

# Light rail



---

# The expertise of a partner **attuned to the needs of local communities and passengers**



As the trusted partner for local authorities, our objective is to offer innovative, reliable mobility solutions, combining operational performance excellence with a sense of public interest. Solutions that contribute to quality of life and the harmonious development of regions, customized to respond to specific local conditions. Solutions that meet the needs of all and provide the high quality of service expected by travelers. Solutions for public transportation that ensure mobility for people -- today and tomorrow.

Attuned to the individual expectations of customers and passengers and the changing needs of communities, Transdev teams engage with our local partners on a daily basis. Our international profile and the diversity of our professions enable us to conceive the most innovative responses to keep our passengers connected when they're on the move, with simple and seamless mobility. Designing the solutions that we deliver to each traveler we serve is our inspiration. Mobility inspired by you.



**Jean-Marc Janaillac**  
Chief Executive Officer, Transdev

---

# Light rail: a breath of fresh air for cities

Around the world, light rail transit (LRT) has become the symbol of a revival in public transportation. With around 400 systems already running in 50 countries and another 260 being built or on the drawing board, light rail is enjoying a new golden age in cities eager to promote more sustainable travel solutions. Passengers overwhelmingly support a major shift back to a transit system transformed by high-end design and the highest standards of service. Yet LRT does more than just modernize mobility: it also breathes new life into the urban environment.

## AN ALTERNATIVE TO CARS IN CITIES

Freed from the constraints of traffic jams, light rail provides speed, frequency, on-time performance and accessibility. It offers passenger capacity able to meet the increasing demand for mobility to serve major routes and link outlying districts.

## A FRESH APPEAL FOR MOBILITY

Comfortable rail cars and quality infrastructure have given citizens a new lease on life when it comes to urban mobility. Designed to minimize pollution and reduce noise while opening up the city, light rail also attracts new passengers with its innovative passenger information and ticketing services.

## THE BASIS OF A MULTI-MODAL NETWORK

Light rail transit provides a solid framework for multi-modal travel. It represents the cornerstone of a system that incorporates transfer hubs for connections to a variety of environmentally friendly passenger transportation solutions such as bicycles, car sharing and Park & Ride facilities.

## A CATALYST FOR URBAN RENEWAL

LRT is a catalyst for active urban transformation. It opens up public spaces, forges ties between neighborhoods and favors the growth of new business clusters. Light rail also helps shape the city's identity by creating a new living environment and urban landscape.

As an established trailblazer for the light rail revival, Transdev is one of the world's leading provider of LRT solutions, with 23 systems running in 11 countries across four continents. The company's pioneering position stems from an ability to provide comprehensive support to local authority partners; from initial feasibility studies to everyday success. Transdev offers project management expertise to ensure seamless integration, in terms of style and substance with the local environment.





# Good reasons to choose **Transdev**



## ONGOING DIALOGUE

### ***Involving communities & stakeholders***

Transdev is careful to anchor projects in the life of the city, by involving stakeholders such as businesses, schools, associations and chambers of commerce... We work to keep city activities accessible during challenging construction periods, ensure public safety when the system is commissioned and help city residents adapt their travel habits through educational campaigns. In Reims, France, we went one step further and asked citizens to be “co-creators” of the vehicle’s design and network rebranding. In Barcelona, we engage extensively with social media channels to shape our latest initiatives and consult the public about future line extensions.

## PROJECT PERFORMANCE

### ***Consulting & engineering expertise***

From the earliest stages of a project, our sister-company, Transamo, provides an overarching vision of the project’s feasibility, safety, operability, urban integration and cost of ownership – including investment, operation & maintenance. Because Transamo has directly advised and assisted the development of over 260 km of light rail, all proposed solutions and advice are anchored in the tried and tested operational experience of the world’s leading systems.

## CONTRACTUAL COMMITMENT

### **Win-win partnerships**

Transdev's rich contractual experience makes us well placed to help deliver your mobility ambitions. In France, we have been a historic partner to cities and regions throughout the renaissance of light rail and a pioneer in public private partnerships. Innovative consortia in Barcelona and Tenerife, Spain, have delivered signature levels of quality and performance while operating contracts in Norrköping, New Orleans and Dublin have created win-win partnerships with local authorities to the benefit of passengers.

## QUALITY AND SAFETY

### **A process of continuous improvement**

Our objective: delivery of service excellence supported by rigorous processes that ensure continuous improvement. In Barcelona, the management system is ISO 9001 and ISO 14001 certified, the safety system OSHAS 18001 certified and all lines EN 13816 certified. Grenoble and Dublin systems are all also ISO 14001 certified and all of our light rail operations adhere to our rigorous internal quality, security and environmental processes.

## KNOW HOW

### **Multi-country leadership**

With 23 systems in 11 countries, Transdev's light rail experts have plenty to share: from large scale line extensions to preventing fare evasion and conducting passenger safety campaigns. Our "Expert.net" knowledge management process facilitates and strengthens the sharing of best practices and the continual enhancement of our multi-country know-how to the benefit of our local clients.



## ENVIRONMENTAL INNOVATION

### **Even more eco-friendly**

We work to maximize the environmental virtues of mass transit through innovative partnerships, green depots and eco-management. In Mulhouse, France, a partnership with electricity provider EDF ensures the tram-train is powered from entirely renewable sources. In Tenerife, Spain, our maintenance depot produces 900 kilowatts of wind and solar generated electricity, representing 16% of the system's energy requirements. In Reims, with our constructor partners, we are extending our experiences in underground electrification to preserve the local environment.

## SATISFACTION

### **Fostering a culture of customer care**

The quality of the interaction between staff and passengers helps define the Transdev "light rail experience." "Going for Care" our multi-country training program, enhances relational skills of employees: in Dublin, Ireland, complaints fell by 40% and perceived quality rose by 16% after training. Our "Meet the managers" initiatives allow passengers to share their daily mobility concerns with senior management on the platform, complementing feedback captured through our customer care centers and online.

## INTEGRATION

### **Designing and managing a seamless journey**

Our expertise in the urban environment and service design facilitates the creation of seamless connections between bus, rapid transit and light rail systems. In collaboration with urban planners and architects, Transdev designs easy-to-navigate transit centers and Park & Rides, complemented by alternative travel solutions such as bikes and car-sharing. Beyond this, our modeling software generates analysis of travel times and passenger flows, allowing accurate timetables and attribution of financial, technical and human resources to enable a truly multi-modal transportation offer.

