LIGHT RAIL TRANSIT

SYSTRA

Enhancing urban vitality

A MOBILITY SOLUTION CLEAN, GREEN AND BUILD TO LAST.

Historically, Light Rail Transit systems (LRT) **have been catalysts for cities to enhance urban transformation, creating** vibrant public spaces, and achieving ambitious environmental and societal goals.

Tramways get people where they need to go efficiently, offering a fast, high-capacity, safe, wide-ranging travel service that is protected from road traffic, with greater accessibility for people with reduced mobility and disabilities.

Their construction gives local authorities the opportunity to make a strong architectural choice in the treatment of roads and public spaces, with a complete redevelopment of traffic routes from one end to the other. LRT also add significant value to local communities acting **as a catalyst for urban unity and identity and promoting well-being**.

Today, as cities seek mobility solutions that meet climate and sustainability goals, tramways are redefining themselves as enablers of greener, more resilient urban environments—integrating tree planting, landscaping, public space preservation, and smart stormwater management. Tramway offers also a low-carbon option, which meets a major challenge for our clients, city and regional players, their residents and users.

Every modern tramway project is designed through a careful assessment of construction and technical options, ensuring that every choice contributes to sustainable urban growth. Investing in tramways means investing in the future of our cities.

Bordeaux (France)

DRIVING SUSTAINABLE & RESPONSIBLE URBAN MOBILITY

Maximize the impact and long-term success of your Light Rail Transit (LRT) project by focusing on the 7 key factors that drive performance and win public support. By prioritizing these critical elements, your tramway will not only deliver lasting mobility, environmental, and community benefits, but also shape the city's image and identity—becoming a symbol of modern, sustainable urban living. In doing so, your project will be celebrated as a valued asset that enhances city life and leaves a positive legacy for generations to come.

1 — DEVELOP A LONG-TERM VISION

Align your LRT project with your city's urban development goals. Tramways catalyze urban transformation and revitalization of public spaces—revitalizing downtown areas, defining a unique city identity through the tailored design of rolling stock and fostering unity among neighborhoods.

2 — PRIORITIZE URBAN INTEGRATION

Place urban integration, architectural quality, and landscape design at the heart of your approach to ensure the tramway enhances the city's character and is embraced by residents and travelers alike.

3 — ADOPT ECO-DESIGN APPROACH

Incorporate sustainability into every phase of your project's life cycle, from initial planning and construction to long-term operation and maintenance.

4 — GUARANTEE SAFE, RELIABLE AND EFFICIENT SERVICE

To meet both performance requirements and mobility demand, it is important to strategically select the tramway route. This involves carefully choosing the alignment to balance demographic trends, major destinations, and technical constraints. Such strategic planning helps guarantee a safe, reliable, and efficient service, while delivering optimal commercial speed and maintaining high safety standards. Furthermore, an effectively selected route ensures efficient connections between existing high-traffic areas and emerging neighborhoods, all while accommodating pedestrians, cyclists, intersections, and road traffic.

5 — ENSURE COST EFFECTIVE INVESTMENTS & OPERATIONS

Develop a Design at Cost approach: incorporate cost considerations from the earliest design phase (feasibility study) to inform architectural and development decisions—including, in particular, material selection—that may result from these choices.

6 — MAXIMIZE ENERGY EFFICIENCY

Integrate solutions that deliver the highest possible energy savings throughout the system's operation.

7 — SECURE SUSTAINABLE FUNDING AND FORECAST DEMAND

Use simulations to evaluate funding models and forecast ridership, ensuring the long-term financial and operational viability of your project.


Besançon (France)


Aarhus (Denmark)

Lyon T3 (France)

360° SERVICE PROVEN ENGINEERING EXPERTISE

Our teams are dedicated to Light Rail Transit (LRT) systems, bringing a holistic vision to address each project's complexity. This approach ensures our LRT projects meet the highest standards of quality, safety, and innovation.

We control CAPEX through long-term traffic forecasts, data analysis, and regularly updated models. Our "Design to Cost" method aligns designs with client budgets, optimizing solutions within financial constraints.

Modeling results allow precise infrastructure sizing and proactive risk management. This ensures controlled investments and sustained mobility performance.

Our experts support every stage of LRT delivery—from program management and planning to design, construction, and operational startup.

