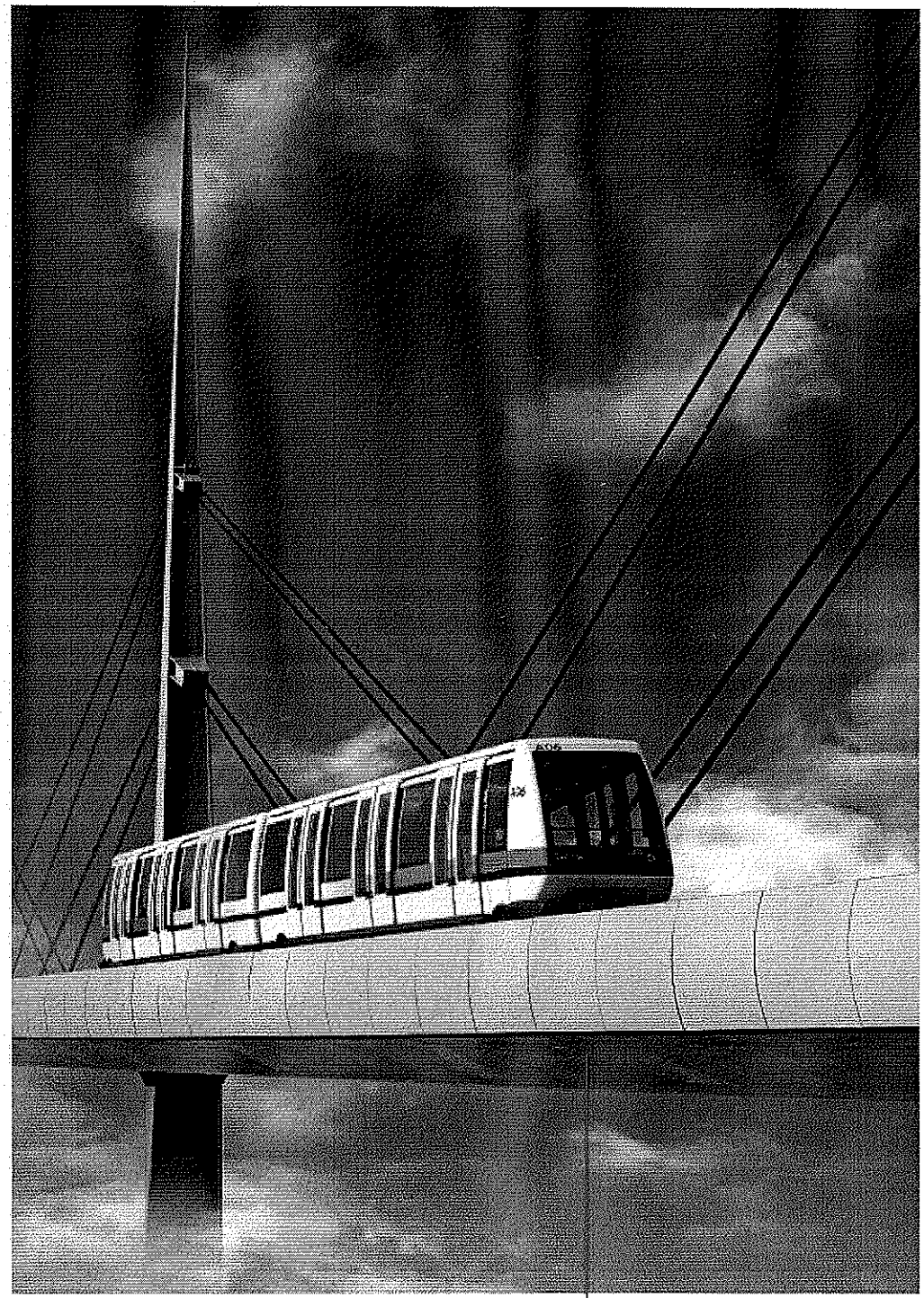


3129

The VAL

The most successful fully automated metro system

Conceived, designed and developed by Siemens Transportation Systems, the VAL (Véhicule Automatique Léger) is the first fully automated light metro, without driver or attendant on board the vehicle. Since its introduction during the eighties, the VAL system has regularly benefited from the latest technology, constantly improving its capacity, reliability and safety. Today, a fully proven new generation of VAL (VAL 208 and VAL 258) brings to the cities and the airports the appropriate solution to resolve their transportation needs.

Inaugurated in Lille (North of France) in 1983, the VAL is also in operation in the cities of Taipei (Taiwan), Toulouse (France), Rennes (France) and soon in Turin (Italy). The VAL system is as well suitable for airport people mover: applications in Paris-Orly and Chicago-O'Hare and soon in Paris-Charles de Gaulle.

