CONTENTS

P 4  Tramways, a tool in a global mobility strategy

P 10  Tramways as an urban planning tool

P 14  French tramway companies

P 28  Tramways of yesterday and today, a strong political commitment

P 31  Further information

USER FEEDBACK

Ghislaine, 25, user of line 2 of the Issy-les-Moulineaux tramway (Île-de-France)

The tramway makes my daily commute easier. The same journey by car takes an hour, but by tram it's 25 minutes. There should be more trams during the rush hour.

Matthieu, 44, user of line A of the Orléans tramway (Centre region)

The tram reduces my daily commute by 15 minutes and driving would be a lot more expensive. It's above ground, people are not stressed and I like this means of transport.

Marie, 34, user of tramway line 2 from Boulogne-Billancourt to La Défense (Île-de-France)

The trams are clean, information is good when there are technical problems and it is pleasant to be above ground as you can see the landscape. Mobile phones should be banned as they cause noise pollution on this method of transport.

Jean-Pierre, 50, user of the T2 tram line from Issy-les-Moulineaux to La Défense and the T3 tram line (Île-de-France)

The T2 is a good means of transport, like line 14 on the metro: it's very convenient, clean and above ground. There should be a more frequent service in the morning rush hour and in the evening, as the waiting times are too long. There are not enough carriages.
Currently, eighteen French urban areas have at least one tramway line and by 2014, nine more towns will have opened their first lines. In France, the organisation of public transport is based on a decentralised administrative system established in the 1980s. For thirty years, land authorities have had great autonomy to develop their public transport networks in a context of very heavy car use. Today, the car is gradually making way for public transport systems and tramways have been experiencing a revival for several years now. Tramways have been making their mark over the years because they fit into the scheme of urban renewal, transport planning and environmental concerns. This is a political choice which is firmly rooted in the sustainable development ethos and enables planners to take a new approach to urban mobility and urbanisation projects. Trams have also become a tool for promoting a town, because building a tramway implies a desire to renew the image of the town where it is located. Many French companies are using their expertise on projects to create tramways and export skills worldwide, ranging from studies and construction to operating tramway systems.
Tramways, a tool in a global mobility strategy

Before a tramway is built, a comprehensive analysis of travel within the town is carried out to ensure familiarity with the transport needs of the population, so that appropriate solutions can be provided.

Tramways are a transport tool which offer certain proven advantages:
- a capacity beyond 3,000 passengers per hour per direction of travel;
- an average commercial speed of 18-22 km/h;
- a regular transport service;
- a high level of comfort;
- optimal accessibility;
- lower cost than an underground system: an average cost of 13-22 million euros per km for the transport component in France.

Compared to the private car, tramways are proving to be a credible means of transport with their dedicated platforms and priority at intersections. They can share the carriageway with other modes of transport, including soft transport (cycling and walking).

In 2010, nineteen French urban areas had at least one tram or underground line:
- Paris, Lille, Lyon, Marseille and Toulouse have an underground network and tram lines;
- Strasbourg, Bordeaux, Nantes, Montpellier, Grenoble, Saint-Étienne, Valenciennes, Rouen, Orléans, Le Mans, Clermont-Ferrand, Mulhouse and Nice have one or more tram lines;
- Rennes has an underground network.

The tramway network in Île-de-France has 32 km of lines (compared to 220 km of underground lines) and there are 375 km of lines in the provinces (compared to 130 km of underground lines). Since tramways made a comeback in Nantes in 1985, they have spread continuously throughout the regions as part of the draft mandate of urban transport management authorities (AOTU) scheduled logically around local elections (1995, 2001, 2008, 2014).

Map of urban areas with public transport systems with dedicated corridors

Source: Certu 2010
The Strasbourg urban area worked particularly hard to reorganise the plan for city centre traffic when it introduced its first tram line, in order to carve out a major role for it, as well as for pedestrians and cyclists.

It was hoped that car traffic would be seen to have decreased in the results of a survey carried out in 1997, three years after the first tram line came into operation. The overall results for the wider urban area did show increased uptake of public transport, but no decline in car use. On arterial routes where public transport performed better, notably in city centres where local authority initiatives involve all methods of transport, car use had declined appreciably.

This demonstrates that tramway lines alone cannot solve all transport problems and that their effect can only be fully felt if they form part of a wider travel policy.

STRASBOURG
The tramway has found its place
Public transport networks with a tramway as their main structural element represent less than 30% of the per km offering, but comprise 55% of the journeys made on the network. Tramways therefore have a very significant share in French network use (See graph below).

Overall, towns which have implemented a dense network of public transport systems with dedicated corridors* have seen a greater increase in passenger numbers than other towns. This phenomenon can be explained by the fact that bringing lines into service is generally accompanied by the implementation of a global transport policy to create a better spread across the different methods of transport used. This therefore encourages greater use of public transport and involves restrictions on traffic and parking, cycle routes, mobility management (development of company transport plans, promotion of new modes of transport such as car pooling and car sharing), an urbanisation strategy, promotion of walking, etc.

* A public passenger transport system using an area set aside for its exclusive use, generally having priority at traffic lights and operating vehicles ranging from bus and underground trains to trams.

