

STRATEGIC SITES WITH A VARIETY OF FUNCTIONS

The industrial sites include Maintenance and Storage Sites (MSS), Infrastructure Maintenance Sites (IMS) and Train Troubleshooting Centres (TTC) which are spread over large land holdings. By pooling their operating arrangements, some sites will also host the Centralised Command and Control stations (CCS) for the network's future lines.

Maintenance and Storage Sites (MSS)



The MSS is where the network's rolling stock is serviced, maintained, repaired and stored. It is also a reception area for the planned automated metro trains.

To enable it to fulfil its role, an MSS comprises different functional units, such as:

- ▶ maintenance shop;
- ▶ storage area;
- ▶ cleaning area;
- ▶ administrative and social facilities for day and night staff;
- ▶ parking and access areas for staff and visitors.

Infrastructure Maintenance Sites (IMS)



The IMS is designed to provide the whole package of corrective and preventive industrial maintenance arrangements for the metro network's equipment, (track, engineering structures, power distribution, etc.)

It is tasked with ensuring the maintenance of infrastructure, including:

- ▶ track;
- ▶ transforming and distributing electricity;
- ▶ transport operation;
- ▶ station equipment;
- ▶ aspects of structural engineering;
- ▶ maintenance vehicles and work trains.

Centralised Command Stations (CCS)



The CCS is the place through which all information relating to the operation of the transport line, (switching, management, energy, passenger traffic, etc.) passes. It is the nerve centre of the line where real-time operational data converges. It has the distinction of operating 7 days a week, 24 hours a day.

The CCS carries out the following roles::

- ▶ command of all train traffic (passenger and maintenance);
- ▶ real-time traffic monitoring;
- ▶ traffic management and "return to normal" following any incident;
- ▶ optimising the quality of the daily service provided to passengers.

Train Troubleshooting Centres (TTC)



The TTC carries out, on a smaller scale than the MSS, light maintenance operations on the rolling stock. It includes pit-lanes, a small workshop and social facilities.



TECHNICAL AND ECONOMIC HUBS

The industrial sites of the Grand Paris Express are, above all, workplaces and as such should help to optimise general conditions of use and activity as regards workplace productivity, safety, welfare and accessibility.

The design of the industrial sites of the Grand Paris Express therefore focuses on worker comfort and improving the environment for maintenance operatives.

Thanks to the large number of jobs it creates, every industrial site of the Grand Paris Express will be a major technical and economic hub, dovetailing with the maintenance sector throughout the Île-de-France. Each will also generate induced employment in administration, logistics, catering, security, etc.

The industrial sites of the Grand Paris Express will rise to the technological performance challenge. The innovative industrial procedure that train automation provides will limit rolling stock downtime and maintain supply flows and access to technical components.

Enhanced by their architecture, the industrial sites of the Grand Paris Express will showcase technological excellence and innovation.



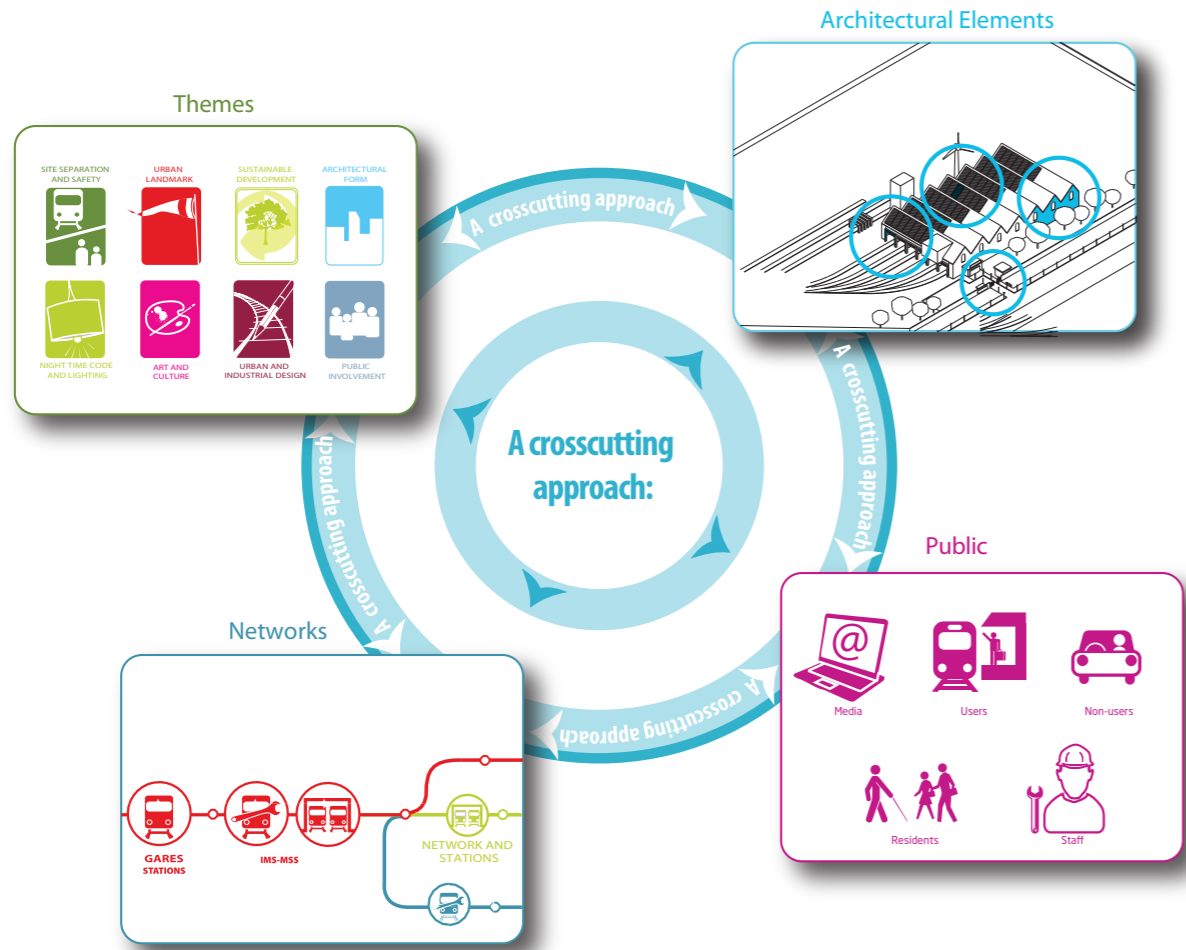
The six challenges facing the industrial sites:

