorities and our partners

As a trusted regional name, the Group fits perfectly into its ecosystem, adapting its solutions and actions to the given context.

Regardless of its role in project organisation, RATP Group efficiently coordinates with the various stakeholders involved. The metro line 14 extension to Orly Airport is an ideal illustration of the Group's skilful coordination. Connecting metro line 14 to metro line 15 on the future Grand Paris Express network, by tunnelling under the airport's runways, required close cooperation between teams from Société des Grands Projets, Aéroports de Paris and Île-de-France Mobilités. The Group also relies daily on two regional agencies managed by its Public Affairs and International Relations division. For instance, as part of the metro line 11 extension project, the regional agency facilitated deeper engagement with elected representatives and technical teams, in order to reach the necessary agreements that would allow works to proceed. The Group also draws strength from its ability to foster relationships of trust with urban mobility transport authorities, and the multiple organisations funding the Group's projects, notably the departmental council, the Île-de-France regional council, the French government, and the European Commission. By regularly monitoring cost and schedules, the Group provides these bodies with accurate reporting that eases their decision-making process.



**François Warnier de Wailly,**  
Director, Bus2025 programme

INSIGHT FROM THE EXPERT

"During the COP21, the Group sought to devise a solution that would facilitate the urban energy transition. This led to the launch of Bus2025, a programme of unprecedented magnitude in Europe, aimed at creating cities with less traffic, generating less greenhouse gas emissions in the process. A trend-setter in its early days ten years ago, the project is now a global benchmark in mass energy transition. The highly ambitious initial vision has since produced tangible results through our ability to conduct wide-scale trials to confirm the feasibility of the model, before making it available. Many cities and urban communities come to us today for advice."



**David Courteille,**  
Technical Director,  
Operational Asset Management  
division, RATP Infrastructures

INSIGHT FROM THE EXPERT

"We led a large-scale operation in Massy, in joint project ownership with SNCF Réseau, to replace the century-old Chartres and Gallardon bridges, and to design their replacements. To achieve this, we established several agreements to conduct these highly complex works together, and to coordinate their operational and strategic management, particularly in monitoring financial goals. This allowed us to pool our respective areas of expertise: SNCF Réseau in designing engineering structures, and RATP Group in managing complex projects that require the suspension of rail operations, as well as the ability to provide replacement services to carry a large volume of passengers. We have also worked together with elected representatives to reach constructive solutions that meet stakeholder expectations. For instance, we prepared the ramps on either side of one of the bridges so that the ramps can later serve the city's project to extend its green belt."



Replacement of the Chartres and Gallardon bridges.



**Tung Nguyen,**  
Project Management Supervisor,  
Paris Rive Gauche (left bank)  
Region, SNCF Réseau

INSIGHT FROM THE EXPERT

"As the bridges to be replaced were rather close to each other, in 2015, SNCF Réseau and RATP Group reached a collaboration agreement. Both project owners conferred in order to establish a single governance, share decision-making processes, and guarantee smooth coordination. It became apparent that a high-capacity crane was required, as it would reduce the impact on rail operations. The constructive talks between our experts, and the emulation inspired by the complexity of the project were the secrets to the success of our joint project."

Replacement of the Chartres and Gallardon bridges.





# Guaranteeing service continuity

When exceptional works have to be conducted on extremely busy lines, RATP Group makes it a priority to keep service standards high. To prevent passengers' commutes from being adversely affected in any way, the Group systematically deploys the know-how it has acquired in service continuity.

Every day, system and infrastructure maintenance operations are conducted at night, leaving no impact on passenger service. In large-scale projects, schedules are established with the same goal of limiting impact on passengers. When replacement services or alternative itineraries are provided, the accompanying passenger information has to encourage network users to plan ahead and adapt their journeys. This is why the Bus2025 programme required a specific type of organisation to maintain passenger service levels while numerous operational centre were simultaneously being renovated. Based on the concentration of passenger volumes, the Group has reassigned affected bus routes to other bus depots, thereby requiring driver rosters to be completely reorganised.



RER line B replacement bus service.