The VAL

by Siemens Transportation Systems

Siemens Transportation Systems
50 rue Barbès - BP 531
92542 Montrouge cedex
France
tel.: + 33 1 49 65 70 00
fax: + 33 1 49 65 70 93
www.siemens-ts.fr

Printed in France - April 2002 - Trends productions

SIEMENS

efficient rail solutions

The VAL

VAL, the new generation of fully automated metro

The VAL system, the first fully automated line haul transit system, without any driver or attendant on board the vehicles, was inaugurated in the City of Lille – France in 1983. Since then, full automation has become a daily reality that matches the challenges of the modern world.

The VAL system was selected and put into operation by several cities (ranging in size from 300,000 to more than 2 million inhabitants) and major airports around the world. In each case, the service is tailored to the specific needs of each city. VAL, with a capacity up to 30,000 passengers per hour per direction, is more attractive than any other conventional system with equivalent traffic capacity.

The new modern VAL system takes full advantage of the latest fully proven technology, enhancing further more its unique and unequalled features with regards to safety, quality of service and flexibility of operation. In order to minimize life cycle costs, its design benefited from a continuous feedback from the operators and STS operation and service activities during nearly two decades of operation.

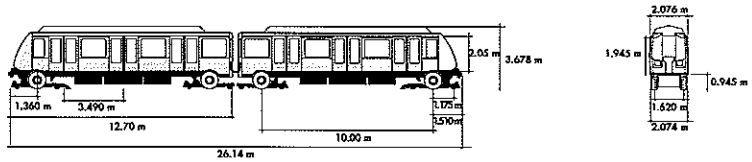
The new VAL features:

> New rubber tired vehicles developed for better performance in terms of power to weight ratio and better comfort, attractiveness, reliability and maintainability. Two vehicle widths, based on the same subassembly design, are available and selected based on the specific site requirements.

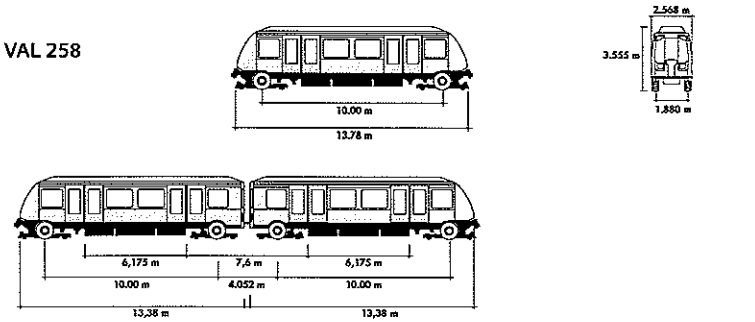
> A new on-board control unit, featuring an open architecture, using standard computer industry components, to be tailored to each operator's specific requirements with regards to multi-media and maintenance options.

> A new Operation Control Center design, using standard off-the-shelf hardware and software, benefiting from worldwide support. Open architecture is provided for easy Operator's access and customization to meet his own needs and requirements.

VAL 208



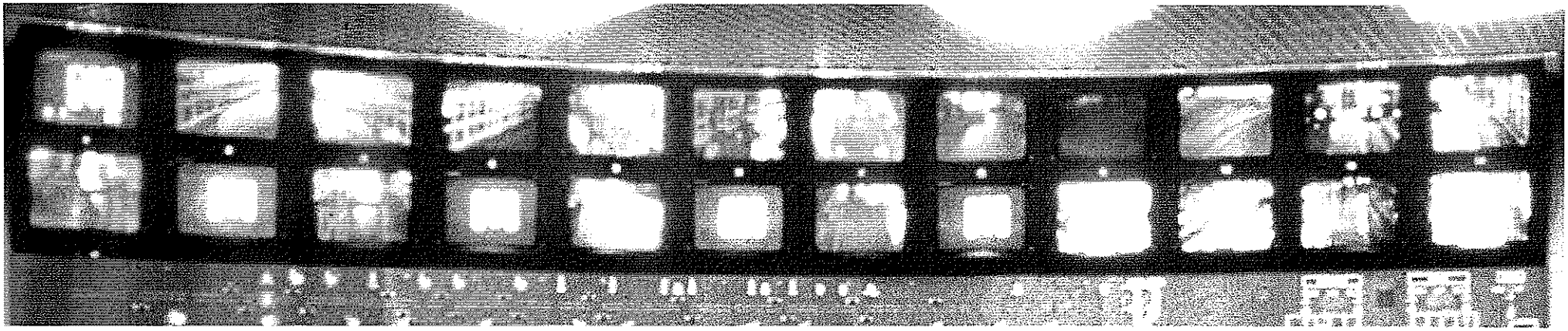
VAL 258



Characteristics:

