



InnoTrans 2021 Report

B2B-Magazine for the Railway Industry

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FOCUS ON

MOBILITY+

In focus: Much more than public transport

Individual mobility, even in rural areas and ideally without your own car: Mobility+, as a dedicated section of InnoTrans, shows the possibilities that are already available today.

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Visions of the future
Autonomous transport systems taking passengers through small tunnels sound like science fiction. In Las Vegas where construction is already in progress, they become reality.

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Safe in the underground
The challenges for track work in underground railways are dense train schedules and darkness. Employee protection is reliably possible even without complex technology.

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Reliable cyber security
Where open standards are progressively used, the risk of cyber attacks also increases. But there are ways to protect sensitive infrastructures and data.



InnoTrans starts digital preview for 2021

The wide-ranging InnoTrans Preview offering will be available until the start of the InnoTrans 2021.

Photo: Messe Berlin

Be part of the world's leading trade fair for mobility.

InnoTrans will bring the industry together on a digital platform from 21 September to give you a fore-taste of the highlights of the coming year. The InnoTrans Preview will focus on innovations in the segments Railway Technology, Railway Infrastructure, Public Transport, Interiors and Tunnel Construction. Trade visitors and interested parties can now take part in the digital preview

on the InnoTrans website (<http://www.innotrans.com/preview>).

Virtual Market Place sets the course for a successful InnoTrans 2021

The Virtual Market Place (VMP) at InnoTrans offers a wide range of services for trade visitors. This is where international exhibitors present their

first product highlights a good six months before the start of InnoTrans 2021. With videos and 3D animations they are giving their impulses for the mobility of tomorrow. Virtual tours of trains or factory halls are a further highlight. In addition to the preview of InnoTrans 2021, the digital preview offers an opportunity to maintain a global dialogue between trade visitors and exhibitors. Exhibitors

can exchange information with their InnoTrans community in webinars.

Premiere of the digital convention

The InnoTrans Convention will take place at the same time. This year, for the first time, the successful InnoTrans Dialogue Forums and the International Bus Forum will take place digitally as a livestream. The forums are organised by the German Railway Industry Association (VDB) and the German Transport Forum (DVF).

Interested parties will then have access to all contributions as videos on demand. On 23 September, discussions will focus on the topic "Using investment run-up strategically – to quickly realise a digital and expanded rail network" (DVF). On 24 September, beginning at 11 a.m., experts like Federal Minister of Transport Andreas Scheuer will analyse the "Rail Revolution 4.0: Picking up speed after the crisis" in the Dialogue Forum of the VDB. At 2 p.m. the International Bus Forum will deal with the topic: "Is the future electric? Strategies for e-busses between climate protection and austerity dictates". Among others, the German start-up company Einhorn Flixbus, MAN Truck&Bus SE as well as the State Secretary at the Federal Ministry of Transport and Digital Infrastructure Dr. Tamara Zieschang will participate.

Just click your way in:

Under this link you will find the offers of the digital preview: [Click here](#) for the digital Convention of InnoTrans.

KOMMENTAR

On track to the future



ZHOU XIAOQIN
Executive Vice
President of
CHINA ASSOCIATION
OF METROS (CAMET)

Photo: CAMET

Since China's first subway was put into operation in 1969, China's urban rail system has undergone 50 years of development. As of June 30, 2020, a total of 41 cities in Mainland China have put 6917.62 kilometres of urban rail transit lines into operation; by the first half of 2020, the designed new line length of approved projects was 272.54 kilometres, and the total new investment was about 230.6 billion yuan. In March 2020, the China Association of Metros issued the 'Development Outline of Smart Urban Rail of Urban Rail Transit Systems in China'. China's urban rail transit industry is changing from rapid development to high-quality development. As the top-level design of informatization of urban rail industry and smart urban rail, the 'Outline' aims to achieve the expected goals of overall scientific planning, careful and rational deployment, and orderly progress.

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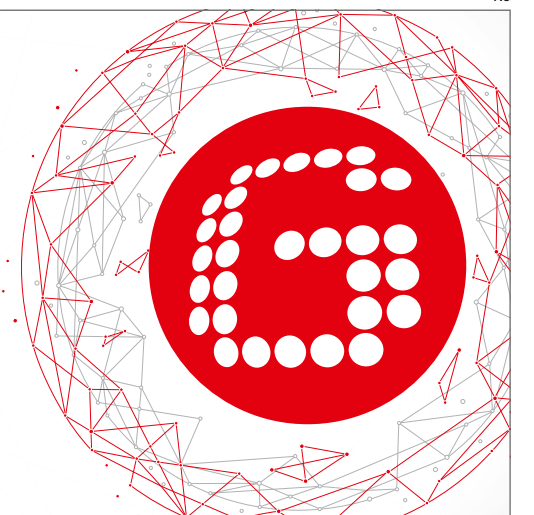


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On track to the future

The 'Outline' puts the safety, convenience and comfort of passengers in first place for innovative development of the urban rail industry, promotes the creation of smart urban rail with technological innovation, and actively promotes the reform of the approval system for urban rail construction planning. It is necessary to achieve innovation in all aspects such as planning and design, investment and financing, project construction, operation management, resource management, project acceptance, and asset management based on the inter-city and cross-level rail transit management mechanism, so as to build a cross-regional rail transit management system.

The 'China Association Of Metros' is a young national first-level industry association with 778 member units. We are willing to carry out more exchanges with urban rail participants from all over the world to promote a healthy and sustainable development of the urban rail transit industry.