**Farida Omari,**  
Operations Director, Metro  
line 4 extension and automation

INSIGHT FROM THE EXPERT

“The greatest demonstration of our prowess was the successful automation and upgrade of a line that was over a century old, without any major service disruption, providing passengers with a public transport service that meets the highest 21st-century standards. Such a technological feat called on the unique expertise that RATP Group and its teams offer. The expertise is not only technical and operational, but also covers seamless integration. RATP stakeholders and subcontractors have shown their deep commitment to keeping the line in operation. The major works that were conducted and consolidated included replacing legacy rail infrastructure installations, raising and reinforcing station platforms, installing platform screen doors, building a new OCC, among other works. At the same time, following the line extension to Bagneux – Lucie Aubrac station, passengers can now reach the city center in under fifteen minutes.”

## COMMUNICATING AT EVERY STEP

Conducting works in a dense urban environment effectively requires passengers, road users, pedestrians and drivers to change their routines. Such works may also generate pollution. RATP Group makes it a priority to minimise the various impacts

on daily life. This is why the Group has systematically adopted an explanatory communication approach, which aims to keep passengers informed during works. Detailed signage, information media, more front-line staff, and adapted passenger information are therefore deployed while works are in progress.



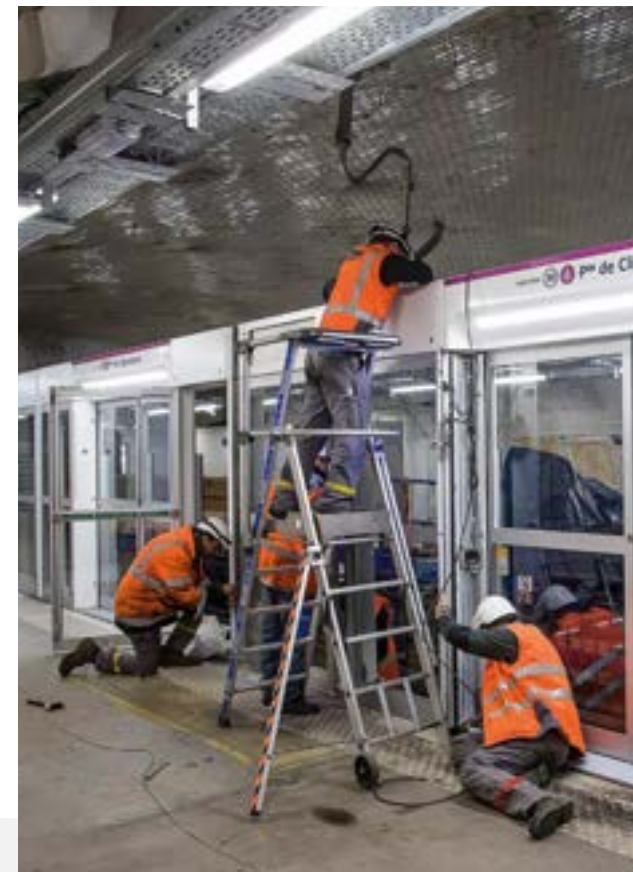
Passenger-oriented communication during metro line 4 extension and automation works.



**Nicolas Le Floch,**  
Director for Strategy,  
RATP Cap Île-de-France

INSIGHT FROM THE EXPERT

“When the Group leads projects that require temporary traffic suspensions, our subsidiary RATP Cap Expertises quantifies, determines, and organises replacement services. Our thorough knowledge of the Île-de-France region, combined with our insight on temporary traffic suspensions, and our expertise as an operator, allow us to offer passengers the most adapted solutions, while guaranteeing dynamic operations. We engage continuously with local authorities, ensuring that regular lines in the vicinity stay informed. We also make efforts to operate in harmony with the urban environment, to avoid congesting other networks, and inconveniencing road users. Such expertise is also demonstrated during exceptionally large events, during which we coordinate transport plans to shuttle participants between event venues and the formal network.”



Installation of platform screen doors on metro line 4.

# Keeping regional ambitions alive across the globe

Through its presence on five continents, RATP Group is one of the rare few operators to be equally at ease with operations and maintenance, as well as project management, on all modes. This unique asset makes the Group particularly attractive to transport authorities both in France and abroad, which call on its unique expertise in network operation and consultancy.

