Supervision at The Heart of Transport Network Security
Supervision plays a key role in any type of transport network – metro, bus, light rail, etc. The supervision system ensures smooth operation of rolling stock, fixed and mobile equipment, and guarantees both personal safety and infrastructure security.

Thales is a world leader in supervision technology, with experience spanning four decades. Its first project – the centralised supervision system for the Mexico City metro, installed when the city hosted the 1968 Olympic Games – was a major success. Since then, a dozen more lines have been added to the metro system that serves the Mexican capital.

Thales has been responsible for approximately sixty transport system supervision projects in Europe, Asia and Latin America, where reliance on public transport is high. It has designed and deployed supervision and control systems for all types of networks – trains, metros, regional rapid transit systems, buses, light rail systems and more – acting as sole provider, prime contractor in association with other partners, or coordinator of consortia of local or international contractors.

Thales is the only company to provide network security, information systems and operation in the form of three integrated systems: fleet management, passenger information and automatic fare collection for single or multi-modal transport systems.
Prime Contracting and Local Partnerships

Drawing on its expertise not only in transport and energy supervision but also in related areas such as automatic fare collection, video surveillance and fleet management, Thales offers two key capabilities as technical prime contractor and industrial architect. As technical prime contractor, Thales delivers comprehensive solutions covering an infrastructure’s entire life cycle, from initial development, deployment and commissioning to maintenance, technical upgrades and functional enhancements. As industrial architect, Thales has the capacity to form and coordinate an entire industrial organisation based on local partnerships, anywhere in the world.

Prime contracting requires expertise in numerous areas. As prime contractor, Thales assumes end-to-end responsibility for a control and supervision project and integrates all the various components: software, wiring, information systems, sensors, networks, etc. After the system enters service, Thales provides maintenance, support and operational training, as well as functional and technical upgrades. In addition, the Thales Group offers a full range of project finance solutions when required.

The project to deliver a secure control centre for lines 3 and 4 of the Guangzhou metro in China is a model of effective cooperation with local partners, including the automated systems specialist Hollysys. For other projects in China, Thales has formed a joint venture with Panda Electronics Group, one of the country’s leading electronics corporations. The joint venture is a long-term project aiming to export the two partners’ know-how to penetrate new regional markets.

Partnership is a pillar of the Thales Group’s strategy. The Group has formed successful partnerships with Mitac in Taiwan, Accenture and MTR in Europe and the United States, MTR in Australia and Panda, Hollysys and LTA in China.
As a supervision and security specialist, Thales has developed a dedicated software product known as SCADAsoft and based on the latest industry standard tools and architectures.

Built on a Corba software bus, SCADAsoft was developed in C++ and Java and uses Ilog man-machine interface components. The product is designed to meet supervision needs in both the energy and transport sectors. It is supported by an extremely high-performance real-time database developed specifically for high-volume, high-performance supervision systems and capable of processing more than one million bits of real-time data.

The first operational version of SCADAsoft dates back to 2001 and the product now represents a cumulative 100 person-years of software engineering and development.

Based largely on industry standard software tools, its open, modular architecture allows for easy integration with other systems. In the transport sector, for example, it interfaces readily with any available type of signalling system.

Thales’ transport experience encompasses a wide range of activities, including deployment of fully automated networks, line renovations, two-layer management systems (centralised/decentralised) supervision and automatic fare collection systems.

Thales’ core competency in this market is that of a system integrator specialising in supervision and the installation of IT-intensive systems.

Alone or with other specialists, the Group responds to different types of RFPs launched by transport operators: combined RFPs for infrastructure deployments including civil engineering, and specific RFPs for line extensions or renovations. In addition to its industrial and technical expertise and specialised knowledge of the transport sector, Thales possesses other specific skill sets, in particular in the increasingly vital areas of network security and physical security for IT infrastructures.

More and more, Thales is surpassing the basic needs of transport operators, offering functional extensions to guarantee higher-level security.

For these advanced needs, Thales offers a secure SCADAsoft solution that guarantees both infrastructure security and data integrity, particularly for communications with key infrastructure units.

Singapore’s North East Line, the third in the city state’s metro system, is still one of the few fully automated metro lines in service. Driverless operation requires 100% secure supervision equipment. The Singapore system has a central command post backed up by a remote command post for emergency operation or crisis situations.

In partnership with local company STE, Thales supplied a turnkey supervision and control system for the metro that includes traffic management, fixed equipment control and communications management. Traffic is managed using the latest version of the Traffic component of the Thales solution, which addresses the specific needs of driverless operation.

For the Météor line in Paris, Thales was selected as prime contractor and worked with various partners to provide local and centralised supervision of fixed equipment - lighting, escalators, elevators, access control gates, etc. - as well as audio, video surveillance, fire detection, intrusion detection, fare collection, remote display and telecommunications equipment.
Security, a Growing Concern

Security is a constant preoccupation for all types of organisations, and public transport operators increasingly require their suppliers to address security issues in their bids. Thales has numerous strengths in this area and has completed many projects in which security played a key role. In January 2005, the Group signed a contract with Guangzhou Metro Corp. to install a control centre for Line 4 of the Guangzhou metro. This will be the first control centre developed with security as the focal point. The solution will monitor all electronic systems of the future line and provide high-level protection from hacker attacks.

The control centre will supervise 15 sub-systems from a centralised facility that provides an overview of every aspect of the network, improving management of both day-to-day operations and crisis situations. This contract followed the 2003 award for the control centre on Line 3, and provides for integration of both lines’ control systems in 2006.

For even more complex needs, Thales has developed a secure system using encryption technologies developed by its team of encryption and IT infrastructure protection specialists. These cost-effective technologies incorporate security functions in native mode. The secure SCADAssoft application is an effective response to growing security threats whose potential costs, in human and financial terms, can be enormous.

Access Control

Controlling access to technical facilities is another important aspect of security. For this requirement, Thales uses and develops biometric access control technologies and other advanced solutions. Thales also provides closed circuit television surveillance systems, as it did for every line in Caracas metro.

These contracts reflect the growing importance that transport operators place on security and access control, and demonstrate Thales’ ability to deliver on their demands.
The Six Functions of Supervision

1. **Traffic Surveillance and Regulation (ATS/ATR):** tracking, routing and train regulation, depot management and timetable management.

2. **Control and Surveillance of Fixed Equipment:** management of auxiliary components and the ventilation/air conditioning system.

3. **Power System Surveillance and Management:** management of the different power networks (high and low voltage), optimisation and automatic reconfiguration of the distribution network, management of backup power supply.

4. **Control Centres and Networks:** management of the data network and the operational control centre.

5. **Operation and Maintenance:** assistance to operators, including decision support system, statistics, and maintenance management (minimum downtime, personnel management, financial tracking, etc.).

6. **Communications Management:** remote audio, passenger information system, radio, telephone, clocks.

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<tr>
<th>Feature</th>
<th>Description</th>
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<tr>
<td><strong>Software Development</strong></td>
<td>SCADAsoft, the core of the supervision system.</td>
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<td><strong>Communications</strong></td>
<td>All local and remote network protocols, wired and wireless, and specialised protocols (TETRA).</td>
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<td><strong>Security</strong></td>
<td>Encryption technologies and public key infrastructures.</td>
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<td><strong>Electronic Transactions</strong></td>
<td>Contact and contactless smart cards. Secure real-time transactions.</td>
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<td><strong>Geolocation</strong></td>
<td>Standard and differential GPS, radio beacons, odometers and, soon, Galileo.</td>
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