

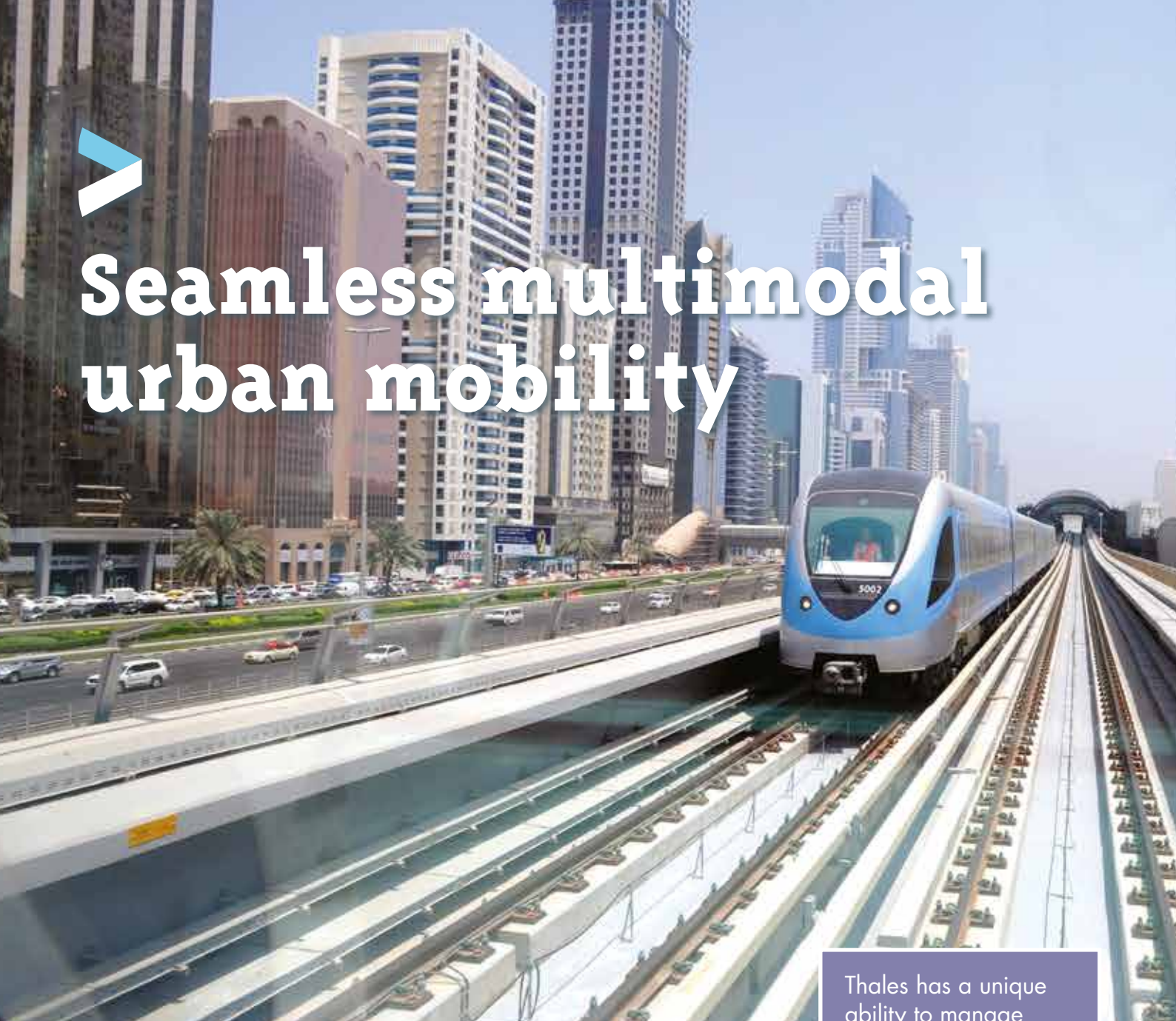
**URBAN MOBILITY**

**HIGH PERFORMANCE SYSTEMS  
FOR RELIABLE, APPEALING AND  
SEAMLESS PUBLIC TRANSPORTATION**





# Seamless multimodal urban mobility



With Thales, increase your network capacity, optimise punctuality and attract passengers with better multimodal door-to-door journeys. We specialise exclusively on IT-based critical solutions that harness our Group's experience in satellite and aviation navigation as well as cyber-security.