---

**Growth of travel on French networks (excluding Île-de-France)**

- Total journeys on 20 networks using public transport systems with a dedicated corridor in 2008: 1,600,000
- Total other networks (more than 200): 840,000
- Total other networks: 1,060,000

Source: Certu TCSP database

**Number of kilometres brought into service annually**

- High service level bus
- Tramway
- Underground and funicular

Source: Certu TCSP database
Increased uptake of public transport in Nantes is based largely on the introduction of three tramway lines since 1985. With 51 km of lines, the Nantes tramway network is the most highly developed in France. It is used by 275,000 passengers daily. This success can be attributed to the tramway’s performance, but also to its integration into an intermodal network. The provision of 5,800 park-and-ride spaces means that intermodality between car use and public transport represents 6% of commuter journeys within the urban area, which is relatively high. Moreover, the tramway is connected to three Regional Express Train (TER) stations on the perimeter of public transport, one river shuttle service, the line 4 Busways and seven forthcoming Chronobus high service level buses (due to enter service in 2012-2013). The Urban Travel Plan 2010-2015-2030 is setting its sights for increasing cycle use very high. Particular attention will be devoted to intermodality between cycling and public transport, which currently represents 1% of commuter traffic.  

NANTES

Successful intermodality
Looking beyond figures for network use, tramways have certainly contributed to the modal shift from car use to public transport. However, the modal shift remains difficult to quantify because changes in individuals’ circumstances are becoming more frequent (house moves, changes of job, changes in family circumstances) and because bringing a tram line into service is often accompanied by other measures (restrictions on capacity for cars, parking policy) whose effects are difficult to separate out.

Household travel surveys* carried out approximately every ten years in French urban areas make it possible to trace the evolution of mobility in the region and to assess the impact of some projects. Thus, it was noted that towns which introduced an underground or tramway line have observed a more significant increase in public transport mobility than other towns.

Today, there are more tramways planned than ever before:

• Toulouse opened its first tramway line in late 2010;
• Reims and Angers in 2011;
• Brest and Le Havre in 2012;
• Dijon, Tours and Lens in 2013;
• Besançon in 2014.

In addition to these projects, new lines or extensions are planned for networks in Saint-Étienne, Lyon, Bordeaux, Montpellier and Nantes.

*Surveys carried out by transport management authorities as contracting authorities

<table>
<thead>
<tr>
<th>Share for each type of public transport with a dedicated corridor in km (as a %)</th>
<th>Share for each type of public transport with a dedicated corridor by journey (as a %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lille</td>
<td>62</td>
</tr>
<tr>
<td>Toulouse</td>
<td>70</td>
</tr>
<tr>
<td>Lyon</td>
<td>48</td>
</tr>
<tr>
<td>Marseille</td>
<td>45</td>
</tr>
<tr>
<td>Rennes</td>
<td>43</td>
</tr>
<tr>
<td>Strasbourg</td>
<td>64</td>
</tr>
<tr>
<td>Montpellier</td>
<td>75</td>
</tr>
<tr>
<td>Rouen</td>
<td>36</td>
</tr>
<tr>
<td>Grenoble</td>
<td>56</td>
</tr>
<tr>
<td>Nantes</td>
<td>59</td>
</tr>
<tr>
<td>St Etienne</td>
<td>51</td>
</tr>
<tr>
<td>Le Mans</td>
<td>50</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>41</td>
</tr>
<tr>
<td>Caen</td>
<td>46</td>
</tr>
<tr>
<td>Mulhouse</td>
<td>51</td>
</tr>
<tr>
<td>Orléans</td>
<td>45</td>
</tr>
<tr>
<td>Clermont-Ferrand</td>
<td>48</td>
</tr>
<tr>
<td>Valenciennes</td>
<td>33</td>
</tr>
<tr>
<td>Nancy</td>
<td>39</td>
</tr>
<tr>
<td>Nice</td>
<td>39</td>
</tr>
</tbody>
</table>

Source: Certu TCSP database – reference year 2008
In 2007, the French state launched the Environment roundtable and invited representatives from civil society to take part in a widespread consultation exercise to draw up a French road map for ecology, sustainable development and planning. Within this framework, the state plans to allocate 2.5 billion euros to developing transport systems with dedicated corridors to achieve a target of 1,800 km of lines by 2020 (article 13 of the framework law of 3rd August 2009 relating to the implementation of the Environment roundtable).

In 2009, as part of the first call for projects, a budget of 810 million euros was allocated to 50 projects in 36 urban areas to finance works starting prior to the end of 2011.

Within the framework of a second call for projects launched in May 2010, the state made 590 million euros available to support 78 new projects backed by 54 transport management authorities: 45 high service level buses, 29 tramways, 2 underground systems and 2 sea links. Nearly 1,000 km of lines will already have been built or launched by late 2013.
Tramways, as an urban planning tool

Tramways interact with the town in many different ways: they are open to the town and visible from the street. Architects and landscape architects use this visibility as an opportunity to refurbish streets front by front around the tramways and to restore a level of comfort and quality of life to city centres which vanished with the omnipresence of the car. Tramways therefore give an immediate impression of environmental enhancement: silence, reduction in air pollution, tree planting, planting on platforms, transformation of the urban landscape.