# Transdev, partner in the tramway's renaissance

Making public transport the engine of tomorrow's mobility is at the heart of Transdev's mission. By participating in the rebirth of the tramway in Nantes, France's first city to reintroduce this transport mode, to be followed soon by Grenoble and Rouen, Transdev is creating unique opportunities to bring this ambition to life. The tram lines' design often serves to accelerate reorganization throughout the mobility chain, implementation of ambitious urban renewal projects and citizen conversion to public transport.

The economic constraints facing local authorities' finances today make the choice of partner-operator critical to the development of major projects.

For 30 years, Transdev has leveraged its operational experience on behalf of public authorities.

Through innovative public-private partnerships, the company has enhanced its range of balanced and effective contractual arrangements to deliver responses that support each city's economic development.

With its long experience in delegated management, Transdev offers contractual formats that provide maximum flexibility in terms of responsibility, ownership and organization. In particular, private-public partnerships have become an essential means of modernizing the sector, a model that Transdev continues to refine to adapt to

tomorrow's challenges. Concession (BOT) contracts, with an average duration of 30 years, enable long-term relationships, based on optimal allocation of responsibilities between public and private sectors for transport infrastructure development and management.

In keeping the public interest as its central focus, the Caisse des Dépôts, a long-term investor with local authorities and Transdev's majority shareholder, adds to the benefits offered by the company.



“

*Our vision:*

*Inventing new mobility solutions for the good of our planet, the sustainable growth of cities and regions and the quality of life of our passengers ”*





Corporate Marketing department  
Corporate Communications department

[www.transdev.net](http://www.transdev.net)



# Shenyang – CHINA

Shenyang Tram  
The first modern tramway in China



## CONTRACT FACTS

**TRANSIT AUTHORITY**  
Hunnan district, City of Shenyang

**OPERATOR**  
Shenyang Hunnan Modern Transport Operation Co., LTD (51% held by the city and 49% held by Transdev / RATP Dev.)

**OPERATION START**  
August 15, 2013

**CONTRACT DURATION**  
3 years

## KEY FIGURES

**NETWORK**  
60 km of track  
65 stations  
4 lines built (lines 1, 2, 3 and 5)  
2 tram depots & maintenance facilities

**SERVICE**  
> Line 1 (from Exhibition center to Olympic Center)  
> Line 2 (from Olympic Center to Taoxian Airport)  
> Line 3 (from Exhibition Center and 21st Century Plaza)  
> Line 4 (project phase)  
> Line 5 (from Olympic Center to Shenyang New City)  
> Line 6 (under construction)

**RIDERSHIP**  
150,000 passengers/day

**VEHICLES**  
> 20 CNR Changchun 70% low-floor light rail vehicles  
> 10 CNR Changchun 100% low-floor light rail vehicles  
> All equipped with super-capacitors energy storage units for catenary-free operation (German Voith technology on 100% low-floor)

**STAFF**  
Total targeted employees: 620

## Context

As one of the top 10 Chinese ecological cities, Shenyang wanted to give priority to the further development of public transportation within its urban area. The main goal was to improve quality of life for its inhabitants by providing an additional alternative mode of transportation as an important link between residential areas, major business districts and the airport. Also, as it is the first modern tram in the country the local government wanted to launch the tram in conjunction with the opening of the 12th China National Games at the end of August 2013. The two major difficulties faced were:

- > extremely tight time scale: all pre-operational work; recruitment, training, testing, etc. completed within 3.5 months;
- > limited local knowledge and experience of tram design and construction, technology and operational management.

## Transdev's answer

To ensure the successful launch of the project, at the starting phase, a group of very experienced specialists was selected from the local team and Transdev / RATP Dev. This team has rich experiences and knowledge of start-up phases in complex public transportation projects and work very closely with the local partner and staff.

### Technical Assistance

- > Provide solutions to mitigate safety risks resulting from system design problems.
- > Provide advice and assistance during the negotiations with the rolling stock maintenance subcontractor.
- > Prepare the Empty Trial Run (ETR) plan and design the ETR scenarios. Provide professional advice and support until operational launch.

### Equip local staff with professional operational and management skills

- > Invited experienced French trainers to provide on-site training to local trainers. Prepared training support and initial certification process for tram drivers.
- > Prepared and delivered initial training to Operational Control Center (OCC) staff.
- > Provided technical and operational support in OCC until the end of the National Games.
- > Developed customized operation guidelines and procedures by drawing from Transdev / RATP Dev's worldwide expertise while taking the local specificities and regulations into account.
- > Defined job descriptions for all key positions and assist the local partner with the recruitment process (candidate assessments, interviews, selections, hiring, etc.).

### Superior customer experience

- Designed marketing materials, including flyers and brochures to:
- > build customer awareness of this new mode of transportation;
  - > educate customers about proper behavior onboard public transit vehicles.

### Uncompromising safety

- > Developed all the safety management rules and procedures including the 20 Emergency Response Plans in case of accident / incident.
- > Organized and make on-going efforts on safety trainings and emergency exercise drills.
- > Closely cooperate with the local (traffic) police for the operational launch.

## Objectives

To set up a showcase in modern tram operation and set the standard for tram operation and management with the focus on operational reliability, service quality and outstanding safety by:

- > securing smooth operational launch in time for the China National Games 2013;
- > achieving high customer satisfaction results;
- > implementing a comprehensive safety management system and instilling a safety culture.

## RESULTS

- > Successful launch: on 15 August, 2013, 3 lines are opened
- > The Shenyang tramway is in the spotlight of the China National Games



# Montpellier – FRANCE

TaM – Unlocking the potential of a city and region



## CONTRACT FACTS

### TRANSIT AUTHORITY

Communauté d'Agglomération de Montpellier

### OPERATOR

Transport Agglomération Montpellier (TaM) a mixed equity company

### ACTIVITIES MANAGED

Operation of bus and light rail network  
Management of parking stations in construction  
Upstream consulting and engineering services

## KEY FIGURES

### SYSTEM

4 lines  
60 km of track  
84 stations  
40 stations connected  
17 Park & Rides,  
5,200 spaces

### Line 1

120,000 trips/day  
17.8 km - 30 stations

### Line 2

40,000 trips/day  
17.8 km - 28 stations

### Line 3

50,000 trips/day  
20.1 km - 27 stations

### Line 4

20,000 trips/day  
8.5 km - 17 stations

### SERVICES

Average service frequency:  
3-5 minutes for line 1  
5-7 minutes for line 2  
6-8 minutes for line 3  
8-9 minutes for line 4

### RIDERSHIP 2012

230,000 trips/day

### VEHICLES

83 vehicles

### STAFF

1,200 employees, including 680 drivers

## Context

An enjoyable city on the Mediterranean Sea, Montpellier is growing in population, and expanding.