**Metros.** Thales has unmatched experience in ensuring metro lines run at peak efficiency with very high reliability and availability. For passengers' comfort and satisfaction, we help you provide punctual trains, accurate real-time information, easy ticketing and wireless connectivity both in station and in motion. Designed for maintainability and optimised for reduced cost of operation, our systems have the most attractive Total Cost of Ownership. Our excellent record of safety and service continuity speaks for itself.

**Light rails, trams & busses.** Thales understands that surface transportation is vital element of your urban transformation programme. Our advanced LRT & tramway control system is a powerful management and control solution for today's high-performance urban networks. Compatible with any type of rolling stock, Thales' turnkey solution provides you with everything you need to optimise the management of your light rail networks and provide easy journeys for your passengers.

**Road.** Thales has decades of experience designing and deploying centralised traffic management systems for urban and suburban areas, including: car park management, road traffic management, free-flow tolling and park-and-ride solutions. You get improved road user safety, quicker travel times, less pollution and an overall more pleasant travel experience for your citizens.

Thales has a unique ability to manage complex engineering projects and deliver fully integrated solutions. You can trust us to integrate your hardware and IT systems while minimising the risks of interfacing different suppliers.







# Signalling solutions

Our best-in-class signalling solutions significantly increase the capacity, safety and security of your public transportation network. With improved reliability and availability, you can enable an efficient and seamless flow of people across your city.

Our trusted, proven urban signalling solutions will boost the performance of your existing network without disrupting operations or help you start your new network right.

**Communications-Based Train Control (CBTC).** Thales literally invented CBTC in the 1980s and today our fully automated, integrated and upgradeable SelTrack™ CBTC continues to lead the industry. Freed from the limitations of conventional fixed-block designs, you can move more people, more quickly, without compromising safety. SelTrack™ CBTC also has a green configuration that consumes 15% less energy. Built to be flexible, it addresses all of your requirements and with optimised maintenance and life cycle costs.

**Route control systems.** Thales LockTrac electronic interlocking systems ensure smooth and safe movements by managing point machines, signals, crossings and other network elements.

**Rail field equipment.** Our FieldTrac family of trackside equipment includes axle counters, point machines, LED signals, automatic warning devices and more.

**Traffic management systems.** Put more trains on existing tracks with the help of our NetTrac ARAMIS (Advanced Railway Automation Management & Information System), which automatically detects conflicts and proposes operational solutions so that any incidents can be quickly managed.

**Street-level signalling.** We also provide tailored solutions for your tram and light rail networks, including signalling for lines and depots, priority management at road crossings, automatic vehicle localisation and tram regulation.



San Francisco's MUNI metro, for example, went from 23 trains per hour to a sustained 48 thanks to SelTrack™ CBTC and the London Jubilee line has over 30% capacity improvement.



# Communications & Supervision



Provide seamless journeys with real-time accurate information (multi-channel audio, video and mobile), on-board security and reliable connectivity through mobile communications (3G, 4G, LTE) and WIFI on board.

The only way to truly ensure security and optimise your costs is to have fully integrated systems across your entire network. Thales provides high-performance, reliable communications and supervision solutions with proven interfaces.

To ensure smooth operations and satisfied voyagers, you must monitor and control every facet of your increasingly complex network. We have our own line of integrated communication and supervision solutions, and we also integrate systems from third parties so that everything you operate liaises smoothly.

**Advanced traffic management.** Thales' integrated Operation Control Centre solutions allow you to optimise network utilisation and automate standard tasks so your teams can focus on higher-value missions. During an incident or crisis, you get valuable decision-making support in real time.

