

SYSTRA

SIGNED UP FOR SUSTAINABLE MOBILITY

2019 ACTIVITY REPORT



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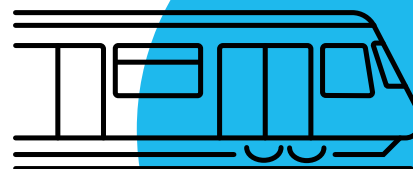
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MESSAGE FROM THE MANAGEMENT

LOOKING AHEAD



“To bring about transport solutions that are meaningful for our era and the one ahead, it is urgent to think long term.”

PIERRE VERZAT

CHIEF EXECUTIVE OFFICER

▼

Sustainable mobility is not just another engineering challenge or equation to solve. It's a challenge that mobilises the qualities we have spent sixty years developing: expertise, innovation, and conviction. It's about responding to an emergency that forces us to think long term. How do we design solutions today that will serve the world tomorrow?

Climate change tests our ability to adapt our proven methods and to invent new ones. Cities everywhere are growing and with this come transport issues. We know how to answer these challenges. We have always sensed the usefulness of our projects, serving the needs of our clients and with them, the needs of their communities. The Covid-19

crisis raises the level of urgency and challenges us to think of virtuous systems able to answer the most immediate needs without jeopardising the development capacity of future generations. By serving our clients and always going further in the sustainable character of our proposals in every respect, we are developing our usefulness to society. Our projects are meaningful because those who undertake them believe in having a positive influence on the lives of millions of people. To achieve such an impact, we need to know how to respond to all the challenges of our age and to anticipate, with our partners, those of the coming decades. What do our clients want today? They want us to help them sustainably support the densification of their territory, planning the intermodality of cities,

to optimise management of their infrastructure, with ever higher levels of safety. In short, we need to deliver solutions that support their goals of resilience and give them the means to ensure a better future for their fellow citizens. We have made ecodesign a major lever within our consulting and engineering offer, a dynamic and changing objective, always at the forefront of needs, enabling us to stay one step ahead. The expectation of excellence is the essence of SYSTRA's signature. It can only be credible if it is in step with its time. The period we are going through reinforces the need to reconcile responses suited to the present while building a sustainable future. In 2020, we are as committed as ever as an actor of change.

PIERRE IZARD

DIRECTOR OF TECHNOLOGIES, INNOVATION
& GROUP PROJECTS OF SNCF, VICE CHAIRMAN
OF SUPERVISORY BOARD*



*Pierre Izard left the Supervisory Board on 26 March 2020.

Climate change remains a major challenge for the entire planet. It is opportune that our guided transport modes are in pole position to provide solutions. We should therefore dare to aim for the total greening of transport system operations. This is the chance for SYSTRA to show that increasing mobility is not at odds with saving the planet. Our clients constantly expect more: more trains in places where networks are already congested, more quality of service, more safety. The recent health crisis reminds us of this. All these goals seem unattainable if we content ourselves with transposing today's methods. Fortunately, we have at our disposal a broad range of technologies that we should put to full use to tackle ever more ambitious challenges.

JEAN-YVES LECLERCQ

CHIEF FINANCIAL OFFICER OF RATP GROUP,
CHAIRMAN OF SUPERVISORY BOARD



MESSAGES FROM THE SUPERVISORY BOARD

EVA RUDIN

INDEPENDENT MEMBER
OF SUPERVISORY BOARD

SYSTRA has a tremendous opportunity, through its original profession, to contribute to sustainable development. We should make ecodesign a real point of differentiation, and convince clients to go in this direction, by helping write specifications to move markets towards the solutions we know to be right. But sustainable development at SYSTRA covers many other subjects, and notably the diversity of its teams. Its human resources policy must continue to offer opportunities to all and encourage this blend that makes us strong. In this light, I warmly welcome the Women@SYSTRA initiative, which I find excellent, and which I support within the Appointments and Remuneration Committee, while continuing to watch over the improvement of male-female equality in the company.



In 2019, the company proved its resilience in a difficult context marked by the freezing of the HS2 project. It sought to further improve the fundamentals, while demonstrating remarkable success in order intake beyond set goals. The Supervisory Board encouraged the Executive Board to propose a growth trajectory for coming years that would be even more ambitious than imagined till now, to make SYSTRA an uncontested leader in transport engineering in each of its key countries, via a strategy combining acceleration of current growth in base activities, development of new innovative services, and external growth operations. This strategy was successfully initiated in 2019 and will actively continue in 2020, even if the Covid-19 crisis will likely oblige a temporary pause. I have great confidence in the future and fundamentals of SYSTRA.

BUSINESS MODEL

CREATING SUSTAINABLE VALUE

MOBILISING OUR RESOURCES

TO RESPOND TO CHALLENGES

60+ years of expertise

7,336
employees worldwide......driven by our values
of excellence, connected teams
and bold leadership......connected through
networks of expertise...

...operating in more than 80 countries...

...accompanied by industrial,
academic, and research
partners......supported by a turnover
of €631m in 2019WE ARE PRESENT
THROUGHOUT
THE ENTIRE PROJECT
LIFECYCLE

OUR ACTIVITIES ARE DRIVEN BY STRONG COMMITMENTS



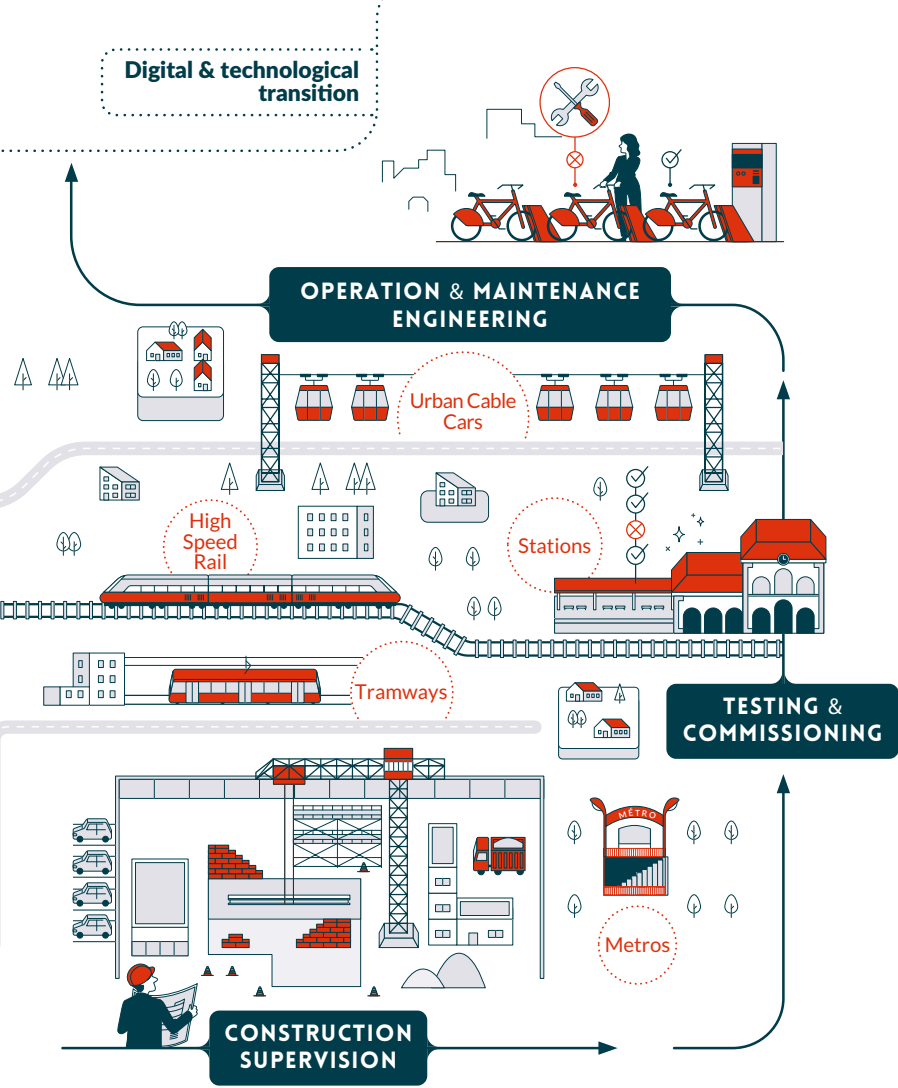
Environment



Ethics

WHETHER CURRENT OR FUTURE

AND CREATE SUSTAINABLE VALUE



Health, Safety & Security

FOR SOCIETY

Designing mobility solutions that are:

- Sustainable to fight global warming and conserve the planet's resources
- Inclusive to offer everyone the freedom to get around for a better life

FOR OUR CLIENTS

Developing more efficient transport and new mobility services:

- Delivering sustainable responses for their needs and those of their users
- Delivering new responses to society's challenges by leveraging ecodesign and digital

FOR OUR EMPLOYEES

Building a relationship of trust and guaranteeing an appealing work environment, based on the passion for our professions and collaboration

FOR OUR SHAREHOLDERS

Developing SYSTRA's activity through sustained and sustainable growth

JOINT INTERVIEW

A CONVERSATION

With Stéphane Birien, Chief Human Resources Officer,
Monica de Virgiliis, Chief Strategy Officer, and Andrew
McNaughton, Strategic Growth Initiatives Director.

► **STÉPHANE BIRIEN**
CHIEF HUMAN RESOURCES OFFICER



**"Sustainability
is at the very heart
of our profession."**

Let's start with 2019. How would you describe the year for SYSTRA?

Andrew McNaughton: 2019 was a year of transition, or rather the end of transition. It's a year that serves as an anchor point: it confirms our transformation and sets foundations for the future. We implemented a new organisation model for the Group around the concept of 'home countries'. What is it all about? It's an organisation arranged around a dozen key countries. These 'home countries' add up to 85% of our business and are the organisational embodiment of our 'local player with international reach' strategy. They truly constitute our 'homes,' our bases, and we are investing in them for the long term with dedicated management to

make them into distinct markets and to adapt our responses at an ultra-local level. This long-term investment was illustrated, for example, by this year's acquisition of TSP Projects in the United Kingdom, doubling our workforce in the country and enabling us to acquire complementary skillsets for this very dynamic market. This reorganisation expresses the change undergone by SYSTRA in the last few years: from a French group with international activities, we have become an international group proud of its French roots.

Monica de Virgiliis: Yes, what you've touched on here, Andrew, is a way to better serve our clients: a dedicated team, in-depth knowledge of the market, and the ability to deliver a personalised response. It's a guarantee for our clients that we are invested in their issues, and ready to respond because we know them in such detail. We are capable not only of responding with great reactivity, but also of proactively anticipating needs that arise and opportunities that present themselves. This kind of reactivity is only possible when you know your market in depth. It's not an option on a continental scale.