Our expertise covers all aspects: track, urban planning and landscaping, systems, stations, structures, depots, rolling stock, maintenance and operations planning.

TAILOR-MADE AND INNOVATIVE DESIGN SOLUTIONS

SYSTRA delivers customized solutions that comply with international standards and adapt to local contexts.

Designs tailored to complex topographies and unique urban environments:

- → Solutions that address climate challenges and incorporate the latest technological advances

COMPREHENSIVE PROJECT MANAGEMENT: FROM DESIGN TO SUPERVISION

Development of optimal solutions combining capacity, comfort, service quality, safety, and operational cost control:

- → Station positioning and seamless urban integration
- → Long-term platform and track design
- → Expertise in acoustics, vibration mitigation, bridges, and tunnels
- → System design to streamline line operation and maintenance, optimize power supply, and position catenary infrastructure
- → Enhanced passenger experience through real-time information and intermodal ticketing solutions
- → Focus on commercial speed, efficient operation, and urban traffic management
- → Optimized rolling stock and depot design, reducing acquisition costs

SUPERVISION & CONSTRUCTION IN URBAN ENVIRONMENTS

Proven system integration strategies for smooth project delivery:

- → Rigorous interface management by experienced project managers and engineers, ensuring compliance with the highest international standards
- → Extensive know-how in building within complex urban settings, including the preservation of archaeological heritage

TESTING & COMMISSIONING

Comprehensive testing to confirm project performance system and guarantee the safety of people and property:

- → Support for project managers throughout construction, testing, and commissioning
- → Collaboration with operators during system start-up

OWNER'S PROJECT MANAGEMENT ASSISTANCE

Our teams combine outstanding organizational and technical expertise, ensuring efficient project delivery—on time and on budget. We offer full-spectrum support covering:

- → Risk management
- → Legal, administrative, and regulatory compliance
- → Public procurement and contract management
- → Coordination of transportation systems, programming, and project delivery

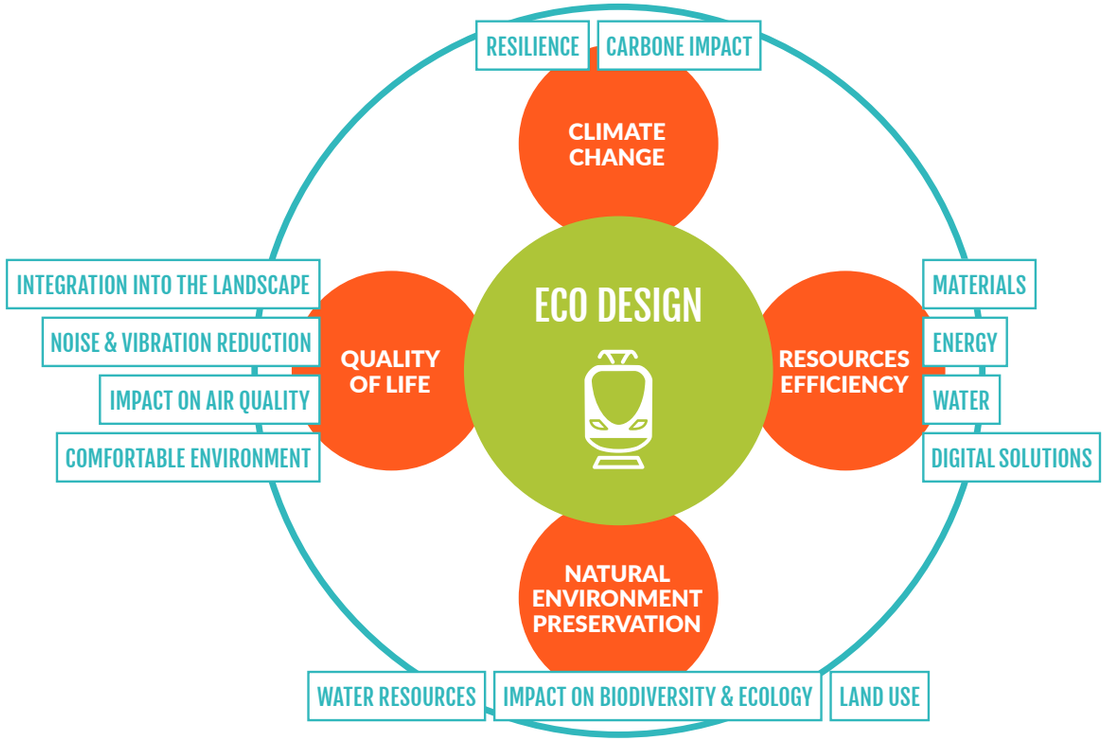

Ouargla Tramway (Algeria)


