Thales: Delivering innovative solutions for future cities
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Thales, a global technology leader

Thales is a global technology leader for the Defence & Security and the Aerospace & Transportation markets. In 2012, the company generated revenues of €14.2 billion with 67,000 employees in 56 countries. With its 25,000 engineers and researchers, Thales has a unique capability to design, develop and deploy equipment, systems and services that meet the most complex security requirements. Thales has an exceptional international footprint, with operations around the world working with customers and local partners.

www.thalesgroup.com/smartcity
1. Thales solutions on show at the Arab Future Cities Summit

Thales is a global leader providing innovative solutions for future cities, backed by decades of field-proven experience within security and transport markets.

At Arab Future Cities Summit Thales will showcase its integrated, intelligent urban security solutions that address the two-fold challenge of offering better public protection, and responding to the emerging needs of public authorities and governments.

**Lean more about the comprehensive security solution for Mexico City** delivered by Thales. This fully integrated solution enables public security operations, and incorporates a city-wide video surveillance system, in the world’s third largest metropolitan area with 22 million inhabitants, making it the most integrated and comprehensive urban security system in the world.

*See annex 1: press data sheet, “Urban security, Mexico City”*

Thales will also be showcasing its ability as a global provider of technologies for **Smart Cities**. Improving citizens’ quality of life, whilst maintaining optimal allocation of resources by combining security and transport systems, Thales’s Smart City approach addresses the challenges of modern urban living.

**Conference Presentation**

*“Decision Making in Future Cities”*

Monday 22nd April, 11:00 - 11:20

Jacques Bourgeois, Strategy & Marketing Director for Thales Transport & Security activities, will present at the summit.

*Cities are becoming larger and more complex than ever, yet future cities will be cleaner, more sustainable, and will offer an enhanced quality of life to their citizens. This is made possible by leveraging the interconnectivity of devices, data, and people. This data is used to provide deep situational awareness enabling strategic and operational decisions to be taken more effectively on the basis of a more complete understanding.*
2. Thales in Qatar

Thales has developed a valued presence in Qatar building upon a longstanding relationship that spans more than three decades. Starting originally with the supply of on-board electronic equipment to the Qatar Navy 30 years ago, the continued commitment of Thales to Qatar was underlined recently in 2012 by investment with the Qatar Science & Technology Foundation.

Recent civil projects in Qatar include:

- **Security:** The State of Qatar has awarded a contract to Thales to secure the New Doha International Airport, where Thales will install 10,000 CCTVs, 3,000 access controls, as well as full LAN connectivity.

- **In-flight Entertainment (IFE):** Building on a growing regional presence, in 2008 Thales was awarded a first contract to fit 32 Qatar Airways A320, then a subsequent contract to provide 30 B787 IFE systems. Thales has been awarded an additional contract to supply the next generation Thales In-Flight Entertainment (TopSeries) and connectivity system for 80 A350 and 10 A380 aircraft.

- **In April 2012, Thales and Qatar Airways** jointly announced the grand opening of a new technology research, development and training centre at the prestigious Qatar Science & Technology Park (QSTP). This technical laboratory currently houses state-of-the-art IFEC equipment that supports software and application prototyping, content integration, system level testing and training.

Defence activities are of equal importance and are the basis on which Thales has built this important relationship with Qatar. In addition to the supply of electronic ship-borne equipment fitted to Qatar Navy corvettes, Thales has also supplied tactical radio capabilities including the widely known PR4G, air surveillance systems, and on-board avionic systems for the Mirage 2000-5 platform.
3. Thales, connecting cities for 25 years

Running a major city is an increasingly complex challenge. Combining a field-proven track record within the urban environment, spanning more than 25 years, with a detailed understanding of its customers’ activities and a broad portfolio of solutions and credentials, Thales has the experience and expertise to meet the concerns of city authorities with a particular focus on mobility and security.

Thales offers a wide range of mobility solutions which facilitate travel, increase transportation network efficiencies, improve traffic flow, and reduce energy consumption.

Thales security solutions cover areas including protection of citizens and critical infrastructure, support to counter-terrorism agencies, and high-level information systems security.