- > A coherent transit system is seen as vital to reducing the disruptive effect of urban sprawl and stimulating the development of lively and dynamic urban areas.
- > The expansion of light rail is at the heart of the city's sustainable mobility strategy.

## Objectives

- > Diminish the impact of individual cars by offering multimodal transportation solutions.
- > Design and operate a connected network with an LRT backbone covering all four corners of the county – redesigning the heart of an entire region.
- > Place the LRT system at the center of a coherent public transportation network, provide access to new modes of transport to facilitate mobility and discourage car use.

## Transdev's answer

### Turning the city vision into reality

Since 1996, our engineering and consultancy company, Transamo, has drawn upon its vast upstream and operational expertise to assist with the planning and delivery of four lines representing 60 km of light rail, with a fifth planned for 2017. Expertise in planning, creation and optimization of light rail were also sourced from Transamo.

**Result:** With an additional 24 km planned by 2017, light rail is poised to deliver additional economic, social and environmental benefits to the city.

### As easy as hop-on, hop-off

Everything has been planned to facilitate seamless mobility for passengers:

- > 40% of central bus stops are directly connected to the light rail,
- > automatic distributors are situated on platforms,
- > real-time information and video screens at junctures between the tramway and bus system leave passengers confident and well-informed as they move between modes,
- > audio announcements give a second layer of information to passengers in case of a disruption of service,
- > real-time information on the move is delivered by text message alerts or mobile websites accessible on wap-enabled smartphones.

### Walk, cycle, drive: passengers have the choice!

With the tramway has come 170 km of cycle lanes and the installation and operation by TaM of 1,600 bicycles. Specialist cycle parking stations are available along lines 1, 2, 3 and 4 and passengers can take their bike for free during nonpeak hours.

5,200 parking spaces across 17 Park & Rides ensure that cars can be left outside the commercial center as the best way to get around town. An integrated parking and return trip ticket are provided for occasional users, and reduced rates for those with an annual public transport pass.

### Innovative ticketing and information solutions

In February 2010, Transdev launched the Pass'Trans solution: by using a USB key equipped with Near Field Communication technology or a contactless card recharger, users can complete all ticketing purchases online with a direct recharge to their seamless travel pass.

## RESULTS

- > The tram network provides essential access to 50% of Montpellier's population (85% with lines 3 and 4) and 45% of jobs
- > A survey of pilot users showed 98% were satisfied or very satisfied with the Pass'Trans service
- > Over 230,000 trips/day in 2012



#### CONTRACT FACTS

**TRANSIT AUTHORITY**  
Autoritat del Transport Metropolità de Barcelona (ATM)

**CONCESSION HOLDER**  
Tramvia Metropolita SA

**OPERATOR**  
FCC-Versia/Transdev (66%), Moventis (34%)

**CONTRACT**  
Concession and operation: BOT

**CONTRACT DURATION**  
25 years

**ACTIVITIES MANAGED**  
System operations  
Maintenance of infrastructure/rolling stock  
Fare evasion control  
Marketing  
Ticket sales (PTA's agent)

#### KEY FIGURES

**SYSTEM**  
2 light rails, 6 lines  
30 km  
56 stations

**SERVICES**  
974 departures/weekday

**RIDERSHIP**  
24 million passengers/year

**KILOMETERS TRAVELED**  
2.6 million km/year

**VEHICLES**  
Alstom Citadis 302  
41 vehicles (23+18)

**EMPLOYEES**  
212 employees

## Context

In 2000, ATM, the transit authority of Barcelona, decided to launch two light rail projects under the name TRAM. Its dual objectives across the city:

- > in the South of the city, develop public transport capacity,
- > in the North, develop an urban and industrial area. The construction of these two ambitious projects began soon after winning the contract in 2000 and the service was opened to passengers in 2004.

## Transdev's answer

### Excellence in managing the project

- > An innovative Build, Operate, Transfer public-private partnership generated 436 million euros of investment and a consortium of clear complementary expertise.
- > Open, constructive dialogue with partners to ensure passenger-focused infrastructure features and vehicle design.
- > Coordination of services between several operators in the city, providing a unique level of service to passengers, both on our network and during connections.

### A high level of technical expertise

With 190 crossroads in a 29 km area, our expertise in system traffic control allows the light rail to reach the speed of 18 km/h without jeopardizing car traffic.

### State of the art quality management system

Barcelona is a fully integrated management system with ISO 9001, ISO 14001, EN 13816 and OHSAS 18001 certifications.

- > Transdev worked with maintenance teams and subcontractors to ensure all elements of the operation achieved international certifications in quality, safety and environmental management.

## Objectives

Developing public transportation ridership is the key objective of the project. The action plan to attract new ridership is based on two goals:

- > provide a credible and reliable system with 95% plus punctuality rates,
- > deliver a superior customer experience for passengers.

- > Daily and monthly reports of key performance indicators are shared within the organization, creating a culture of transparency and performance.

### Friendly, passenger-focused service

- > A diverse and youthful workforce receives front-line customer service training.
- > Deployment of Transdev's proprietary "Listen" customer feedback and complaints system.
- > Extensive engagement with social media channels to shape our latest initiatives and dialogue with the public.

### Information and education

- Particular focus has been paid to creating a safe environment.
- > Educational programs and special campaigns about behavior aboard and fraud.
- > Close collaboration with regional and local police and communities.
- > Anti-racism and conflict resolution training for ticket inspection and safety teams.
- > Increased technical support and coordination with CCTV.
- > Automation of fines and payments.