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INTERVIEW WITH ...**DR. HEIKE VAN HOORN**

Deutsches Verkehrsforum
(German Transport Forum)

DR. BEN MÖBIUS

Association of the German Railway
Industry



Dr. Heike van Hoorn,
(German Transport Forum)

Photo: DVF

? **InnoTrans Report:**
What lessons can politics and society learn from the Corona crisis for the future of mobility?

Dr. van Hoorn: There is one thing the mobility industry has proven in this unprecedented crisis: You can rely on it! The companies of the transport and logistics sector have ensured the supply of goods to the population, even under the most difficult conditions such as border closures and slumps in demand. In future, it will be important that the cooperation between the Federal States and the Federal Government works better. There have been differences in the way they have handled the exception to the ban on driving on Sundays and public holidays. Also the cooperation within the EU must be improved. Sudden border closures must not be allowed to occur in the same way. I see a positive future for the mobility sector, provided that we manage to set the appropriate framework conditions. In other words this means that we need high levels of investment in infrastructure and digitisation, new technology, propulsion systems and fuels, and a reduction in bureaucracy.

? *Why did you choose the topic "Rail Revolution 4.0: Picking up speed after the crisis"?*

Dr. Möbius: A new mobility, especially by rail, is one of the great, fascinating future tasks of our time. The protection of the climate requires a clean mobility. Now the worldwide economy and society are facing the economic relaunch, another enormous task. The railway industry in Germa-

InnoTrans Convention – between ReStart and mobility revolution

The premiere of the digital InnoTrans Convention will start on 23 September. The two dialogue forums and the International Bus Forum will be available live in stream format or as video on demand on the InnoTrans website. In an interview, the two organisers, Dr. Heike van Hoorn and Dr. Ben Möbius, talk about the opportunities and prospects of mobility.

ny provides innovative solutions for both challenges. With Rail 4.0, we are interlinking previous antagonists, climate protection and growth – that is the essence of the mobility revolution. For most people, equating sustainability with sacrifice in their everyday lives is not exactly the best solution. Rail 4.0 does not mean a sacrifice, but rather a promise. Because, for the first time, more mobility will work with almost zero emissions – and with added value in industry in Germany and Europe. And this will become tangible in everyday life: An intelligent infrastructure, networked trains and alternative propulsion systems will make it possible to substantially improve the quality of travel with more timely circulations and greater personal freedom to make travelling more enjoyable with lower emissions. This is good for the economy, good for the climate and of course good for people. Now, with political backing, we can set the mobility revolution 4.0 in motion. This is exactly what our forum will be about.

? *What is your personal programme highlight at your dialogue forum?*

Dr. Möbius: Well, my highlight is actually the basic philosophy of the forum. It's not about show effects, but about the constructive interaction between politics and mobility experts at both national and European level. In this way, our forum aims at bringing vision and reality a step closer to one another – or at least showing how it could be done. Politicians are increasingly turning to railways for a sustainable economic recovery and effective climate protection strategies – and rightly so. What are the political and railway industry's visions of the future for the transport sector? Unfortunately, transportation is still a climate offender with an emission balance that has been rising since 1990.

But we will not make any progress with grumpy speeches. Instead, we shall move forward with innovations in the railway industry in Germany. Because they contribute to convincing and inspiring offers for people. Our experts will present solutions for challenges and provide an exciting insight into tomorrow's mobility. A preview of the rail of the future, so to speak.

? *How do you perceive the current situation and the perspectives of the mobility industry at a global level?*

Dr. van Hoorn: The situation has improved in Germany and the EU since the outbreak of the pandemic. Nevertheless, the transport sector in particular is suffering from its consequences. Many companies are export-oriented and depend on global demand, such as manufacturers in the automotive or rail sectors or air transport. The global situation is not good yet. The USA in particular are a major problem. In the long term there will be a recovery. Nevertheless, the crisis may cause traffic flows to change permanently. In future we may perhaps not make as many business trips as before the crisis.

Dr. Möbius: There is no doubt that the current situation is altogether serious. The crisis has put a severe damper on the mobility sector. And our industry has been partly affected as well. We are facing difficult times, especially in global exports that are so important for us, now that public investments are being postponed. By contrast, the market in Central Europe is very stable. I am convinced that this will remain a major trend: more and more people want to travel in a particularly climate-friendly way. We must now act cautiously, regain the confidence of passengers and convince them of the benefits of rail with an attractive



Dr. Ben Möbius, (Association of the German Railway Industry)

Photo: VDB

product strategy. The political will to achieve this goal is crucial. We can see that. The railway industry in Germany is an excellent technology partner and is ready for implementation.

? *What are you particularly looking forward to at InnoTrans 2021?*

Dr. van Hoorn: I am looking forward to hopefully again getting in touch with the visitors and exhibitors at the fair. There is no substitute for such contacts. As the DVF, we will also be represented there with two forums and discuss exciting topics.

Dr. Möbius: I personally look forward to the overwhelming range of innovations that our industry has to offer on a global scale - despite the crisis - as well as to the future mobility in all its diversity. And I also look forward to the personal exchange with our colleagues and partners from all over the world. This is what makes InnoTrans, the leading trade fair for our industry, so incomparable, even, or especially, in times like these.

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EU Commission approves Bombardier/Alstom takeover



Draft image of the HS2 project in Great Britain.