Stéphane Birien: To pick up on your point, I believe the best way to sum up 2019 is to say we were getting prepared. In barely twelve months we gave ourselves the means, both human and organisational, to deal with any challenge. And Covid-19 is a challenge that allowed us to test the relevance of this organisation from the start of 2020. As a more efficient organisation, it is also able to meet the most specific needs of our clients. We have increased

our workforce by 10% while focusing on creating a positive experience for our staff at every stage of their professional life with us. Recruiting and investing, giving people opportunities, it's an entire mindset we've put in place, along with appropriate tools.

A.M. I would add that these first months of 2020 have clearly shown that we were ready to confront even the unexpected. I don't think we would have been able to respond as effectively to a crisis of this magnitude twelve months ago.

S.B. Absolutely! A new organisation that's more energetic, more efficient, and which capitalises on ten years of organic and external growth to face up to new challenges. It's quite unique to be able to build up such strength in so little time.

M.d.V. For me, you can sense this efficiency in the organisation of large-scale projects like Etihad Rail or HS2, which are built around international teams, localised around the world, and encouraging symbiosis of their skillsets. It's a strong differentiating factor being able to function like this, without borders or silos.

S.B. We realised that SYSTRA is far more international than we imagined, even while we maintain and develop an extremely strong pool of expertise in France. This state of mind is now so firmly rooted in our DNA that we forget how rare a company of our calibre is in our sector.

► **MONICA DE VIRGILIIS**
CHIEF STRATEGY OFFICER



"Our priorities are those of our clients."

Now that the Group knows where it stands, where is it going? What are the priorities for the years ahead? What will the future look like?

M.d.V. Our priorities are those of our clients. We only exist to provide answers to their problems. We are in some high-growth markets that are undergoing fundamental transformations. Increasing transport capacity, expanding existing networks, implementing new technologies, protecting against cyberattacks, establishing multimodal networks, building a sustainable future, such are the challenges we are meeting with all our clients. Our efforts must address these priorities because they are our clients' priorities.

A.M. You're right, Monica. Now that we are prepared, our priority is to expand our horizons as much as possible and to see far into the future of our clients and our markets. Today, what keeps our clients up at night isn't necessarily the problems piling up on their desks right now, but often the ones they will have to solve in the near future. We need to be able to get on the same wavelength.

S.B. To achieve that, we need to develop our adaptability and be equipped to be constantly ready.

We are aware, now more than ever, of the volatility of our business. We need to keep being agile, to reinforce our robustness while adapting to constantly changing contexts. I see a parallel with the priorities of our clients, that you described so well: we need to have the same high standards in the management of our employees. We must continue to constantly recruit the best talent and develop our teams together, as above all our clients come to us looking for expertise. And we need to have teams that reflect the international world in which we are growing. Diversity, in all its aspects, constitutes a key factor for our development. It is a strength, a differentiator, and a source of enrichment in our daily interactions. We all understand that to broaden our horizons, as you said Andrew, we need to keep evolving our teams to maintain that openmindedness which makes us so strong. And in the same way that we need to understand what our clients' priorities are, we need to be in sync with those of our employees. They are looking for meaning, too, and want to contribute to a more sustainable future.

M.d.V. Deploying an ever more international approach represents a priority. Not only is it a client promise that carries weight, as we have emphasised, but also as Stephane says, internationalisation is an exceptional advantage to attract the best talent. There is nothing more fulfilling for an engineer than to work on meaningful projects as part of a multicultural team where everyone grows together.

A.M. You both mentioned the challenge of a sustainable future. I believe that for SYSTRA, building a sustainable future is much more than a challenge, and much more essential than an objective. An objective can change. Working for a sustainable future is part of our DNA, a fundamental building block of our identity, and therefore unchangeable.

M.d.V. I agree completely. Covid-19 has been a massive shock, but it's only the tip of the iceberg of profound changes triggered by human activities, much like global warming. We may now be facing the first truly global phenomenon,

which affects all people indiscriminately, and this crisis shows that it is vital to think in terms of global responses. With this type of challenge, our models are put to the test and it's only by thinking without borders or silos that we can find answers.

S.B. Our activity has always aimed to help populations and therefore the planet. Sustainability is at the very heart of our profession since we have to come up with future solution on a grand scale. Something we observe more and more in our recruitment process: a lot of young people join us today to be solution finders in a world that simply must invent a sustainable future.

A.M. The world is on the verge of irreversible change. In the short term, we can think of impacts in regards to management of course, but we need to look much further. Population growth and mass urbanisation are certainties and challenges that need to be met in a sustainable way, there's no other alternative. And SYSTRA has more than sixty years of expertise on this kind of challenge.

ANDREW MCNAUGHTON
STRATEGIC GROWTH
INITIATIVES DIRECTOR



"We have become an international group proud of its French roots!"

2019 KEY FIGURES

A LOCAL PLAYER ALL OVER THE WORLD

Deep knowledge of local markets coupled with synergies between our centres of expertise across the world allows us to be there wherever we are needed.

Canada
144 

United States
177 

Brazil
491 

LOCATIONS WORLDWIDE AND EMPLOYEES



7,336
employees

+11%
increase in personnel

2019 TOPLINE NUMBERS

€631m

TURNOVER

60+ years

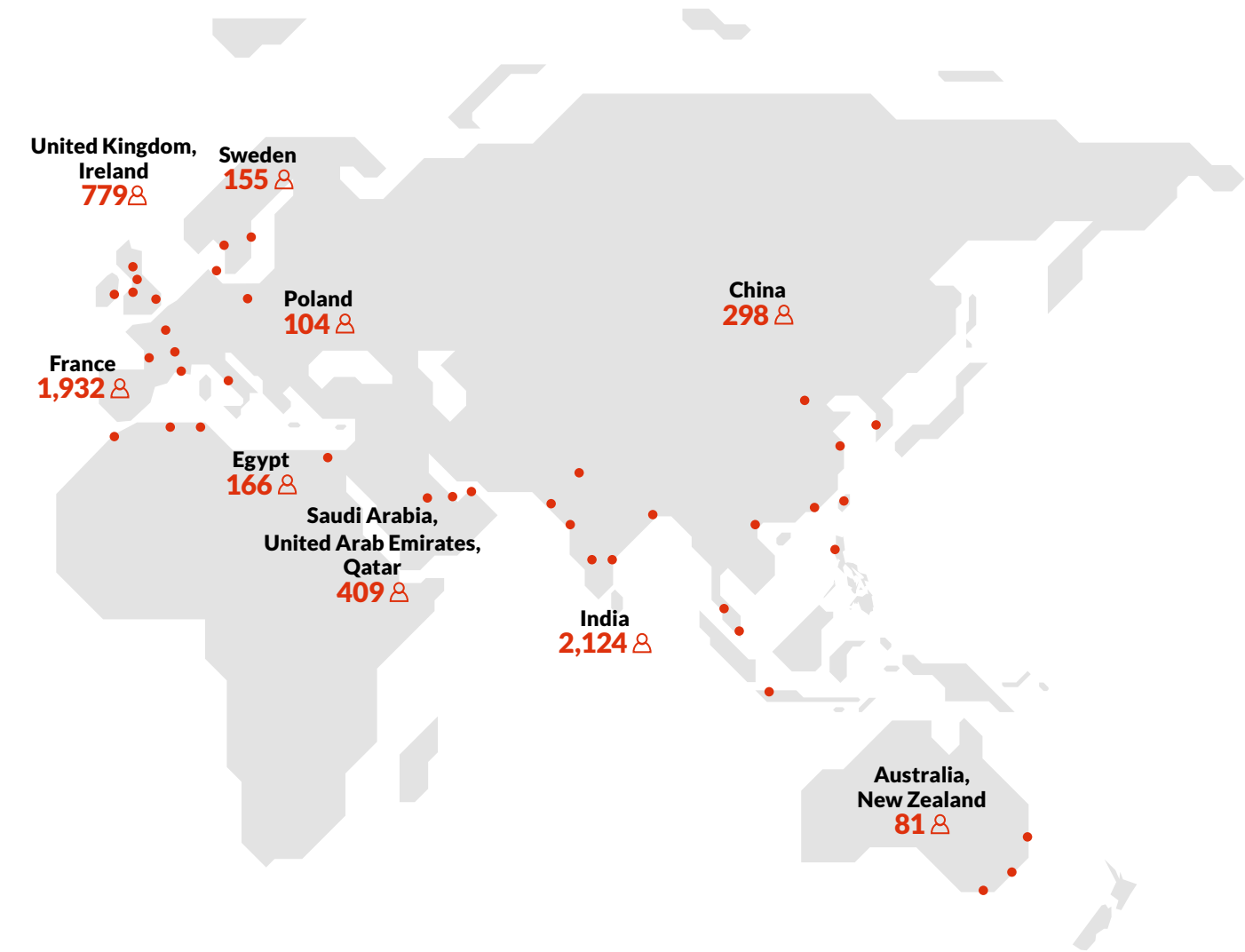
EXPERTISE IN
TRANSPORTATION

70%

TURNOVER
ACHIEVED ABROAD

80 countries

OPERATIONAL
PRESENCE



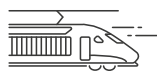
LEGEND	MAIN LOCATIONS AND MAIN SYSTRA CENTRES OF EXCELLENCE	NAMED COUNTRIES TOP 12 OF SYSTRA WORKFORCE
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The maps shown in this public document aim only to illustrate the organisation of operational activities specific to SYSTRA. They do not reflect any intention to express an opinion concerning geopolitical issues. SYSTRA, its subsidiaries and affiliates can in no case be held responsible for any interpretations that may arise.

2019 rankings Engineering News-Record (ENR)	#4 MASS TRANSIT AND RAIL	#8 BRIDGES	#9 TRANSPORTATION	#34 INTERNATIONAL DESIGN FIRMS
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REFERENCES

CONTRACTS WON



RAILWAY LINES



METROLINK TRAIN, UNITED STATES

PARIS-LYON HIGH SPEED LINE FRANCE

At the beginning of 2019, SYSTRA successfully signed several contracts with the Paris-Lyon revamping programme, which aims to modernise the oldest and busiest high speed line in the French network. To increase service frequency at a stage where the line has reached saturation, we are conducting studies of technical plans prior to regenerating the signal boxes that safeguard the line's 483km of tracks. This will be equipped with the Level 2 interoperable European ERTMS (European Rail Traffic Management System) signalling system so that by 2030, capacity moves from 13 to 16 trains an hour with the added benefits of managing the maintenance operations and work on the lines.

SKIERNIEWICE-ŁUKÓW NO.12 LINE POLAND

The Polish rail network operator, PKP PLK, has assigned SYSTRA the modernisation of this strategic integrated corridor to the TEN-T (Trans-European Transport Network) programme. Our missions range from studies to acceptance of works, stretching along 161km including the highlight of an iconic bridge over the Vistula River. It is the largest project ever undertaken by the Group in Poland.

RENOVATION OF A RAIL FLEET IN CALIFORNIA UNITED STATES

A joint venture between Talgo and SYSTRA Canada has won a contract for the total renovation of 121 railcars for the Metrolink company in southern California. Our teams will modernise the equipment and strive to improve the reliability as much as the appearance of coaches, notably for the greater comfort of passengers.

