

SYSTRA SOLUTIONS

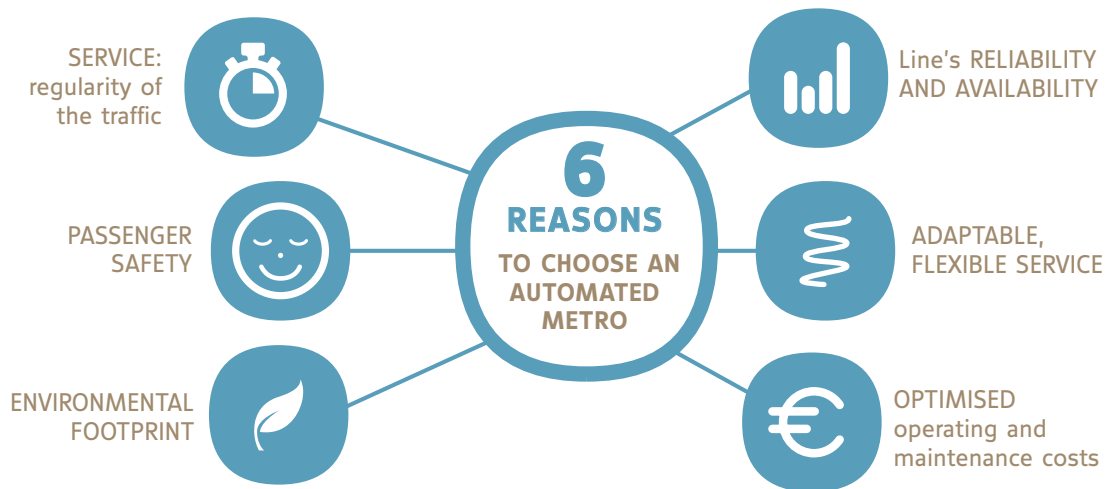


The partner you can
trust to build your
AUTOMATED METRO

AUTOMATED METRO

A SUSTAINABLE SOLUTION FOR RESPONSIBLE URBAN MOBILITY

A transport mode to meet the escalating needs for efficient urban transport, to serve growing cities and help reducing atmospheric pollution.



A CLASSIFICATION OF AUTOMATED METROS

GRADE OF AUTOMATION	GoA1	GoA2	GoA3	GoA4
SYSTEMS	Automatic Train Protection	Automatic Train Protection + Automatic Train Operation	Automatic Train Protection Automatic Train Operation + Automated track supervision system	Automatic Train Protection Automatic Train Operation Automated track supervision system + Automated door management
TRACTION	Driver	Automatic	Automatic	Automatic
BRAKES	Driver	Automatic	Automatic	Automatic
DOOR CLOSING	Driver	Driver	On-board staff	Automatic
INCIDENT MANAGEMENT	Driver	Driver	On-board staff	Automatic



For your
AUTOMATED METRO
CHOOSE SYSTRA
 AND GET THE BEST

50% of automated metros under construction, the world over

60 years' experience on successful projects.

100% MASS TRANSIT & RAIL

Projects in **100** CITIES OF 1,000,000+ INHABITANTS

80 COUNTRIES with operational presence

A dedicated centre of excellence
 An international technical network

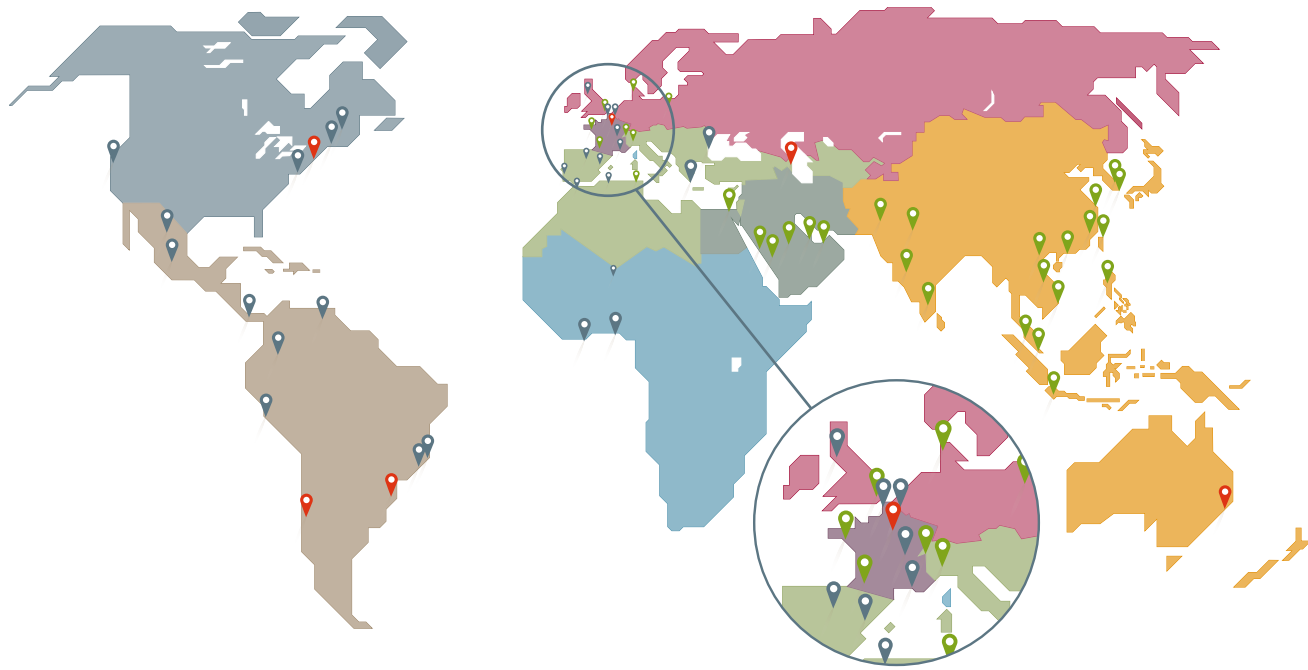
PROVEN, CERTIFIED TRANSPORT integration processes using IEEE 1474 AND IEC 62290 as references