Graphic: Bombardier Transportation

On 31 July 2020 the European Commission approved the acquisition of Bombardier Transportation by Alstom. The authorisation is subject to the full implementation of Alstom's commitments.

Given that both companies are among the world leaders in rail transport, the Commission concluded that the transaction, as originally notified, would have raised

competition concerns. Specific problems were identified in the areas of high-speed and long-distance trains based on market leadership and market share respectively. The

Commission also identified the risk of a more difficult access for other suppliers in the field of signalling technology for long-distance railway lines.

Rolling stock and production

Alstom's commitments for the rolling stock sector include the sale of the assets contributed by Bombardier to the Zefiro V300 train platform developed jointly with Hitachi. Alstom has also committed itself to take measures to maintain the offer made by the Bombardier/Hitachi consortium to supply high-speed trains for the HS2 project in the UK. Other commitments include the divestiture of Bombardier's Talent 3 long-distance train platform and Alstom's production facility in Reichshoffen, France, and part of Bombardier's production facilities in Hennigsdorf, Germany.

Signalling technology

As regards signalling, conventional on-board units (OBUs) including the necessary interface information and support services must remain available to competitors. Conventional OBUs must continue to be supplied to the Dutch infrastructure manager ProRail for the benefit of all interested operators. The EU Commission concluded that the transaction would not raise competition concerns on other signalling technology, given Bombardier's low market share in this field. The approval is subject to the full accomplishment of all commitments. The transaction is expected to be completed in spring 2021 and will cost Alstom around €5.8 to 6.2 billion (as of February 2020).

NEWS

Change in the VDB Presidency



Andre Rodenbeck
Photo: VDB e.V.

As of mid-July Andre Rodenbeck has become the new President of the German Railway Industry Association (VDB e.V.). In his main function he is CEO of Siemens Rail Infrastructure at Siemens Mobility GmbH. Andre Rodenbeck has worked for Siemens since 2003 and became CEO Rail Infrastructure in April 2019. As General Manager Mass Transit, Head of Sales for Mainline Signalling, Director Sales and Projects, Business Development and Project Manager, the graduate in economic engineering worked for Siemens Mobility in Spain, Thailand and Germany, among other countries. For personal reasons, the previous chairman of the German Association of the Railway Industry, Michael Fohrer, surprisingly gave up his chairmanship of Bombardier Transportation and at the same time his position at the VDB in mid-July. He had been appointed President of VDB on 29 November 2019 after Volker Schenk had resigned his mandate at the end of his four-year term of office. The German Association of the Railway Industry represents the interests of its more than 200 member companies in the railway industry.

Boring – not tiresome at all

Elon Musk is known to almost everyone in one way or another. The bustling Canadian-US American entrepreneur with visions not only builds electric cars (Tesla), he also sends countless small satellites into space (Starlink) with the aim of making fast internet available all over the world. He also runs SpaceX, a commercially successful space company.

Another of his – albeit somewhat less well-known – enterprises is The Boring Company; boring here means "drilling" (not "dull"). The aim of the company is to build tunnels much faster than before in order to realise Musk's visions for relieving urban traffic. In underground tunnels, also known as loops, Autonomous Electric Vehicles (AEVs) will transport up to 16 people at up to 250 kilometres per hour on modified Tesla Model 3 platforms. The capacity will be up to 4,000 vehicles per tunnel tube per hour. A short test tunnel in Hawthorne, California, was completed at the end of 2018, and a first regular project at the Las Vegas Convention Center (LVCC) is un-

der construction and is intended to transport visitors quickly between the exhibition halls. The Hyperloop project goes one step further: capsules for up to 16 people are to be transported on air cushions through tubes at up to 1,000 kilometres per hour.

Limiting factors

Common to all projects, however, is that driving the tunnels takes (too) long and is very expensive. After Godot and Line-Storm, The Boring Company now has the third generation of tunnel boring machines, called Prufrock, in service. Conventional tunnelling machines can nor-

mally complete around 150 metres a week, depending on the type of ground to be excavated. Even snails travel faster. Despite higher power consumption, modified knives and, above all, a smaller tunnel diameter for the AEV than conventional road or underground tunnels, progress is far too slow for somebody like Elon Musk.

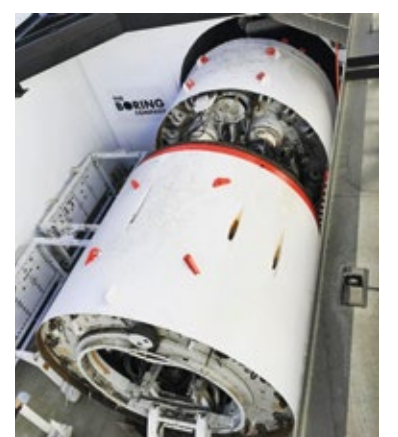
Who beats the snail?

For a competition, The Boring Company has now asked the question: "Can you beat the snail?" Students, companies and hobby engineers from all over the world were called upon to design and build their



Construction site of the LVCC

own solution for the construction of tunnels for the competition to be held in spring 2021. The challenge is to drill a 30 metre long tunnel with a cross-sectional area of 0.2 square metres (corresponding to a circle with a diameter of 0.5 metres). The winners will be chosen in the categories of fastest tunnel completion, fastest tunnel construction including a driving surface (tested with a remote-controlled Tesla model car) and most precise guidance system (how far is the tunnel out of its alignment). No further details have been revealed at the time of going to press.