#### RESULTS

- > Listen, claim resolution time has been reduced 22.5%
- > From 2011 to 2012 fare evasion has decreased: -14% for T4 and -49% for T6





#### CONTRACT FACTS

**TRANSIT AUTHORITY**  
Reims Métropole

**OPERATOR**  
CITURA

**CONCESSION OPERATOR**  
MARS Consortium  
(Mobility Agglomeration Reims)  
17% Transdev  
17% Alstom Transport  
17% Bouygues  
17% Caisse d'Épargne Lorraine Champagne Ardennes  
30% Caisse des Dépôts

**BEGINNING OF CONTRACT**  
April 2011

**DURATION OF CONTRACT**  
30 years

#### KEY FIGURES

**SYSTEM**  
2 lines  
11.2 km of track  
23 stops  
3 park and ride facilities

**RIDERSHIP**  
45,000 passengers / day  
Total network of approximately 200,000 as of 2016

**VEHICLES**  
18 trains  
Alstom Citadis 302  
Capacity 205 passengers  
Speed: 20 km / h downtown and up to 70 km / h outside the city center

**STAFF**  
600 employees, including 420 drivers

## Context

In this historic city of the famed Champagne region, the local community sought to achieve its vision of mobility through the renovation of the public transport network and creation of two tram lines to be integrated into the existing infrastructure. A public-private partnership would develop the project, involving the local community and respecting the city's architectural and cultural heritage.

## Transdev's answer

### The MARS consortium

Responsible for the project's investment, construction, operation and maintenance, this innovative urban public-private partnership features:

- > Speed of construction: new engineering techniques enabled installation of up to 300 m of track per day;
- > Respect for the local environment: next generation buried catenaries were used for the 2 km in the area of the opera and other important architectural sites;
- > Transformation of the urban landscape: more than 100,000 m<sup>2</sup> of green space were renewed and new pedestrian zones created.

### Involving the community

The views of Reims' citizens were invited, not only on the vehicles but also on the new network's palette of colors:

- > Result of a hard-fought contest between three Alstom concepts, the tramway's design, inspired by the famous region's heritage, evokes the image of a champagne flute;
- > More than 85% of 7,300 voters chose the strong, united colors of designer Ruedi Baur.

### Boosting mobility and fluidity

- > A completely re-imagined network: bus routes and schedules are designed to optimize intermodality, with particular attention to connections with the regional and national rail network, with four major stops. Buses circulate at a high frequency, with additional evening services and lines extended into developing neighborhoods.
- > Centralized control: coordination of the entire network from a modern technical center.
- > Passenger information: smart route planners and real-time information on network disturbances.
- > Park and ride stations: three sites with 431 places and free parking for annual subscribers. Occasional users benefit from unlimited parking and bus / tramway return tickets at preferential prices.

### Integrated ticketing and services

- > The "Grand R" card was launched at the opening of the network to encourage multimodality. This unique, individual contactless card, can be recharged at 139 self-serve stations and sales outlets and on the Internet through a card reader with USB cable.
- > The Citevia prepaid credit card, tested starting in May 2011 in partnership with the Caisse d'Épargne, allows its more than one thousand holders to recharge their tickets at 12 ATMs.

## RESULTS

- > 35% of Reims' population lives within 500 meters of a tramway station
- > 512 people trained through nearly 1,000 courses
- > 182 versatile tram and bus drivers



# Lyons – FRANCE

Rhôneexpress – An innovative direct airport transfer contributing to regional growth



## CONTRACT FACTS

**TRANSIT AUTHORITY**  
Conseil Général  
du Rhône

**OPERATOR**  
Transdev

**CONSORTIUM**  
28% Transdev  
35% VINCI  
37% Caisse des Dépôts

**CONTRACT START**  
August 2010

**CONTRACT DURATION**  
30 years

**ACTIVITIES MANAGED**  
Development of project  
Operations and  
maintenance  
Customer care  
Ticketing  
Marketing &  
Commercial

## KEY FIGURES

**SYSTEM**  
22 km of track  
4 stations

**SERVICE**  
365 days per year,  
5 am-midnight  
Every 15 mn at peak  
hours (6 am - 9 pm)  
Every 30 mn off-peak

**RIDERSHIP**  
3,000 passengers/day

**VEHICLES**  
6 Stadler Tango capable  
of up to 100 km/h

**STAFF**  
65 employees

## Context

A city of 1.5 million inhabitants located at the heart of a region of high economic and tourism activity, Lyons wished to improve the image and efficiency of transferring to Lyons' Saint Exupéry airport. It also became vital to alleviate pressure on the main Lyons train station and improve access to national and regional rail links through the high-speed station in the airport.

## Transdev's answer

### An inventive transportation solution

The first direct express rail airport transfer service in France, Rhôneexpress is a Tram Express able to reach high commercial speeds (up to 100 km/h); but also travel on the existing urban tram network to reach the heart of the city.

**Result:** Only 7 km of the 22 km line is new construction. The tram-train shares the same operations and control center as the urban tram network.

### Integrated coordination of traffic

With tracks shared by both the tram-train and urban light rail transit, special segments of the line have been devised to allow Rhôneexpress priority over the urban tram network, which stops more frequently. A joint traffic control system and operational center was developed to:

- > coordinate departures of both lines,
- > manage three places in each direction to overtake the urban tramway.

**Result:** Guaranteed transit time and reduced infrastructure costs.

### Comfort and convenience

Customer focus has been applied at each stage of the project.

- > Departures from 5 am until midnight, with services every 15 minutes for the majority of timetabled hours. Last departure is guaranteed, even in case of air travel delays.
- > Passengers have quick easy access to high-speed rail, bus, plane, metro and light rail services from the Rhôneexpress stops.

## Objectives

- > Identify a flexible and inventive public-private partnership to deliver the project.
- > Create a fast, attractive and efficient transfer solution with the tram-train.
- > Deliver Transdev's mobility expertise in the conception, construction and operation of the project.

> Tram-train vehicles have been especially designed with the airport traveler in mind, including comfortable seating, electricity outlets for chargers and laptop computers, extra baggage space and overhead racks and tables.

> Tickets can be purchased on-board, at self-service kiosks at stations, on-line or through a multitude of partners.

> A range of services is offered on board trains, including taxi reservations, digital media, magazines, new literature, events and the Lyons City Card.

### Committed to customer care

> Rhôneexpress is permanently staffed on-board with a customer care and sales agent to provide additional information and orientation.

