

LRT & TRAMWAY SOLUTION

# For optimised operations and maintenance



# City challenge

Light rail schemes are not only transport projects, but also city transformation projects.

Light Rail Transit (LRT) and tramways are playing an ever more important part in meeting the need for sustainable, high-performance transport in cities. Quick, clean and green, LRT signals a city's commitment to embrace change.

But getting it right goes beyond simply procuring tracks and vehicles. Delivering a successful and attractive light rail project hinges on the ability to meet a range of complex passenger and operator needs in a short timeframe.

For passengers, safety, comfort and security are fundamental requirements. Quality of service is also vital, so punctuality, accurate real-time information and easy ticketing are essential.

For operators, there's a need to optimise capacity and ensure networks operate at peak efficiency from day one to ensure passenger satisfaction and achieve maximum return on investment.

To meet these objectives, operators need an advanced LRT and tramway control system.



**€110 billion**

estimated annual cost of road congestion in Europe.

**400+**

light rail networks in operation worldwide with more than 170 in Europe.

**488**

cities with more than one million citizens in 2014. The UN expects this number to rise to 662 by 2030.

**3,000 to 11,000**

passengers per hour per direction (PPHPD) with light rail.

# A new approach for demanding cities

Thales' 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 operators with everything they need to optimise the management of their light rail networks – and provide easy journeys for passengers.

Advanced features and functionalities include:

## Simulation and Training platform

– simplifies fault analysis and supports the training of control centre operators.



Manchester Metrolink Tramway Control Centre

## Flexible and intelligent Traffic Light Priority management

– continuous train-to-ground communications at road intersections enables synchronised priority requests based on the real position of the tram and its speed, while minimising the waiting time for private road traffic. The solution also allows a significant reduction in the number of field elements, so installation and maintenance are easier.

## Embedded tools for service quality analysis

– including charts with real-time information and files that can be exported to other tools.

## Whole-life customer assistance

– a complete range of services including training, support and maintenance.



Thales' LRT & Tramway interlocking for single point machine, terminal and depot

## High-level integration at the control centre and on board

– enhanced integration reduces risk during implementation, cuts down the number of components, simplifies operations and eases the maintenance burden.

## Train Regulation and Smart Timetable Management

– high-level regulation with Smart Timetable Management provides driver support with real-time journey information (timetable/headway mode/provisional service with automatic timetable regeneration in the case of disruption).



Thales' driver console

## Adding value with smart control

Thales' advanced LRT & Tramway Control System helps operators to cut dwell time, reduce delays and improve punctuality. And because it tackles the problem of driving ahead of schedule, passengers spend less time waiting at stops. These capabilities boost customer satisfaction, stimulate growth and maximise ROI for operators.

## Compliant with national and international standards

IEC 61508, EN 50121, EN 50125, EN 50126, EN 50128, EN 50129, EN 50155; BOStrab; VDV; Guidance on Tramways; AREMA.

# A complete and advanced LRT & Tramway solution

Boosting quality of service and passenger satisfaction

## Signalling

A complete signalling portfolio, from line-of-sight solutions, including point controllers, single-track management and depot control, to mixed traffic solutions for tram-train applications.

## Automatic Vehicle Localisation and train regulation

Accurate Automatic Vehicle Localisation and high-level regulation provide real-time driver support, with journey information to increase punctuality and quality of service.

## Priority management at road intersections

Intelligent priority management at road-rail junctions improves punctuality, enhances traffic flows and optimises the balance between public and private transport. With broadband radio communication, the need for cabling and trackside equipment is minimised.

## On-Board System (OBS)

The vehicle OBS is at the heart of intelligent operations. It provides driver advisory functions, driver login/logout, route setting, localisation, security information and communications (to passengers, train-to-ground and train-to-OCC).

## Optional functions

A range of additional functions can be provided at the customer's request. These include Automatic Train Stop and speed supervision.

## Operation Control Centre (OCC)

Managed through an intuitive and integrated user interface, Thales' OCC platform provides operators with complete visualisation and control of every subsystem to guarantee smooth, continuous operations.