Godot – the first generation of tunnel boring machines
Photos: The Boring Company

FOCUS ON

PUBLIC TRANSPORT

More than public transport: Mobility+

Designing mobility individually and sustainably – even without your own car, that is Mobility+. Mobility services that complement public transport, such as shared mobility, mobility apps, technologies and offers for the first and last mile, are future-orientated. At InnoTrans 2021, Mobility+ therefore now has its own thematically focused exhibition area.

More efficient processing thanks to digitised ticket controls



Data validation and payment processing from one source

Graphic: Arvato Financial Solutions

Online ticketing, real-time schedule information and self-check-in: digitisation has produced some pragmatic solutions for transport companies.

There are other points of contact along the customer journey in public transport that have a potential for digitisation – especially in ticket

control. In a 2019 Statista survey, 16 percent of the passengers questioned stated that they occasionally used public transport intentionally

without having a valid ticket. And furthermore, there are those who have simply forgotten it. No matter for what reason a consumer cannot

show a ticket at a control: for transport companies it is essential that the increased fares resulting from checks are paid. At the same time, ticket control ties up personnel capacities and is time-consuming – especially if the person being checked cannot identify himself or herself. In such cases the police must be called in to identify the person and retrieve his or her personal data. This is often omitted for reasons of efficiency, so that it is not uncommon to find out that the checked person has no valid address.

Complete digital solution from one source

With the modular End2End Mobility solution from Arvato Financial Solutions, checks can be carried out more efficiently: if necessary, when identification documents are missing, the system can already compare the passenger's name and address during the check in conformity with data protection regulations. This prevents fraud and avoids follow-up costs. Ticket control is faster thanks to the digital checking system. Customers also benefit from the digital process, as the receipt for the increased fare contains a link to a self-service portal. This enables them to pay the outstanding amount in the shortest possible time and gives them the choice between

various payment methods, and even allows them to pay comfortably from their mobile device. In addition, customers who have a season ticket and have forgotten it can upload a photo of their valid ticket on the portal. This saves them having to go to a customer service branch of the transport company to prove that they have a valid ticket. The portal can be designed in the corporate identity of the respective public transport company.

In addition to data validation, the offer also includes the complete processing of increased fare payments – from bookkeeping to any necessary reminder or debt-collection procedures. Arvato Financial Solutions technologies are used to facilitate digital control solutions in around 80 percent of German public transport companies.

How late payers become loyal customers

The pragmatic handling of the inspection can even lead to consumers being positively disposed towards the transport company despite the unpleasant situation, thus increasing customer loyalty. One figure illustrates the potential of the digitised control system: around 59 million euros in liquidity have already been repaid to transport companies in 2019.

Travelling wisely and saving time

Commuters lose a lot of time every day on their way to and from work. The Time Miles bonus system promises to provide a remedy: it rewards flexible, multimodal mobility behaviour and thus helps to disentangle traffic flows.

Berlin experiences the worst situation: according to a study by the US traffic information service INRIX, in 2018 capital city dwellers have lost an average of 154 hours of their lives in traffic jams and congestions. The situation in other German conurbations does not look much better, either. It is estimated that over half a million hours worth four and a half billion euros are lost every year across Germany, and the environment is additionally polluted with 600 tonnes of CO₂ as a result of the increased fuel consumption. And

a sustainable improvement is not in sight, since neither the road network nor the public transport system can be adapted in any short-term to the foreseeable increase in commuter traffic.

Flexibility as a solution

The Berlin start-up company Zeitmeilen AG, a sister company of highQ Computerlösungen GmbH, wants to show a way out of this dilemma with a new type of digital service. The idea is that commuters should not stub-

bornly take the same route every day, but they should rather base their route selection on the individual recommendations of their mobility app. The recommended route can be different every day, even if the destination is identical, or – for instance in cases of extensive traffic obstructions – it can be suggested to leave the car at the nearest park-and-ride site and continue by underground. The aim is to reduce peaks in the density of traffic in conurbations by dispersing them in time, space and mode and to improve the mobility offering in rural areas by linking, optimising and orientating it to the demand. Both urban and rural areas can benefit by introducing the respective transport strategies into the platform. With the highQ MobilitySuite a holistic, platform-

based mobility solution was developed to implement this. It is an open and flexible mobility platform with standardised assistance functions that offers the right solution for every mobility context. The mytraQ app is the mobility controller of the suite

and rewards environmentally conscious traffic behaviour with the integrated bonus system of 'Time Miles' (Zeitmeilen). The aim is to achieve a "social mobility", in which the routes of an entire group are optimised rather than those of individuals.



Optimising the daily commute to work with the help of an app

Photo: Zeitmeilen AG

Rethinking mobility



With its concept, Uber wants to contribute to a turnaround in mobility behaviour.

Photo: Uber

An intelligently networked, flexible and reliable mix of different alternatives to private cars plays an important role for the future of mobility. After all, no one can achieve a traffic turnaround alone.

■ Uber is currently available in eight cities in Germany – Berlin, Munich, Düsseldorf, Frankfurt, Cologne, Hamburg, Stuttgart and Duisburg.

The company arranges trips carried out by licensed car rental companies and their employed professional drivers. In some cities, users can also

book classic taxi rides directly via the Uber-App. With the brokered rental car trips, the customer sees the fixed price as well as the driver profile including photo, number plate and car type before the start of the trip. The payment is contactless and can be made by credit card or PayPal.

