

## 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.

#### **ADRESSING YOUR NEEDS**

Increase Capacity

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



## **PARTNERING WITH YOU**

#### OUR CUSTOMERS



Transport operators



authorities

Rail infrastructures owners

#### 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

#### **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

#### 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<sup>™</sup> Digital Service Platform



1,500 experts in 26 service centres worlwide

**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



#### TRAIN AUTONOMY

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

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

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

#### 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<sup>™</sup> CBTC 8th Generation; TransVital<sup>™</sup>; 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 OREEN 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**<sup>TM</sup>:

15% reduction in traction energy consumption on a

**500km** line can cut CO<sub>2</sub> 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 CO<sub>2</sub> emissions of

200,000 tonnes per year\*

\* Modal shift from Road to Rai

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

Traffic Management System **ARAMIS**<sup>TM</sup> to support decisions optimizing performance & energy consumption.

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

#### **OUR REFERENCES**



## 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





## STUTTGART. MAIN LINE RAIL

- aigital 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
- Ontrol Centres





## SAUDI ARABIA. MAIN LINE RAIL

- Longest worldwide railway to adopt ETCS L2
- NSR contributes significantly to Saudi Vision 2030 goals

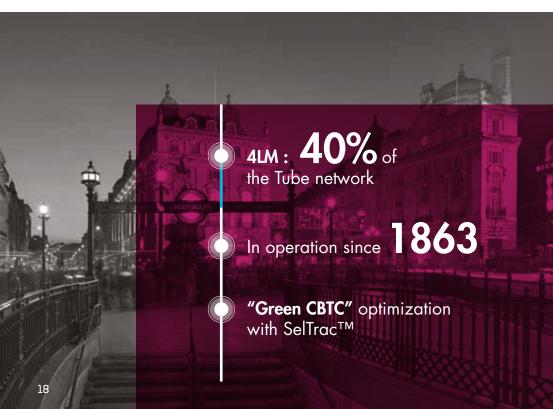
## CHINA. URBAN RAIL

**38** lines into operation equipped with SelTrac™

in 17 cities

SelTrac™ CBTC

+1,450km of lines in service





## LONDON . URBAN RAIL

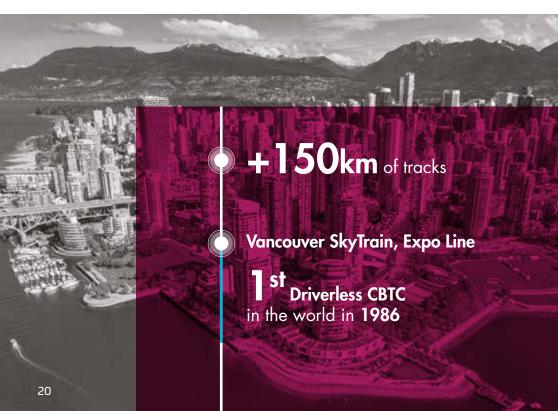
- One of the world's busiest metros a

  33% increase in peak-hour capacity
- Jubilee and Northern lines already in service

## SINGAPORE. URBAN RAIL

- st largest re-signalling project
- NSEW lines carry

66% of Singaporean commuters





CANADA. URBAN RAIL

- +140 trains
- 6 lines equipped with SelTrac™ CBTC technology in 3 cities Vancouver - Ottawa - Toronto

## 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





- - 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

Tackling the ever increasing passenger demand across key routes





## TAIWAN . SUPERVISION & TELECOMS

- 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

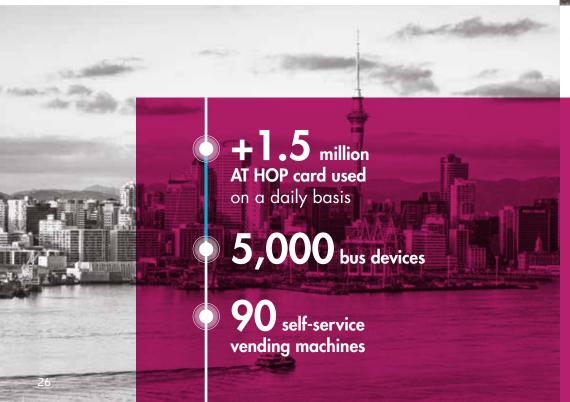
18 original and 19 additional stations



## **AUCKLAND**. TICKETING

- system for bus, train and ferry ticketing
- 127 point of sales terminals

- 187<sub>validators</sub>
- **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