ASSISTING THE EUROPEAN UNION AGENCY FOR RAILWAYS EUROPE

SYSTRA is mobilising a team of around twenty senior experts with strong international experience in the European Rail Traffic Management System (ERTMS) to help ERA, the EU Agency for Railways. Their objective will be to assess several technical ERTMS signalling solutions on the ground to enable interoperability of rail networks across the entire continent, with a single new standard for the control-command systems of trains.

ETIHAD RAIL FREIGHT NETWORK UNITED ARAB EMIRATES

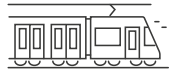
The Etihad Rail freight railway network currently under construction is the largest project of this type undertaken in the region. It has mobilised over one hundred employees since SYSTRA won three successive design & build contracts in 2019 and 2020 for the implementation of phase 2. We are working within three joint ventures for constructing a total of 272km out of the 650km currently underway. This rail network aims to connect cities and port terminals, freight yards and passenger terminals, to interconnect all of the Emirates.

(To find out more, see page 21)



REPLACEMENT OF RADIO SYSTEMS AUSTRALIA

The public transport authority of the Perth region has chosen SYSTRA to upgrade the railway radio telecommunications, as part of deploying the new international norm of 3G+ mobile telephony. Thus equipped, the regional network will be more robust and more flexible thanks to total digital radio coverage.



LIGHT RAIL TRANSIT

TRANSFORMATION OF THE NANCY TRAMWAY FRANCE

The Nancy tramway is getting a complete makeover with SYSTRA. New rolling stock, new amenities, extended routes, it's an exceptional project that will be delivered from 2023 in the capital of the Lorraine region. The aim for the Metropolis of Greater Nancy is to be able to count on a mode of transport that is faster and more reliable, but also 100% electric and boasting landscaped facilities such as bike paths. To achieve it, SYSTRA must design a complete system, which must furthermore follow the existing route in the town centre.

TRAMWAYS OF FLORENCE, BOLOGNA AND CAGLIARI ITALY

No fewer than three major Italian cities are calling upon SYSTRA-SOTECNI for tramway projects. In this way, we are helping cut air pollution due to road traffic, while conserving the architectural heritage of town centres with collective mobility solutions that are safe, efficient, and sustainable.

LINE 5 OF THE MONTPELLIER TRAMWAY FRANCE

Building on more than forty years of expertise in trams, SYSTRA has been given control of engineering and project management of this new line on the Montpellier network with Artelia and Atelier Garcia Diaz. We are taking charge of all the tramway system, from studies through to the planned commissioning in 2025. The line will serve densely populated areas and numerous strategic activity hubs around the city. It will be connected to all the existing network, considered on its artistic merits as "the sexiest tram in Europe" (New York Times, 2012).



CONSULTANCY AND URBAN PLANNING

UPGRADING TELECOMMUNICATIONS INFRASTRUCTURE FRANCE

Property engineering and project management teams from SYSTRA are working for Hivory, the company in charge of upgrading and operating telecommunications infrastructure for the Altice group. It involves deploying new pylons to address the digital divide and accelerate mobile coverage of territories. SYSTRA is thus diversifying its projects and opening up to other forms of connected mobility, with new clients and expertise connected to its historical professions.

MOBILISE YOUR CITY PROGRAMME ETHIOPIA

The French Development Agency (AFD) has chosen the consulting expertise of SYSTRA to design several sustainable urban mobility plans, within the framework of its Mobilise Your City programme. Among our areas of action is the city of Dire Dawa where we are developing, through a consultation process involving local inhabitants, strategic and concrete low-carbon projects for the next twenty years.

TRAMWAY IN MONTPELLIER, FRANCE



AVIATION

RESTRUCTURING A TERMINAL AT LONDON HEATHROW UNITED KINGDOM

SYSTRA is supporting the busiest airport in Europe with the restructuring of London Heathrow's Terminal 2. The project aims to completely rethink the system of baggage handling and sorting to set a new international standard for the sector. Staged over five years, our mission has already entered the feasibility phase, marked by the installation of the engineering systems' software infrastructure.



BRIDGES

EXTRADOSED BRIDGE OVER THE BRAHMAPUTRA RIVER

INDIA

SYSTRA has signed a contract in India for a new road bridge set to ease the flow of road connections for three million inhabitants of the Guwahati metropolis in Assam State, in north-eastern India. We are heading a project management consultancy mission which notably covers a review of studies, environmental impact management, and construction supervision of this structure that should cut travel times by 75 minutes. Construction began in 2020 and it is due to open in 2024.



STATIONS

ORLY AIRPORT STATION FOR THE GRAND PARIS EXPRESS

FRANCE

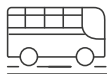
The Groupe ADP (Paris Airports) has appointed SYSTRA for construction works management of this new station connecting with Paris metro lines 14 and 18. It will be commissioned in 2024 to enable line 14, the backbone of the Grand Paris Express, to link the city and Olympic sites with Orly Airport. The project is being achieved entirely using BIM (Building Information Modelling) and also includes the construction of a 10-floor parking facility.

OLD OAK COMMON STATION

UNITED KINGDOM

The British Government has selected the Balfour Beatty/Vinci/SYSTRA consortium to steer construction of this new station, the most ambitious of the HS2 high speed network. It is located west of London, in a neighbourhood enjoying a revival, and will be the country's most interconnected hub with direct access to three international London airports and eight of the UK's ten biggest cities. With this flagship station, more than 60,000 jobs and 5,500 homes will be created while greatly increasing British rail capacity.

(To find out more, see page 23)



BUSES

ELECTRIFICATION OF THE ORLÉANS BUS NETWORK

FRANCE

Orléans Metropolis has the goal of seeing its bus network become the first in France to run entirely on electric power by 2025 to reduce harmful emissions from its public transport. In association with RATP Real Estate, SYSTRA is supporting the energy transformation of Orléans Metropolis and is working on adapting terminals, for existing depots as well as building a specific new depot designed using BIM, all fitted with solar panels. The Group is active on similar missions in Montreal, Canada, and in Saint-Denis and Neuilly-Plaisance in the Paris region.

DESIGN OF THE MECCA BUS NETWORK

SAUDI ARABIA

The Mecca authorities have chosen the skillsets of SYSTRA to establish the city's first permanent bus network. This network should simplify life for both locals and pilgrims, of whom several tens of millions visit each year, but also prompt a shift from private car use towards public transport. Central to achieving

the Vision 2030 development plan laid down by the Saudi government, this project totals 12 bus routes, more than 500 bus stops, and will mobilise over twenty of the Group's experts over a period of thirty months.

OPTIMISING THE TERESINA BUS NETWORK

BRAZIL

The Group is accompanying Teresina, the largest city in the State of Piauí with nearly a million inhabitants, to improve its bus routes and the passenger experience. For thirteen months, SYSTRA consultants in Brazil but also in France will work on solutions, notably digital ones, with the University of Fortaleza. Design thinking workshops will look at using blockchain to secure payments. Connections of different routes will also be reconsidered to guarantee passenger safety, especially for women, and to offer better organised itineraries.



UNDERGROUND STRUCTURES

TUNNEL EURALPIN LYON-TURIN (TELT)

FRANCE AND ITALY

Mobilised as early as 2002 for the initial studies, SYSTRA Group is one of the main engineering firms to work on TELT. The entities SYSTRA S.A. (in France) and SYSTRA-SOTECNI (in Italy) are currently working on construction of more than half of this twin-tube rail tunnel, in cooperation with Setec (lead company of the S2IP consortium on lot 2), Italferr (lead company for civil engineering on lots 3 and 4 in Italy), Pini Swiss Engineers, and Gestworks. At the end of 2019, SYSTRA, as part of a consortium, won the project management contract for the last two lots of civil engineering on the Italian side, from the tunnel entry in Susa up to the border with France. Planned for completion in 2030, this new 57.5-km link will be the longest rail tunnel in the world. By reducing travel time between Lyon and Turin by one hour, the connection will lower road traffic across the mountains and thus improve quality of life in the Alps.

TUNNEL BORING MACHINE, TELT PROJECT, FRANCE-ITALY





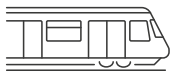
MONTREAL METRO, CANADA

LINE 15 WEST AND 15 EAST OF THE GRAND PARIS EXPRESS FRANCE

The Société du Grand Paris has appointed SYSTRA for project management technical assistance on the western and eastern sections of line 15. This will be the most complex and most interconnected part of the Grand Paris Express, but also the busiest with a million daily passengers. Our teams will be responsible for steering the design-build contracts for all of this route. This project is one of the most important ever won by SYSTRA, and confirms the Group's major role in the development of this super-metro for the Paris region.

MODERNISATION OF THE MONTREAL METRO CANADA

Fifty-seven years after carrying out design studies for the first three lines of the Montreal metro, SYSTRA, in consortium with WSP, is about to renew all the systems and modernise their infrastructure. Under the project name 'Réno-Systèmes,' the mission will extend into 2025 covering broad areas of intervention, from electrical supply to ventilation through signalling, centralised operating control, and noise pollution. The SYSTRA Canada business unit therefore has lots to celebrate on the first anniversary of opening its branch dedicated to urban transport.



METROS

LINE 7 OF THE SANTIAGO METRO CHILE

A new page in SYSTRA's history is being written in Chile with the future line 7, which is planned for commissioning in 2026. The Group will undertake design studies of systems, workshops, and rolling stock for this new automatic metro line. We have accompanied Metro S.A. since 1967 and have signed 80% of the studies for the Santiago metro network.

NEW LINE FOR THE TOULOUSE CONURBATION FRANCE

This key developmental urban project is among the most ambitious being undertaken in France. In 2025, the third metro line will link the east and west of the Toulouse metropolis to offer more options for public mobility. After initial technical studies starting in 2017, then assisting in systems project management and land management assistance in 2018, SYSTRA won two infrastructure project management contracts in 2019. The consortium we represent is responsible for the central and underground section of the line, covering more than half of its route.

AUTOMATION OF THE NEW YORK SUBWAY UNITED STATES

SYSTRA's expertise in Communications-Based Train Control (CBTC) has again been chosen by New York City Transit (NYCT), for the specification, development, installation, testing and implementation of new signalling systems. SYSTRA is also heavily involved in projects to upgrade the accessibility of New York's subway network.

(To find out more, see page 32)

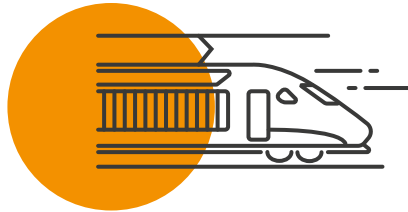
LINE 5 AND 9 OF THE MUMBAI METRO INDIA

India's most heavily populated city is enhancing its metro network with two additional lines, for which SYSTRA is general consultant on civil engineering works in a 60/40 consortium with Consulting Engineers Group Limited. The 26km of this infrastructure will be largely a viaduct and will serve the north-east and central-west of the commercial capital of India. With over 18 million inhabitants in its urban area and a density of more than 20,000 people per square kilometre, large-capacity collective transport needs are great in Mumbai.