> Employees are trained in Transdev's international customer care program, and our customer feedback and complaints management system, "Listen," has been applied across the operation to improve the reactivity and level of customer care to passengers.

**Result:** One million passengers in first 11 months of operation, ahead of predictions.

### Real time passenger information

Information screens on board give passengers up to the minute details on departures/arrivals for high-speed train links and airlines, as well as infotainment such as news and weather.

A SMS alert system allows customers to be notified in real time of any traffic problems and disruptions.

## RESULTS

- > 95% satisfaction rate
- > 49% of passengers combine public transportation use with the tram-train service
- > 45% business travelers

# Nantes – FRANCE

TAN – A showcase  
of sustainable mobility



## CONTRACT FACTS

**TRANSIT AUTHORITY**  
Communauté Urbaine  
Nantes Métropole

**OPERATOR**  
SEMITAN  
a mixed equity company

**CONTRACT DURATION**  
7 years

**CONTRACT START**  
2010 (renewal)

**ACTIVITIES**  
BRT – BusWay®  
Tram  
Ferry

## KEY FIGURES

**580,000 inhabitants served**  
523 km<sup>2</sup>

**SYSTEM**  
3 lines of tram  
42 km of track  
82 stations  
39 Park & Rides,  
5,800 spaces

**RIDERSHIP**  
Line 1: 111,400  
Line 2: 82,000  
Line 3: 73,000

**KILOMETERS TRAVELED**  
5.5 million km in 2011

**VEHICLES**  
91 vehicles:  
46 Alstom,  
33 Bombardier  
and 12 CAF (line 1)

**STAFF (tramway & bus)**  
1,740 employees

## Context

Nantes is a beacon of public transportation development. Located in the Western part of France, it was the first city to reintroduce the tramway in France in 1985. Since then it has been a genuine pioneer facing the numerous challenges to continuously redefine urban mobility. The light rail system now represents over 42 km across three lines upon which a multimodal network with optimal interconnections to bus, BRT, boat and bicycle services are built.

## Transdev's answer

### Long-term vision and partner

Transdev has worked with the Nantes Metropole Community Council for over 25 years, providing expertise and continuous improvements to create an optimized network to meet the mobility needs of the community. Several major extension and infrastructure projects have been successfully completed.

**Result:** All three lines are NF quality certified for their reliability, punctuality and customer service.

### Promoting and creating a mobility culture around light rail

> Intermodality: all transportation modes of the city of Nantes are accessible with a single seamless ticket. To support this, Transdev has developed a range of targeted online services providing customers with access to personalized information.

**Result:** 80,000 annual pass holders and 34,000 subscribers to an online personalized mobility space.

> Engaging companies and their employees to reduce use of private vehicles is a key target. By developing adapted services online, attractively priced local businesses have become an ally in creating mobility change. Our portal dedicated to companies, "Espace Pro," allows companies to manage the payment and distribution of annual passes as well as personalized mobility information for visitors.

**Result:** 350 businesses subscribed to an "employee mobility plan."

> Removing congestion from the city center: complementing the development of light rail, Park & Ride services have been an important solution to remove congestion from the city center. In 2008, 42 Park & Ride stations, totaling 6,500 spaces (+ 64% since 2002) were implemented and integrated into the transportation network – ideally located along major arteries and ring-road exits in direct connection with all three lines of the tramway network.

**Result:** Ridership of 80% and 10-15% use increase annually.

## Objectives

- > Make public transportation an attractive and integrated service incorporating new lines and infrastructure and creating synergies with all possible modes and partners.
- > Aim for a 50-50 share between individual vehicles and collective transportation.
- > Reduce the environmental footprint of transportation services.

## RESULTS

- > 12% decrease in automobile traffic 2000-2008
- > 195 journeys per inhabitant a year, the second highest in France and a 30% increase since 2000
- > Civitas\* Awards:
  - "European Green Capital" of the year - 2013
  - "Cit'Ergie" for the extensive integration of mobility services - 2010
  - "City of the Year" for sustainable mobility - 2009

\*CIVITAS: the European Union initiative to promote cleaner, better, more sustainable and energy efficient urban transport strategies in European cities

# Tenerife – SPAIN

## Light Rail System

A unique project and environment



### CONTRACT FACTS

#### TRANSIT AUTHORITY

Cabildo Insular de Tenerife

#### OPERATOR

Metropolitano de Tenerife

#### CONSORTIUM

80% Cabildo  
8.5% Transdev  
6% CajaCanarias  
4% Sacyr  
1.5% Ineco

#### CONTRACT START

March 2003

### KEY FIGURES

#### SYSTEM

2 lines  
**Line 1**  
12.5 km, 21 stations  
4 station extension project to Tenerife airport  
**Line 2**  
3.8 km, 6 stations  
3 station extension project (1.7 km)

#### RIDERSHIP

52,000 passengers/day  
14 million trips/year

#### VEHICLES

26 vehicles  
Alstom Citadis 302  
200 passenger capacity  
20-70 km/h

#### STAFF

183 employees including 68 drivers

## Context

Located in the volcanic Canary Islands, the establishment of a light rail system presented a range of challenges:

- > design a network in a very constrained environment: average continuous slope of 5%, narrow streets,
- > tackle a growing population coupled with an ever-increasing number of private cars across the city in order to avoid government expectation of gridlock on the metropolitan area's roads by 2012,
- > create minimum disturbance to the local community.

## Transdev's answer

### Deliver a light rail concept and infrastructure in response to a unique landscape

- > Extensive feasibility study phases and population mapping to ensure the most efficient network.
  - > Plan and design tracks, platforms, vehicles and electrical infrastructure over 5-9% inclines.
  - > Transdev's company, Transdata worked throughout the conception and construction phases to provide an operational management system and IT backbone fit for the highest standards of operational quality.
- Result: 66% of the metropolitan area population of 400,000 lives within 500 m of a station.

### Respect Tenerife's precious environment

- > With an 880kW solar plant, Tenerife's light rail maintenance depot produces up to 1.5MWh of electricity per year, representing 16% of the system's energy requirements.
- > To conserve energy, regenerative brake technology saves 30% more than conventional braking systems.

### Drive modal shift and relieve the city from congestion

- > At peak hour frequency, from 7am to 3pm, trams run every 5 minutes across the double track lines.
  - > All-night Friday and Saturday night service has proved popular.
  - > Real-time passenger information, clear multi-lingual signage and instructions, adapted to assist everyone to take the light rail.
  - > Extensive redesigning of urban space has created new pedestrian areas.
- Result:** Over 10,000 car journeys eliminated from the metropolitan area in the first year of operation.

