



THALES

Building a future we can all trust

Thalesgroup.com



**GROUND
TRANSPORTATION
SYSTEMS**

Transforming mobility

BY YOUR SIDE SUPPORTING YOUR BIG AMBITIONS

Countries, cities and transport operators rely on Thales' Ground Transportation solutions to meet new mobility needs.

We use the power of digital technologies to offer innovative and cybersecured solutions in signalling, train control, supervision, communications and revenue collection.

Using our expertise, we help our customers build safe, affordable, accessible and sustainable mobility, benefiting today's passengers and future generations.

No matter how challenging the project, we are by your side, building a future we can all trust.

ADDRESSING YOUR NEEDS

- Increase **Capacity**
- Improve **Operations & Reduce Life Cycle Costs**
- Leverage **Digital Solutions & New Business Models**
- Meet **New Standards & Technologies**
- Reduce **Energy Consumption** to Meet **Environmental Needs**
- Support **New End-to-End Travellers' Behaviours**

ENHANCING THE PUBLIC TRANSPORT EXPERIENCE

7.8 billion people in the world are increasingly mobile

55% of the world's population live in urban areas

Sustainable Mobility towards less pollution & less congestion

Digital is transforming mobility

PARTNERING WITH YOU

OUR CUSTOMERS



Transport operators



Transport authorities



Rail infrastructures owners



EPCs



Consultants

AN EXTENSIVE PORTFOLIO



SIGNALLING



COMMUNICATIONS & SUPERVISION



FARE COLLECTION



SERVICES



CYBERSECURITY



DIGITALISATION

Ideally positioned to support your Digital Transformation

OUR SOLUTIONS

SIGNALLING

Ensure safe travel for passengers and goods
Maximise the capacity of your network

- Train control systems
Main Lines ETCS L1, L2, L3
Urban (attended or driverless): CBTC
- Route control systems
Electronic & digital interlockings
- Field equipment
Digital axle counters, point machines;
track circuits; checkpoints and signals
- LRT & Tramway management and Priority
- Management Systems
Traffic management systems
Driver advisory systems
- Extensive Services Portfolio
Knowledge Management, Life Cycle; Tools &
Diagnostics; Predictive maintenance



250,000
Thales rail field
equipment
installed worldwide

COMMUNICATION & SUPERVISION

Guarantee operational efficiency
Ensure passenger safety & comfort



124 metro lines
in 36 cities
equipped with integrated
OCC solutions

- Data-Driven Integrated Operation Control Centres
- Telecom solutions: network backbone and radio
- Passenger information and connectivity
- Security and video surveillance
- SCADA solution for fixed asset and traction power
- TransVerse™ Digital Service Platform

FARE COLLECTION

Guarantee operational efficiency
Ensure seamless and convenient travel experience

- Open multimodal fare collection systems
- Ticketing inspection and validation equipment
- Innovative ticket validation with touchless options
Contactless bank cards; smartphones & hands-free
- From field equipment to cloud-native back-office solutions
- All-inclusive ticketing with road tolls and car park payments



50 million
ticketing transactions
per day
all over the world



1,500 experts
in 26 service centres
worldwide

SERVICES

By your side,
ready to go the extra mile

- Maintenance & spares services to maximise availability
- Life cycle support services to protect investments made and keep systems up-to-date
- Competence & consultancy services to provide know-how for more efficiency
- Full operation services teaming with or on-behalf of the customer
- Data driven digital services available on the TransVerse™ Digital Service Platform

OUR SOLUTIONS . FOCUS ON DIGITALISATION

Ideally positioned to support your Digital Transformation

DATA-DRIVEN INTEGRATED OCC

By better exploiting and correlating data, data-driven operation centres can provide a fully integrated operator experience (Supervision & Control) for security, passenger comfort, and train regulation

Over 50 use cases: Energy savings / Passenger density & guidance / On-demand train scheduling / Crisis management / Multimodal supervision / and more...

