Globally unique transportation concept: "Complete mobility" from Siemens
Siemens presents rapid transit systems at the UITP Transport Exhibition 2009 in Vienna

"Public Transport – Making the right Mobility Choices" is this year's slogan for the international UITP trade fair for rapid transit in Vienna organized by the UITP (Union Internationale des Transports Publics), the International Association of Public Transport. For the first time, the Siemens Mobility Division will be presenting solutions not only for rail transportation but also for road traffic. Driven by urbanization and demographic change, the demand for such solutions is growing worldwide. The United Nations, for example, is expecting that two thirds of the world population will be living in cities in the year 2030. These conurbations need efficient traffic and transportation systems in order to retain and improve their competitiveness and quality of life. With its globally unique concept "Complete mobility", Siemens is able to network different transportation systems with each other so that people and goods can be conveyed to their destination quickly, safely and with minimal harm to the environment.

Siemens will be presenting new solutions and products from June 7 to 11, 2009, at the UITP Mobility and City Transport Exhibition in Vienna. For Siemens Mobility, Vienna is not just an exhibition location; many products from the Mobility Division are in daily use in Austria's capital, which is also an important production location. Most trams, metro vehicles and suburban rapid transit systems come from the Vienna factory in Simmering and the systems for managing and controlling road traffic in the city are also, to a significant extent, from Siemens as well. "Vienna is a Siemens Mobility City", said Hans-Joerg Grundmann, CEO of the Division. "Here, an efficient transportation concept is being concretely applied that can be a model for cities and conurbations all over the world. After all, the need for modern mobility solutions is growing – not only in Vienna but everywhere on the globe. The annual growth in the rapid transit market will be over three percent by 2016. For us, as one of the world's leading suppliers of integrated transport and logistics solutions, the prospects are very good."
Siemens is the only company in the world to have a holistic transportation concept as well as the products and competence needed to put it into practice: from operations control systems for rail and road to traction supply and rolling stock for urban, regional and long-distance transportation, not to mention turnkey systems, airport logistics, and postal automation. All this is a demonstration of what makes Siemens Mobility unique, in that no other competitor has such an extensive portfolio for such a wide range of sectors.

**Siemens presents the longest low-floor tram in the world**
The Siemens Mobility Division has presented its Avenio tram concept. With a length of up to 73 meters, the new model will be the longest 100 percent low-floor tram in the world. The Avenio is a further development of the Combinos such as those manufactured for Budapest and Almada. A lightweight steel car body structure, a new welding technique and fewer installed parts than in the preceding models lower both the weight and manufacturing costs of each individual vehicle. Lateral stability elements reduce the track forces that act on the vehicle during movement through curves and thus increase passenger comfort and well-being. The interior layout has also been improved in order to create more seats. The Avenio will not only be the longest low-floor tram in the world but also the quietest. For the Combino in Budapest, noise emissions have already been reduced by 15 decibels compared to preceding vehicles operating on this line. The Avenio will foreseeably be built for the first time as an eight-unit vehicle for Tel Aviv.

**Syntegra powered bogie reduces environmental pollution and saves costs at the same time**
The new Syntegra powered bogie has been in use in passenger service in Munich’s metro network – operated by the Munich Municipal Authorities (Muenchner Verkehrsgesellschaft) – since August 2008 and, so far, has experienced no problems whatsoever. The Syntegra weighs up to two metric tons less than its predecessors, which means that vehicles fitted with the new bogie need around 20 percent less energy than conventional vehicles. The new system combines traction unit, running gear and brakes in a single item of equipment that is the only one of its kind in the world. Not long ago, it was nominated as a contender for the Austrian national "Innovation 2008" prize as well as receiving several other awards.

In the metro in Munich, Siemens has also been testing a completely new cooling system for the Syntegra recently. The principle of the so-called 'passive head-wind cooling' concept is that the surface of the engine, which is still completely encapsulated, is cooled solely by the head wind. All components of the previously employed water cooling system are dispensed with. This makes the new cooling equipment completely maintenance-free.
Moreover, the weight and necessary mounting space of the Syntegra traction system are reduced even more. As soon as the scheduled series of tests has been completed, the new generation of traction systems will be used in passenger service.

**Energy storage system enables environment-friendly tram operations without OCL**

Siemens is in the process of launching the new Sitras HES hybrid energy storage system on the market. It consists of a Sitras MES mobile energy storage unit and a traction battery. “Trams with hybrid energy storage systems can operate without an overhead contact line (OCL) over distances of up to 2,500 meters. They not only preserve historical buildings and enhance the appearance of the urban landscape, they are especially environment-friendly and save energy,” said Michael Meinert, development manager responsible for the new system at Siemens Mobility. Vehicles equipped with energy storage systems consume up to 30 percent less energy per year and produce up to 80 metric tons less CO$_2$ emission than vehicles without energy storage systems. Thanks to a new connection concept, Sitras HES and Sitras MES can be retrofitted in existing vehicles without any difficulty; the tramway infrastructure remains completely unaffected. In Portugal, the hybrid energy storage system has been successfully used in passenger services since November 2008. It has also been certified according to BoStrab (German Construction and Operating Code for Tramways) for use in the public transport.

**Contactless monitoring system for the detection of wire cracks along railway lines**

The new contactless measuring and monitoring system Sicat CMS detects wire cracks and duly notifies the operator by cable or radio. With this information the rail operator can pinpoint the location of damage swiftly and accurately, focus his rectification work more deliberately and reopen the railway line much sooner, the availability and safety will be increased. Such monitoring is particularly useful at critical points on the line such as grade crossings, bridges, tunnels and station platforms. Another contactless monitoring system aids to reduce the service costs of the operators. Due to the innovative RFID monitoring of voltage limiters at the track and the automatic transmission of the status information to the central control room, the previously routine check is no longer necessary.