Tramways reshape the urban landscape
Having scrapped tramways in the 1950s, the first French towns to reintroduce trams in the mid-1980s, Nantes and then Grenoble, accompanied their introduction with major urban renovation schemes to help the local population to accept their reappearance on the streets. Tramways help to rebuild a quality town by restoring an urban landscape often disfigured by cars: removal of urban barriers, redistribution of traffic, greater awareness of cyclists and pedestrians, architectural approach to designing stations, etc. Some renewal projects are spectacular. In Grenoble, for example, line 3 of the tramway wipes away the former urban motorway of the old boulevards, with its huge flyovers which used to carry 70,000 vehicles per day; it was a real urban barrier which made travel from north to south of Grenoble impossible for non-car users.

Tramways support urban development
Building a tramway in a town has an impact on businesses both during and after its introduction. It also brings about changes in the structure of the town as tram lines generate urban transformation, especially in terms of districts appeal.

The impact of tramways on businesses
Business owners are initially concerned about the loss of trade from customers who travel by car, but subsequently realise that a more peaceful environment can be profitable for them. Feedback in France demonstrates that after the building phase which can be very damaging, and following a period of adaptation and adjustment, businesses overall find that trade returns to previous levels or turnover even improves (see personal accounts on page 11). However, it is difficult to isolate the tramway effect from the local, national, or sometimes even international, context. The tramway tends rather to accentuate pre-existing trends:

- tramway projects are accompanied by a redefinition of public space, leading to a change of image. This provides an opportunity for owners to reassess their businesses. The most frequently observed trend is the growth of the service sector, banks, restaurants and other service sector activities. The central district generally attracts leisure shopping, leaving more practical purchases to outlying areas;
- changes to traffic flow, and therefore to customer parking and deliveries, may have a negative impact on businesses which are already vulnerable. Some businesses which relied mainly on passing trade, often on the fringes of the town centre, and which have not adapted their operations to the new trading environment, may experience serious problems;

THOUGHTS OF AN ARCHITECT

“No since Baron Haussman opened up central Paris, have we had such an effective tool as tramways for redesigning urban spaces which had been entirely devoted to a car-based approach since the 1960s. By readjusting the balance of a shared carriageway we are raising all the right questions. What kind of city do we want for an increasingly urban population? The carriageway becomes an urban project in the 19th century architectural sense of the term, whereas before it was only a technical project to process as many cars as possible”.

Ministry for Ecology, Sustainable Development and Energy
What was the impact of the tramway on your business?

Denis Mollat, Managing Director of the Mollat bookshop in Bordeaux

The tramway runs right in front of my bookshop on the rue Vital-Carles. Although there was no noticeable decline in trade during the building works, since the tramway came into service we have seen turnover rise by 12%. This is due to the improved service provided by the tramway and also to the introduction of intermodality to Bordeaux (electric shuttle service, cycling, bus and train). We have noticed customers coming in from outside the city as they can now get into the city centre more easily and a growth in student customer numbers as there is a direct shuttle service to the universities: the Talence campus is a 20 minute tram journey from the town centre. Bordeaux has become an open and welcoming city.

Jean-Daniel Caillet, founder and manager of the Mer & Espace brand

Although I commend their speed, the three years of building works were very hard for business. My shop is located in the city centre and turnover dropped by 40% and, if I had not had a second shop, I would definitely have had to close down. But those difficult times were soon forgotten as we have now matched our highest turnover again, our customers are more high-end and thanks to the policy of assistance for traders implemented by the Bordeaux urban community, I have been able to give my place Gambetta store a makeover to bring it up to the modern standards set by the new tramway. With the park-and-ride services on the outskirts of Bordeaux, there are even attempts being made to encourage customers to leave their cars outside the city and to use public transport to travel to the city centre. The tramway and Bordeaux’s listing as a UNESCO World Heritage Site mean that it is genuinely attractive for a significant number of tourist customers all year round.
In terms of shopper traffic for businesses, the Grenoble regional urban planning agency has observed that the tramway helps to redistribute custom either as a result of increased mobility or because it has profoundly changed access to the city.

An accelerator for urban projects
Extending a tramway line to areas outside the town centre raises strong urbanisation challenges for the zone being connected. However, a tramway project alone is not a vector for urbanisation; it accelerates urban development projects where these have already been incorporated into urban development plans. This is the case with line 2 of the Lyon tramway serving Bron. The municipality of Bron, part of the inner ring of the Lyon urban area, had been developing for many years an urban policy, which one of the major strands was the creation of a proper town centre for the municipality. Routing the tramway through the centre of the municipality has been a driving force behind the redevelopment of the centre of Bron, whilst contributing to shaping it. At the same time, the line has had positive effects on property development by speeding up new building along avenue Franklin Roosevelt. According to property professionals, therefore, the arrival of trams in Bron has helped to bring forward by ten years plans to develop a proper town centre for the municipality.