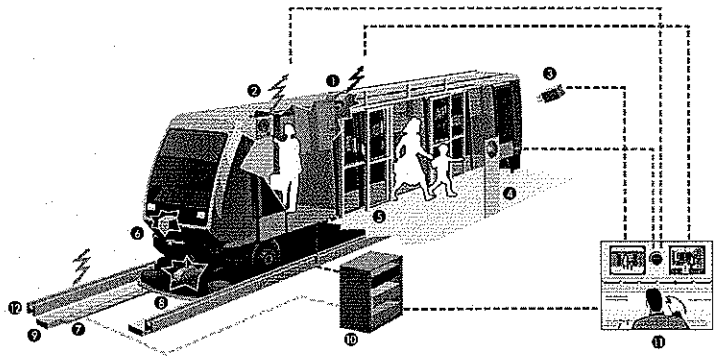
	VAL 208	***VAL 258***
Base config.:	*Married pair*	*Single car*
Weight with A/C:	*31.2 tons*	*19 tons*
Useful interior area:	*45 m²*	*25 m²*
Nbr seats (mini):	*11*	*8*
Nbr doors / side:	*6*	*2*

Train configuration: *1 to 6 cars*
Power supply: 750 VDC
Propulsion: 4 motors/car, 65 Kw each
Options: *Air conditioning*
On-board video surveillance
Dynamic display
Variable seating configuration



The VAL operation

The VAL system requires no drivers or attendants on board the vehicles or in the stations. From the control center, only a few operators supervise the whole system as well as the movement of the trains and of the passengers. They control the system start up and shutdown and respond to any unscheduled events such as failures or emergencies.



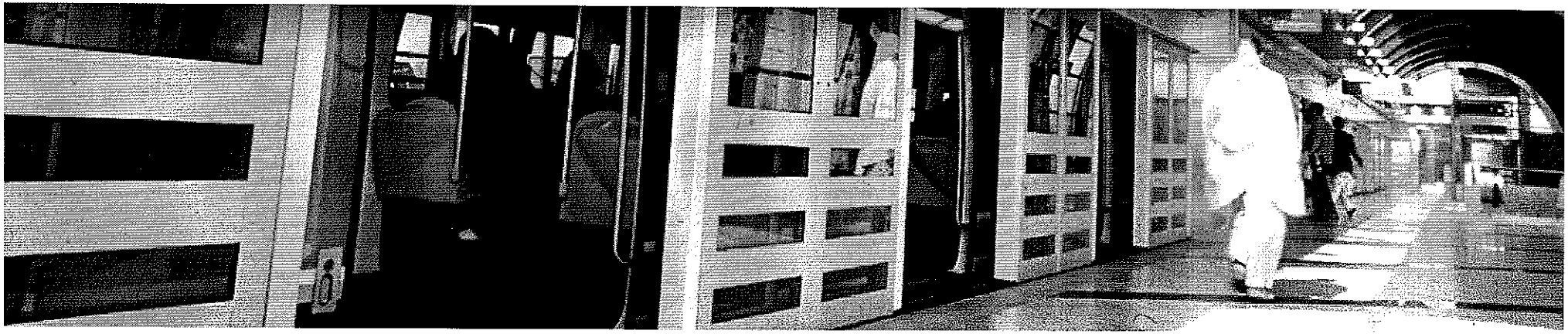
❶ On board video monitoring
❷ On board intercom
❸ Station video monitoring
❹ Station intercom
❺ Platform doors
❻ On board control unit
❼ Transmission line assembly
❽ Wayside vehicle communication
❾ Track running rails
❿ Wayside control unit
⓫ Operation control center
⓬ Guidance/power rails

Each operator has a console which, in addition to continuous communication capabilities with the passengers on board the trains and in the stations, provides all remote control capabilities for train operation, station status and power supply management, failure management.

Beyond the normal operating mode for maximum service conditions, the system allows for the implementation of alternate modes ensuring a reduced service, whenever required.
Depending on the requirements, the operational modes may include pinched loop, bi-directional capability, shuttle mode and single track operation.
Unlike other systems, the VAL features some automatic recovery strategies which do not require the intervention of central control or operators.