Casablanca (Morocco)

Dubai (United Arab Emirates)

APPLYING A SUSTAINABLE DESIGN & CONSTRUCTION APPROACH AT ALL STAGES OF YOUR PROJECTS

The modern tramway is more than just a transport system; it acts as a driver of sustainable urban transformation. In cities like Le Havre, Sfax, Tours, and Lyon, tramway projects go beyond mobility, fostering urban renewal through green spaces, increased vegetation, and improved stormwater management. Our approach emphasizes ecological integration—ensuring green corridors, biodiversity, and harmony with urban surroundings. Multidisciplinary teams review existing data, consult stakeholders, and incorporate innovative solutions such as vegetated and permeable surfaces. This holistic process not only delivers efficient mobility, but also enhances urban character, climate resilience, and quality of life, establishing the tramway as a force for greener, dynamic cities.



Sustainable design is a project design method that covers all areas of expertise. It aims to reduce environmental impacts, enhance the positive effects on sustainable development by taking into account the performance of the entire transport system, cost control and returns on investment over the entire life cycle of a project.

Our framework for sustainable design and construction is centered around 4 aspects.
It provides very specific environmental expertise, linked to the geographical characteristics of the sites where the projects are to be carried out and the need to manage their impact on the environment.

Stormwater Management and Soil De-Impermeabilization

SYSTRA integrates advanced stormwater management strategies into LRT projects, prioritizing maximum water infiltration through central or lateral trenches.
This approach reduces runoff and flood risk, supports groundwater recharge, and enhances sustainability and resilience.
By complying with environmental regulations and improving water quality, our solutions contribute to long-term environmental protection and project performance.

WITH CARBONTRACKER
YOU MAKE THE CHOICE OF A "GREENER" DESIGN AND OPTIMISE THE CARBON IMPACT OF YOUR PROJECTS!

Carbon Tracker, is a web application, BIM-compatible that measures, monitors, and controls your project's carbon performance at each phase, from concept design to infrastructure delivery.