Tramways bring districts closer together
Tramway projects in France have often provided opportunities for urban renewal around the tram lines. Priority districts in town planning policy have not been overlooked and have benefited from state funding to redesign public spaces and improve the living environment. In 2009, 30% of funding provided by the French state to municipalities for tramway projects was allocated to service and redesign of space in the districts through which they pass, based on the model of La Paillade in Montpellier, La Source in Orléans, or Hautepierre in Strasbourg.

Efforts to carry out an in-depth redesign of public space surrounding tramway projects also allow links to be built between districts and the impact of urban barriers to be reduced or eliminated. This tends to bring closer together districts identified for priority treatment in a town-centre development policy.
In Montpellier over the last ten years, the tramway has provided a framework for urban development projects. The first line defines the central artery for the expansion of the city towards the sea. The second line provides a basis for the development of more sparsely populated suburban areas and the third line provides a foundation for urban planning, employment and housing initiatives. For example, university buildings have been sited around tram lines. Within the framework of the renovation project for the route to the sea, dubbed “From Montpellier to the Sea”, the city has chosen to build a direct tram line (7-8 km) to allow the reorganization of business, the creation of a development cluster for housing and employment, and the structuration of the ecozone designated for this area of Montpellier. In Montpellier, the tramway is a political choice and a key element in the re-structuring of the city.
French tramway companies

French tramway expertise is recognized worldwide. Many French companies are associated with tramway construction schemes, are involved at every level (studies, construction and operation of systems) and also export their know-how abroad.

Operators

Four French groups have been operating tramway networks in France for 30 years and worldwide for 20 years.

Kéolis
Via its Transétude subsidiary, Kéolis has been advising transport authorities considering undertaking public transport projects with dedicated corridors. Kéolis also operates underground systems and automatic underground systems in France. SNCF is the majority stakeholder.
www.keolis.com

Kéolis implemented projects
In France: Bordeaux, Caen (TVR), Le Mans, Lille, Lyon
Internationally: Germany, Australia (29 lines in Melbourne), Belgium, Canada, Denmark, the United States, Norway (Bergen), the Netherlands, Portugal (Porto), the United Kingdom, Sweden

RATP
The RATP group is the world’s sixth largest player in the public transport sector. Through its subsidiary, RATP Développement (RATP DEV), it operates and maintains urban and inter-urban transport networks. RATP DEV combines the expertise of a world leader with the dynamism, flexibility and corporate culture of its ground subsidiaries. The Systra and Xélis subsidiaries carry out engineering projects.
www.ratp.fr

RATP implemented projects
In France: Île-de-France (four lines), Mulhouse (two lines in collaboration with Transdev)
Internationally: Italy (Florence and Genoa), Hong Kong (a line in partnership with Véolia Transport)

KEY FIGURES

---
3.4 billion euros turnover in 2009
160 subsidiaries in France
45,500 staff of whom 29,500 work in France and 16,000 internationally
2 billion passengers transported in 2009
Sites in 11 countries

---
4.432 billion euros turnover in 2009
48,191 staff worldwide
44 subsidiaries
Sites in 12 countries
Many calls for tender, aiming to build tramway systems, are scheduled in 2012, especially in Santos (São Paulo state), Cuiaba (Mato Grosso state) and Goiânia (Goiás state). The adoption of this new transport mode at the scale of a country-continent like Brazil underlines the will of Brazilian cities to be equipped with modern and ecological transport systems, which constitute an attractive alternative to individual motorised transport. It is also about benefiting from the modern image of tramway in urban renewal projects. The French-Brazilian cooperation has accompanied this evolution for many years, especially by financing feasibility studies (FASEP) in Rio de Janeiro, Santos and Jundiaí, realized by French engineering companies specialized in tramway.
Transdev
The Transdev group became involved very early in project management support for public transport tramway systems with dedicated corridors. It is a subsidiary of the Caisse des dépôts et consignations (CDC). Transdev’s expertise covers engineering project services, transport system management (infrastructure, rolling stock, systems, workshops, depots, etc.), urban integration and commercial management. Client consultancy is provided by its Transamo subsidiary.
www.transdev.fr

Transdev implemented projects
In France: Nantes, Grenoble, Strasbourg, Montpellier, Mulhouse, Orléans, Reims
Internationally: United Kingdom (Nottingham), the Netherlands (Utrecht), Spain (Tenerife and Madrid suburbs), Morocco (Rabat-Salé)

Véolia Transport
Véolia Transport is the number one private European public passenger transport operator and number two worldwide. It operates 13 tramway networks in nine countries across four continents. In December 2010, Transdev and Véolia Transport merged to become the world number one private passenger transport group.
www.veolia-transport.com

Véolia transport implemented projects
In France: Lyon (Rhônexpress rapid tramway line connecting Lyon Saint-Exupéry international airport and Lyon Part-Dieu high-speed TGV train station), Nancy, Nice, Rouen, Saint-Étienne, Valenciennes
Internationally: Australia (Sydney), Germany (Berlin, Görlitz), Spain (Barcelona), Hong Kong, Ireland (Dublin), Sweden (Stockholm, Norrköping), Norway (Trondheim)

KEY FIGURES
-----
3.6 billion euros turnover in 2009
Over 60% of turnover generated outside France
47,000 staff
No. 1 for transport on demand in Europe
4th largest European private public transport operator
11 tramway systems in operation
2 under construction

KEY FIGURES
-----
5.86 billion euros turnover in 2009
Sites in 28 countries
77,591 staff
2.32 billion journeys made in 2009
Working for 5,000 public authorities worldwide
The reconstruction of the network was a major challenge for New Orleans after Hurricane Katrina and it was also a means of rebuilding links in a city flooded by 80%.