Thales solutions are developed around a foundation of innovation and openness, and strive to:

- Expand integration and connectivity of systems
- Improve citizens’ quality of life
- Increase operational efficiency

See annex 2: Position paper

*The interconnected city: improving the quality of life of citizens*
4. Thales in the security market

Thales offers customers an unparalleled experience within the security market domains with a recognised expertise for large-scale, complex systems integration.

a) The market and its environment

Security threats are inherently difficult to manage because there are so many different types – terrorism, cybercrime, urban crime, trafficking, illegal immigration, natural disasters, industrial accidents, etc. – and because they are constantly evolving; however, their economic impact can be enormous. In addition, information systems themselves are more vulnerable to attack, so it has become crucially important to ensure the security of data and data networks.

Speed of response is increasingly crucial to ensuring security: responders and decision-makers need to be alerted as early as possible, and they need faster access to reliable, detailed information so that they can decide and act effectively in a crisis situation. Post-event analysis tools are also needed to help them capitalise on past experience.

b) Thales’s security solutions

As a leading player in the security market, Thales is positioned as an added-value systems integrator, equipment manufacturer and service provider.

Thales has a large number of security specialists, including 4,500 staff in France alone, who provide integrated, resilient security solutions that help national governments, local authorities and civil operators to protect people, sensitive data and critical infrastructure.

Thales solutions are built around each customer's concepts of operations (CONOPS) and incorporate advanced technologies - some of them developed for the military - that represent a significant competitive advantage in the security market today. By implementing Thales solutions, customers benefit from advance protection against security risks, and immediate access to the most relevant information so
they can make the right decisions at the right time and act accordingly. With Thales security solutions, incidents and crisis situations are managed quickly and effectively, and customers can focus on their core missions and thus improve overall operational efficiency.

**Key Figures**

*No. 1 worldwide in security for interbank electronic transactions*

*No. 3 worldwide in hardware-based encryption systems*

*No. 1 in Europe for information systems security*

c) Thales added value

- Systems integration capabilities for complex large-scale systems that leverage customers' legacy solutions.
- Systems built around the latest game-changing technologies: sensors, networks and information systems security, secure cloud computing, algorithms, data fusion, and the management of large volumes of video, voice, text and data.
- An international footprint with a proven ability to work with local partners worldwide.
- A deep understanding of our customers' lines of business, based on a leadership position within flagship programmes.

d) A leading global provider of security solutions

Thales solutions secure the four key domains considered vital to modern societies:

- **Government**
  
  *Border surveillance, homeland security, identity management, national and supranational security, etc.*

- **City**
  
  *Urban security*

- **Cyberspace**

- **Critical infrastructure**
  
  *Government sites, oil & gas infrastructure, nuclear power stations, sensitive sites including museums, mosques, prisons, and train stations.*
5. Thales in the transport market

Thales systems are part of the largest metro networks in the world: Paris, London, New York, Toronto, Dubai, Singapore, Shanghai, and many more. Thales is a world leader in the urban transport industry, offering cutting-edge solutions that are perfectly attuned to today’s market requirements.

a) Urban transport trends

The need to maintain development of urban and inter-city transport has never been more acute. Major drivers for change include:

- Demand for interconnected networks to improve traffic flows and make travel easier and more attractive.
- Growing urbanisation, with more than half of the world’s population living in urban areas.
- The emergence of megacities: 19 cities worldwide now have populations of over 10 million.
- Ageing transport infrastructure in many metro networks.
- A sharper focus on sustainability to reduce the carbon footprint of ground transportation.
- Pressure on operators to reduce operating and maintenance costs while ensuring optimal safety conditions.

Thales helps urban transport operators and network managers see through the growing complexity of their systems, increase capacity and offer new services that enhance the passenger experience and make public transport more attractive. Thales designs, develops and supplies equipment, systems and services in the areas of signalling, communication & supervision, telecommunications and ticketing.
b) Thales’s transport solutions

The world leader in signalling systems: Thales’s systems automatically control train speeds and boost performance while improving the safety and comfort of passengers and optimising costs.

- The SelTrac CBTC signalling system is now the technology of choice for new metro lines and upgrades to existing infrastructure.
- The SelTrac CBTC system is in service on 55 lines in 30 of the world’s largest cities, transporting 3 billion passengers a year and equipping a total of 1,200 km of lines. Thales technology has been selected for re-signalling projects on some of the most prestigious metro systems in the world, including the New York subway, the London Underground and the Paris metro.