From the (big) city to the rural area

In addition to the eight cities, Uber is also present in the countryside. In Kirchheim near Munich an initial pilot project was launched in 2019 to test how the intermediary model in Germany can also

work outside large cities. A second pilot project in Falkensee in Brandenburg has been running since June 2020 and offers residents a flexible and reliable connection to public transport. The aim is to encourage people to use alternative mobility options and to increasingly leave their private car at home. Only a variety of different mobility offers such as public transport, taxis, rental cars and sharing services can relieve the traffic.

Environmentally friendly vehicle fleet

More than 50 percent of the vehicle fleet of Uber's partner companies are fuel-efficient hybrid vehicles. With the Uber Green option in the app, customers can book a ride in an e-car at the touch of a button. Uber also encourages partner companies to electrify their fleets.

NEWS

■ Making Mobility Intelligent

The start-up company MOTIONTAG develops software that enables services for seamless intermodal mobility experiences and disruptive mobility offers. By integrating the software into smartphone apps, real-time data will be generated that enable the assessment of the effective mobility behaviour and depict travel chains of people on the basis of a new type of data collection through an AI assessment of the sensor technology of the smartphone. Mobility patterns and means of transport used are automatically recognised. The recording is passive, without user interaction. Thanks to the constantly increasing sensor performance, large amounts of data can be generated via smartphone tracking and individual movement data can be recorded anonymously. Combined with classically collected data sets such as public transport timetable data or General Transit Feed Specification (GTFS) data, this provides spatial indicators that are relevant for planning. The MOTIONTAG technology thus helps transport companies to draw valuable conclusions from large amounts of data, to gain a clear understanding beyond their own system use and thus to optimise their public transport services.



Data collection can improve offers.

Graphic: Motiontag

Tailor-made solutions for demand-controlled transport

Intelligent shared mobility solutions improve public transport services and increase their acceptance by users. Padam Mobility, founded in 2014 and headquartered in Paris, offers so-called "white label" software tools to operate demand-responsive transport (DRT) services more efficiently with the help of artificial intelligence.

■ With this offer, Padam Mobility can cover a wide range of application cases, such as serving peripheral urban and rural areas, first and last mile connections, secondary lines, transport services for people with reduced mobility or company and school transport.

Features of the Software as a Service (SaaS) solutions

Padam Mobility's Software as a Service (SaaS) solution tools enable transport service providers as well

as businesses to increase the attractiveness of their covered areas, better connect less densely populated areas, strengthen sustainable development and reduce operating costs. The tools include intuitive user interfaces for mobile applications, websites and call centres, ergonomic driver interfaces for each mode of operation and comprehensive and powerful management interfaces for transit operators and public authorities. Feasibility studies, simulations, operational support and statistics can also be implemented.

Benefits for passengers

Real-time optimisation of routes, timetables and vehicle utilisation, reservations in real time or in advance, even for several travel dates, are convincing arguments for passengers. Thanks to appropriate interfaces, the software, which is adapted both visually and functionally by the respective operator, can integrate existing transport networks, journey planners and also third-party providers. The average rating

by users of the service is 4.8 out of 5 points.

Deutsche Bahn, Keolis, Transdev, Île-d-France Mobilités, BusItalia, Asia Mobiliti and dozens of other local authorities and transport operators, companies and consultancies are using Padam Mobility products. Siemens Mobility has invested in the company in 2018.

Thanks to a clear navigation, different modes of transport can be displayed



Graphic: Padam Mobility

The World Cup of urban transport in Doha



In Doha, the metro projects should be completed by 2022.

Thales is building a rapid transit system in Qatar that will not only comfortably and seamlessly carry the expected million visitors to the 2022 World Cup, but that will also massively increase the share of public transport from 0.5 percent today to 21 percent in just a few years.

■ On the three lines of the Doha Metro, 110 fully automated trains will be running on a total of 85 kilometres of track. They will connect the most important areas of Doha, including Hamad International Airport, the old city and the newly developing inner city areas. The Thales VOBC (Vehicle

On Board Computer) devices are part of the CBTC (Communications Based Train Control) signalling system Sel-Trac™. They enable the train to communicate with the rest of the system, including trackside equipment and the control centre, and provide the entire system with real-time updates on

speed, location and other operational information about the train. This ensures efficiency and safety, and maximises capacity while reducing train headways to a minimum.

Thales' fully integrated operations control centre ensures a seamless operation across the Doha metro network by providing real-time control mechanisms. It integrates and manages data from multiple third-party systems and provides a holistic view of the network. Thanks to its centralised coordination function, the operations control centre improves the incident response time and ultimately reduces network congestion, emissions and travel times. In addition, Thales'

communication and security systems improve video surveillance in stations and on board trains. The integrated approach of video analysis and its connection to a centralised system provides a safe and timely train experience for commuters. The Red Line, the longest with 18 stations over 40 kilometres, is already operational. The Golden Line, consisting of eleven stations, is also in operation. Both lines have already served commuters and tourists as well as major events.

Thales has been able to meet the schedule thanks to the experience gathered in other major metro projects around the world. Thales is playing a key role in ensuring the success of this important part of Qatar's National Development Plan for 2030.

Firstly, the company is supplying key elements of the new metro. These include a complete train control system with driverless CBTC (Communications Based Train Control) signalling, the operations control centre as well as the passenger information and announcement systems, CCTV (video surveillance) for passenger traffic management and safety and automatic ticketing systems. Secondly, Thales' experience in integrated project management turned it into the only interface with the eight different contractors and their electromechanical suppliers. The project is part of a wider mission to fulfil Qatar's National Vision 2030 plan and helps to meet its objective to reduce the country's energy consumption and carbon footprint.