REFERENCES

INAUGURATIONS AND COMMISSIONINGS



RAILWAY LINES

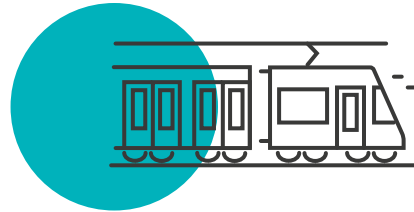
First test run of the Dakar TER
SENEGAL 14/01/19

**Bhadan-Khurja section
 of Eastern Freight Corridor No.1**
INDIA 15/08/19

**Rail network of the Port
 of Dunkirk**
FRANCE 11/10/19

**Zhengzhou-Xiangyang
 high speed line**
CHINA 01/12/19

**Léman Express line from
 Annemasse to Geneva**
FRANCE AND SWITZERLAND 15/12/19



LIGHT RAIL TRANSIT

Line 2 of the Casablanca LRT
MOROCCO 24/01/19

**Extension of line C of the
 Bordeaux LRT**
FRANCE 20/02/19

Metro Express LRT
MAURITIUS 03/10/19

Extension of line T1 in Asnières
FRANCE 12/10/19

Line T6 of the Lyon LRT
FRANCE 22/11/19

**Extension of LRT line T4
 in Montfermeil**
FRANCE 14/12/19

Line D of the Bordeaux LRT
FRANCE 14/12/19

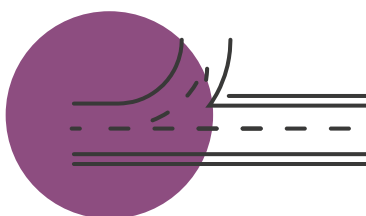


BRIDGES

Sheikh Jaber Al-Ahmad Al-Sabah Causeway (Kuwait City-Subiyah)
KUWAIT 01/05/19

Samuel de Champlain Bridge (Montreal-Brossard)
CANADA 28/06/19

Atlantic Bridge (ex-Third Panama Crossing)
PANAMA 02/08/19



ROADS

Widening of the A406 motorway (Mâcon)
FRANCE 14/11/19



METROS

Line 3 of the Santiago metro
CHILE 28/01/19

Aqua Line of the Noida metro
INDIA 07/03/19

North-South Corridor of the Lucknow metro
INDIA 08/03/19

Red Line of the Delhi metro
INDIA 29/03/19

First line of the Ahmedabad MEGA metro
INDIA 18/04/19

First line of the Nagpur metro
INDIA 29/04/19

Northwest line of the Sydney metro
AUSTRALIA 26/05/19

Phase 1 of the Doha metro (Red line)
QATAR 28/05/19

Phase 4 of line 3 of the Cairo metro
EGYPT 15/06/19

Cityringen line of the Copenhagen metro
DENMARK 29/09/19

Phase 2 of the Doha metro (Green, Gold and Red lines)
QATAR 10/12/19





WORKING TOWARDS SUSTAINABLE MOBILITY



From Dubai to Chiloé, from Montreal to Jakarta, SYSTRA's commitment to sustainable mobility exists in many forms: here, an ecodesigned bridge or metro line to reduce road traffic; there, an all-electric bus or solar-powered signalling system... Discover actual proof of this commitment through a wide spectrum of projects that we are undertaking in several regions around the world.

COMMITTING TO THE ENVIRONMENT



“Environmental responsibility constitutes an essential component of sustainable development. Beyond the good practices we adopt on our sites, what characterises SYSTRA is linking the technical identity of projects to a sustainable design approach. And if the word ‘approach’ seems soft, don’t be mistaken, it is a firm responsibility we place upon ourselves. Climate change and carbon emissions are at the forefront of international development programmes, and SYSTRA, as a global company in the mobility sector, has an important role to play. By optimising and enhancing projects that have a positive effect on the carbon footprint, we make a major contribution to the carbon neutrality pathways sought by our clients. SYSTRA’s hallmark sustainable development style expresses itself throughout the lifecycle of projects we support, from planning to design, from construction to commissioning, then during operation and maintenance. To achieve this, we leverage the key assets of SYSTRA around the world: our technical excellence, our mastery of ecodesign, and our farsighted and innovative vision on sustainable mobility topics.”



CHRISTELLE CHICHIGNOUD
GROUP SUSTAINABLE DEVELOPMENT DIRECTOR

METRO

INDONESIA



A BREATH OF FRESH AIR FOR JAKARTA

The Jakarta metropolitan area is huge. With more than 30 million inhabitants, the Indonesian capital is catching up with Tokyo for the title of largest city in the world. Given its size, it's difficult to believe that the first train network only opened in 2019. This underlines how critical it is to improve day to day life for the megacity's residents. Launched in 2015, our project covers a network of three aerial train lines, totalling 43km and 18 stations.

When it opens, the Greater Jakarta LRT will link the city centre to the adjoining towns of Bogor, Depok and Bekasi, which is where it gets its moniker Jabodebek (Ja-Bo-De-Bek). The train system will give a breath of fresh air to the megacity and its inhabitants, whose everyday life is often marked by long traffic jams and the air pollution that creates.

Although Jakarta already has a public transport system composed of a bus network and intercity trains, the use of cars has taken over, causing travel time and the level of fine particles to increase. Once completed,

the Jabodebek LRT will therefore reduce CO₂ emissions by several thousands of tonnes each year – an important environmental and public health objective set by the Transport Minister and the government.

The SYSTRA Group started on this project with one of Indonesia's leaders in construction, PT Adhi Karya (Persero) Tbk, working firstly on the route and detailed studies of the U-shaped viaduct. The U-shaped viaduct solution, patented by SYSTRA, is an environmental solution which allows a large reduction in the quantity of materials used, and helps the viaduct to integrate better into its environment. Then the Group was tasked with the track studies, of the depot as well as all the railway equipment. For Indonesia, this is the very first train project to use an automated traffic control system (known as CBTC, Communications-Based Train Control).

Building this train line in a densely populated environment is a challenge which requires the country to use the best expertise. SYSTRA has requested extensive prefabrication to minimise onsite activities and also to reduce the turnover of apparatus and lorries to avoid adding to road traffic. In addition, we will speed up work and have better quality control.

With the inauguration planned for 2021, the Greater Jakarta LRT will bring the Indonesian capital into a more responsible era of transport, where individual travel is no longer a threat to public health. This is a unique project for SYSTRA, in terms of size and the solutions implemented, but also in terms of its potential to bring a more sustainable future for a whole country.



“This project is not only of huge benefit to the environment. It also addresses a key public health objective and will allow the volume of CO₂ emitted to be reduced, thereby protecting the lungs of 30 million inhabitants of this ever-growing city. As engineers who are mindful of environmental issues, it's with undeniable pride that we contribute to this sort of progress.”

AREZKI TOUAT
VICE PRESIDENT FOR ASIA



43km

of overhead trains



3

lines



18

stations

URBAN CABLE CARS

FRANCE



TOULOUSE ELEVATES ITSELF

The love story between the Pink City and aviation just started a new chapter. By the end of 2020, the first urban transport cable car in France will open its cabin doors to passengers ready to board for a 3-km flyover above the southern area of the city.

This cable car is an innovative mode of transport in France, and the choice made by Tisséo, the authority overseeing transport in Toulouse, bridges environmental issues and sustainable transport. Led by the management of SYSTRA's Consultancy department, environmental studies resulted in the development of a project which fitted in with an area known for its ecological credentials.

The line crosses a Natura 2000 zone and the regional nature reserve Confluence Garonne-Ariège. All design choices were therefore made in a continued effort to consider the most environmentally friendly options for all species of flora and fauna, protected or not. From the structures and building methods selected by the SYSTRA Structural and Civil Engineering department which conducted the studies, to worksite scheduling planned to avoid disrupting the reproduction of species onsite, the new urban cable car will not simply be transporting passengers at the same rate as the metro or tramway. It will allow users to buy into strategic divisions of the sector while taking a mode of transport 30 times

cleaner than a car, and has the added bonus of views over the Pyrenees. The '3S' technology (which stands for 'drei Seile', or 'three cables', in German) used here is a large-capacity detachable cable car technology. The line will consist of 15 cabins with 34 seats designed by Pininfarina, which will be as comfortable as the seats found on the tramway. Each cabin is suspended by a carriage which rolls on two load carrier cables and is towed by another dedicated cable. These cabins are detachable and slow down approaching the stopping point in the station, allowing perfect accessibility for people with reduced mobility along the whole line.

The infrastructure discretely blends into the environment, on a visual and acoustic level, and can function in wind speeds of up to 108km/h. SYSTRA, in a consortium led by Poma, was also able to draw on the expertise of its Operational Security department in order to adapt to urban transport safety requirements; up until that point a system rarely adopted in French towns.

If these achievements weren't enough, close to one of the project's stations, the city of Toulouse also built the largest urban photovoltaic plant in France. Composed of 35,000 solar panels, it produces 20 GWh per year, providing the 7.8 GWh needed for the cable car and making it the first public transport project 100% powered by solar energy!



"SYSTRA's core business has always been developing environmentally friendly modes of transport: trains, metros and tramways already have virtuous energy balances. The urban cable car is a promise to go further in sustainable transport."

CHARLES-ALEXANDRE CAYATTE
SYSTRA TELEO
PROJECT MANAGER



3km

route, longest urban cable car in France



100m

drop



1,500

passengers per hour in each direction (the system allows for larger capacity)



100%

powered by solar energy



FREIGHT

THE UNITED ARAB EMIRATES



THE UNITED ARAB EMIRATES... BY TRAIN



Launched in 2009, the rail freight project Etihad Rail offers the United Arab Emirates the means to support their economic growth while developing an environmentally friendly network.

The first phase of the project was completed in 2016 with the opening of a section connecting gas fields in the south and east of the country to the exporting port in Ruwais, allowing the daily transport of 22,000 tonnes of sulphur granules. Just one trip in this freight container means a 70 to 80% reduction in CO₂ emissions, and removes the equivalent of 300 lorries from Emirati roads.

The second phase will connect the whole of the Emirates linking the country's economic hubs and points of export. A multicultural team at SYSTRA provides implementation studies on behalf of three groups of manufacturers. In addition to the reduction of road traffic and greenhouse emissions, the construction of this new network will take into account the country's most advanced environmental standards, in particular for building design.



"In a country which revolves around road transport and where the price of petrol is relatively low, having SYSTRA involved in the design of a project with such positive effects on the environment proves a commitment fully in line with our position."

**AYMEN CHEIKH
MHAMED**

SENIOR VICE PRESIDENT
DESIGN AND BUILD

METRO

DENMARK



IN COPENHAGEN, CARBON NEUTRALITY AT THE END OF THE TUNNEL

With 75% of daily movements carried out on foot, by bike or public transport, Copenhagen is a champion of low-carbon mobility. To respond to its continuing population growth, the city has built itself a third metro line.