Photo credit: Dubai ©SYSTRA

Paris, Dubai, Doha, Santiago, London, New-York, Sydney, Shanghai, Riyadh, Lyon, Brussels, ...

For 60 years, SYSTRA have been engineering unrivalled and solutions based on a comprehensive knowledge of components - this has resulted in SYSTRA having reputation as one of the major designers of automated metros.

All over the world, our Group is designing **one of every two automated metros**. SYSTRA relies on an organisation based on close client relations and efficient service, to meet a growing world demand, while respecting specific local conditions.



Upgrade of existing lines

Upgraded and new lines

New lines



Photo credit: ©SYSTRA - Paris ligne 14

SOLUTIONS INTEGRATOR

WE TURN YOUR VISION INTO PROGRAMMES, MADE OF PERFECTLY CONTROLLED STAGES THAT COMPLY WITH ALL OF YOUR CONSTRAINTS AND NEEDS.

Thanks to our experience gained on emblematic international projects and the world's most heavily used networks, our staff have the technical expertise to propose the most original and practical solutions, while respecting international standards and your local environmental and safety requirements.



1

SPECIFYING A TECHNICAL SOLUTION

In order to combine capacity, comfort, safety and optimised operating costs, our experts help you defining your transportation system.

- Stations: sizing, platform screen doors
- Rolling stock: capacity, speed, braking performance, comfort.
- Technical installations: track alignment, locating the depot.
- Signalling: signalling types, grade of automation, headway, supervision.

2

MANAGING YOUR PROJECT TO MEET YOUR SCHEDULE AND BUDGET

From initial studies to construction, testing and operating, SYSTRA deploys proven skills at every stage of the infrastructure lifecycle. This places SYSTRA apart from every other engineering company in the world.

3

MANAGING INTERFACES

Transportation systems often involve complex, multi-disciplinary issues. Efficient project management depends on complete control of internal and external interfaces. SYSTRA face the challenge and propose a trustworthy systems integration strategy, so that you can concentrate on managing your project.

4

SUPERVISING CONSTRUCTION AND TESTING

This crucial phase needs to be scheduled, right from the start of your project, it requires meticulous coordination. Our experts are on hand to help you prepare and carry it out.

5

GUARANTEEING RELIABLE OPERATING

Every day, our guiding principle is to deliver technical excellence, particularly safety, to our customers throughout the world. Our experts guarantee that every transportation system delivers the required level of safety.

SYSTRA +

- **THINK GLOBALLY, work pragmatically:** this means taking all present and future issues into consideration to provide a robust, original and competitive solution.
- **INTEGRATE OPERATING AND MAINTENANCE CONDITIONS,** right from the start of design.
- **COMBINE extensions** to existing lines with pioneering new lines, into an effective network.
- **APPLY THE LATEST TECHNOLOGY TO YOUR PROJECTS,** to cater for extreme operating conditions, and scrupulously respect your deadlines and budget.
- **GIVE INDEPENDENT ADVICE** on the best industrial solutions