After Hurricane Katrina, only 74 out of 379 buses and 7 out of the 66 streetcars remained. To speed up the process of re-establishing the network, the city authorities signed an initial delegated management contract with Véolia Transport in October 2008, which was extended for a further ten years in 2009. This was a first for an American urban area, especially as Véolia’s role went beyond simply operating the system. The French company also worked to develop the network and its experts were able to provide assistance, where requested, in obtaining subsidies, notably government funding.

It was a major achievement to be in charge of restoring the tramway in the city where A Streetcar Named Desire was filmed and where the green streetcar is emblematic. This was a challenge, which Marc Joseph, the Vice President and Director General of Véolia Transport USA, did not underestimate: “When you revive a transport system, you bring the city back to life.”

NEW ORLEANS
Véolia Transport wins the tramway contract
Engineering companies

These companies are involved in designing tramway projects: studies, project management, project management support to project owners, construction supervision.

**Artelia (formerly Coteba)**
Artelia is the result of a merger between Coteba and Sogreah offering a global and multidisciplinary engineering and project management vision in the construction, infrastructure and environment sectors. Artelia uses its expertise in the field of public transport systems with dedicated corridors to design and coordinate different disciplines relating to track infrastructure, rolling stock, electric power supply, signalling, safety equipment and operating equipment.

[www.arteliagroup.com](http://www.arteliagroup.com)

Artelia implemented projects
**In France:** Nancy, Caen, Bordeaux, Clermont-Ferrand, Le Mans, Nice

**Ingerop**
Ingerop carries out studies and provides support and consultancy to project owners at every phase of development of a public transport system with dedicated corridors, from feasibility analysis to the operational launch.

[www.ingerop.com](http://www.ingerop.com)

Ingerop implemented projects
**Tramways** currently operating in France (Bordeaux, Clermont-Ferrand, Grenoble, Marseille, Nice, Valenciennes), in Spain (Barcelona)
**Ingerop** is involved in tramway projects in Algeria (Algiers, Constantine), Spain (Saragossa), France (Angers, Le Havre, Saint-Denis - Sarcelles, Nice, Grenoble, Clermont-Ferrand, Valenciennes, Strasbourg, Toulouse)
**Ingerop** is carrying out feasibility studies in Brazil (Guarulhos, Jundiai, Santos), Spain (Andalusia), Italy (Bergamo, Genoa), Mexico (Morelia)

**KEY FIGURES**

---

**300 million euros turnover in 2009**
**2,500** staff, of whom **20%** work abroad
**1/3** of business is generated internationally
**20** European subsidiaries and more than **20** permanent sites worldwide

---

**157.6 million euros turnover in 2009**
**1,500** staff worldwide
Over **250** engineers and specialist technicians
Ingerop is working on twelve projects in Spain with its Spanish subsidiary Ingerop T3. It is responsible for connecting two Barcelona tramway lines and for a preliminary design study for Tramvia Metropolita, also in Barcelona. It is working in Grenada on a planned four kilometre section of the tramway line 1 and providing technical support to the project owner for systems and equipment for this tramway. Ingerop provided technical assistance for systems and equipment for the Madrid, Parla and Pozuelo tramways and worked on tramways in Cordoba, Jaén, Seville, Malaga, Saragossa and Palma de Majorca.

BARCELONA

Ingerop carries out twelve projects in Spain
Egis
Egis is a subsidiary of the Caisse des dépôts et consignations and a European leader in engineering for urban and rail transport. It works in close partnership with transport authorities, towns and regions in France and abroad. As a designer, Egis responds to issues concerning transport and planning policy, implementation of technical solutions and organizations of contractual and financial packages. As an implementer, Egis can coordinate major operations and see them through to completion in accordance with the commitments made.

www.egis.fr

Egis implemented projects
In France: Besançon, Brest, Bordeaux, Dijon, Grenoble, Lyon (Rhônexpress rapid tramway between the city centre and Saint-Exupéry international airport), Montpellier, Nice (line 2), Orléans, Paris (extension of the Maréchaux tramway), Strasbourg, Toulouse
Internationally: Algeria (five towns), Jordan (Amman), Poland (Kraków), Ireland (Dublin), Portugal (Porto), Spain (Tenerife), Morocco (Rabat-Salé)

Systra
Systra has been actively involved for nearly 30 years in the construction of many tram lines, ranging from preliminary studies to assistance with putting the system into operation. Today, Systra provides project management or project management support to project owners on some twenty tramway projects worldwide. The two main Systra shareholders are SNCF (36%) and RATP (36%). Systra was ranked the leading international urban and rail transport engineering company by the respected American journal Engineering News Record.