Commissioned in September 2019, Cityringen is a circular automatic metro line running 24 hours a day, 7 days a week. Measuring 16km in length, it represents Denmark's biggest worksite in almost 400 years. With this new line, most of Copenhagen's residents are within 600 metres of a train or metro station,

and the city is doing whatever it takes to encourage people to leave the car behind. In consortium with Cowi and Arup, SYSTRA has worked on every phase of this project for over a decade, from design studies to construction supervision.

The design and construction choices made for Cityringen are aligned with the environmental goals of the Danish capital. For example, the stations are positioned beneath existing squares or parks, minimising the impact on traffic, networks, and surrounding housing. They also offer bicycle parking spaces to encourage intermodality.



"In a city positioning itself as a world leader of innovative environmental approaches, the Cityringen project is a vibrant example of sustainable mobility which will have a positive impact both on Copenhagen's quality of life and on the capacity of its transport services."

NICOLAS FOUCHER

ARCHITECT, URBAN
PROJECTS DEPARTMENT

RAIL

UNITED STATES



PHILADELPHIA FILLS UP ON SUNSHINE

Serving almost 4 million people, the Southeastern Pennsylvania Transportation Authority (SEPTA) operates a multimodal public transport network covering more than 700km of lines in the Philadelphia region. In 2011, the operator launched a vast sustainable development programme, called SEP-TAINABLE.

Within the framework of this five-year plan, renewed in 2017, the SEPTA regional authority is multiplying initiatives designed to improve the energy efficiency of its network and activate sustainable transition levers. In this context, the SYSTRA team

was entrusted with an unprecedented mission: to design an emergency signalling system completely powered by photovoltaic energy. This alternative system of the future will provide the main system with a 48-hour backup electricity supply. By adding to this energy mix the resources of local urban electricity networks as a third option, this architecture will ensure network resilience and operating continuity. The use of photovoltaic energy, produced by solar panels at each signalling point, was firmly decided upon by the authority in its efforts to cut greenhouse gas emissions. Indeed, the operation should allow savings of more than 55,000 tonnes of CO₂ per year.



“The winning equation achieved by SEPTA proves that reducing costs and carbon emissions can go hand in hand. More safety and reliability for the network, a lower energy bill for the operator, the community and the environment; it’s a winning system on every level that puts the Philadelphia region one step ahead of the country’s other cities.”

CRAIG JONES

DIRECTOR OF SIGNALS,
SYSTRA USA

METRO

SAUDI ARABIA



THE RIYADH METRO, A BENCHMARK CONSTRUCTION PROJECT

For the first public transport network to grace its capital, Saudi Arabia was thinking big. With 6 automated lines, 176km of track, and 85 stations, the Riyadh metro sets the tone well beyond the borders of the peninsula. Its construction has been the subject of much attention on the environmental front.

The project, on which work began in 2013, comprises three design-build lots. The joint venture PARSONS-EGIS-SYSTRA heads the project management and construction supervision onsite for lots 1 and 2, or 60% of tracks and 70% of stations of the whole project. This network will ultimately serve

3.6 million passengers a day and allow daily reductions in carbon emissions equivalent to 1,200,000 trips by car. The project’s environmental impacts have been analysed from day one. For this purpose, SYSTRA put in place follow-up of construction activities based on ten environmental criteria, assessed by a team that inspects the 200 worksites daily. Dust control measures, sound and vibration control, waste management, soil protection, protection of flora and fauna, etc: these evaluations provide a monthly barometer of the environmental impact of the metro construction, and allow corrective actions to be taken to maintain the sector’s highest standards.



HIGH SPEED

UNITED KINGDOM



IN THE UK, THE COUNTRY'S SECOND HIGH SPEED LINE IS AN ENVIRONMENTAL PROJECT



OLD OAK COMMON STATION

Thirteen years after the opening of High Speed 1 - Britain's first high speed line connecting London to the Channel Tunnel - High Speed 2 will ultimately connect the capital with the major northern cities of Birmingham, Manchester and Leeds. HS2 will provide rail capacity and connectivity across the country, serving eight of Britain's 10 largest cities.

HS2 will be a great boost to the UK's carbon net zero commitment by 2050. Emitting 17 times less carbon than the equivalent domestic flight and 7 times less carbon than the equivalent car journey, HS2 will be the low-carbon option improving air quality, and allowing better traffic control while providing a step change in service to rail passengers.

The HS2 project is being undertaken to the highest environmental standards and its design and construction will be equally exemplary. SYSTRA and its partners are widely implementing ecodesign with a target to reduce the carbon footprint of the HS2 line by 50% compared to the preliminary design. Furthermore, the use of BIM (Building Information Modelling) to provide

collaborative modelling that integrates every aspect of the project, has been set to an unprecedented level, giving a level of detail never before seen for a project of this scale.

Old Oak Common Railway Station

SYSTRA is part of a joint venture with Balfour Beatty and VINCI, providing expertise in the design of the new Old Oak Common Station near Heathrow Airport west of London. This complex railway station will be the biggest in the UK in over 100 years. It will provide an interchange for HS2 and the new Elizabeth Line (Crossrail) providing the link between high speed, regional services and London Underground as well as access to Heathrow Airport. The project's HSQE (Health, Safety, Quality and Environment) management approach is steered by SYSTRA and includes the definition and close monitoring of environmental performance indicators.

Northern sections

SYSTRA is part of the design team working alongside Mott MacDonald for two sections of the new railway line on behalf of the construction joint venture Balfour Beatty VINCI: the section entering the city of Birmingham and the 'delta junction' or intersection enabling the implementation of the route heading further north to Manchester and Leeds. Working on these northern sections of HS2, SYSTRA is drawing upon its global pool of resources from Poland, France, India, the UK and South Korea, with more than 250 staff currently working on the project with more joining to deliver the detailed design phase.



"The HS2 line will introduce significant capacity to the UK's rail network. I am proud to say that it is first and foremost an ecological response to a growing demand for travel."

BRUNO SARRET
LEAD DESIGN MANAGER,
OLD OAK COMMON STATION



"SYSTRA's part in this flagship project is consistent with our goal to develop and promote sustainability throughout the entire life cycle of every project."

LUDWIG CUFFE
HS2 DEPUTY DESIGN JOINT
VENTURE DIRECTOR

SUSTAINABLY INNOVATING FOR THE FUTURE



“Innovating sustainably isn’t simply a question of technology. It is above all a way of thinking, a philosophy of action, constantly applied. We often believe that innovating consists of inventing something new. However, thinking sustainably is first about imagining other uses for what already exists. It’s about optimising, extending, reusing. In short, having a precise goal and doing something better with what exists, to only supplement with new solutions where it’s truly necessary. Applied to our projects, this philosophy represents a measure of confidence for our clients. The assurance of appropriate sound advice that will maximise the mobility solutions in place before seeking to add an extra layer. Sustainability is also judged on the adaptability and connectivity of mobility solutions and the technologies we suggest: we constantly need to imagine what will happen next, and therefore give our solutions the ability to evolve, to respond to constraints that may not yet exist. Innovating sustainably has always been the engineer’s job: can we answer the problem efficiently and sustainably with an existing solution? If not, it’s up to us to invent one that will still be an answer tomorrow.”



DEVINA HASSANALY

DIRECTOR MOBILITY & FUTURE CITIES,
SYSTRA SCOTT LISTER

BUS

CANADA

FRANCE



AN ELECTRIC FUTURE FOR BUSES

All over the world, governments and transport network-organising authorities have embraced mobility as a key lever in the fight against climate change. Perhaps because adapting buses is quicker to set in motion than other modes of transport, they are in the front line of this sustainability revolution. In this three-stop tour, our headline act is the electric bus, future champion of carbon dioxide emission reduction.

2025 is the very close deadline set by the Quebec provincial government to convert bus fleets to 100% electric; no subsidies will be granted for the purchase of non-electric buses after that date. For Quebec, capital of the eponymous province, it is therefore a non-negotiable imperative, since such subsidies are critical to the transport companies which operate public networks. The Réseau de Transport de la Capitale (RTC) must electrify a fleet of 600 buses, a considerable project which can obviously not be undertaken in a rush. SYSTRA Canada has been supporting the operator since 2019 to define the strategic approach for this electrification in a rapidly changing context. This will involve a complete overhaul of the bus network within ten years, leading to the opening of a new tram line in which SYSTRA is also involved. Successful planning is key to the project's success. That's why SYSTRA teams developed a specific simulator called TESS (Transit and Electromobility Smart Simulator) to model network and operating scenarios. This decision-making tool notably enables us to anticipate the behaviour of infrastructure and the technical requirements needed for efficient vehicle operation. TESS therefore improves the consulting and support deployed by SYSTRA to effectively move projects forward for clients.

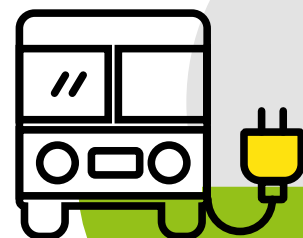
In France, will 2025 be the year of the electric bus? It certainly seems so, since that is also the date set by the RATP for achieving its Bus 2025 plan, a programme aimed at operating a fleet of 100% eco-friendly vehicles in the Paris region. Eco-friendly rather than electric, as this new generation fleet will mix totally electric buses with others powered by renewable energy sources like biogas. This conversion plan constitutes one of the historic operator's responses for cutting greenhouse gas emissions by 20% as enshrined in the region's urban transport plan. In addition to 5,800 buses, the depots will also need to be converted to receive, maintain and recharge this new fleet. SYSTRA is supporting the RATP with commissioning tests on two of its depots, at Lagny (Paris 20th district) and Corentin (Paris 14th district). It's an unprecedented mission as these are the very first trial phases of this kind, carried out without affecting normal operations.

However, it isn't only in very large capital cities that buses are leading a revolution. By the end of 2025, the Orléans metropolis will have converted its entire fleet of 215 vehicles to all-electric. SYSTRA, in association with RATP Real Estate, is also committed to this project, providing assistance in technical project management, legal and financial in the deployment phase, and contract enforcement. The first delivery of buses is planned in 2021.



"The topic of electric buses brings traditional thinking into question and allows us to explore a new mode of transport, with an industrial offering and regulatory framework that are still in their infancy. It is vital to position ourselves in this novel field as early as possible to forge our expertise and innovate. Innovating means knowing how to do more with less, to reinvent ourselves. It's precisely the challenge posed in the fight against climate change."

ROMAIN TAILLANDIER
URBAN TRANSPORT MANAGER,
SYSTRA CANADA



STATION

UNITED KINGDOM



LEEDS GETS A FACELIFT



The United Kingdom's third busiest railway station outside of London, Leeds City welcomes 30 million passengers a year. Built in 1938, the station began redeveloping the access hall in 2018, to present a modern and welcoming entrance for travellers.