More than 14,000,000 trips annually.

55% of trips made by light rail were previously made by car or on foot, 78% of our passengers have a personal car.

### A passenger friendly service

- > The light rail is equipped with on-board Wi-Fi Internet for the convenience and comfort of the passengers.
- > Clear audio information traces the stations along the route and is also available on screens.
- > The system is completely accessible for people with reduced mobility.

**Result:** The low floored vehicles and stations are 100% accessible; first Spanish operator to obtain the AENOR certificate of universal accessibility in 2011.

### RESULTS

- > Line 1 transported 50,000 passengers per day during its first days of operation, two years ahead of the original objectives
- > First Spanish operator to obtain the AENOR certificate of universal accessibility in 2011





#### CONTRACT FACTS

**TRANSIT AUTHORITY**  
Railway Procurement Agency (RPA)

**OPERATOR**  
Transdev Ireland

**CONTRACT START**  
2004

**CONTRACT DURATION**  
5+5 years

#### KEY FIGURES

**SYSTEM**  
2 lines  
37 km of track  
54 stops  
6 Park & Rides

**SERVICES**  
783 departures/weekday

**RIDERSHIP**  
80,000 journeys/day  
29.4 million passengers/year

**KILOMETERS TRAVELED**  
3 million km/year

**VEHICLES**  
66 vehicles  
Alstom Citadis

**STAFF**  
300 employees,  
including 170 drivers

## Context

In 1994, within the framework of its urban development plan, the City of Dublin decided to implement – in addition to its existing network – a light rail system, for quick and environmentally friendly transportation with high customer capacity to meet rush-hour demand. To build the light rail system, a dedicated agency, RPA, was set up to manage the project. In 2002, Transdev won the contract to operate the light rail lines and began services in 2004.

## Transdev's answer

### A win-win partnership with the PTA

Transdev supports and works in partnership with RPA, sharing global best-practices and building an open dialogue with Luas stakeholders and employee representative bodies.

### A high level of performance

- > Operations are ISO 9001 and ISO 14001 certified for quality and environmental management. Business Working Responsibly Mark certifies the company's responsible and sustainable practices.
- > The management team is focused on security, driver availability, service disruption management and optimization of timetables and services.
- > Levels of fare evasion are monitored and assessed monthly to identify proactive prevention measures.  
**Result:** Finalist in the Chartered Institute of Logistics and Transport, Passenger Transport Awards.

### A customer care approach

- > Regular "Meet the Managers" initiatives to solicit customer feedback on the platform allow us to listen to passengers' expectations and supplement continued customer satisfaction surveys and feedback.
- > LUAS benefited from Transdev's exclusive programs enabling high service quality: all employees receive Transdev's international customer care training, deployment of "Listen," Transdev's customer feedback and request program.

**Result:** Winner of Irish Institute of Training and Development, Training Award.

### Continued development

Honoring our commitment to provide ongoing improvements, Transdev delivered, in October 2010, a 7.5 km extension to the Green Line. In July 2011, a 4.2 km extension of the Red Line was launched, completed with a new 300 place Park & Ride facility at the Cheeverstown stop. These major extensions were handled with an experience and professionalism that enabled a seamless performance for the customer and operations.

On both occasions communications and marketing campaigns throughout the work and launch created an ongoing dialogue with the public and major events to publicize public transportation benefits.

## Objectives

Transdev has full operational responsibility, with the goal of providing service excellence:

- > manage and measure improvements in availability, on-time performance and passenger satisfaction,
- > provide on-going improvements in fare evasion control: for any fare evasion over 8%, we pay 50% of the total revenue lost to RPA,
- > contribute to improving the image of public transportation in Ireland.

#### RESULTS

- > 85% satisfaction rate, and nine out of ten passengers would recommend LUAS as a transportation option
- > 2012 reliability performance: 99%





## CONTRACT FACTS

**TRANSIT AUTHORITY**  
Syndicat Mixte des Transports en Commun Agglomération Grenobloise (SMTC)

**OPERATOR**  
SEMITAG,  
a mixed equity company

**NETWORK**  
Transport Agglomération Grenobloise (TAG)

## KEY FIGURES

28 districts served  
400,000 inhabitants  
321 km<sup>2</sup>

**SYSTEM**  
4 lines  
29.6 km of track  
63 stations, 125 platforms  
7 Park & Rides  
Extension projects:  
> extension of line B in 2014 (1.6 km)  
> creation of line E in 2014/2015 (11.3 km)

**RIDERSHIP**  
220,000 passengers/day  
(source 2008 SMTC survey)

**KILOMETERS TRAVELED**  
3.9 million km/year

**VEHICLES**  
88 vehicles  
35 Citadis  
(270 passenger capacity)  
54 TFS vehicles  
(170 passenger capacity)

**STAFF (tramway & bus)**  
1,450 employees  
including 870 drivers

## Context

Located at the foot of the Alps, the city and wider region of Grenoble has demonstrated a strong political will to protect the environment. Steps taken include a “Local Climate Plan,” adherence to “Agenda 21” and signature of the UITP Sustainable Development Charter.

Changes in urban sprawl and an aging population have accelerated the development of entirely new and extended light rail lines to provide a high-quality alternative to the individual car and reduce urban congestion.

## Transdev’s answer

### Supporting 10 years of ambitious network growth

Between 2000-2010, major investments led to expansion of the tramway to line B in 2001 and 2006, completion of the 9.6 km line C in 2006 and the most recent 2.6 km line D in 2007.

Transamo, Transdev’s engineering company contributed to the legal, administrative and technical development of lines C and D, including a new bridge combining light rail and car access.

Throughout this development, the Transdev expertise in light rail operations and management ensured a smooth introduction into operational service, communication with passengers and stakeholders as well as a redesign of the bus network around the new lines. Extensive driver training programs and internal education programs complemented their introduction.

**Result:** Today 44% of the agglomeration’s population (172,000 people) and 50% of employment locations (89,400 positions) are within 400 meters of a light rail station.