## Passenger Information & Comfort

Real-time management of passenger information, public address and web applications.

## Passenger Infrastructure & Security

Access control, perimeter security, intrusion detection, CCTV, video analysis and encrypted communications.

## Voice and Data Communications

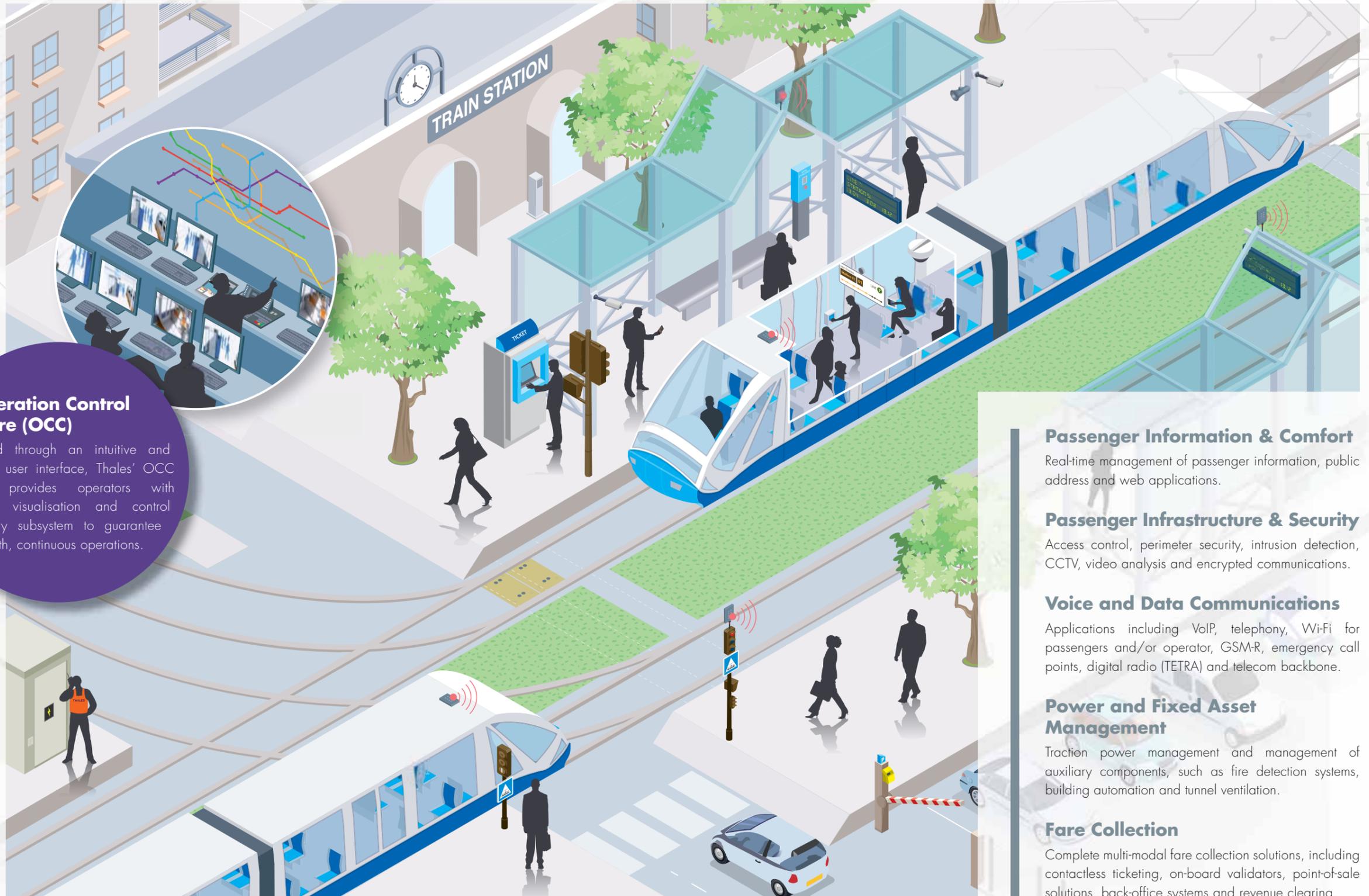
Applications including VoIP, telephony, Wi-Fi for passengers and/or operator, GSM-R, emergency call points, digital radio (TETRA) and telecom backbone.