Whether regions seek consultancy on network design, the acquisition of new systems, or line operations, the Group advises them according to their needs and specific characteristics. RATP Group efficiently mobilizes its in-house experts, backed by its extensive experience in the Île-de-France region and a constant drive for innovation, enabling clients to benefit from its expertise. The city of Angers in France entrusted RATP Dev with the management of its transport network, which has been boosted following the commissioning of two new tram lines, and the expansion of a greener bus network. In Casablanca, Morocco, where



Angers tramway



**Jacquou Trouillard,**  
Administrator of Operator Rolling Stock and Maintenance, Stabling, OCC, Sydney Metro Airport, RATP Dev

INSIGHT FROM THE EXPERT

“Together with Sydney Metro, which will open a strategic automated metro line at the end of 2026 or the beginning of 2027, my role is to oversee all aspects of procuring and maintaining future rolling stock, the logistics of train depots and parking areas, as well as the line’s command post, and maintenance and administrative buildings. We assess the proposed design submitted by the metro manufacturer, by ensuring that it meets the operational expectations that are not always expressed in the transport authority’s specifications. For instance, we have requested the addition of lateral windows to the emergency driver’s cabin, which drivers absolutely need when trains switch to manual driving. We review each design stage to guarantee that it would not generate constraints in the future. Our strength lies in our ability to detect these issues. Vendor partners and the transport authority heed our advice, as it is grounded in both theory and practice!”



Casablanca tram network.

**Over 780**

**cities** worldwide have placed their trust in RATP Group

## ALLIED IN AUTOMATION

The city of Belgrade, Serbia, is set to inaugurate an ambitious project: commissioning three metro lines, stretching over a distance of 69 kilometres, serving just as many stations. Since 2022, it has been relying on the Group’s expertise to design

solutions meeting the highest standards. RATP Dev teams support strategic choices, and draw attention to the challenges involved in operating and maintaining an automated system, while prioritising the passenger experience and eco-friendliness, and optimising the life cycle of installations.

RATP Dev has been operating the tram network since 2012, contributing to the city’s revitalization through the extension of the first line, the opening of a second line in 2019, and the commissioning of two new lines in 2024. These developments represent a total of 25 kilometres and 40 additional stations served, putting essential services within reach of residents throughout the city. In Cairo, Egypt, RATP Dev has taken over the operation and maintenance of metro line 3. In line with the goals of the local transport authority, RATP Dev provides a high-end service on the line, which is currently being extended, guaranteeing punctuality, service frequency, quality and expertise in asset maintenance, and top-level customer service. As of January 2025, RATP Dev will advise SYTRAL Mobilités on managing and operating the metro, tram, and river shuttle networks in the Lyon urban area. Together with TCL network specialists, RATP Dev will oversee the major modifications commissioned by SYTRAL Mobilités, notably the project to automate metro line A, upgrade metro lines C and D, commission tram lines T9 and T10, and extend tram line T6.



Cairo metro.



## Relying on partner experts

To maintain its lead in the urban mobility sector, RATP Group surrounds itself with the best partners. Benefiting from its industry-wide vision and experience across the entire value chain, the Group coordinates its partners' operations, and challenges their innovations to achieve the highest standards.

The success of Group-led monumental projects is the result of both its in-house skills, and its ability to collaborate with the industry's best partners. Coordinating these assets is a feat in itself, involving the evaluation and integration of various parties into complex schedules. As such, when the opening date of the metro line 14 extension was brought forward, the Group effortlessly mobilised its project owner partners and rescheduled operations, while keeping to agreed budgets and time frames. The challenge was further complicated by a worldwide health crisis that notably created issues in the raw material supply chain. On metro line 11, RATP Group relied on its in-house project management division to build the transport system (railways, signage, and power supply), while outsourcing miscellaneous works on roads and networks. Another of the Group's strengths stems from the long-term relationship that it has forged with external partners. RATP Group relied on the mobilisation of major electricity suppliers EDF, Enedis, GRT Gaz, and GRDF to connect its 25 operational bus depots to the gas and electricity networks as part of the Bus2025 programme, meeting ambitious project timeline. Fruitful discussions were also held with Siemens and Alstom: the Group was able to leverage its expertise as a transport operator and maintenance provider to perfect their rolling stock.



Digital representation of a maintenance centre, simulating a maintenance operation on the upper section of the train.



### SMART CHARGING, INNOVATING FOR A LOW-CARBON FUTURE

The technology behind smart charging makes it possible to charge a fleet of buses when electricity costs the lowest, and generates the least CO<sub>2</sub>. Today, this state-of-the-art system has been installed in four bus depots across the Île-de-France region – Corentin, Les Lilas, Malakoff and Lagny.