**Passenger information and comfort.** Offer travellers an enjoyable, reassuring experience with on-board, in-station and online information and entertainment, audio announcements, web connectivity, help points and more. Our Advanced Passenger Information Service software manages heterogeneous input sources and coordinates information across multiple channels.

**Telecom networks.** Thales has specialised telecoms solutions for public transportation, including broadband track-to-train communications, backbone, optical networks and radio (GSM-R, TETRA, LTE, WiFi). Thales DigiMax, for example, is our innovative TETRA solution that meets demanding safety requirements.

**Security management.** Our on-board video surveillance system (OBV) maximises physical security. We also address cyber security threats by preventing and even countering hacks and attacks. Other Thales solutions can detect abnormal behaviour, congestion zones, fire, smoke, intrusion and more.



# Services

By choosing Thales, you get guaranteed access to the expertise you need to keep things running safely, smoothly and efficiently throughout the lifetime of your system.

For more than 30 years, Thales has been a leader in services for urban operators. We have a service portfolio tailored to your needs and our network of service experts guarantee help is always close at hand. Thales provides complete maintenance support to reduce costs; upgrades to boost performance and operation support for smooth running.

Furthermore, Thales has highly innovative service offerings including predictive maintenance and intelligent asset management.

For the entire life of your Thales solutions, you can be confident that we will be at your service.



Thales can help you provide access to personalised information, journey planners and seamless ticketing to make offering multimodal journeys easier than ever.

## Ticketing & revenue collection

Our TRANSCITY™ solutions make public transport more appealing for your users and more cost-effective for you. We can support any model of transit governance and meet the requirements of bus, tram, ferry, metro and train networks of all sizes, including associated car parks.

You want to boost the appeal of public transport, create incentives, enable payment via contactless smart cards, contactless bank cards or smartphone apps — and yet also reduce fraud, secure revenues, cut your costs or implement new fare strategies: Thales can help.

For more than 40 years, Thales has been designing, providing, installing and maintaining cutting-edge ticketing and revenue collection solutions. Designed for multimodal transport in cities, TRANSCITY™ offers seamless travel through the different modes of transport, including road tolls and car parks: one ticket for the full ride.

TRANSCITY™ is scalable from a single bus line up to a nationwide system, with an open architecture, enabling flexibility and evolutions with new entrants.

We have a complete range of equipment for vending, validating and controlling travel rights, granting access in metro networks and car parks. We have the cloud-native back-office systems you need to deploy mono- or multi-modal ticketing. And we have a robust, proven central processing system designed for all modes of public transport as well as car parks and bikes.





# Ready for tomorrow

Thales is already working on the solutions you will need to successfully face the disruptive challenges of the future.

The most important potential disruption of the future is digitalisation, and Thales is ready to support your transition.

Our work with **big data** and **business analytics** will permit you to find new ways to use information about voyagers and their habits to help you deliver more personalised and more customised services.

For example, we understand your passengers increasingly want the ability to plan and purchase **multi-modal door-to-door journeys**: we are working to make that easier to provide and manage.

We will help you make urban transportation more appealing, thereby helping to reduce roadway congestion as well as limit your country's carbon impact. We are proud to have been a founding member of **Shift2Rail**, a European initiative developing digital innovation and designing the future European rail systems.

We are examining the many ways that predictive algorithms, machine learning and the internet of things could be used to further reduce your maintenance and operational costs.

We are striving to make it possible to smoothly and securely interface our traffic management systems directly with your IT systems, as well as ensuring that our software systems are fully **cloud-compatible**.