## Power and Fixed Asset Management

Traction power management and management of auxiliary components, such as fire detection systems, building automation and tunnel ventilation.

## Fare Collection

Complete multi-modal fare collection solutions, including contactless ticketing, on-board validators, point-of-sale solutions, back-office systems and revenue clearing.



# Championing LRT integration

## ▣ Norway – Bergen Bybanen

The city of Bergen in Norway chose Thales to supply safe and secure transportation solutions for its Bybanen light rail network. Thales' integrated solution includes:

- Communications system with video surveillance, backbone, TETRA radio, SCADA and passenger information
- Signalling system for the line and depot including Automatic Train Stop
- Priority at road and pedestrian crossings

## ▣ UK – Manchester Metrolink

A complete and fully-integrated system for Manchester Metrolink – the UK's longest light rail network:

- Communications systems, including passenger information and video surveillance
- Overhead lines and traction power
- Automatic Vehicle Localisation, priority management at road crossings and signalling systems
- Systems integration and maintenance.

Manchester Metrolink – multi-category winner in the Light Rail Awards 2013:

- European Supplier of the Year – M-Pact Thales consortium
- UK Light Rail Project of the Year – Manchester Metrolink
- Operator of the Year – Manchester Metrolink operator RATP

## ▣ LRT and tramway references

(underway or in service)

Thales' LRT solution can be integrated in any rolling stock from any manufacturer.

### Belgium

Charleroi - *Bombardier*

### Brazil

Santos LRT - *Vossloh*

### Canada

Edmonton LRT - *Siemens*

Ottawa LRT 'Confederation Line' - *Alstom*

### France

Marseille tramway - *Bombardier*

Nantes-Châteaubriant tram - *Alstom*

Orléans - *Alstom*

### Ireland

Dublin Luas - *Alstom*

### Italy

Florence L1 - *AnsaldoBreda*

Palermo - *Bombardier*

### Norway

Bergen Bybanen, Phase 1 and 2 - *Stadler*

### Portugal

Metro de Porto - *Adtranz and Bombardier*

### Spain

Alicante Line 2 tram-train - *Bombardier*

### UK

Croydon Tramlink - *Bombardier*

Manchester Metrolink - *Bombardier and*

*AnsaldoBreda*

### USA

San Francisco Muni - *AnsaldoBreda*

# Why Thales ?

## ▣ Customer focus

Thales has a deep understanding of the transport market and works in partnership with customers to deliver solutions that meet specific operational needs and conform to operators' business rules.

## ▣ Complete portfolio

Our systems offer is the largest in the market and includes a consistent suite of solutions, from communications and supervision to passenger information and security – all based on resilient telecoms infrastructure that is designed to meet the challenges of the transport environment.

## ▣ Advanced supervision

Thales' Operation Control Centre (OCC) platform offer the highest levels of integration and automation, with the ability to provide seamless supervision of every subsystem – including legacy and 3rd party systems.

## ▣ Proven integration skills

We offer complex systems integration expertise in both brownfield and greenfield projects, with an unparalleled ability to design, deliver and maintain the world's largest and most demanding transport communications and supervision solutions.

## ▣ A trusted partner

Thales is a dependable long-term partner with operations in 56 countries and a heritage that stretches back more than a century. Our worldwide installed base and network of integration and competence centres means Thales is always at your side, with solutions delivered and maintained by expert local teams.

## ▣ Secured by Thales

Security is at the heart of every Thales' solution. The systems we build for our customers draw on our expertise and leadership in domains that include aerospace, defence and security.

## ▣ At your service

Through-life support for communications and supervision systems, including maintenance, upgrades and operations outsourcing.



# THALES

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**Thales Communications & Security**

20-22 rue Grange Dame Rose - 78141 Vélizy-Villacoublay – France

Tel: +33 (0) 1 73 32 00 03