The studies carried out by SYSTRA enabled a new station entrance to be designed, while ridding it of dangerous materials present in the original structure, and developing a building with greater resistance to malicious acts or possible attacks. Our team developed a new standard of analysis for Threat, Vulnerability and Risk Assessment (TVRA) for risks inherent in existing railway infrastructure, an unprecedented exercise on this type of project in the UK.



"SYSTRA's proactive approach to subjects such as risk and threat management undeniably merits recognition from its clients and peers. Integrating these dimensions into a proposal with high added environmental value is a very robust differentiating factor."

EMILY SHAW
PROGRAMME MANAGER,
SYSTRA UK

RAIL

CHILE



THINKING AHEAD TO LAST LONGER: THE CHILEAN EXAMPLE

With more than 2,000km of track, the Chilean rail network is deeply rooted in the country's history and development. From the Peruvian border to the gateway to Patagonia, it provides the country's essential connections. How did this historic transport network become a platform for sustainable development?

In 2018, Chile's public railway operator EFE (Empresa de los Ferrocarriles del Estado) entrusted SYSTRA and Chilean engineering firm Poch (WSP), with a mission of unprecedented scale: to carry out an obsolescence study of the entire national network, then develop software to simulate this obsolescence and related risks for the next fifty years, and to recommend an investment plan. The study is daunting

indeed: EFE has tens of thousands of rail assets, some located in very remote places. Months of work are needed to produce an exhaustive inventory of Chile's assets. It is fieldwork supported in relay by teams in Santiago, Mexico and Paris, and mobilising 16 areas of expertise. The project will next serve as a pilot for SYSTRA to develop a tailored software application, HyperAsset, designed by Qeto, the Group's data science and digital transformation studio. Development of this tool constitutes a fundamental prerequisite to sustainable management of the network. It will allow EFE to prioritise its investments according to obsolescence scenarios and to implement its own sustainability criteria. This kind of tool already exists in other sectors but is still in its infancy for railway asset management.



"Innovative digital tools will become the norm, bringing together infrastructure managers, operators, companies, consultancy firms and financiers around the sustainable management of rail networks."

BRICE-MANUEL CATALA
SYSTRA ASSET MANAGEMENT
PROJECT MANAGER IN CHILE

BRIDGES

CANADA

CHILE



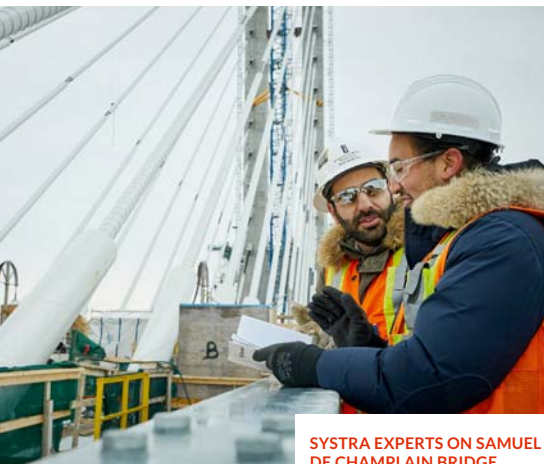
TODAY'S BRIDGES FOR TOMORROW'S CHALLENGES

Involved in infrastructure projects all over the world, SYSTRA makes a point of developing engineering structures that are not only innovative but also sustainable. Designed to resist and live with their environment, the bridges of Champlain in Quebec and Chacao in Chile bear witness to a know-how built up over time.

With its double point cable-stayed form proudly crossing the Saint-Laurent River, the new Samuel de Champlain Bridge, inaugurated in 2019, has quickly found its place in the Montreal landscape. Its 3.4km of spans link the cosmopolitan Quebec capital to its smaller sister city, Brossard, on the other side of the river, in a stride that now leaves the original bridge in the shade. The new crossing is performing well on many counts: its robust design supports the comings and goings of 40 to 50 million motorists each year, and commercial traffic with a value in the order of 20 billion dollars. A transport corridor that's essential for the development of the Greater Montreal community, the province, and Canada. Designed by a research group (TY Lin, SYSTRA IBT and SNC Lavalin)

to last 125 years, it is only the second bridge in North America to receive the prestigious Platinum Envision Award for the excellence and sustainability of its design. Thanks to a design of made-to-measure cables, it possesses an avant-garde de-icing system that enables it to withstand harsh Canadian winters while protecting users against falling ice. The construction feats achieved on a very restricted commercial maritime corridor, the involvement of the local population, and environmental protection measures applied throughout the build, vividly demonstrate that economic usefulness can coexist with societal and environmental excellence.

In the South of the American continent, another bridge in which SYSTRA participated as part of a consortium with Hyundai, OAS and AAS-Jakobsen, is about to revolutionise the industry of an entire community. On Chiloé Island, in Patagonian Chile, the Chacao bridge has begun to sink its poles into an inlet separating the archipelago from the continent. Chiloé is home to the bulk of the Chilean salmon industry, one of the world's largest, as well as a burgeoning mining industry. Its inhabitants depend on ferries to reach the rest of the country, with unpredictable weather conditions making this connection very intermittent. Seismic risk is also extremely high: the strongest earthquake ever recorded was at Valdivia in 1960, reaching 9.60 on the Richter scale. It happened 200km from here, and the 2010 Maule earthquake in the centre of Chile triggered a tsunami that caused damage as far away as Polynesia. This suspension bridge, which will be the longest in Latin America when it opens, was therefore scaled to withstand powerful earthquakes thanks to consolidation of the foundations and pylons, as well as contained steelwork. These precautions will help ensure a lasting connection with the continent for the people of Chiloé, reinforcing their safety, supplies, and ability to develop.



SYSTRA EXPERTS ON SAMUEL DE CHAMPLAIN BRIDGE



“The demands of a project like Champlain are not only those of the client, but also those of the populations it must serve. Our mission is to respond, through design, to very real problems that change over time. Our structures need to solve these problems with sustainable solutions.”

ZAC MCGAIN
GENERAL MANAGER,
SYSTRA IBT IN CANADA



“Thinking sustainably means building for every scenario, even the most unpredictable. Climate change is pushing us to make realities of these hypotheses and to give our structures the wherewithal to withstand unprecedented events.”

BÉNÉDICTE PICH
DIVISION MANAGER,
STRUCTURES & STRUCTURAL
ENGINEERING DEPARTMENT.

RAIL

AUSTRALIA



AUSTRALIA EMBRACES EUROPEAN STANDARDS

After Sydney took the lead modernising its urban train network signalling, it's now the turn of the country's third city, Brisbane, to acclaim European standards for implementation of its new railway.

The metropolitan area surrounding Brisbane is the economic heart of Queensland, a state two and a half times the size of France. With more than 3.5 million inhabitants, the region in the south-east accounts for more than 70% of the total population of the state. And this demographic pressure is only increasing. Brisbane has indeed three points of appeal: on an economic level, the city has succeeded in attracting the regional headquarters of international companies; in terms of higher education, the University of Queensland is at the forefront of research in areas such as biomedical innovation; and on a tourism level, the region is the hub with direct access to Gold Coast beaches and the Great Barrier Reef. The number of Brisbane inhabitants is therefore exploding, and this sustained development is taking its toll on transport infrastructure which is getting close to its maximum capacity.

In 2016 the Queensland government constructed a new urban train line, the Cross River Rail project, one of its priorities with regard to infrastructure. Thus 10.2km of tracks – including 5.9km of twin tunnels under the Brisbane River and financial centre – and four new underground stations will be built before 2024, reinforcing the existing network. The project is broken into three contracts, including the construction of the ETCS (European Train Control System), on which SYSTRA will consult on quality advice alongside the Hitachi Rail STS representative.

This is the second major Australian infrastructure project to choose the European system as reference for its rail signalling. This system, already used notably

on the South Europe Atlantique high speed line in France, alleviates the need for line side signalling which ensures permanent communication between the train and control centre via a wireless network. It enables optimal traffic management, with trains running more frequently and enhanced safety, two essential elements in the success of the Cross River Rail project.

The opening of this new line kicks off a true intermodal management of transport solutions in the city, bringing a better foundation to support the region's economic development, living conditions and employment opportunities to the whole of south-east Queensland.



“This is one of the very first deployments of ETCS in an Australian city. It's an opportunity to demonstrate that this system forms a benchmark in supporting projects which improve living conditions, economic development and the creation of employment in high-potential urban areas.”

CHRIS HURST

QUEENSLAND OPERATIONS MANAGER,
SYSTRA SCOTT LISTER



DIGITAL

AUSTRALIA



SYSTRA DIGITISES MELBOURNE TRANSPORT



In order to greatly improve traffic flow and safety on its roads, Australia's second largest city is removing 75 level crossings by 2025. The implementation of this project and the resulting works are major focal point for the State of Victoria which put out a call for bright ideas during a hackathon won by SYSTRA.

The Level Crossing Removal Project (LXRP) is the largest project of its kind ever undertaken in the State of Victoria. Directly tackling the city's bottlenecks and thereby helping to reduce pollution, removing 75 level crossings should give Melbourne residents a better quality of life every day, while stimulating the local economy and generating thousands of jobs for the demolition of infrastructure and renovation of the stations concerned.

Nevertheless, the magnitude of the task has authorities fearing that traffic conditions will significantly worsen during the work, even though the LXRP is meant to solve that problem. This is why, at the end of 2019, the State of Victoria organised a hackathon* to develop a digital solution that would improve the operation of replacement bus and substitution services.

The Group's Australian subsidiary, SYSTRA Scott Lister, took part in the hackathon in partnership with Viseo, a company chosen for its expertise in User Experience (UX) design and web development. Competing against five rival groups, SYSTRA and Viseo came up with an app in one week that can display and use various transport data sources, calibrate the number of buses needed according to the volume of passengers to carry, and optimise their frequency and trip time. The secret to the winning team's success? The involvement of an experienced developer from Qeto, SYSTRA's digital transformation, development and data science studio, the user interface designed to respond to the client's brief, the processing of previously under-used data, and the experience acquired during the development of Itsim. This editing and modelling app for public transport networks designed by SYSTRA is already used in France by the transport organising authority of Clermont Auvergne Metropolis and by operators.

The combining of skillsets from SYSTRA Scott Lister (knowledge of mobility solutions and of the regional territory and data analysis), Qeto (transport modelling) and Viseo (UX design and web development) convinced the State of Victoria's authorities and enabled the grouping to win the first stage of the hackathon. During this phase, the Vistra (Viseo and SYSTRA) team produced an MVP (Minimum Viable Product) of the platform, along with recommendations for its development and the integration of new technologies. A second phase is being launched.

*A hackathon is a challenge during which teams of developers, graphic artists, interface designers and project managers get together to work in collaborative mode on computer programming projects.



"By digitising our expertise in planning transportation services, we have created a tool with numerous benefits for our client. This tool facilitates transparency and communication on the number of buses required during planned disruption to rail services, improves the results by incorporating previously under-used data and reduces the time required to plan replacement buses."