www.systra.com

Systra implemented projects
In France:
• Project management or project management support to project owners: Nantes, Orléans, Bordeaux, Lyon, Mulhouse, Marseille, Nice, Saint-Étienne, Reims, Brest, Île-de-France, Tours, Le Havre, Besançon, Lens
Internationally:
• feasibility studies in Canada (Montreal), Baltic states (Riga, Vilnius, Tallin)
• creation of new lines in Algeria (Algiers) and in Morocco (Rabat-Salé, Casablanca)
• projects to renovate former lines in Romania (Bucharest, Iasi)

KEY FIGURES

Egis
72.9 million euros turnover in 2009
7,300 staff worldwide
400 engineering professionals
20% of business generated abroad

Systra
252.6 million euros turnover in 2009
2,510 staff worldwide
Projects in 350 towns and 150 countries
80% of business activity generated internationally
The eastern line of the Algiers tramway, which is 23 km long with 38 stations, should come into service in late 2011 and, along with line I of the underground, will constitute one of the main structural arteries of the Algiers transport network. An initial 13 km section between Bordj El Kiffan (town) and the Les Bananiers district (Mohammadia) will come into service in 2011. Since 2006, Systra has been the agent for the project management group, with responsibility for approving detailed pre-project plans, assisting with the preparation of works and equipment contracts, checking compliance with construction plans and monitoring works and equipment.
Rolling stock manufacturers

Thanks to rolling stock designers and manufacturers, tramways now look modern. Until recently, most of the trams running on French networks were manufactured by Alstom. However, trams designed by Bombardier, Siemens and Translohr have been selected by some transport management authorities. Tramway rolling stock on the French networks is generally owned by the transport management authority and selected on the basis of a call for tenders. Nevertheless, where it is operated under private contract, the concession company owns the equipment.

**Alstom transport**

Alstom transport provides total transport system management and turnkey solutions: rolling stock, signalling, infrastructure and services. Alstom transport has supplied the trams for many networks in France and abroad and offers the Citadis option with its flexible capacity trams. Alstom has also installed track, signalling and electrical supply systems including the APS system (supplying power at ground-level) allowing to removal of catenaries. Recently, Alstom has been providing an innovative fast track laying technique called Appitrack. [www.alstom.com](http://www.alstom.com)

**Alstom transport implemented projects**

**In France:**
- rolling stock: Bordeaux, Nantes, Grenoble, Île-de-France, Le Mans, Lyon, Montpellier, Mulhouse, Nice, Orléans, Rouen, Strasbourg, Toulouse, Valenciennes
- Citadis trams: Angers, Brest, Dijon, Reims
- APS system: Angers, Bordeaux, Orléans, Reims

**Internationally:**
- Tramway carriages: Netherlands (Rotterdam), Ireland (Dublin), Spain, (Madrid-Parla, Barcelona, Tenerife), Australia (Melbourne), Turkey (Istanbul), Tunisia (Tunis)
- Orders for rolling stock for lines under construction: Spain (Jaén), Algeria (Algiers, Oran, Constantine), Morocco (Rabat, Casablanca), Brazil (Brasilia)

**Lohr**

Lohr is a privately-owned French group based in Alsace which has been a world-class specialist in the design and implementation of transport systems for goods and passengers for over 45 years. Lohr notably provides the Translohr tramway which runs on tires with a central rail guide. [www.lohr.fr](http://www.lohr.fr)

**Lohr implemented projects**

**In France:** Chatillon-Viroflay, Clermont-Ferrand, Saint-Denis - Sarcelles

**Internationally:** Italy (Padua, Venice-Mestre), China (Tianjin-Teda, Shanghai)

---

**KEY FIGURES**

- 2,000 employees
- 230 professional staff across Europe
- 6 sites worldwide

---

**KEY FIGURES**

- 23 billion euros turnover in 2009, including 5.8 billion euros for Alstom transport
- 96,500 staff including 27,000 Alstom transport staff
- Operating in over 70 countries
- No. 2 in underground and tramway systems in the world
Alstom exports Citadis to Tunisia

Citadis has been running in Tunisia since 2009. With 39 new trains, the tramway meets the city’s growing need for public transport. The feedback for the first Citadis in North Africa is positive.
**Bombardier**

Bombardier offers transport solutions on a worldwide scale in two business sectors – aeronautics and transports. Its Bombardier Transport division is the world leader in the construction of rail transport equipment and provision of associated services. It has a vast industry portfolio and delivers innovative products and services which set new standards in sustainable mobility. Based on the four principles of energy, efficiency, economy and ecology, Bombardier’s ECO4 technologies are energy-saving, protect the environment and improve global train performance. Bombardier supplies the Flexity tramway system.

www.bombardier.com

**Siemens**

Siemens France has skill centres which operate across the whole Siemens group worldwide in cutting-edge sectors such as automated transport systems. Siemens SAS/MO represents the group’s Mobility operations in France and markets its rolling stock and rail products. Siemens Mobility provides automatic control systems, fully automated systems, rolling stock, electrification, services, maintenance and turnkey projects. Siemens supplies the Avenio tramway, the latest product in the range, offering multiple configurations and currently used in many cities worldwide. It also produces the Avanto tram-train which can connect city centres to suburban zones without transshipment and run on conventional railway tracks.