No. 1 worldwide in communication & supervision: Integrated solutions for transport network operators.

- The latest supervision systems provide a 360° view of all of the applications handled by the operations control centre, simultaneously managing traffic flows and enhancing passenger safety and comfort (passenger information, door and escalator management, etc.).

World leader in ticketing systems: Thales fare collection solutions are suitable for single metro lines as well as nationwide, multi-modal, multi-operator systems.

- Thales pioneered the use of contactless smart card technology in the transport sector and has supplied the ticketing and fare collection systems for urban transport networks in Auckland, Bangkok, Caracas, Lisbon, New Delhi, Dubai, Singapore and Toronto.
c) Thales added value

Thales has engineered a number of technological breakthroughs to help its customers meet these new challenges, and now offers fully proven solutions including CBTC (Communications-Based Train Control) signalling systems, contactless smart cards, smart-phone payment systems, multi-modal and multi-operator ticketing systems, and integrated supervision systems.

For more than 75 years, Thales has consistently invested in R&D to optimise the critical decision chain and make information systems more efficient. Thales’s systems approach is the key to achieving optimum performance and maximum safety while reducing overall life cycle costs for operators.

Key Figures

- **CBTC signalling solution in service in 30 of the world’s largest cities**

- **Thales is the only provider of nationwide, multi-modal and multi-operator ticketing and fare collection systems**

- **Global leader in integrated communication and supervision systems for urban transport networks**

- **€1.5 billion in revenues and 7,000 employees working for the transport sector**
Annex 1: press data sheet

“Urban security, Mexico City”
The Challenge

The goal of the project is to better protect citizens from a wide spectrum of risks including crime, terrorism, attacks on strategic sites, natural catastrophes and other emergencies.

It is a cooperative endeavour by the government of Mexico City, one of the world’s largest megacities, Telmex, a leading Latin American telecommunications company, and Thales.

Thales has applied the latest available technology to provide videosurveillance services, process emergency calls and manage events. Drawing on its experience in the defence sector, Thales has all the expertise required to implement its technologies in complex environments, adapt solutions to requirements and provide the necessary training.

This is the most ambitious public safety project in the world, with more than 500 engineers and experts from the Mexico City police department, Telmex and Thales working together.

Urban security, Mexico city
«Ciudad Segura»

BENEFITS

• More than 600 incidents per day managed by the five C2 centres (Dec. 2009 to Sept. 2011)
• Average response time of 4 mn 30 s
• Crime rate reduced by 12.5%
• Operational efficiency of the police increased by 19.1%
• Vehicle thefts reduced
Urban security, Mexico city

The Solution

Thales and Telmex have delivered a centralised C4I centre, which coordinates five regional command-and-control centres in charge of multi-agency public safety operations both on a routine basis and during emergency situations.

The solution includes videosurveillance (8,080 cameras dedicated to urban surveillance, traffic management and license plate recognition), operational forces tracking and status monitoring, emergency call handling and dispatching of first responders and other forces.

The project also includes two mobile command-and-control centres receiving information from unmanned air vehicles deployed for remote surveillance. Both these components of the solution facilitate decision-making and response processes everywhere in the city.

Key features

- Videosurveillance network (8,080 cameras dedicated to urban surveillance, traffic management and license plate recognition)
- Integrated, unified command-and-control system including:
  - **one C4I centre**
    - 5 floors, 20,000 sq.m, heliport
    - Control room 250 positions
      - 60 call-takers
      - 70 radio dispatchers
      - 80 video operators
      - 12 operators dedicated to intelligence and reporting
      - 20 operators dedicated to system monitoring
  - **five C2 centres**
    - Control rooms 35 to 60 positions
    - 750 police officers
  - **two mobiles C2 units**
    - Laboratory / development platform link to Polytechnic Engineer High School
    - NOC: Network Operational Centre
    - SOC: System Operational Centre
    - Training facility
Annex 2: Position paper

The interconnected city:

improving the quality of life of citizens
The interconnected city: improving the quality of life of citizens
The smart city concept is a vision shared by major cities as they chart their future course — with more services, greater efficiency and a focus on sustainable development — and the industry players that are helping them to step up to the challenges of growing urbanisation and eco-awareness.