Easy capability to cope in real time with the traffic demand is offered by the automatic insertion-removal of vehicles on the line, either according to a pre-defined time table, or by a simple control by the operator at the Control Center.
If exceptionally, a train is stranded on the line, it can be automatically pushed by the following train, without the need for human intervention, for easy alighting the passengers at the next station.
An emergency evacuation handle is provided at each door of the car.
When this handle is pulled, it transmits immediately an alarm to the Control Center. Whenever possible, the train continues to the next station, where passenger evacuation and the inspection by the operating personnel are more convenient. Otherwise, the traction voltage is automatically shut-down, all the trains located on the section of the line are stopped, and the vehicle door located near the emergency handle can be opened.

At Chicago O'Hare airport, since its opening in the early 90's, the VAL has been operating around the clock, 24 hours a day, all year long on an elevated guideway contending with most severe weather conditions (123 days per year of subfreezing temperatures, 23 inches of snow fall and daily January average temperatures of 19° F).



The VAL solution,

A modern metro for the City

An automated people mover for Airports

An optimized solution for return on investment

Reduced initial investment costs

For a given traffic capacity, VAL's increased train frequency (with train headway down to one minute) allows shorter train length.

VAL achieves the same capacity as other systems but with shorter train lengths. This is a determining factor for reducing the costs of the infrastructure, the length and the design of the stations, the size of the tunnels and guideways, contributing also to the reduction of time and nuisance during construction. This considerably facilitates implementation in crowded cities where smaller viaducts and tunnels can be used.

Increased revenues

On a segregated right of way , with powerful vehicle propulsion and rubber tire adhesion, VAL provides high commercial speed (nearly twice as much as LRT's) and punctuality, thus offering short travel time and high traffic capacity.

Easy connection with other modes of transport is provided by the frequent trains, avoiding dissuasive waiting times at transfer stations, even during off-peak hours. This greatly enhances the attractiveness of the system.

Minimising the Operating costs

At any time, trains can be automatically inserted into or removed from revenue service by simple, remote commands from central control operators. This translates into unprecedented flexibility for metro operation

The fleet and headway can be adjusted to the optimal transport capacity to match the demand in real time. This, of course, yields a transportation efficiency, since only a minimum of empty places is transported, and is a significant measure of the operator's profitability.

Enhancing the Operator's image

Compared to a conventional system, drivers or on board attendants are not required for VAL operation, and personnel may be reassigned to roving services without additional expenses. Staff is redeployed for providing assistance to passengers, information, first maintenance (tracks, stations, trains,...), security services (in connection with local police services), fraud reduction, etc, for improving the quality of service offered.

A friendly system without drivers or attendants on-board the vehicles

Safety, the first priority

Full automation precludes the risk of human error or misbehavior, a frequent cause of accidents that still occurs in rail transit today.

Segregated right of way prevents collisions with road vehicles or pedestrians. This greatly enhances the system availability.

Platform doors prevent falls on the track, a frequent cause of accident and delays on systems not equipped with platform doors.

The automatic leveling of the vehicle floor to the station platform level allows safe access for the elderly or disabled passengers.

Unique built-in safety features (such as station door operation or emergency evacuation) have been designed into the VAL system for the protection of the passengers.

A comprehensive, highly reliable communications system

Through telephones, intercoms, public address, cameras in the stations and in the trains, quick analysis of any situation as well as exchange of information, initiated by passengers or operating personnel, are managed by Central Control Operators.

This greatly enhances the feeling of security of the passenger, especially during off-peak hours, when the trains are less crowded.

As well it is a tool to record and follow up any incident.