- **Ensure transport provision**, i.e. ensure the availability, reliability and safety of rolling stock and meet expected levels of service.
 - **Integrate and optimise maintenance procedures** for the automatic metro system, in particular by means of an industrial procedure that can limit rolling stock downtime and maintain supply flows.
 - **Ensure conditions are in place to enable various types of trades** to operate securely and produce high quality work, with a continuing focus on well-being and skills development.
 - **Guarantee accessibility and security for all stakeholders**, whether operatives, visitors, etc.
 - **Ensure the industrial site sits well with its urban landscape and reflects the architectural quality** of its environment, keeping any inconvenience for residents to a minimum.
 - **Adopting a comprehensive environmental approach** to the architectural design by optimising natural inputs, controlling emissions, using low impact materials, waste management, etc.
- Going forward, the industrial sites of the Grand Paris Express will be emblematic of a qualitative approach to employment and industrial activity in Ile-de-France.**

The future T7 tram line, MSS in Vitry-sur-Seine (France).



A BESPOKE APPROACH FOR THE INDUSTRIAL SITES OF THE GRAND PARIS EXPRESS



A multidisciplinary approach

Given the multiplicity of challenges facing the industrial sites of the Grand Paris Express, the Société du Grand Paris has taken a multifaceted approach to each project.

This approach starts by looking for potential sites, conducting feasibility studies and developing site-specific programmes that take account of the characteristics of the site, the type of activities that will be performed there and any constraints that are specific to the area.

Each industrial site will then be designed by a specific contractor who will combine technical and architectural design and incorporate considerations such as ergonomics and sustainable development.

Two crosscutting codes have been drawn up, guaranteeing overall consistency for the sites: an architectural, urban design and landscape code for the industrial sites, and a signage code.

A multi-stakeholder approach

Exploitation and management of the industrial sites will be entrusted:

- ▶ for maintenance and storage sites (MSS), train troubleshooting centres (TTC) and centralised command stations (CCS): to an operator designated by STIF – the transport authority in Ile-de-France – during the project implementation phase, following a call for tenders;
- ▶ for infrastructure maintenance sites (IMS): to RATP – the technical project manager – in accordance with Article 20 of the Grand Paris Law (2010-597) of 3 June 2010.

RFF and SNCF are also involved in exploring the options for connecting the IMS to the national rail network, which will be necessary in order to route work trains into the Grand Paris Express network.

Local stakeholders, (regional and municipal authorities, public development institutions etc.), are of course closely involved throughout the project design and implementation phases.



Mulhouse tram maintenance workshop (France), DLRW Architects.

MAINTENANCE ESSENTIALS No. 1

Industrial sites of the Grand Paris Express Ensuring a high quality transport service

The Grand Paris Express will soon provide a new public transport network with more than 200 automatic trains covering the 200 kilometres of track between its stations every day. Its associated industrial sites, operating alongside the network, ensure that the line can operate properly and guarantee the long-term viability of the service. They host the activities that are essential to maintaining the quality, cleanliness and safety of rolling stock and infrastructure. Consequently, they will be delivered about a year before the first sections of the Grand Paris Express are commissioned.

The industrial sites exemplify the ambitions of the Société du Grand Paris in terms of innovation, sustainable development and cost control and will underpin the technological challenge involved in

delivering a high quality maintenance service. They will be at the heart of this industrial innovation.

Thanks to these new industrial sites located throughout the Paris region, the Société du Grand Paris will also be in a position to support the development of the neighbouring areas by creating highly skilled technological activities and more than 1,000 direct jobs. Designed in concert with the local authorities, these future industrial sites will also be catalysts for urban development.

The industrial sites of the Grand Paris Express will, over time, provide over

1,000 direct job vacancies.