Better protection for track workers in underground railways

Track work during ongoing operations can be dangerous. There is often no way of determining the exact whereabouts of track workers in underground operations with regard to the moving sources of danger, i.e. the metro trains.

■ The Canadian company Willowglen Systems has now developed an advanced warning system designed specifically for use in metro operations. Consisting of Proxicom tags for workers and train drivers and a Proxicom server, the Proxicom warning system significantly increases the safety of workers in the track area. The tags are worn on their waistcoats or armbands by both the workers and train drivers, but they can also be placed in the train driver's cab. By comparing the position data of the workers and the trains, the corresponding server generates an alarm in case of a warning. When a metro train approaches a distance or time threshold that can be configured, the

system automatically triggers acoustic and visual warnings and vibrations that are received by both the workers and the metro driver. This reduces the risk of a possible collision and thus the risk of injury and death. As an option, the alarms can also be sent to the tablet of a site supervisor.

The advantages are obvious

Proxicom leverages Willowglen's extensive integration experience in transportation systems to provide a secondary worker warning platform that can be cost-effectively integrated into existing safety and operating systems. This is done using COTS components that are easy to use and that can be enhanced with management reporting capabilities.

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The safety of workers must be safeguarded even with high train frequencies.

Photo: Willow Glen Systems

Safe test operations under high voltage



Safety first: In a test cage the rail vehicles undergo dozens of functional and electric tests.

Photo: Pilz GmbH & Co. KG

An integral safety concept from Pilz GmbH & Co. KG – from risk assessment to operations with the automation system PSS 4000 – ensures the safety of Bombardier's rail vehicle test benches in Bruges.

■ Pilz GmbH, an automation company based near Stuttgart, was responsible for the development and implementation of the safety concept required for the test benches and therefore carried out the risk anal-

ysis, all calculations, the programming, validation and development of the concept. Before rail vehicles that are built by Bombardier in Bruges, Belgium, are allowed to run on international routes, they undergo

various functional and electronic tests.

Bombardier tests more than 5,000 connection points per train under 1,000 volts high voltage in test benches. To achieve this, the Pilz automation system PSS 4.000 controls all safe inputs and outputs, using the coded safety switch PSENcode in addition to the emergency stop.

PSENcode monitors the doors to the test cage to prevent unauthorised opening. If an emergency stop is triggered, the entire cage is also disconnected from the power supply.

The safety solution provides employees at the control cabinet with a comprehensive diagnostic tool for these safety functions. The automation system PSS 4.000 from Pilz includes control equipment in various performance classes, numerous I/O modules and visualisation and engineering software. One programmable logic controller (PLC) each assumes the control of two test cages. A PLC is placed in the first test cage and an I/O module in the second, both connected via the real-time Ethernet SafetyNet p.

Efficient data management

Within PSS 4.000, the software platform allows for separately testing PAS 4.000 objects and storing them in a programme library. New objects can be based on existing ones, but they have their own specific parameters. A second similar programme can be created more quickly because the programming effort is reduced. The result is a safe and efficient test operation with low system downtimes.

Ad

We are on Track! Electronic control for rail vehicles

Socket-outlets with built-in USB charger

The two into one solution for charging mobile devices on rail vehicles

- AC 250 V / 16 A socket with mechanical protection against accidental contact (shutter)
- 2 USB charging ports with max. 2,4 A
- Fast charging regardless of the brand of the mobile phone or tablet
- Temperature range -25 °C to + 55 °C
- Stand-by consumption ≤ 50 mW
- VDE certified
- Complies with the standards EN 50155, EN 50121-3-2, EN 61373 and EN 45545-2

**TWO
into
ONE**



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LÜTZE 
TRANSPORTATION

Fast and economical component cleaning



Efficient cleaning of wheelsets and bogies using the Pacific cleaning system.

Photo: BvL Oberflächentechnik GmbH

Long running times and big travelled distances leave heavy soiling on bogies, wheelsets, wheel bearings and train engines.

■ The cleanliness of railway components plays an important role in the fast and smooth handling of repairs, crack inspections, maintenance and servicing. Massive soiling, oils and rust make the cleaning of these usually heavy components a great challenge.

Modern cleaning with the highest precision

An Austrian railway operator has found a fast and economical cleaning solution for his maintenance plant. He chose two models from the German cleaning system manufacturer BvL Oberflächentechnik GmbH from Emsbüren. After carrying out comprehensive test washing in the BvL technology centre, it was decided to provide the Pacific spray system for cleaning large parts and the Niagara spray-flood system for cleaning bear-

ings. Premature wear of axle bearings can be prevented by completely removing fine sand from the bearings. For this purpose, these are fixed in special baskets and cleaned in a washing chamber. The basket rotates around its horizontal axis and cleaning is ensured by a special nozzle system with flat-jet nozzles in the completely flooded washing chamber.

Ideal cleaning solution

Very good cleaning results are achieved in both systems, and the fully automatic function makes the handling easy to operate. As the plant for large parts is installed in a pit, the unit is easy to load and can be easily accessed for maintenance. It is also important that the systems are 100% available and that all washing cycles can be interconnected with other data interfaces.