www.siemens.com

**Bombardier implemented projects**

In France: Marseille (equipped with Flexity Outlook), Nantes, Strasbourg

Internationally: Germany (main site), Austria (Graz, Innsbruck, Linz), Australia (Adelaide, Melbourne), Belgium (Brussels), Spain (Alicante, Valencia), the United States (Minneapolis), Italy (Milan, Palermo), Poland (Kraków, Lodz), Portugal (Porto), United Kingdom (Nottingham), Switzerland (Geneva, Zurich), Turkey (Istanbul, Bursa, Eskisehir)

Contract in the planning stage: Canada (Toronto)

**Siemens implemented projects**

In France: line T4 Aulnay-Bondy (Île-de-France), Mulhouse-Vallée de la Thur line

Internationally: United States (Las Vegas tram-bus), Italy (Bologna with the TEO Tram Elettrico Ottica network)

---

**KEY FIGURES**

- **19.4 billion dollars turnover for the financial year to 31 January 2010**
- **62,900 staff including 33,800 Bombardier Transport staff**
- **59 production and engineering sites and 20 service centres**
- **Operations in 25 countries**

---

**KEY FIGURES**

- **2.7 billion euros turnover in 2009**
- **400,000 staff, including 8,055 Siemens France staff**
- **7 production sites**
- **5 world skill centres**
- **22 million euros annually devoted to R&D**
- **3.3 billion euros worth of orders taken in 2008**
The city of Bologna has accepted Siemens' bid to equip the TEO Tram Eletrico Ottico network with the Siemens Optiguide optical guidance system. TEO comprises four trolley bus lines with continuous guidance systems, which go through Bologna and its suburbs from east to west.
Major public works groups

Three major French companies, Bouygues, Eiffage and Vinci provide design and construction services for tramway lines. Depending on the circumstances, their role ranges from building the platform to leading a consortium or a concession group.

**Bouygues** operates in the transport sector via its subsidiary Colas Rail. The Colas Rail cluster comprises construction, replacement and maintenance of high-speed lines and conventional railway track, tramways, underground systems, and management and engineering for major turnkey projects. Being a member of the Colas group, world leader in road construction and maintenance, gives Colas Rail a solid foundation based on very high level expertise and technologies. Colas operates mainly in France and the United Kingdom, but also in Belgium, Romania, Venezuela, Egypt, Algeria and Morocco. Bouygues is currently building and will operate the Reims tramway which will enter into service in April 2011.

www.bouygues.com

**Eiffage** is the eighth largest European construction and concession group. It carries out complementary activities: financing, design, infrastructure and project construction and maintenance via five operational sectors (Eiffage constructions, public works, concession, Forclum, Eiffel). Eiffage and its subsidiaries have been involved in the construction of tramway lines in some twenty French towns, as well as in Madrid.

www.eiffage.com

**Vinci** finances, designs, builds and manages transport infrastructures, public and private facilities, water, energy and communications networks. The Rhônexpress link connecting Lyon city centre to the city’s international airport, which came into service in August 2010, was built within the framework of a public-private partnership between the Rhône département and Vinci Concessions. The design and implementation contracts were carried out by subsidiaries of the Vinci group, including Eurovia travaux ferroviaires.

www.vinci.com

**KEY FIGURES**

- **Bouygues**
  - 1.3 billion euros turnover in 2009
  - Over 133,000 staff
  - Operating in 80 countries

- **Eiffage**
  - 13 billion euros turnover in 2009
  - 70,000 staff
  - 500 business units
  - 30,000 projects annually in Europe

- **Vinci**
  - 31.9 billion euros turnover in 2009
  - 162,000 staff
  - Operating in over 100 countries
  - 240,000 projects in 2009
The Vinci company is the mandator of the Rhônexpress grouping responsible for the construction and operation of the high-speed tramway link in Lyon. Rhônexpress, which runs from Part-Dieu railway station to Lyon-Saint-Exupéry airport, guarantees:

- a departure every half-hour from 5 am to 6 am and from 9 pm to 12 am;
- a departure every 15 minutes from 6 am to 9 pm;
- a 365-day per year service;
- a journey time of under 30 minutes;
- a return journey to Lyon after midnight when a flight has been delayed if it was scheduled to land before 11.30 pm.
Tramways of yesterday and today, a strong political commitment

Although tramways have now come back to the urban landscape, it was necessary to make a break with the supremacy of the car in the 1960s to return to this form of public transport. The success of the new French tramways can partly be explained by the favourable context of decentralisation, with the introduction of a proactive national policy in the period 1990-2000 based on incentives (transport levy, grants) and supports (laws, tools, methodologies), as well as the emergence of strong local policies in favour of organising global urban transport schemes. The tramway option has been gaining ground consistently since the 1970s as an urban transport system.

1950-1970: the supremacy of the car
In 1946, 48 French cities had tramways and this was the preferred method of public transport across Europe, with underground systems being reserved for capital cities such as Paris. From the 1950s, car use peaked and tramways were questioned by French towns wishing to adapt to car use. In the 1960s, with the exception of Lille, Marseille and Saint-Etienne, all French tramways were dismantled to make way for cars.