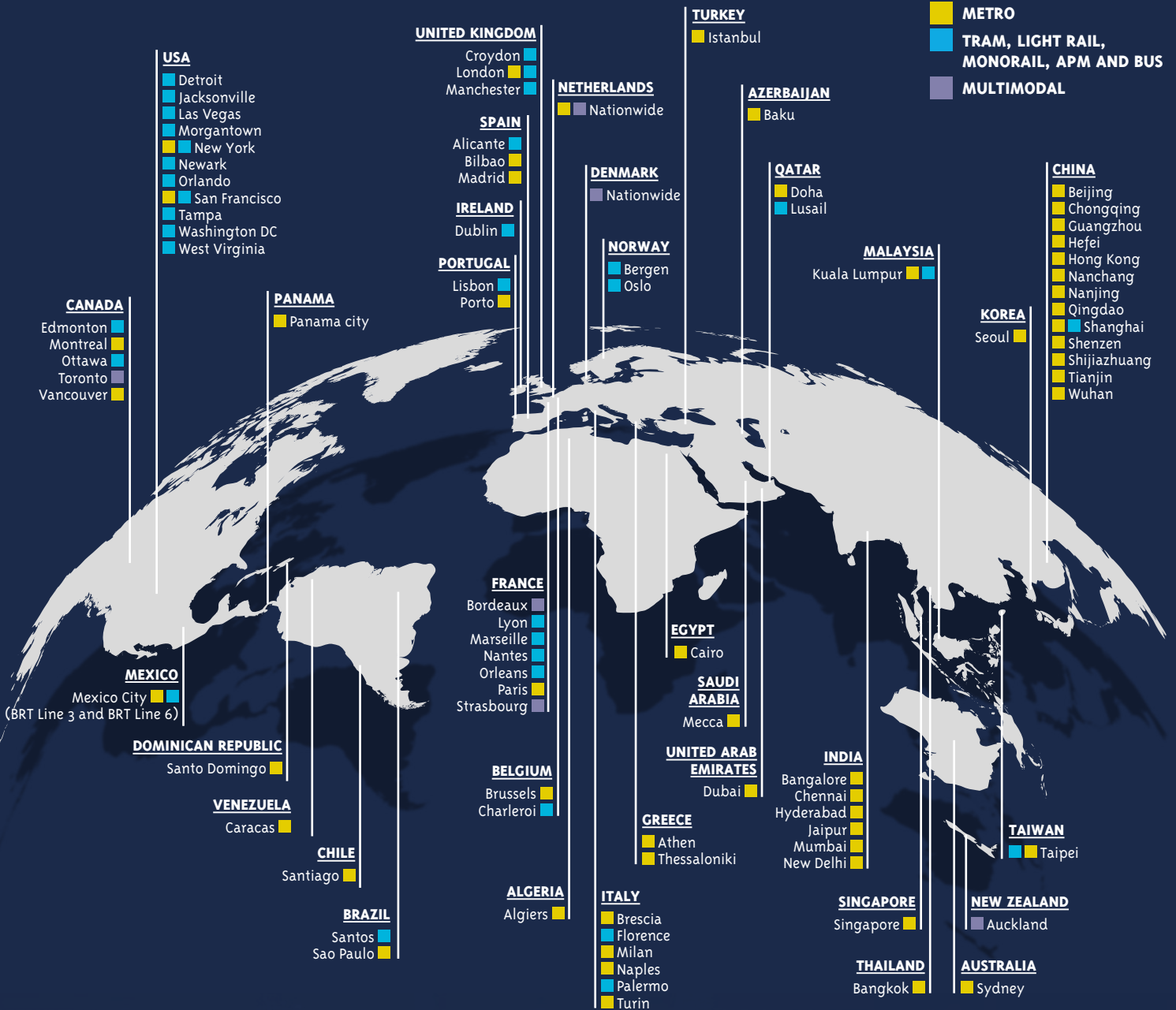
We are also working on **cyber security solutions** to help prevent hacking and reduce the risks of threats to your passengers, staff and infrastructure.

Choosing Thales is choosing a partner with extensive internal expertise and a wide variety of contacts both within and beyond the rail industry, all committed to helping you succeed.





# References



## THALES IS EQUIPMENT AGNOSTIC

Our solutions work with all rolling stock: Thales is currently powering rolling stock manufactured by Alstom, Ansaldo-Breda, Bombardier, CAF, CNR and CSR of China Railway Rolling Stock Corporation, Kawasaki, Kinki Sharyo, Mitsubishi, Hyundai-Rotem, Siemens, Taiwan Rolling Stock Company (TRSC), Vossloh, Von Roll and more.



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