Cyber security for railways

Increasing digitisation enables smart mobility solutions and significant efficiency gains. However, the other side of the coin is the emergence of new cyber threats. The new Selectron attack detection system TDS (Threat Detection Solution) is designed to effectively counter these dangers and secure railways against cyber attacks in future.

■ Railway networks are becoming more vulnerable to cyber threats due to the ever-increasing networking and the use of open standards. Rail transport services are part of critical infrastructure according to the EU NIS Directive 2016/1148 and must be protected against cyber attacks to ensure a high level of availability, reliability and safety of rail transport. Rail operators are required to continuously monitor their control systems. Deviations in network traffic are subject to mandatory reporting. This is why the Swiss company Selectron Systems has developed a new attack detection system: the Selectron TDS (Threat Detection Solution). It is based on proven intrusion detection technology and has been adapted to the technological and organisational characteristics of TCMS systems. The TDS was designed to be efficiently integrated into existing systems without any retroactivity.

The solution which has been developed according to the holistic 'Defense in Depth' approach is certified to IEC 62443 Security Level 2 and ensures continuous real-time monitoring of network traffic. In Selectron's

holistic cyber security concept, it thus takes on the role of an alarm system. If it detects an anomaly, a warning message is sent to the railway operator, who can then take appropriate counter-measures before any damage occurs. The results of current pilot projects with long-standing customers confirm the great success potential of this solution for the railway industry. In future, railway operators will be able to recognise attack pat-

terns at an early stage and to comply with increased legal requirements.

The early warning system is scheduled to be available on the market from early 2021 both in a basic and a full version. While the basic version will work locally and can therefore be easily integrated into legacy systems, the full version will offer additional functions including a tighter detection of anomalies based on artificial intelligence in cloud applications.



Holistic cyber security concept from Selectron Systems AG

Graphic: Selectron Systems AG

NEWS

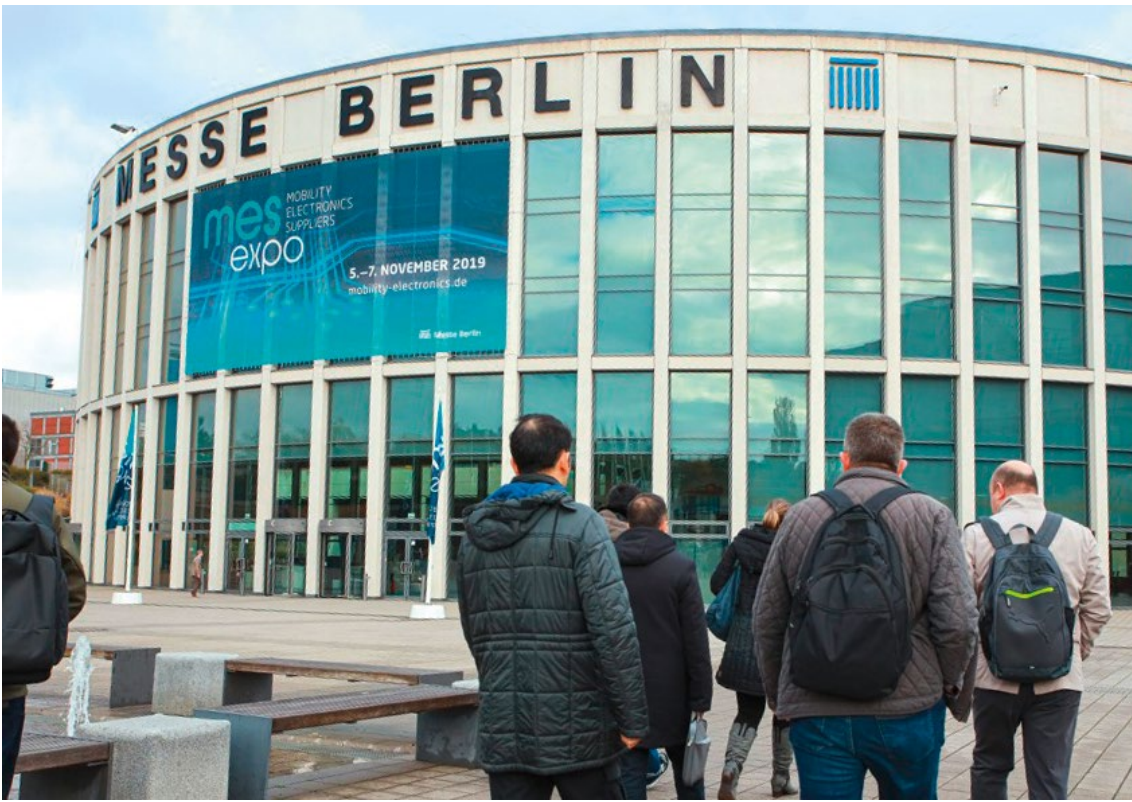
Seating comfort for travellers throughout the world

The comfort of travel is not least determined by comfortable seats in the chosen means of transport – after all, one often spends many hours there. In addition to customer comfort, the durability and ease of maintenance are also decisive factors for operators. The Turkish company Pilot Seating, based in Bursa, has been manufacturing driver seats for Mercedes-Benz since 1967 and has many years of expertise in the production of seats. In addition to seats for lorries, buses and various machines, the portfolio of Pilot Seating today includes seats for ships and – since 2017 – also for trains. In addition to height-adjustable seats for train driver's cabs, the company's product range includes modular passenger seats for both trams and trains. In addition to their low weight and high level of protection against vandalism, the seats are available in graduated seat widths to meet different requirements. Thanks to comprehensive and fully integrated manufacturing capacities including research and development, design, prototype production, tooling, mould making and testing, new projects can very quickly go into series production. Changes to standard ranges can also be made flexibly and reliably. This ensures the delivery of high quality products that are consistently and continuously tested for performance and durability and certified according to the applicable ISO and EU standards. Today Pilot Seating supplies OEM and aftermarket customers in various sectors around the world.