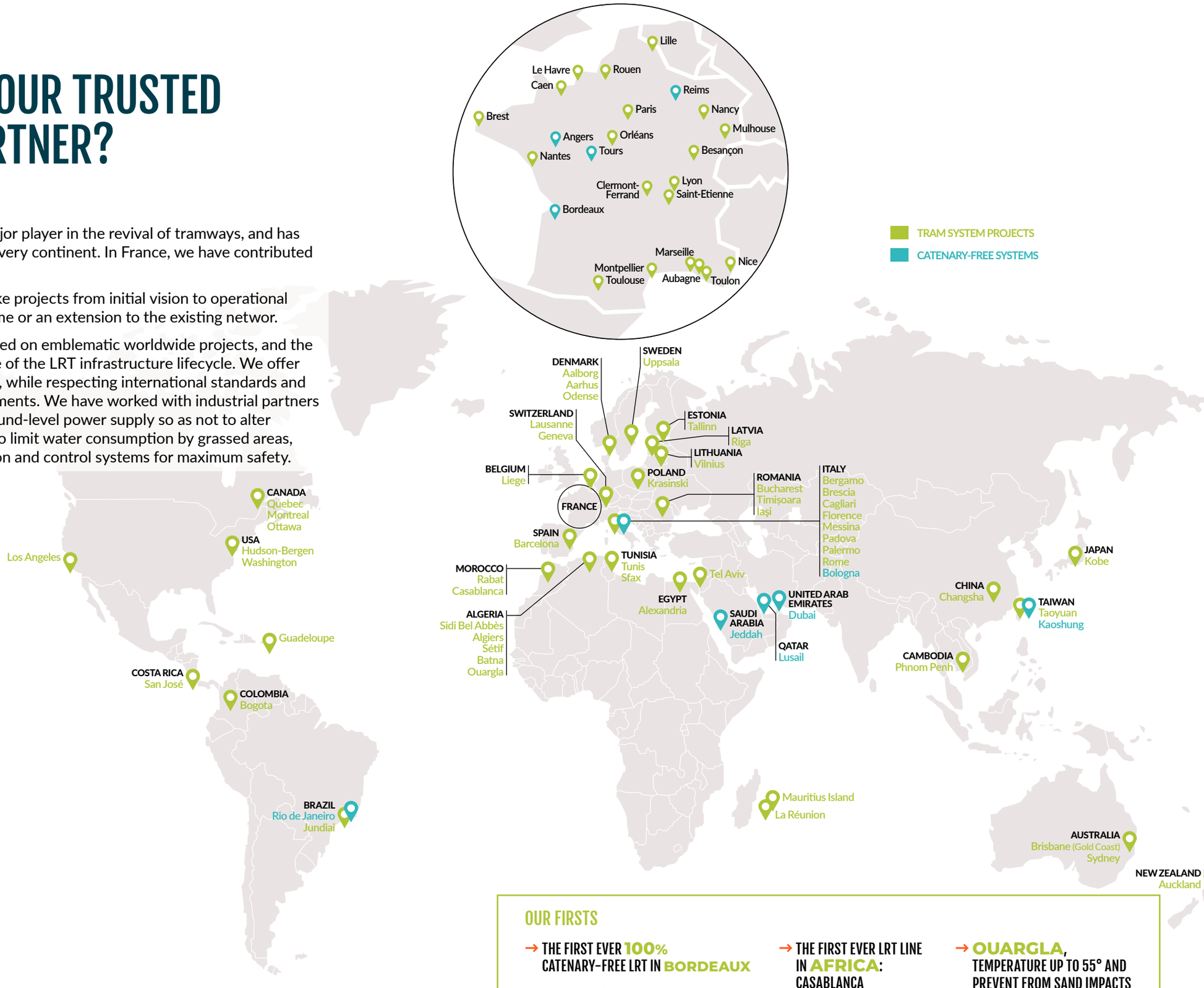
- → Automation of project carbon footprint calculations
- → Immediate visualization of carbon emissions from technical and geographic assets
- → Tracking of high carbon emission elements
- → Comparison of the carbon weight for the different design scenarios
- → Visualization of carbon emissions avoided by design choices
- → Management and monitoring of carbon performance throughout the infrastructure life cycle

WHY SYSTRA IS YOUR TRUSTED AND RELIABLE PARTNER?

For almost 50 years, SYSTRA has been a major player in the revival of tramways, and has designed over 700km of new networks on every continent. In France, we have contributed to almost 90% of the networks in service.

Our experts are supporting our clients to take projects from initial vision to operational reality—whether a completely new rail scheme or an extension to the existing networ.

Our clients benefit from our experience gained on emblematic worldwide projects, and the skills we have tried and tested at every stage of the LRT infrastructure lifecycle. We offer you the most practical and original solutions, while respecting international standards and your local environmental and safety requirements. We have worked with industrial partners to develop customised solutions such as ground-level power supply so as not to alter the historic landscape, controlled irrigation to limit water consumption by grassed areas, platform doors and automatic train protection and control systems for maximum safety.



OUR ADDED VALUE

- → **700 KM** OF LRT DELIVERED WORLDWIDE
- → SYSTRA HAS BEEN SUPPORTING THE REVITALIZATION OF CITY CENTRES FOR OVER **40 YEARS**
- → **85%** OF TRAMWAY NETWORKS IN FRANCE HAVE ENGAGED SYSTRA
  (as Project Manager, Assistant to the Owner, or Strategic Consultant)
- → **1** INTERNATIONAL CENTRE OF EXPERTISE IN TRAMWAY ENGINEERING, BASED IN LYON

OUR FIRSTS

- → THE FIRST EVER **100%** CATENARY-FREE LRT IN **BORDEAUX**
- → ONLY **30** MONTHS: RECORD DELIVERY SPEED CONSTRUCTION IN **CASABLANCA** 1ST TRAMWAY ON THE AFRICAN CONTINENT
- → THE FIRST EVER LRT LINE IN **AFRICA**: CASABLANCA INNOVATIVE CONCRETE SOLUTIONS FOR EXTREME CLIMATE CONDITIONS
- → **OUARGLA**, TEMPERATURE UP TO 55° AND PREVENT FROM SAND IMPACTS
- → INNOVATIVE UNDERGROUND WATER DRIPPING SOLUTION **PARIS T3 LINE**

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CONFIDENCE MOVES THE WORLD

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