TRANSVERSE™, THE DIGITAL SERVICES PLATFORM

By providing an online cybersecured SaaS* platform, operators can run and manage their digital services (including third-party) from any device

TIRIS™; NAIA™; PULSE™; GreenSpeed™; Protostellar™; Video analytics

CYBERSECURITY

TRAIN AUTONOMY

For Urban: Reduce track bed equipment, accelerate deployment, increase reliability and improve accuracy

POC: RailBot™; GOA3/4; Advanced autonomous services like precision positioning; obstacle detection and Tramway collision avoidance

For Main Line: Allow trains to be more punctual, greener, safer, and even driverless in the future

CONNECTED JOURNEY

Digitalisation starts with passenger experience and expectations. It Helps Transport Authorities improve Door-to-door Passenger Experience

TRANSCITY™, Multimodal orchestration

DIGITAL SIGNALLING

Deploying modern Digital signalling and train control technology will increase capacity, reduce delays, enhance safety and drive down costs

SelTrac™ CBTC 8th Generation; TransVital™; Smart Maintenance ERTMS L3

OUR SOLUTIONS . FOCUS ON CYBERSECURITY

Ensure service continuity of all your vital systems

Protecting Transport infrastructure **end-to-end**
Unified Cybersecurity & Safety Approach

CYBERSECURED BY DESIGN PRODUCTS & SOLUTIONS

- Digital platform, products and solutions comply to standards (IEC-62443, ISO 27001)
- Vital platform certified IEC62443 SL3

CYBER ENHANCEMENTS FOR LEGACY SYSTEMS

- Rail Domain Detection
- Upgrading architecture, products & security controls

CYBERSECURITY SERVICES FOR BETTER PROTECTION

- Training, assessment, monitoring, maintenance, incident management & recovery



CONTRIBUTE TO GREEN MOBILITY

To support our customer's engagement on green initiatives, we are using digital technology to boost the environmental performance of rail.

Connected Driver Advisory System **GreenSpeed™**:

15% reduction in traction energy consumption on a **500km** line can cut CO₂ emissions by **20,000** tonnes per year

Traffic Management System and Automatic Train Operation:

A capacity increase of **20%** on a **500km** line can generate a reduction of CO₂ emissions of **200,000** tonnes per year*

* Modal shift from Road to Rail

Green CBTC, an ATO function of **SelTrac™** CBTC designed to save metro traction power.

Traffic Management System **ARAMIS™** to support decisions optimizing performance & energy consumption.

Intelligent **Fixed Asset Supervision** to manage wayside and station energy consumption, using **TransVerse™**.

OUR REFERENCES

■ Main Line Rail
 ■ Urban Rail
 ■ Ticketing
 ■ Supervision & telecoms



GOTTHARD . MAIN LINE RAIL

● **Signalling under the Alps**
Gothard base tunnel

● **Switzerland** committed to shifting freight from road to rail
The tunnel plays a vital role in reducing the impact of road traffic in the fragile Alpine environment

● **World's longest rail tunnel**

● **ETCS Level 2**

● **57km** from end to end

● Trains can travel at up to
250km/h

STUTTGART . MAIN LINE RAIL

● **Blueprint for future national & European projects**

● Digital Rail Germany initiative to modernise the network
"Digitale Schiene Deutschland »

● **1st** digital node in Europe

● **Deployment of**

- ETCS
- Digital interlocking system - DSTW
- Preliminary work on trackside ATO
- Capacity & Traffic Management System - CTMS

NORWAY . MAIN LINE RAIL

Over **4,200km** of lines equipped with the new signalling system by **2035**

1,900 trains per day monitored by

3 Control Centres

New technology ready to face today's technical, operational & societal challenges

ARAMIS™ New Generation a single operation tool for **Bane NOR** network

SAUDI ARABIA . MAIN LINE RAIL

The **1,362km** freight line serves Saudi Phosphate and Bauxite mines

The **1,314km** passenger line connects Riyadh to Al Qurayyat

Longest worldwide railway to adopt ETCS L2

NSR contributes significantly to **Saudi Vision 2030** goals

CHINA . URBAN RAIL

38 lines into operation equipped with SelTrac™

in 17 cities

SelTrac™ CBTC

+1,450km of lines in service

The world's largest urban rail market

LONDON . URBAN RAIL

4LM : 40% of the Tube network

In operation since 1863

"Green CBTC" optimization with SelTrac™

One of the world's busiest metros a 33% increase in peak-hour capacity

Jubilee and Northern lines already in service

SINGAPORE . URBAN RAIL

1st largest re-signalling project

NSEW lines carry

66% of Singaporean commuters

100km delivered in
6.5 years project

141 passenger trains
CBTC equipped

CANADA . URBAN RAIL

+140 trains

6 lines
equipped with SelTrac™ CBTC
technology in 3 cities
Vancouver - Ottawa - Toronto