Half of the Earth’s current population of 7 billion lives in towns and cities. According to UN forecasts, it will have reached 9 billion by 2050 and 70% of that number will be city-dwellers. Such high concentrations of people pose many challenges to local authorities, among them atmospheric pollution, traffic congestion and security.

By improving their citizens’ quality of life and operating transport and security infrastructure in optimal fashion, cities everywhere hope to secure a position among the world’s Top 100 most attractive places to live.
Increasingly complex to manage

Running a major city is an increasingly complex challenge. At the same time, the information and communication technologies that interconnect the systems required to manage an urban area are opening up new opportunities for public policymakers. Today, two key groups of stakeholders are driving this trend. First, cities want to improve the quality of their citizens’ lives by providing innovative services and optimising operations on a day-to-day basis and during major events or crises. And second, transport, security and public service operators are looking to organise their information systems as a network to make their operations greener, less costly and more efficient.

By optimising how they manage the urban environment and offering a wider choice of new services, local authorities are also seeking to attract new businesses to drive economic growth.

Thales is positioned in two key segments: mobility and security

With a proven track record spanning more than 25 years, a detailed understanding of its customers’ activities and a broad portfolio of solutions and credentials, Thales has the experience and expertise to meet the concerns of city authorities, with a particular focus on mobility and security. For Thales, the ultimate objective is to pull together all the systems used to manage city operations through its smart city platform:

**Mobility** solutions are designed to make transport systems more agile, optimise network capacity and efficiency, and facilitate travel while improving traffic flows, saving energy and curbing greenhouse gas emissions.

**Security** solutions cover such areas as citizen protection, anti-terrorism, protection of critical infrastructure and information systems security.

Thales’s smart city platform enables closer integration of these solutions and other systems to coordinate day-to-day operations, plan and manage major events and provide high-level oversight in crisis situations.
Thales offers customers a range of solutions for smart cities both large and small:

- **major cities with an integrated approach to urbanisation**: large-scale projects incorporating security management and intelligent transport systems;
- **cities with a step-by-step approach**: optimisation of transport and security infrastructure to improve public services and operational efficiency.

Three case studies illustrate the kind of solutions Thales is deploying around the world.

**Mexico City - The world’s largest urban security system**

In Mexico City, a megacity of 22 million people, Thales and telecommunications operator Telmex have implemented a solution including more than 8,000 video cameras, gunshot sensors, automatic number plate recognition cameras, aerial surveillance drones and emergency call points in the city’s streets.

All these subsystems are operated by five local command-and-control (C2) centres, overseen by a city-wide C4I centre (command, control, communications, computers and intelligence). This “megasystem” transmits alarms to police, fire crews and emergency services whenever unusual events or behaviour are detected. In a major emergency, the police can also deploy two mobile tactical C2 centres that remain in contact with the C4I centre at all times.

The Thales solution offers much more than just technology. It is also vital to gain an in-depth understanding of the customer’s business processes and tailor the solution to each organisation’s culture, business practices and legal and operating environment. This insight into how customers operate is what makes the difference when deploying complex solutions.

Built around the intelligent use of data and multi-agency coordination, the solution implemented by Thales has significantly increased the security of Mexico City’s population, shortening average response times by a factor of three. Crime in the metro has fallen by 80%, while car thefts have been reduced by almost 8% and criminal activity is down 35% in certain previously neglected areas of the city that are now thriving.

**Mexico City – A comprehensive, integrated system**

With 22 million inhabitants spread over 5,000 square kilometres, Mexico City is the world’s third largest megacity. Thales has worked in partnership with the Secretariat of Public Security to transform citizen safety and security by deploying the world’s most comprehensive urban security system. In particular, this system features:

- 1 city-level C4I (command, control, communications, computers and intelligence) centre
- 5 local C2 (command-and-control) centres
- 2 mobile tactical C2 centres (Tetra, HF and satcom technologies)
- 4 aerial reconnaissance drones
- More than 8,000 CCTV cameras (mostly Pan-Tilt-Zoom models)
- 36 gunshot sensors
- 255 automatic number plate recognition cameras
- A city-wide emergency phone network
- 8,000 Public Address speakers
- Vehicle location capability for all 25,000 police cars
- Mobile Data Terminals and PDAs for police officers
A multi-modal travel pass for Auckland

Inaugurated for the 2011 Rugby World Cup, the multi-modal travel pass supplied by Thales made it easy for residents and visitors to New Zealand’s capital city to get around during the event. Passengers continue to benefit today, making trips on trains, buses and ferries with a single ticket.