GUILLAUME PAIX

SENIOR TRANSPORT
PLANNER, SYSTRA SCOTT LISTER



"It's a very fine example of collaboration between teams. We brought all of Qeto's experience in software development to this challenge, experience we gained in France, to help SYSTRA Scott Lister meet its client's expectations."

THOMAS JUIN

CHIEF DIGITAL OFFICER

ASSUMING OUR SOCIETAL RESPONSIBILITY



“What is the point of a company? Not so long ago, a company defined itself by what it did or what it produced. Its product and profession represented the entire purpose. But for some years now, driven by a growing realisation across society at large, far more is asked of companies. Clients, employees, but also public players and individuals, all expect a company to answer this simple but essential question: what do you do for society? Societal responsibility is proof through action of a system of fundamental values. A sense of awareness which makes the business useful. For over sixty years, we have been lucky to practise a profession that is meaningful in itself. Designing and building mobility solutions for all, serves society while supporting its development and helping make it more egalitarian. But our commitment does not stop there. It is embodied by the way in which we see our role, and the meaning we give to our projects. Societal responsibility is not a collection of resolutions or objectives; it is a constant involvement, a strong and integrated determination to positively impact the communities we serve. It constitutes a significant differentiator.”



SUZANNE WALKER
HUMAN RESOURCES DIRECTOR,
SYSTRA LTD.

METRO FRANCE



BUILDING THE GRAND PARIS EXPRESS AND ITS METRO

The Grand Paris Express is consistent with the ambitions driving the metropolis: elevating a region on the international stage while boosting its competitiveness and sustainability, thinking about trade and mobility in the 21st century, opening access and correcting social inequalities reproduced from generation to generation.

By 2030, the Greater Paris region will have seen the emergence of four new metro lines, or 200km of track and 68 stations, and an equal number of new neighbourhoods developed on the principles of intermodality, interconnection, and sustainability.



“The project management technical assistance on lines 15 West and 15 East calls upon three key qualities from SYSTRA. Firstly team spirit, vital in a project where you need to combine multiple sets of expertise. Next comes excellence, essential due to the stakes of controlling risk linked to works of extreme complexity in a dense urban setting. Finally audacity, considering the highly innovative construction mode for a project of this scale.”

NICOLAS MASSART

PROJECT DIRECTOR ATMO GRAND PARIS

The transformation represented by Grand Paris Express gives rise to a city demonstrating greater solidarity, that is more sustainable and more global.

SYSTRA has been associated with the project since the beginning in 2011. Today more than 250 employees are involved in the design and construction of this extraordinary worksite.

Since the summer of 2019, SYSTRA has provided project management technical assistance (PMTA) for lines 15 West and 15 East, a fifteen-year contract and one of the most important ever won by the company. From Pont-de-Sèvres to Champigny, and passing through the future hubs of La Défense and Carrefour Pleyel, this portion of the project is the most complex, as it is the most interconnected with existing networks and the section that will likely serve the greatest number of passengers.

This mission of unprecedented scale calls upon all the Group's know-how. It follows the new design-build approach driven by the project sponsor, Société du Grand Paris, to control costs and timings. In parallel, SYSTRA is providing project management for the infrastructure of line 15 South, and for extensions to line 14 (under RATP control); project management of the Vitry maintenance site and Orly airport station, as well as assistance on project management systems and project management of intervention vehicles, rolling stock and automated driving mechanisms.

This scope of responsibility, the largest of any engineering company involved with the Grand Paris project, depends on the expertise acquired by SYSTRA on all its large-scale projects handled to date, whether French high speed train lines or the Riyadh metro in Saudi Arabia, to name but two.



“The Grand Paris Express project allows Paris to impose itself as a global scale metropolis while making social commitments that flow directly from COP 21. It is a catalyst for improvement of our practices with a strong societal commitment angle, for projects that are more sustainable, safer, more ethical, and better integrated into the dense urban environment in which we operate.”

ANNELISE BAUDOUIN

GRAND PARIS EXPRESS
OPERATIONS DIRECTOR



200km
of new lines



68
stations



+2 million
passengers per day in 2030



250+
SYSTRA employees mobilised

METRO

UNITED STATES



NEW YORK SUBWAY GETS UP TO SPEED WITH ACCESSIBILITY

With 115 years on the clock and nearly 5 million passengers per day, the New York subway is a vital arterial network for an extremely dense metropolis and increasingly mobile communities. Its 472 stations interconnect every neighbourhood (from Bronx through Manhattan and Queens to Brooklyn). To allow people with disabilities to fully benefit from this unrivalled transport network, NYCT has launched a vast station renovation programme.

In the city that never sleeps, New York City Transit (NYCT) decided to make its infrastructure compatible with the needs of people with disabilities by making a strong commitment: to make the city's 100 most essential stations completely accessible to all by summer 2020. A major undertaking on century-old structures.

All these stations were indeed built before adoption of the Americans with Disabilities Act (ADA), the federal law governing standards which came into force in 1990. The stations of Bedford Park Boulevard, Gun Hill Road and Greenpoint Avenue for example, the three that SYSTRA teams are

working on, date from 1933. Evolving within dense urban settings, the pre-construction, construction and implementation operations undertaken by SYSTRA must proceed without disruption to services and access to the stations open to passengers 24/7. This constitutes the only access point to the network for the communities of Bedford Park and Dyre Avenue in the Bronx and Greenpoint in Brooklyn. In Bedford Park, SYSTRA is supervising the installation of three lifts which will allow people with reduced mobility to easily access street level, mezzanine level, and the platforms from the station entrance. The rest of the station must also be brought into line with the ADA to facilitate travel: signage, access ramps, guardrails, platform edges, dedicated lanes, as well as the equipment required to operate and maintain the new lifts. The same work is being undertaken at Greenpoint Avenue station. None of this would be possible without seamless coordination with the client, maintaining a close relationship with the communities directly concerned by developments, as much to ensure safety during the works as to guarantee their acceptance.



"SYSTRA's commitment to the well-being of all categories of commuters finds a new area for expression with these projects implemented by New York City Transit. The success of these projects will once again demonstrate to this major player that SYSTRA is a reliable partner for this type of operation with significant social impact."

SEYMOUR PORTES
EXECUTIVE VICE PRESIDENT,
NEW YORK REGION



CHARITABLE WORK

WORLD



OVERCOMING OBSTACLES, A JOB FOR ENGINEERS

SUSPENSION BRIDGE OVER THE RIO YACO, BOLIVIA



SYSTRA is involved in various charitable projects and with those who have made their life's work to help the most vulnerable.

In **Bridges to Prosperity**, SYSTRA has found the means to support a universal cause: access to essential services. Founded in Colorado in 2001, this NGO set itself the task of building footbridges in places where natural obstacles prevent local populations from accessing infrastructure for healthcare, education or employment. Teams of volunteers design and build the bridges with local volunteers, thus ending rural isolation for those communities. For their third collaboration with the NGO, SYSTRA colleagues got involved in the construction of a suspension bridge 48 metres above the Rio Yaco in the Bolivian Andes, giving the communities of Challome Grande and Challome Chico

a lasting link between their villages located on opposite sides of the river. In Australia, SYSTRA has partnered with Griffith University to develop a programme of financial support for Aboriginal people and to facilitate access to education for them. The **SYSTRA First People's Award in Engineering** is a scholarship granted to Aboriginal students to enable them to pay part of the material costs linked to their studies. In the United Kingdom, SYSTRA is a permanent sponsor of the **Surrey Wildlife Trust**, which works to protect biodiversity and raises awareness with the general public, and is a partner of the charity **Dementia UK** which helps people suffering from dementia and their carers.

METRO

UNITED ARAB EMIRATES



DUBAI TRACES ITS COURSE FOR 2020

At the end of 2021, Dubai will invite the world to a World Expo that the Emirate hopes will be symbolic of its ambitions, and of a future in touch with the challenges of our era. To support this outstanding event, an extension of the metro network was decided upon and set in motion in 2015 under the supervision of SYSTRA.

Dubbed Route 2020, this extension comprises 15km of track and 7 new stations which will add to the 70km and 47 stations already in service. The first entirely automatic network implemented in the Arab world, in 2009, the Dubai metro boasts one of the longest driverless metro lines in the world (52km).

But this project is about more than breaking records. In an Emirate-city of ever-increasing proportions, the metro has proven incredibly successful. To escape increasingly congested roads, the city's inhabitants and visitors have approved of this network and used

it massively since it opened. Indeed RTA, the operating authority, reports more than 1.5 billion journeys made during the first ten years, in carriages that have gone beyond their standard capacity to transport nearly 560,000 passengers a day.

The extension will enable the network to welcome some 25 million visitors expected between 1 October 2021 and 31 March 2022 for the World Expo. It also falls within a longer-term development framework of mobility solutions aimed at a middle class with strong demand. Public transport has found its place in Dubai and is boosting development of business and residential neighbourhoods without resorting to an all-car solution. Once the Expo is over, these new stations will enable the emergence of a tertiary job pool, and allow the activities of a nation on the rise to diversify a little more.



"The extension of the Dubai metro is part of a broader MasterPlan 2030, aiming to make the territory a model of sustainable and societal development with infrastructure designed as much for the present as for the very long term."

MARC SEFFACENE
TECHNICAL DIRECTOR,
MIDDLE EAST REGION

METRO INDIA


INDIA'S MEGACITIES INVENT THEIR SUSTAINABLE FUTURE

Home to almost one-fifth of the planet's population, India faces incredible demographic challenges and their importance is not about to diminish. Various forecasts agree that it will be the world's most populous country by 2025. Over 65% of its inhabitants still live in the countryside, but the rate of urbanisation is climbing year on year, representing a growing pressure on metropolitan areas and their infrastructure. SYSTRA, which has a strong presence here, is supporting several Indian megacities to implement sustainable urban development.

The Nagpur metro

Located in the centre of the country, Nagpur is home to over 2.4 million people and was recently ranked fifth city worldwide in terms of growth dynamic. Benefiting from the Indian government's commitment to support all conurbations with more than 2 million inhabitants by developing a metro rail network, Nagpur inaugurated construction of its new system in two stages: firstly in March 2019, with the opening of the North-South corridor, then at the start of 2020, with the launch of the East-West corridor. SYSTRA has been accompanying the Maharashtra Metro Rail Corporation as a general consultant since 2016 with a broad-spectrum consulting mission, entailing the phases of design, construction, testing and implementation of what will become the country's thirteenth underground and its first 'green' network. In addition to running 65% on solar energy, the future metro will include a rainwater recovery system at each station. In this way, it will contribute to the country's overall effort towards access to water for the entire population.

Delhi banks on automation

Having been open for less than three years, the Delhi metro's line 7 (the Pink Line) and 8 (Magenta) are set to become India's leading ambassadors for automation. To move from a level 2 system, the current level where the

driver controls opening and closing of doors as well as managing emergency situations, to a level 4 system allowing trains to run without any staff onboard, the Delhi Metro Rail Corporation chose SYSTRA: the Group is carrying out a complete audit of the current system and the steps to implement in order to achieve automation. This will improve train frequency and punctuality, essential factors to ensure the network helps people make 5 million journeys each day and continues to be one of the most effective tools to fight the air pollution besieging Indian cities.