+150km of tracks

Vancouver SkyTrain, Expo Line

1st Driverless CBTC
in the world in 1986

GRAND PARIS EXPRESS . SUPERVISION & TELECOMS

Connecting hubs
& accelerating territorial
development

3 interconnected lines

50 stations

125km
of new lines

159 trains
equipped by Thales

1200 access gates

Revenue collection systems
supplied by Thales

1st section in service
for Paris 2024 Summer Olympics

500 ticket-office/ticket
vending machines

SYDNEY . SUPERVISION & TELECOMS

31 stations

66km

1 line

2 sections

Flexibility & optimisation with
integrated OCC

Ensuring a 30-minute journey,
every 3 minutes,
from home to anywhere in the
future 3 Central Business Districts

SANTIAGO . SUPERVISION & TELECOMS

Construction
& maintenance

L3 & L6

Increasing the frequency
of train services:
90 seconds

Extension

L1 & L5

Tackling the ever
increasing passenger
demand across
key routes

Renovation

L4 & L4a

Centralising all the critical
data into one system
with integrated OCC

TAIWAN . SUPERVISION & TELECOMS

The **3** LRT lines
equipped by Thales

Modern
safety-critical systems

Reliable journeys
for passengers

BANGKOK . TICKETING

From a daily ridership of
400,000 to **800,000**

Automatic Fare Collection system across
18 original and **19** additional stations

Gates and **Token Issuing Machines (TIM)**

AUCKLAND . TICKETING

+1.5 million
AT HOP card used
on a daily basis

5,000 bus devices

90 self-service
vending machines

1 system for bus,
train and ferry
ticketing

127 point
of sales terminals

187 validators
and

80 gates
on platforms

JAKARTA . TICKETING

● An integrated payment system using an Account-Based Ticketing (ABT) solution for intermodal transportation

● A total of **14** fare categorisations will be available

● Up to **2 million** trips per day allowed by the new ticketing platform

● **5** public transport systems covered

NETHERLANDS . TICKETING / MAIN LINE RAIL

● **6,000** gates

● More than **600 km** to be equipped with ERTMS and the GAST-ERTMS axle counting system

● More than **25 million** transactions per week

● A nationwide multimodal ticketing system

● Implementing ERTMS Central Safety System into the Dutch railway network

QATAR . MAIN LINE RAIL / SUPERVISION & TELECOMS

Increase Public Transport Share from

0.5% to **21%** in 2020

Providing fully integrated solution for the **supervision, telecommunication, security & fare collection systems** for the new **Lusail Transit**

1st three lines of Doha metro

Providing advanced **CBTC signalling, telecommunications, security & integrated OCC and automatic fare collection systems** for **Doha Metro**

Integrated supervision and communications

Operation Control Centre

Driverless operation

Revenue Collection Systems

DUBAI . SUPERVISION & TELECOMS / URBAN RAIL / TICKETING

7% Increase in ridership in 2016

1st Metro in the gulf region

31 stations

90km of metro lines

**Dubai Red Line
Green Line
Dubai R2020 – Dubai Red Line Extension**

PORTUGAL . MAIN LINE RAIL / SUPERVISION & TELECOMS

Implementing **ARAMIS™**
system

Controlling **1,250** trains/day,
over **1,313km** of tracks

Deploying
Telecommunication

Security Solutions

Passenger Information Systems

EGYPT . MAIN LINE RAIL / URBAN RAIL SUPERVISION & TELECOMS / TICKETING

Providing critical systems for Cairo
Metro since 1981 on Lines 1,2 & 3
**Automatic Fare Collection
&
Integrated Supervision
and Communication Systems**

Upgrading Egypt's busiest railway
25 million passengers per year
140 to **160km/h**

Extra capacity with **5**-minute headways

A RELIABLE PARTNER CLOSE TO YOU

A WORLDWIDE PRESENCE

In Rail Technology
since **1950**

- Transport authorities
- Transport operators
- Rail infrastructure owners
- EPCs (Engineering-Procurement and Constructions Companies)

Over
250
customers

In more than
60
countries

INTERNATIONAL TEAMS

+ 9 000
employees
worldwide

5 digital hubs & competence centres



Toronto



Berlin



Manchester



Singapore



Paris

25
R&D &
integration
centres

Dedicated teams in
52
countries



20-22, Rue Grange Dame Rose
78140 Vélizy Villacoublay
France
Standard +33 1 73 32 00 00
Accueil +33 1 73 32 00 03
thalestransport@thalesgroup.com

> Thalesgroup.com <