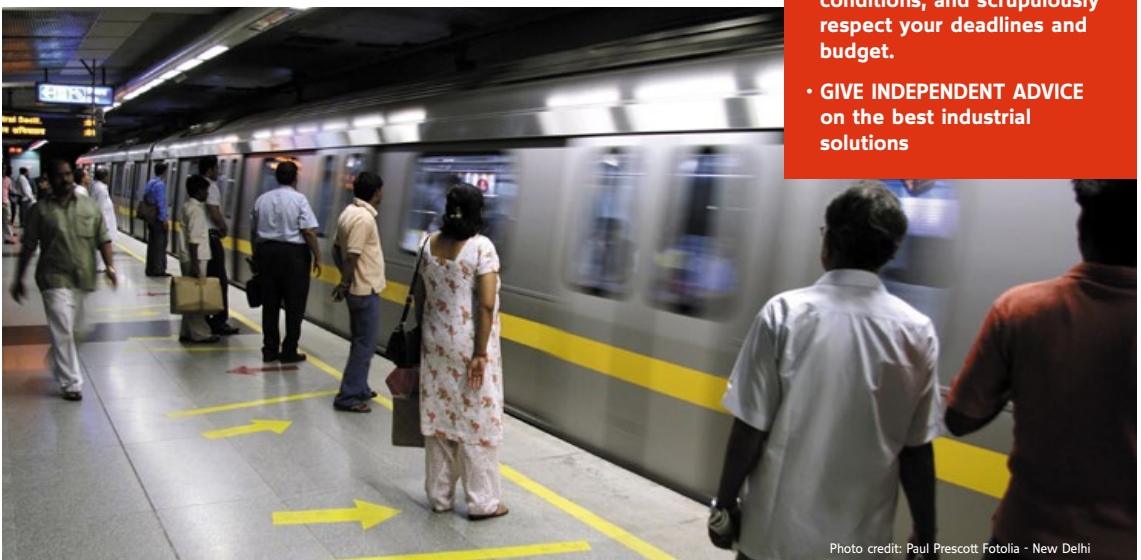


Photo credit: Paul Prescott: Fotolia - New Delhi

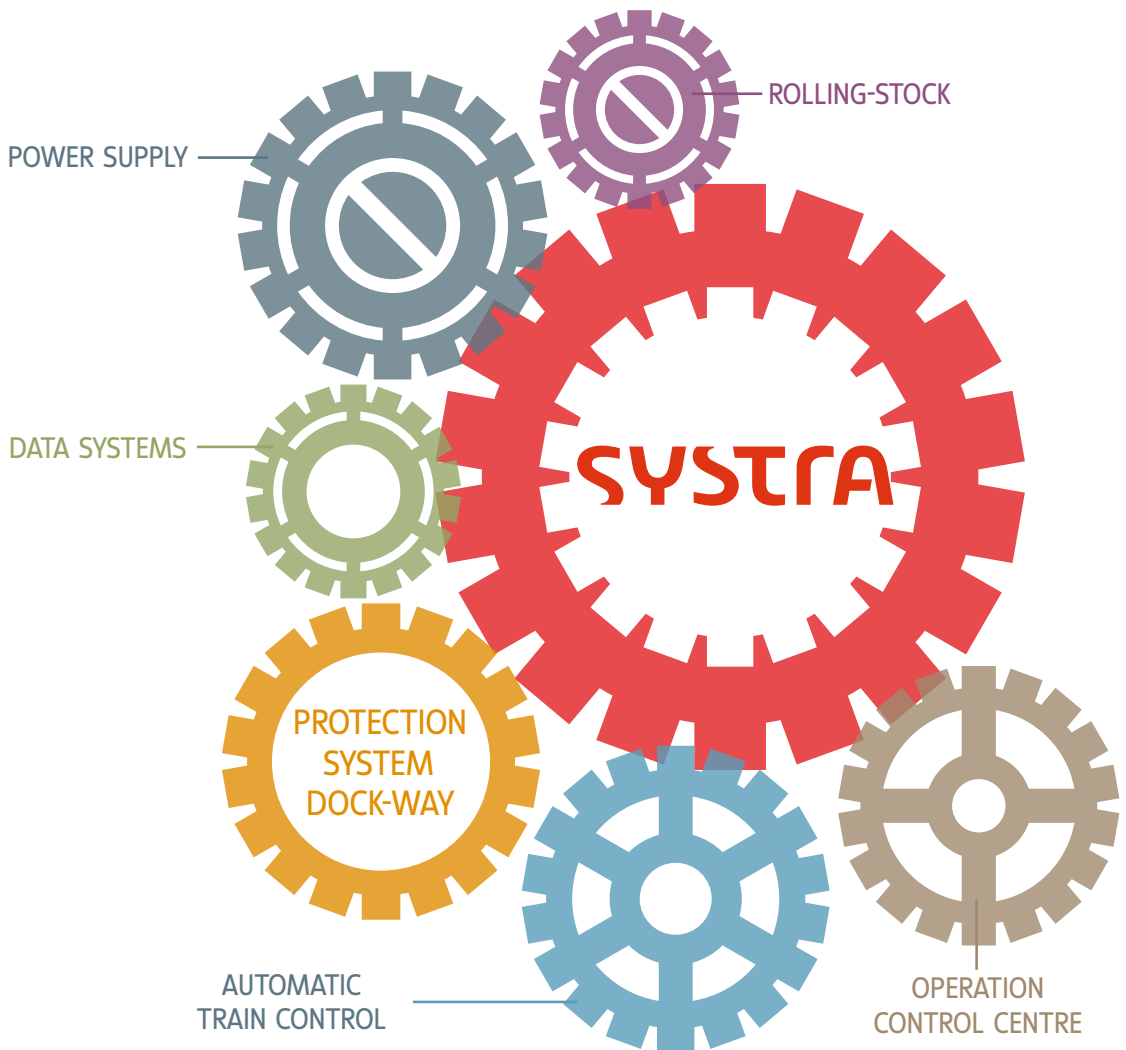


ZOOM

Photo credit: Seong Joon Cho CAPA Pictures - Busan

INTEGRATION OF A TRANSPORTATION SYSTEM

Only the people with in-depth knowledge of operating requirements and principles, the characteristics of different components, along with the strategies for integrating and commissioning them, can offer the client the most relevant solutions. SYSTRA's teams of experts have worked on automated metro projects the world over, so they are familiar with the different product lines proposed by manufacturers. This is what gives SYSTRA a unique capability to assemble and integrate solutions for new or renovated lines.



WE RELY ON EXPERTISE IN ANY TECHNICAL FIELD

SYSTRA deliver solutions suited to your local conditions, present and future, based on our market knowledge, our experience of major projects worldwide, and our knowledge of any industrial player.

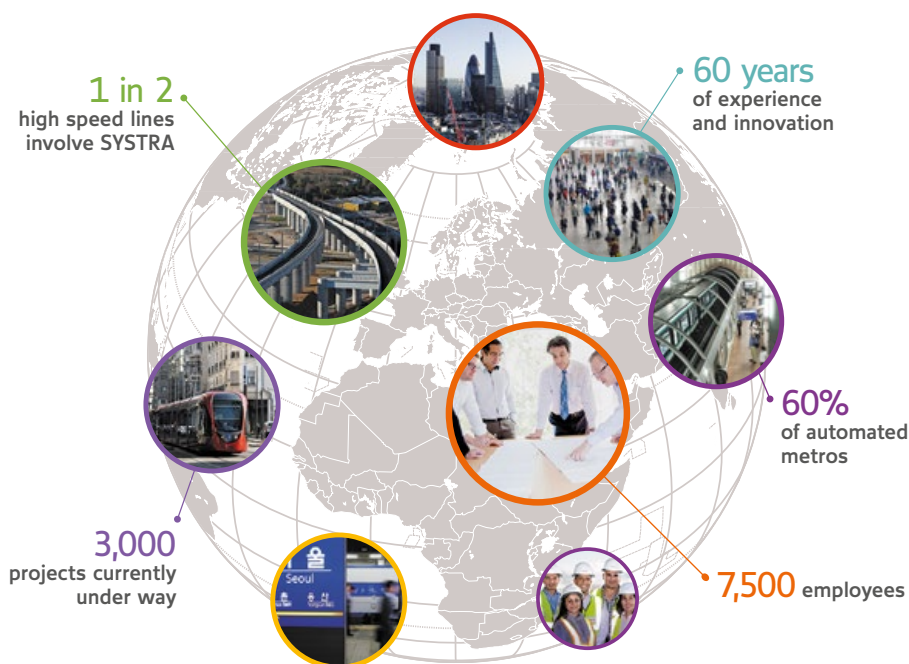
Managing the integration of the transportation system

Processes	Systems' specification and design	Interfaces	Testing and installation on site	Safety assurance
Requirements management	Operation and Maintenance Engineering	Interface management	Site testing	Systems' safety
Configuration management	Transportation System Functions & Performance		Managing and monitoring failures	Reliability, Availability, Maintainability
Management of technical data	Systems' architecture		Trial Operation Management	Cyber-Security
Verification & Validation strategy	Migration strategy		Training management	Security of people
	Noise & Vibrations		Handover to Client	User interfaces and human factors
	Electro-magnetic compatibility, Electro magnetic interferences		Performance monitoring	Independent Safety Assessor
	Earthing Bonding principles			



CONFIDENCE MOVES THE WORLD

The Group assists growing towns and regions that need reliable, fast, clean transport systems, to make a lasting improvement to their residents' living standards.



SYSTRA SA, French limited company with a European Board and a Supervisory Board, Share capital: 33 302 018 Euros, Incorporated under N° 387 949 530 RCS Paris - Photo credits © SYSTRA - 10/2021

72, rue Henry Farman
75015 Paris - France
Tel. + 33 1 40 16 61 00
contact@systra.com
systra.com

SYSTRA