## NETHERLANDS. TICKETING / MAIN LINE RAIL

- 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





**DUBAL.** SUPERVISION & TELECOMS / URBAN RAIL / TICKETING

7% Increase in ridership in 2016

st Metro in the gulf region

90km of metro lines

**Dubai Red Line Green Line** Dubai R2020 - Dubai **Red Line Extension** 

## PORTUGAL. MAIN LINE RAIL / SUPERVISION & TELECOMS

- Implementing ARAMISTM system
- Controlling 1,250 trains/day, over 1,313km of tracks



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

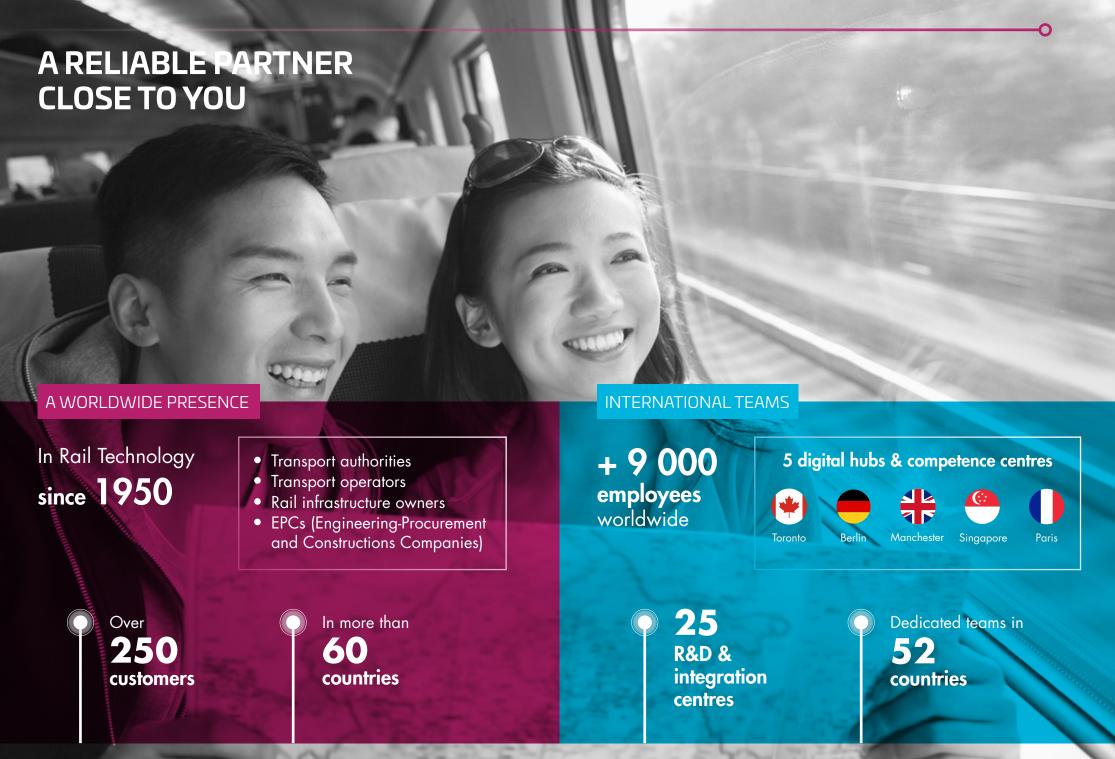


Providing critical systems for Cairo Metro since 1981 on Lines 1,2 & 3

**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



#### THALES **Building a future** we can all trust

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 <