### INNOVATING FOR SUSTAINABLE MAINTENANCE

Major projects led by RATP Group benefit from its approach to continuous innovation. Notably, this approach applies to maintenance, which will play a greater role in the decades to come. Anticipating breakdowns, and limiting their impact, are some of the key goals of predictive maintenance. Data gathered from sensors that are embedded on trains

and tracks now allow the Group to continuously monitor the operational status of its assets. By analysing such data, breakdowns can be anticipated, indicating exactly how and when to conduct repairs. Efficiency in maintenance is also enhanced by virtual reality: the Group uses cutting-edge technology to simulate maintenance operations, through digital representations of trains and maintenance centre.

In the future, maintenance operators will be equipped with augmented reality glasses, which will provide them with instructions from a remotely connected expert guiding them through their operations. To provide relief to maintenance operators who adopt uncomfortable positions as part of their duties, RATP Group has recently equipped 12 maintenance centre with 140 latest-generation exoskeletons for 300 employees, in a European first.



Éric Mévellec,  
Dreev Chief Executive Officer,  
EDF Group

"Discussions between RATP Group and Dreev began five years ago, when Dreev was newly created. Very quickly, both companies realised that they shared the same values regarding operational efficiency, and leading by example in their efforts to combat climate change. During a phased electrification process, which presented its own challenges, I was impressed by the commitment and agility with which RATP Group teams adopted this new technology to make it an everyday tool. While initially cautious, they systematically equipped four bus depots, thereby demonstrating the efficiency of the technology, in reducing both emissions, and electricity costs."

# Rising to challenges of the future

The Group has long been committed to a strict approach to corporate social and environmental responsibility, in which its major projects are seen as opportunities for change, to create more resilient cities.

## RAISING ENVIRONMENTAL REQUIREMENTS

In the future, networks that have to be operated and maintained will become far more extensive, and more vulnerable to the higher environmental risks that cities encounter. To counter these issues, the Group is increasing its ability to take on major projects by factoring in environmental considerations at every level. This commitment is evident in the large-scale initiative to introduce greenery across the Group's properties, which not only introduces nature back into the city, but, more crucially, chooses plant species that consume less water, such as the grass on tram line T3b platforms. Water consumption is also targeted by an ambitious water plan, which is currently being rolled out. Given the increasing frequency of droughts, the Group has decided to act on various fronts, by optimising consumption, and recovering and reusing non-potable water. Works carried out on the tram line T3b extension precisely meet these goals, and include the installation of open-ground drainage trenches to collect run-off water, and redirect it into the ground instead of the wastewater system. Furthermore, sprinkler systems used together with subirrigation, make it possible to repurpose mine water.



Green roofs at Ateliers Vaugirard maintenance centre project.

## LEADING PROJECTS WHILE PRESERVING REGIONAL IDENTITY

Through meticulous scheduling and the adoption of methods aimed at minimizing noise, vibration, and dust pollution, RATP Group ensures that its worksites – whether on its own properties or as part of major projects – minimize their impact on local residents. RATP is also invested in recycling building materials. Currently, 70% of construction site waste is recycled.



**Pierre Florent,**  
Operations Director,  
Metro line 11 extension,  
Project Management division

INSIGHT FROM THE EXPERT

“The Group has set very high CSR standards. During the metro line 11 extension, we had indicated in our specifications that 800,000 tonnes of excavated earth had to be safely stored and recycled. From a social point of view, workforce integration clauses that we impose on our project managers have resulted in numerous hires, some of which were career switches or permanent contracts, in a region that has a very high unemployment rate.”

## FOSTERING WORKFORCE INTEGRATION

Major works led by RATP Group serve as platforms for integrating local workforces into the regions involved. Workforce integration clauses are systematically included in all project management contracts. For instance, the recent southward extension of metro line 14, generated 460,000 workforce integration hours. RATP Group relies on regional facilitators, who mobilise local employment stakeholders. The Group works together with these facilitators to encourage contracting companies to promote long-term employment, upskilling, training and the development of workforce integration programmes. In Cairo, Egypt, where RATP Dev operates metro line 3, the subsidiary hires and trains local staff, and increases female representation in its workforce, notably in driver positions. The goals of RATP Group Foundation are also in line with this ambition, as it supports initiatives that target people who have been excluded from the workforce, to facilitate their return to the workforce.

Metro line 14 southern extension work site.



**2.6 ha**  
of RATP Group-owned  
real estate  
incorporate greenery

**4.4 million**  
workforce integration hours  
completed since 2011  
through RATP purchases

**Over 2,300**  
people hired locally  
in Riyadh



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