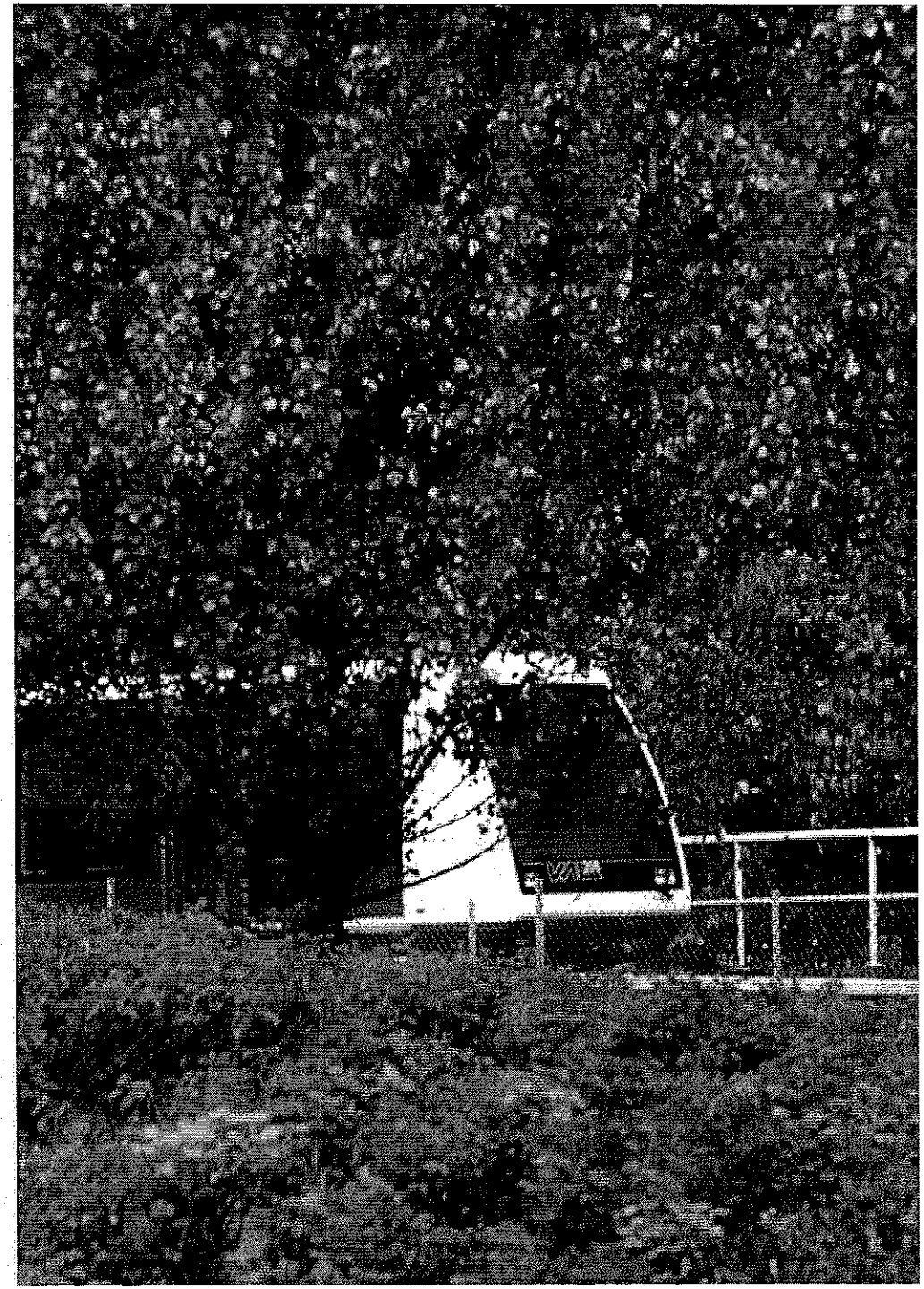
In addition, the built-in safety features of the system are not impaired in the case of loss of communication with the Control Center

The protection of the environment

The electrical propulsion system of the VAL vehicles does not contribute pollution to the environment, the vehicles are designed with regenerative braking for reduced energy consumption.

The VAL vehicles run on rubber-tired wheels for substantial noise reduction when compared to conventional steel wheel on steel rail vehicles.

On a segregated right of way, the VAL system is independent of road traffic.



Siemens Transportation Systems

Competence center for mass transit automated systems

A subsidiary of Siemens France and functionally affiliated to the Transportation Systems Group (TS) of Siemens AG, the S.A.S Siemens Transportation Systems (STS) is a Siemens competence center for mass transit automated systems.

World leader in manless metros, in automatic train control systems and in the automation of conventional metro lines, STS is also in charge of marketing all Siemens TS' products and railway services on the French market.

The solutions proposed by STS include:

> *Manless metros: VAL (in Lille, Taipei, Toulouse, Rennes and soon in Turin), VAL for airports (in Paris-Orly, Chicago-O'Hare and soon in Paris-Charles de Gaulle), MAGGALY (in Lyons), "Météor" (line 14 of the Paris metro);*

> *Automatic train control systems (PA 135 control unit, SACEM, CBTC) already installed in more than twenty urban metro networks worldwide (Mexico City, Prague, Paris, Lyons, Budapest, Caracas, San Juan, Hong-Kong,etc.) and soon in New York.*

> *Civis, developed jointly with Irisbus, this new urban transit mode, half bus half tramway, features an optical guidance system.*

Thanks to STS, more than 1,600 metro trains throughout the world transport every day 13 million passengers under the best conditions of comfort and safety.

Further information on STS can be found at: www.siemens-ts.fr

Further information on TS can be found at: www.siemens.com/ts