The nation's Capital Region rethinks its network

With 46 million inhabitants, the national Capital Region which surrounds Delhi and overlaps several States is an area as strategic economically as it is critical in terms of development. To support its growth in a sustainable way, the authorities decided to roll out a regional transport network totalling over 700km of tracks across several corridors. SYSTRA is intervening on the Delhi-Meerut section for the detailed design of 12 stations and 42km of viaducts. The stations will be designed to attain the country's highest levels of environmental certification.



"Investment in sustainable infrastructure is flying high. The magnitude of the projects we are undertaking is not only determined by their cost but also by the importance of the economic, social and environmental questions they allow to be addressed. By integrating these problems at every stage of our missions, we ensure the future of SYSTRA and its ability to differentiate itself."

HARI SOMALRAJU
MANAGING DIRECTOR
OF SYSTRA IN INDIA

METRO IN NOIDA, DELHI



BUS BRAZIL



SALVADOR DE BAHIA GETS A REVAMP FOR ALL ITS RESIDENTS



With 2.8 million inhabitants, the town of Salvador is one of the most dynamic cities in Brazil and the fourth largest city in the country. But this dynamism doesn't yet benefit everyone; 40% of the population of the capital of the state of Bahia still live below the poverty line. Rethinking the metropolitan transport network, and thus access to services and employment, seems to be a vital lever for economic development that benefits everyone.

Since April 2019 SYSTRA has been working alongside Salvador's city council on a complete overhaul of the city's bus network, which will soon include new BRT (Bus Rapid Transit) and BRS (Bus Rapid Service) corridors as well as an electric fleet, one of the first in Brazil. This project is essential to the development of the city: it will provide qualitative transport solutions to underprivileged populations, therefore offering them access to employment, education and leisure activities. But it is also an opportunity for the city to promote the use of clean power for transport, with most electricity in Brazil coming from hydroelectric sources.

As the main objective is to serve the communities, SYSTRA's approach, to an even greater degree than usual, was taken under the premise of collaboration and co-construction with the population concerned. There was indeed no way we would decide on the reorganisation of the network in a vacuum. As a result, we analysed users' needs in depth to ensure the forthcoming network was compatible with the developmental needs of these communities. An unprecedented task in Brazil, where civil servants often develop their operational plans internally.

Salvador city council's approach is therefore not only innovative, but shows a sincere desire to tackle the problem of social inequality in the area. And as social development goes hand in hand with environmental issues, the capital of Bay of All Saints chose to make this redesign a spearhead for electric public transport in Brazil. For this, SYSTRA Brazil was able to draw on the expertise of its Canadian colleagues, who have mainly worked in Quebec, to put together a business strategy for 200 electric buses, or 10% of the new fleet.



"The execution of this project requires more than just technical competencies. It is tied to adopting an ethos which motivates the team and spreads to its stakeholders, in order to understand and consistently meet the needs of everyone involved. Thanks to this approach we have been able to build lasting solutions which have already changed daily life for the people of Salvador."

**MARC-OLIVIER
MAILLEFAUD**

CEO OF SYSTRA BRAZIL



4 million

inhabitants affected by the project



40%

of Salvador's population live below the poverty line



200

electric buses, or 10% of the fleet

GOVERNANCE

THE EXECUTIVE COMMITTEE

11 MEMBERS

The Executive Committee of SYSTRA assists the Board in its task of general management of the Group. Its purpose is to develop the Group strategy, and steer its growth while ensuring client satisfaction throughout the projects undertaken.

- 1 **PIERRE VERZAT**
CHIEF EXECUTIVE OFFICER
CHAIRMAN OF THE EXECUTIVE BOARD
- 2 **PIERRE GOSSET**
CHIEF TECHNICAL OFFICER
MEMBER OF THE EXECUTIVE BOARD
- 3 **BRUNO SCHMITT**
CHIEF FINANCE
AND ADMINISTRATION OFFICER
MEMBER OF THE EXECUTIVE BOARD
- 4 **JEAN-CHARLES VOLLERY**
CHIEF INTERNATIONAL
AND DEVELOPMENT OFFICER
MEMBER OF THE EXECUTIVE BOARD
- 5 **STÉPHANE BIRIEN**
CHIEF HUMAN RESOURCES OFFICER
- 6 **OLIVIER DEZORME**
CHIEF FINANCIAL OFFICER
- 7 **FRÉDÉRIC LEGUAY**
SENIOR VICE PRESIDENT RISKS AND SUPPORT
- 8 **ANDREW MCNAUGHTON**
SENIOR VICE PRESIDENT IN CHARGE OF
STRATEGIC EXTERNAL GROWTH INITIATIVES
- 9 **DIDIER TRAUBE**
SENIOR VICE PRESIDENT, FRANCE
- 10 **ARNAUD VALRANGES**
SENIOR VICE PRESIDENT,
INTERNATIONAL WEST
- 11 **MONICA DE VIRGILIIS**
CHIEF STRATEGY OFFICER



GOVERNANCE

THE SUPERVISORY BOARD

Made up of business leaders, sector experts, and members elected by the staff, the SYSTRA Supervisory Board comes together at least four times a year to review the Group strategy, its performance, and commitments.

17 MEMBERS

JEAN-YVES LECLERCQ

CHAIRMAN OF SYSTRA'S SUPERVISORY BOARD; CHIEF FINANCIAL OFFICER, RATP

XAVIER QUIN*

VICE CHAIRMAN OF SYSTRA'S SUPERVISORY BOARD; INDUSTRIAL DIRECTOR OF SNCF VOYAGEURS

CATHERINE GUILLOUARD

CHAIRWOMAN AND CHIEF EXECUTIVE OFFICER, RATP

MARIE-CLAUDE DUPUIS

SENIOR VICE PRESIDENT STRATEGY, INNOVATION AND DEVELOPMENT, RATP

JULIE REINER**

CHIEF FINANCIAL OFFICER, SNCF GARES & CONNEXIONS

PIERRE FA***

MEMBER APPOINTED BY SNCF
PRESIDENT OF THE ENGAGEMENT COMMITTEE

FRANÇOIS DE MONTALIVET

PERMANENT REPRESENTATIVE OF BNP PARIBAS PARTICIPATIONS

RÉGIS MONFRONT

PERMANENT REPRESENTATIVE OF CRÉDIT AGRICOLE CIB

PASCAL POIROT

INDEPENDENT MEMBER
PRESIDENT OF THE AUDIT COMMITTEE

EVA RUDIN

INDEPENDENT MEMBER
PRESIDENT OF THE NOMINATION AND COMPENSATION COMMITTEE

FABIENNE FAYARD

EMPLOYEE-ELECTED MEMBER

ÉRIC PRUVOST

EMPLOYEE-ELECTED MEMBER

MOHAMMED-ZAKARYA RAOUNAK

EMPLOYEE-ELECTED MEMBER

JOSÉ SIERRA

EMPLOYEE-ELECTED MEMBER

BRIGITTE VERCHÈRE

EMPLOYEE-ELECTED MEMBER

ALAIN FRYBOURG

OBSERVER, PERMANENT REPRESENTATIVE OF NATIXIS

PHILIPPE DE VULPIAN

OBSERVER, PERMANENT REPRESENTATIVE OF SOCIÉTÉ GÉNÉRALE



Working session, February 2020

*Member since 20/02/2020 and Vice Chairman since 25/03/2020.

**Member since 20/02/2020.

***Member since 25/03/2020.

GOVERNANCE

FINANCIAL RESULTS

SUMMARY

(as at 31 December 2019)

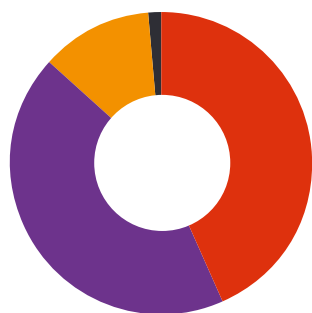
*On 1 January 2019 the Group applied the IFRS 16 'Lease Agreements' norm.

**In 2019, the Group recorded a provision under 2018 for unoccupied premises; the 2018 accounts have consequently been corrected.

CONSOLIDATED ASSETS (IN € THOUSANDS)	2019*	2018**
Intangible, tangible assets and goodwill	282,262	169,899
Non-current financial assets and equity method investment	506	610
Other non-current assets	32,679	30,522
TOTAL NON-CURRENT ASSETS	315,447	201,031
Other current assets	438,445	413,228
Cash and cash equivalent	45,167	57,330
TOTAL CURRENT ASSETS	483,612	470,558
TOTAL ASSETS	799,060	671,590

CONSOLIDATED EQUITY AND LIABILITIES (IN € THOUSANDS)	2019*	2018**
Equity attributable to owners	203,057	126,991
Non-controlling interests	2,348	2,363
TOTAL NET EQUITY	205,404	129,354
Long-term provisions	45,340	22,003
Non-current financial liabilities	136,049	84,791
Deferred tax liabilities	2,797	4,200
TOTAL NON-CURRENT LIABILITIES	184,186	110,994
Short-term provisions	5,291	7,737
Current financial liabilities	135,836	123,732
Other current liabilities	268,344	299,773
TOTAL CURRENT LIABILITIES	409,470	431,242
TOTAL EQUITY AND LIABILITIES	799,060	671,590

SYSTRA SHAREHOLDER STRUCTURE



43.4%

RATP

43.4%

SNCF

11.9%

Banks

4.4% Crédit Agricole

3.3% BNP Paribas

2% Société Générale

1.7% Natixis

0.5% FCPE (employee shareholding vehicles)

1.3%

Employees

FINANCIAL INDICATORS

INCOME STATEMENT (IN € THOUSANDS)	2019*	2018**
Consolidated revenue	631,173	586,200
TOTAL OPERATING INCOME	631,173	586,200
Operating expenses	-578,621	-554,596
EBITDA	52,552	31,604
Amortisation, depreciation and provisions	-39,018	-20,700
Share of profit (loss) from investments in joint ventures and associates	181	217
OPERATING PROFIT	13,716	11,121
Net financial income	-3,733	-237
INCOME BEFORE TAX	9,983	10,884
Income tax expenses	-9,885	-9,794
CONSOLIDATED NET INCOME	98	1,090
NET INCOME – NON-GROUP SHARE	-189	310
NET INCOME – GROUP SHARE	287	780

*On 1 January 2019 the Group applied the IFRS 16 'Lease Agreements' norm.

**In 2019, the Group recorded a provision under 2018 for unoccupied premises; the 2018 accounts have consequently been corrected.

SALES INDICATORS	UNITS	2014	2015	2016	2017	2018	2019
Order intake	m€	632	609	542	642	585	855
Order book as months of revenue	Month	23	19	18	18	17	21

SYSTRA



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CONFIDENCE MOVES THE WORLD