Passengers can also use the rechargeable travel pass as an electronic wallet, and the local authorities are considering plans to extend the programme to include access to public monuments and museums.

In addition to travel passes, an online passenger information and service centre, and systems for topping up and validating passes, the Thales fare collection solution also manages and distributes ticket revenue to participating transport operators.

Today, Auckland’s residents and visitors have a practical way of getting around and will soon be able to use their mobile phones as contactless travel passes. At the same time, the city authorities are able to manage transport systems centrally and analyse travel statistics so they can tailor services to passengers’ evolving needs.

“Information systems are becoming increasingly interconnected, offering opportunities to develop new services. For example, a passenger can search the quickest way to get to a station by combining different modes of public and private transport, depending on traffic conditions and personal preferences.”

Thales has provided multi-modal, multi-operator ticketing systems in major cities including Toronto and Oslo as well as nationwide systems in the Netherlands and Denmark.

Strasbourg optimises transport and major event management

On a smaller scale, Strasbourg, the seat of the European Parliament, illustrates the trend towards integrated city management by combining its traffic control operations with an urban videosurveillance centre. Close coordination of transport and security systems is key to effective management of a crisis or major event.

For the Strasbourg Urban Community and its half a million residents, Thales has deployed a traffic control system to regulate vehicle flows, coupled to the city’s operations support and passenger information system. These systems work together to give priority to buses and trams and encourage use of public transport.

The automatic traffic information and control system, called SIRA C, has been extended to manage pedestrian areas and available parking spaces. The Strasbourg Urban Community has also decided to combine its videosurveillance and urban traffic control centres under one roof for better coordination, while each retains its own organisational independence and characteristics.

The Strasbourg Urban Community is now looking at the possibility of sharing data between the two systems to obtain as much information as quickly as possible and anticipate events before they occur.

These examples illustrate the smart city in which separate urban information systems are coordinated to increase operational efficiency and make cities more attractive.
Thales technologies at the heart of the smart city

The Thales Hypervisor supervision system is a key technology supporting the smart city concept through its ability to coordinate separate urban information systems, now or in the future. Its open, service-oriented architecture enables interconnected systems and subsystems to share the data needed to optimise individual applications as needs evolve.

From an operational standpoint, the intuitive, web-based interface gives users a city-wide picture in real time, providing unmatched decision support for coordination of operations and emergency responses.

Finally, data from the city’s transport, security and other systems is archived in the smart city platform and can be analysed to yield greater insight into the changing urban context in order to manage resources and plan future developments.
Besides the operational benefits of its mobility and security solutions, Thales’s smart city platform coordinates vital information and optimises services to citizens, now and in the future.

## THE SMART CITY PLATFORM

- Coordinated and secure data sharing between stakeholders to improve a city’s operations and quality of service to citizens
- Integrated city planning and management, from daily operation of public services to coordinated management of large-scale events and crises

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• Urban security in major cities
  - Mexico City

• Site security
  - French Ministry of Defence (Balard), Mecca, Dubai Airport

• Multi-modal and multi-operator ticketing systems
  - Nationwide: Netherlands, Denmark
  - Urban: Auckland, Toronto

• Metro command-and-control systems
  - RATP France, Shanghai, Caracas, Mecca

• Tram and bus operational support and passenger information systems
  - Bergen, Marseille, Lyon, Charleroi

• Web and smart phone passenger information systems
  - Nationwide: Online Journey Planner (United Kingdom)
  - Urban: www.map.rtm.fr
    (Marseille: metro, bus and tram)
    www.carto.strasmap.eu
    (Strasbourg: road traffic, parking spaces, pollution, bicycles)

• Urban traffic control systems
  - Strasbourg, Seine-Saint-Denis department

• Parking management systems
  - Paris airports, 40% of car parks in France

• Road toll and eco-tax solutions
  - Brisbane (Australia), Ecotaxe (France)

• Multi-domain supervision: metro, ticketing, car parks and airport security
  - City of Dubai
The interconnected city: improving the quality of life of citizens