1970: a tax in favour of public transport
In the early 1970s, the period of economic growth and the dominance of the car began to wane. The negative effects of car use (congestion and pollution) and the first oil crisis encouraged the French state to relaunch urban transport schemes. A transport levy (versement transport) was introduced: it was raised on companies employing more than nine staff located in areas served by urban transport systems, in order to finance public transport. This tax helped to develop urban transport and to build major underground systems in Lyon, Lille and Marseille.

1980: decentralisation favours the introduction of tramways
In the early 1980s, a significant decentralisation process was established and benefited tramway systems. Different levels of local administration (towns, "départements", regions) were responsible for organising public transport and the Urban Travel Plan became the main planning tool for urban transport planning (Framework law on internal transport, LOTI, 1982). The principle objective of this plan was to develop public transport and project management was entrusted to urban transport management authorities. Underground systems were only suitable for large urban areas and so tramways became the solution for the majority of towns. Nantes (1985) and Grenoble (1987) reintroduced the first tramways to their networks and chose the standard French tramway developed on the basis of a state-sponsored initiative (concours Cavallé, 1975).

1990-2000: tramways are backed up by national transport and urban planning policies
The 1990s saw a rise in environmental concerns and the 2000s link urbanisation and transport, thus favouring the introduction of tramways. In 1996, the law on clean air and the rational use of energy (LAURE) set Urban Travel Plans (PDU) the priority target of reducing car use. Urban Travel Plans became mandatory for towns with more than 100,000 inhabitants and enforced a global approach to the organisation of travels. During this period, urban planning had been suffering from a lack of impetus. Suddenly Urban Travel Plans, which were usually planning tools for the medium term (5 to 10 years), included an element of longer term urban planning (10 to 20 years). In parallel, the state with its policy of grants, encouraged local authorities to build new public transport systems.
THE TRAMWAYS OF YESTERDAY
with dedicated corridors, sharing public space between different forms of transport. The rebirth of tramways in France can be pinpointed to this period, with the construction of the first lines in Strasbourg and Rouen in 1994.

**In 2000, the law on Solidarity and Urban Renewal (SRU) restored the primary purpose to Urban Development Plans by making the sub-regional structure plan (SCOT), an urban planning tool, work on longer timescales and a larger spatial scale. This law provided a strong incentive to link urbanisation with transport. Tramway schemes must be included in urban planning (the travel component of SCOTs) together with all the urban projects which accompany them or are generated by them. Urban development must be organised around shared public transport routes, as for example in Montpellier. The Urban Development Plan become once again the tool for public transport planning policy: structuring public transport around tramways, reorganising bus networks and providing transport on demand, social pricing, information, accessibility, park-and-ride, etc.**

It has to ensure a balance between mobility needs and environmental protection on the one hand and to increase social and urban cohesion on the other hand. Thus transport occupies a much more significant role at the heart of local public policy.

**Since 2000: the tramway remains the high-priority method of public transport**

French tramways are continuing to evolve:
- in 2003: Bordeaux opened three tram lines based on the new generation of more accessible rolling stock (integral low floor) with careful attention to design and customisation in many cases (Alstom’s Citadis) and meeting the requirements of urban requalification;
- in 2006, the first lines came into service in Mulhouse and Valenciennes, Clermont-Ferrand launched its tramway on tires and Paris completed its network;
- in 2007, Nice and Le Mans opened their first lines to the public.
Further information

Acronyms

AOTU: autorités organisatrices des transports urbains (Transport Management Authorities)
BHNS: bus à haut niveau de service (Bus with High Level of Service)
LAURE: loi sur l’air et l’utilisation rationnelle de l’énergie (Law on Clean Air and Rational Energy Use)
LOTI: loi d’orientation des transports intérieurs (Framework Law on Inland Transport)
PDU: plan de déplacements urbains (Urban Travel Plan)
SCOT: schéma de cohérence territoriale (Sub-regional structure plan)
Sru: loi solidarité et renouvellement urbain (Law on Solidarity and Urban Renewal)
TC: transports en commun (public transport)
TCSP: transports en commun en site propre (public transport systems with dedicated corridors)

Additional resources


ACTIF: Aide à la conception des systèmes de transports interopérables en France (Resource for the design of interoperable transport systems in France) www.its-actif.org

Certu: Centre d’études sur les réseaux, les transports, l’urbanisme et les constructions publiques (Centre for the study of networks, transport, urban planning and public building projects) www.certu.fr

PREDIM: Plate-forme de recherche et d’expérimentation pour le développement de l’information multimodale (Platform for research and development of multimodal information systems) www.predim.org

PASSIM: Portail annuaire des sites et des services sur le mobilité (Portal and directory for sites and services on mobility) www.passim.info

Contacts

Directorate General for Infrastructure, Transport and the Sea
Mail: sfd.dst.dgitm.developpement-durable.gouv.fr

Department for European and International Affairs
Tel.: + 33 (0)1 40 81 27 40 (Transport Managing Officer)

Centre for the study of networks, transport, urban planning and public building projects
Email: DD.CERTU@developpement-durable.gouv.fr