Comfort with the right seat for everyone

Photo: Pilot Seating



The MES Expo will take place from 9.11. to 11.11.2021 in Berlin.

Photo: Messe Berlin

Mobility seen from a new angle:

Science Slam Premiere at InnoTrans Friday

■ Not only the exhibitors at the upcoming InnoTrans will be convincing with their innovative ideas – the Science Slam is also all about visions of future mobility. The Science Slam is a format for scientific communication. Young talents explain their research projects in short, popular scientific lectures and then have them evaluated by the audience. At InnoTrans, the Science Slam focuses on the topic of mobility and related fields. Five scientists from the relevant research fields will compete for the award. They have ten minutes to convince the audience with their entertaining and creative Science Slam lectures in English. The aim of the event is to get out of the ivory tower of science and to present the audience with a trenchant, entertaining and easy to understand presentation of the perspectives of mobility.

Smart mobility experience

MES Expo extends the Early Bird option and launches a new content platform

■ Anyone wishing to participate in the B2B platform for the electrical supply industry in the mobility sector can benefit from the special Early Bird option until November 2020.

Following the successful premiere of MES EXPO 2019, the second edition of the trade fair, which focuses on automo-

biles and commercial vehicles as well as rail transport, will take place in Berlin from 9 to 11 November 2021. The trade fair will be specially designed for the electrical supply industry and will be accompanied by a future-oriented framework programme and a procurement centre. Interested parties will receive

exciting insights into the industry even before the event on the newly launched platform 'MES Insights', which will be organised in cooperation with Vogel Media. It serves as a professional complement away from the trade fair.

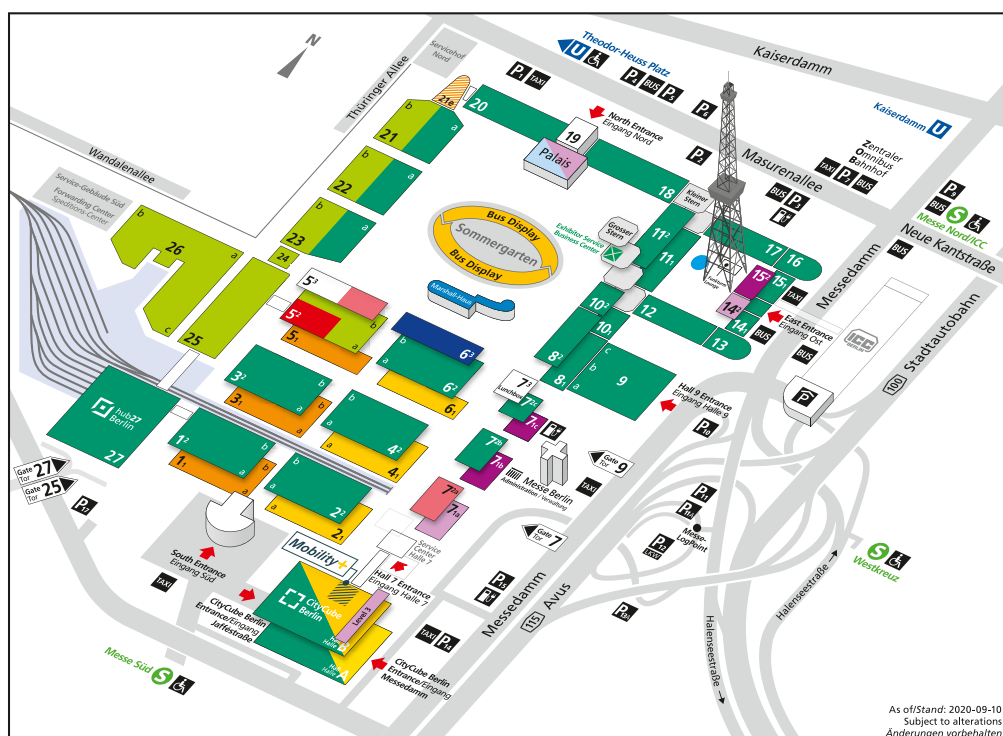
Up-to-date information can be found on the [MES-Expo](#) homepage.

Save time and money online

■ The ticket shop for day/permanent and student tickets is now online. To avoid long waiting times we recommend buying tickets online in advance.

This will save you additional money and you can use public transport in Berlin free of charge during the validity period (ABC).

Trade visitor pass	Online	On-site
Day ticket	50 euros	95 euros
Permanent ticket	75 euros	130 euros
Day ticket for students	13 euros	13 euros



Exhibition grounds InnoTrans 2021



- Railway Technology
- Interiors incl. Travel Catering & Comfort Services
- Railway Infrastructure
- Tunnel Construction
- Public Transport incl. Mobility+ / Mobility+ Corner
- Outdoor Display
- Bus Display
- Opening Ceremony
- InnoTrans Convention
- Speakers' Corner
- InnoTrans Campus
- Business Lounge (Marshall-Haus)
- Press Center
- Restaurant "Meet'n'Eat"
- FoodCourt

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