**Adaptive signal control improves traffic flow for car drivers by 30 percent on average**

One of Siemens Mobility’s central themes at the UITP exhibition in Vienna will be solutions for road traffic. Representative of these solutions will be the “green wave for Muenster”, where road users benefit from a succession of green lights more frequently thanks to the Sitraffic Motion adaptive network control system. Since the middle of last year, the new procedure analyzes the current traffic situation on a main artery and then automatically optimizes the red-green phases of the
traffic signals at the 24 intersections on this road. The result is an average 30 percent reduction of driver waiting times at traffic lights. This figure was corroborated by a study done by Ruhr-Universität Bochum and published at the beginning of 2009. Fuel consumption and exhaust emissions are reduced as well. These results certainly convinced the people of Muenster, for the city council has decided to link up a second main traffic artery to the Sitraffic Motion system in the near future.

**Slovakia employing new toll system for trucks**

Recently, Siemens has been awarded a contract by SkyToll, a consortium of the companies Sanef and Ibertax, for supplying the relevant technology of a new toll system in Slovakia. For Siemens, the total order volume amounts to 81 million euros. The equipment includes the on-board units for the vehicles in addition to the electronic detection system. A contract for the installation and operation of a satellite-based toll system had previously been awarded to SkyToll by the Slovakian road traffic authority NDS (Národná diaľnicná spoločnosť’ a.s.). Trucks and buses weighing 3.5 metric tons or more will be detected. The road network to be monitored has a total length of 2,400 kilometers. In contrast to conventional microwave systems, satellite-monitored toll concepts are characterized by the fact that the position of the vehicles is directly detected by satellite via the on-board units and this information is passed on via mobile radio to the control center for further processing. This technology is therefore especially suitable when a toll is to be imposed on an extensive road network and not just on highways.

**Hybrid buses provide environment-friendly urban transport**

The Siemens Industry Automation Division will be showing its electric drive system for environment-friendly hybrid buses. In vehicles with the Elfa hybrid system, different energy sources such as combustion engines and electric motors are combined and backed up by energy storage units in the form of batteries or capacitors. When the bus is driving in the upper speed range, the combustion engine is used whereas, when the bus starts to move, the energy storage unit supplies power to the electric motor. The energy storage unit is charged when the bus brakes. In contrast to normal buses, the braking energy is not lost but is converted into energy by the electric drive motors. Special high-performance capacitors that can quickly absorb and output the electrical energy again are used for storage purposes. Due to this method of energy recovery and an energy management system, fuel consumption and emissions can be lowered by up to 30 percent. City bus operation involves frequent braking and acceleration, for example at stops or traffic lights. The system is therefore especially suited to them. From the modular system that is offered, bus manufacturers can select the desired combination of electrical components and energy sources such as combustion engine, fuel cell and energy storage unit.
IT solutions improve processes in public city transport

In the booth of the Siemens Mobility Division, Siemens IT Solutions and Services will be presenting the Roman and PTnova railway management system, the new background sales system for transport companies operating in the urban public transport sector.

With the help of the modular "Roman" software, timetables can be drawn up, checked and evaluated. Roman calculates the run times of the timetable routes as well as the use of personnel, powered vehicles and wagons. As a result, these resources can be assigned more quickly, transport inquiries can be accelerated and procedural costs and standstill times can be reduced. Thanks to the optimized planning processes, substantial time and cost savings can be achieved, as well as more flexibility during planning. The system has been developed further in collaboration with a series of railway transportation companies all over the world and has been used successfully for years by numerous railway companies in Europe, Asia and Africa.

PTnova is the only background public-transport sales system in the world that has been directly integrated into the SAP system. This means that all the advantages of SAP (SAP ERP 6.0) are available without a separate interface for accounting. PTnova controls all sales-related business processes such as ticket sales, seasonal passes and customer management, electronic fare management and the pursuit of fare offenders. It also automates the entire flow of data – from sales and invoicing to booking procedures. The software solution is based on SAP Netweaver technology and is therefore especially user-friendly among its numerous other qualities. Users can see the information they need and can also gain access to PTnova via an Internet browser. One special technical feature is the non-proprietary interface. It ensures that all previous systems such as mobile or stationary automatic ticket machines, ticket printers and payment systems can be connected to PTnova without any problems. PTnova was developed in conjunction with Wiener Linien, Muenchner Verkehrsgesellschaft, VAG Nuernberg, Hamburger Hochbahn AG and Rhein-Neckar Verkehrsgesellschaft and tested in a pilot scheme with Wiener Linien.

The Siemens Industry Sector (Erlangen, Germany) is the worldwide leading supplier of production, transportation, building and lighting technologies. With integrated automation technologies as well as comprehensive industry-specific solutions, Siemens increases the productivity, efficiency and flexibility of its customers in the fields of industry and infrastructure. The Sector consists of six Divisions: Building Technologies, Drive Technologies, Industry Automation, Industry Solutions, Mobility and Osram. With around 222,000 employees worldwide Siemens Industry posted a profit of EUR3.86 billion with revenues totalling EUR38 billion in fiscal year 2008 (ended September 30). www.siemens.com/industry
The **Mobility** Division (Erlangen, Germany) is the internationally leading provider of transportation and logistics solutions. With its "Complete mobility" approach, the Division is focused on networking the various modes of transportation in order to ensure the efficient transport of people and goods. “Complete mobility” combines the company's competence in operations control systems for railways and traffic control systems for roadways together with solutions for airport logistics, postal automation, traction power supplies and rolling stock for mass transit, regional and mainline services, turnkey systems as well as forward-looking service concepts. [www.siemens.com/mobility](http://www.siemens.com/mobility)