### Pioneering safety, security & accessibility for all

TAG is the first French tramway network to have been made fully accessible to mobility-impaired passengers. Stations are equipped with:

- > sloped access and tactile flooring for all 125 platforms of the network,
- > direct access to the tramway from the platform,
- > line names, stops, and destinations available in Braille, including on automatic ticketing machines on platforms,

## Objectives

- > Develop and extend the light rail system, including introduction into service of lines “C” and “D” and strengthening of the accompanying bus network.
- > Increase the accessibility of the network.
- > Apply operational expertise and certified management techniques to ensure the highest quality experience for passengers.

- > on-board visual and audio announcements.

**Result:** 100% of platforms and vehicles are accessible to all passengers and the network was recognized with the “Palme d’or” for its efforts in 2009 by Ville, Rail & Transport magazine.

Since October 2004, Transdev put into place a new procedure to support staff when victims of an aggression or of anti-social behavior on board the transport system, combining security services, legal proceedings and psychological support.

**Result:** A study carried out in 2011 to evaluate the perception of safety by the network’s passengers revealed that 96% felt “completely or comfortably safe,” up from 94% in 2007.

### 2013 - 2020: A new ambition

On April 22, 2013, the TCMS renewed its confidence in SEMITAG / Transdev. The new DSP will:

- > Develop a transportation offer to cover 99% of the population;
- > Achieve ridership of 100 million in 2020, compared with 77 million in 2012;
- > Propose a hierarchical network of four major levels: a tramway reinforced with line E and the extension of the B line and bus lines organized by service level: Chrono, Proximo and Flexo;
- > Offer easy daily payment methods (develop remote sales, ATM sales through partnership with local banks, NFC testing, post-travel payment ...);
- > Increase multimodality through the “Maisons de la Mobilité” and multimodal advisors.

## RESULTS

- > The network is certified ISO 9001, 14001 and OHSAS 18001 and all four light rail lines are “NF” certified for their adherence to reliability, punctuality, cleanliness and customer service criteria
- > Modal share for cars has decreased from 53% to 47% to the benefit of public transportation between 2002-2010
- > Strong success of the first Chrono line in 2012: + 5,000 trips/day

# Mulhouse – FRANCE

Soléa – Reducing congestion,  
stimulating growth



## CONTRACT FACTS

**TRANSIT AUTHORITY**  
M2A (Mulhouse Alsace  
Agglomération)  
Région Alsace

**OPERATOR**  
Soléa,  
a mixed equity company

**ACTIVITIES MANAGED**  
Tram-train  
Urban bus and light rail  
network

## KEY FIGURES

**32 towns served**  
**252,000 inhabitants**

**SYSTEM**  
1 tram-train line  
22 km of track  
18 stations

**SERVICES**  
70 round trips a day

**KILOMETERS TRAVELED**  
500,000 km

**VEHICLES**  
12 tram-trains capable of  
up to 100 km/h and  
carrying 230 passengers

**STAFF (tram-train)**  
27 employees  
including 15 drivers

## Context

The Thur Valley is one of the key axes of Southern Alsace, populated with numerous and dispersed villages and towns. Heavily congested, particularly with commuters entering or returning from Mulhouse, 80% of road traffic is local.

Authorities set out ambitions to deploy an efficient and effective transportation solution to link and rejuvenate the communities, businesses and services along the valley while considerably reducing congestion and emissions.

## Transdev's answer

### The first interconnected Tram-Train in France

A range of stakeholders contributed to the success of the project's numerous technical and contractual innovations. In addition to the vision and support of regional and city authorities, Transdev teams worked closely with partners such as the state rail operator and infrastructure companies, SNCF and RFF, energy company EDF and the technical experts of our upstream consulting and engineering firm, Transamo.

- > Already responsible for the technical development and operational success of the urban light rail system, Transamo worked to define the design, operational procedures and integration of urban and national rail infrastructure.
- > Soléa training and driving staff collaborated with SNCF counterparts to ensure drivers became expert in both heavy and urban rail procedures and shared operational supervision for the service from two control centers.
- > Partnership with EDF in the "Equilibre" energy program across the entire tram and tram-train network to provide energy produced from entirely renewable sources.

**Result:** A smooth and successful launch and a punctuality rate of nearly 95% on average from February to May 2011.

### Developing mobility

The tram-train efficiently uses only four additional kilometers of track, yet manages to connect to a range of communities, including 6,500 secondary school pupils at one end in Thann, 6,000 university students and nearly 700 shops at the other end downtown. Connections include:

- > 600 new parking spaces and secured facilities for 250 bicycles,
- > 11 of the 18 stops connect directly to the light rail network,
- > launch of a third tram line and reorganization of three bus lines to strengthen transfers to the urban network,
- > connections to regional, national and high-speed rail network.

### Attractive and integrated ticketing

A unique system has been designed to allow all tram-train passengers to complete their journey on the urban network with the same ticket. Available from automatic vending machines, Soléa agencies and across a sales network, users can choose from a single one-way ticket to a monthly pass.

## Objectives

- > Deliver an integrated and rapid new transportation corridor with optimized intermodal connections linking residential, commercial and areas of natural beauty.
- > Optimize use of pre-existing rail networks to reduce costs and introduce new synergies in pricing, operation and energy.
- > Reduce congestion and improve environmental performance.

## RESULTS

- > An estimated 5,200 tons of CO<sub>2</sub> avoided every year
- > A 25% reduction in commuting time for students leaving Thann for the University downtown and 12,000 passengers a day during the week



# Rouen – FRANCE

TCAR – A pioneer in light rail construction and management



## CONTRACT FACTS

**TRANSIT AUTHORITY**  
Communauté d'agglomérations Rouen Elbeuf Austreberthe (CREA)

**OPERATOR**  
TCAR  
subsidiary of Transdev

**CONTRACT (concession)**  
Financing and construction of the light rail  
Management of the TCAR system (light rail, BRT, bus)  
Cost risk  
Traffic risks

**CONTRACT START**  
1994

**CONTRACT DURATION**  
30 years + 1

**KEY FIGURES**  
44 communities served  
413,000 inhabitants  
523 km<sup>2</sup>

**SYSTEM**  
2 lines with  
1 shared trunk line  
18.3 km with 3.2 km of shared trunk line (with 1.7 km of tunnel and 31 stations (including 5 underground)

**SERVICE**  
From 4:40 a.m. to 11:10 p.m.

**AVERAGE FREQUENCY**  
3 minutes at rush hour,  
4 minutes at peak hours on the shared trunk line

**RIDERSHIP**  
64,000 passengers / day  
15.1 million trips in 2012

**DISTANCE**  
1.46 million km in 2012

**VEHICLES**  
Alstom Citadis 402 tram cars  
279 passengers each

**EMPLOYEES (bus & tram)**  
1,149 employees, including 680 drivers

## Context

By the late 80s, the system was saturated and the city needed to create an efficient mode of transportation to better serve Rouen's left bank and downtown area. In 1990, the Greater Rouen community launched a concession tender to build and finance a "metro-style" light rail system and operate its integrated network. It was awarded to the concession holder SOMETRAR, which outsourced its operation to TCAR, the network's historical operator.

## Transdev's answer

### A strong commitment over a period of 30 years

Transdev fully owns the concession-holder company and commits to a high level of annual ridership every five years.

### Transdev's expertise in support of a fully integrated and complex system

- > A single control center manages three modes of transportation (light rail, BRT and buses), involving totally different technologies.
- > Introduction in January 2009 of a fleet of 550 bicycles, including flexible rental plans and a selection of electric bikes. TCAR also provides maintenance, cycle safety initiatives, staff training and events.
- > With more than two kilometers of underground routes, Transdev offers professionalism and a high level of technical expertise: all new drivers receive three weeks of training.

### Continuous improvement of service

Transdev is proactive about improving customers' experience:

- > Improving passenger capacity and layout on board, by studying new vehicle design.
- > Optimized connections: a partnership with the French national railway operator is on the way to improving the connections between light rail systems and regional trains.
- > Simplified and easy-to-understand fare structure.
- > Cutting edge passenger website featuring personalized space for renewing subscriptions, access to loyalty programs.
- > Contactless integrated ticketing system.
- > In 2012, the increase of light rail capacity with the 27 new Citadis 402 in place of 28 TFS vehicles (the capacity per day increased from 60,000 to 100,000).

### Stay tuned

In 2010, TCAR launched a set of new functions to its website: e-boutique, real-time trip planner, dynamic mapping.

In 2012 : 16,500 purchases have been made online and 500,000 alerts have been sent to passengers by email and 600,000 by SMS according to their choice.

## Objectives

- > Manage the light rail system in integration with other transportation services such as BRT, buses, taxi lines and services for customers with special needs through optimized connections, management of disruptions and passenger information.
- > Maintain the light rail system and its stations.
- > Advise the Transit Authority about the replacement of rolling stock and major infrastructure maintenance.

## RESULTS

- > From 2003 to 2012, public transportation ridership increased 22%
- > Light rail drivers received a score of 8/10 for their driving skills and their ability to handle unexpected situations
- > More than 3.5 million visitors for [www.crea-astuce.fr](http://www.crea-astuce.fr)



# Hong Kong – CHINA

## Hong Kong Tramways

A rejuvenated mobility icon



### CONTRACT FACTS

**TRANSIT AUTHORITY**  
Hong Kong SAR /  
Transport Department

**OPERATOR/OWNER**  
Hong Kong Tramways  
Ltd, a member of  
Transdev RATP Asia

### KEY FIGURES

**HONG KONG**  
Population 7 million  
Density of 6,350  
inhabitants/km<sup>2</sup>

**SYSTEM**  
1 line, 16km  
6 terminal stations  
6 routes

**COVERAGE**  
6.1 million km/year

**RIDERSHIP**  
215,000 trips/day  
75 million trips/year

**VEHICLES**  
163 double-decker  
trams,  
including 2 antique  
'heritage' trams

**STAFF**  
650 employees  
including 340 drivers

### Context

The only double-decker light rail system in operation in the world, Hong Kong Tramways is a veritable icon of mobility since its inception in 1904. Over 100 years later, the system retains a special place in a city able to boast an outstanding transportation infrastructure. Since assuming operational management in April 2009, the focus has been on addressing much needed operational and technical improvements, customer services and reviving the aging rolling stock.

### Transdev's answer

#### An in-depth diagnosis

An extensive and well publicized satisfaction survey, community stakeholder meetings and the latest in origin/destination analysis were just some of the techniques used. In collaboration with those who ride, live and work alongside the system, a shared "wish list" of improvements has provided the backbone of the company's strategy.

#### A proactive and demand-driven organization, inside & out

- > Scheduling and analysis tools: tram schedules were quickly improved to reflect passenger needs rather than internal supply and constraints.
- > A revitalized management structure focused on achieving improved technical and customer care performance.

#### Technical know-how to boost performance

- > Across the fleet, new AC traction motors have not only improved reliability and efficiency, they also have reduced electricity consumption through their regenerative braking system and reduced stopping distances.
- > Frequent, noisy rail replacement work generated additional traffic and disturbed residents and businesses. New maintenance methods and welding techniques have prolonged rail service life and reduced maintenance and operating noise.
- > All trams were fitted with a real-time positioning and monitoring systems alongside 600 electronic RFID

### Objectives

- > Improve understanding and fulfillment of passenger and community expectations
- > Enhance frequency, comfort and security of the tramway
- > Deliver an ambitious program of technical and operational improvements
- > Harness technical and organizational developments to ensure an improved customer experience, notably through real-time passenger information

tags situated along the route – enabling proactive traffic regulation, management of delays and improved communications with drivers and on-board staff.

#### A tramway transformed!

A major investment and renovation project has significantly improved passenger comfort and public perception of the tram while completely respecting the historic design.

- > The light-weight aluminum body improves the trams' aesthetic appeal, reduces wood consumption and maintenance costs and makes the trams lighter, thus also saving energy.
- > Spacious new seating design, complemented by new full-size doors and windows
- > New CCTV cameras and screens to improve safety, particularly at boarding, and fully equipped driver's cabins.
- > New lighting, audio, static & dynamic passenger information displays.

#### Inventing the NexTram

Developed by Hong Kong Tramways, this innovative tool was the first of its kind in the city. NexTram information includes:

- > next three trams approaching any of the 118 stops;
- > possible delays and disruptions automatically and in real-time;
- > customer service information and announcements.

### RESULTS

- > 94% satisfaction rate – of which 55% are very satisfied
- > +33% in revenue from advertising since 2009
- > Ongoing renovation of 12-15 tramways a year