Berlin, 24 – 27 September 2024

InnoTrans 2024 Report

B2B-Magazine for the Railway Industry

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IN FOCUS

RAILWAY TECHNOLOGY

More international than ever

Now covering 200,000 square metres of exhibition area with 42 exhibition halls as well as outdoor display and track areas, 2,900 exhibitors from 59 countries await guests at the 14th InnoTrans from 24 September.

New set-up

Modular design enables development of customised track maintenance machines with alternative drives in a series-like production process.

Planning ahead for the future

The digital electro-pneumatic brake paves the way for increased train frequencies, improved timetable stability and punctuality.

Built into the chassis

An all-electric bus chassis improves safety and extends range while being easy to maintain and environmentally friendly.

Berlin hosts the world

InnoTrans features world premieres and an explosion of innovations

Over 2,900 exhibitors from 59 countries and guests from all over the world will fill the 42 exhibition halls and the outdoor and track area under the Berlin Radio Tower from 24 to 27 September 2024. The exhibition area at the 14th InnoTrans is larger than ever before: 200,000 square metres will be filled with the latest innovations, including about 220 world firsts. They are marked on the stands and hall plans. Further information on the world premieres can be found in the World Innovation Guide, the InnoTrans app and on the **InnoTrans website.**

Ceremonial opening

The opening ceremony will kick off on 24 September 2024 at 10 a.m. at palais.Berlin. More than 1,000 national and international representatives from business, science and politics have been invited. After a welcome address by Dirk Hoffmann, COO of Messe Berlin, Magda Kopczyńska, Director General of the EU DG MOVE, and Dr Volker Wissing, the German Federal Minister for Digital and Transport, will speak. This will be followed by a panel discussion on the topic "From Hype to Reality – AI in the Mobility Sector". Susanne Henckel, State Secretary at the Federal Ministry for Digital and Transport will be joined by: Dr Richard Lutz, Chairman of the Board & CEO of Deutsche Bahn, Mohamed Rabie Khlie, Director General of the Moroccan National Railways Office (ONCF), Henri Poupart-Lafarge, Chairman of the Board of Directors & CEO of Alstom, Michael Peter, CEO of Siemens Mobility, and Javier Martínez Ojinaga, CEO of CAF Construcciones y Auxiliar de Ferrocarriles. This will be followed by the official opening tour.

Exchanging ideas at a high level

The InnoTrans Convention offers expert talks, presentations and panel discussions with international guests. At the heart of the InnoTrans Convention are the Dialog Forums, which will take place daily at palais.Berlin during the trade fair. They are organised by the German Railway Industry Association (VDB), the German Transport Forum (DVF), the European Rail Industry Association (UNIFE), the German Electro and Digital Industry Association (ZVEI) and the Association of German Transport Companies (VDV). InnoTrans also offers a related supporting programme for each topic-specific area, whether it is the International Design Forum, the International Bus Forum, the International Tunnel Forum, the DB Innovation Forum or the Public Transport Forum. Further information on the Dialog Forums and all other events can be found here in the report (pages 8-9) and at **InnoTrans Plus**. The online platform contains all the important information you need to prepare for and follow up on your visit to the trade fair.

Multifaceted supporting programme

But there are many more events at InnoTrans. Organised by the International Rail Catering Group (IRCG), the Hospitality Forum on Wednesday from 2 p.m. to 4 p.m. in the CityCube will focus on innovations in railway catering. Mobility trends are also on the agenda on Friday: at the premiere of the Railway Influencer Festival, selected exhibitors will meet influencers, bloggers and YouTubers in the Marshall-Haus. For the first time, an independent jury will confer the Railway Influencer Award. The best trade fair and brand videos will be honoured, as will the best YouTube channel on mobility topics (page 2).

Focus on AI

Another premiere is the AI Mobility Lab exhibition area (page 2). 42 exhibitors from a total of 17 countries, from Australia through to Singapore to Canada, from the fields of AI, cybersecurity, data protection and robotics will be showcasing their innovations in Hall 7.1a. The exhibitors include companies such as Google Cloud, IBM, Cisco, Next Generation Robotics and the CRRC Academy. As AI now plays a role for all exhibitors, there will be additional guided tours to exhibitors offering AI-based products, services or solutions (page 16). In terms of content, the topic will be rounded off with presentations on cybersecurity or AI in the AI Mobility Corner.

Well catered for

Messe Berlin supports trade visitors to InnoTrans with numerous services. A daily business breakfast for early risers before the opening of the trade fair, a business lounge with computer terminals, discussion and quiet areas as well as an Oktoberfest restaurant with reservation options will ensure a pleasant stay. Exhibitors and applicants will have the opportunity to meet each other at the InnoTrans Campus in Hall 7.2c. This is where they will find an exciting programme on careers and an overview of job vacancies. Visitors can keep up to date with the **InnoTrans app**. Every morning, the InnoTrans Daily newsletter will provide exhibitors, media representatives and guests with fresh information about the trade fair. One can register **when purchasing tickets** and also on the InnoTrans website.

InnoTrans has organised shuttle services from BER Airport to the city to ensure smooth travel to and from the trade fair. With their InnoTrans tickets, guests can also use the public transport system free of charge. Kick scooters, scooters and bicycles are available for hire in designated areas around the exhibition centre.

COMMENT

A warm welcome to the future of mobility

Kerstin Schulz, InnoTrans Director

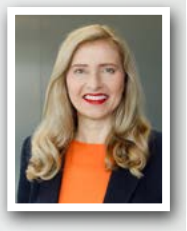

Photo: Messe Berlin GmbH

When Berlin becomes the hotspot of the mobility industry for four days at the end of September, it's finally InnoTrans time again. InnoTrans was held for the first time in 1996, with 172 exhibitors, 4,500 square metres of exhibition space and 6,300 visitors. Today, InnoTrans is bigger and more international than ever before and every two years serves as a driver of innovation, a success booster and the largest marketplace for the railway industry. No other mobility trade fair brings together so many decision-makers, makers and visionaries to exchange ideas, prepare business deals and finalise investments. In addition to global players and medium-sized companies, many international transport companies and international joint pavilions can also be found at InnoTrans. A single visit to the trade fair gives trade visitors direct access to all the markets of the world. At InnoTrans, visitors can discover numerous world premieres and experience the complete 360 degree view, from exhibitors and

CONTINUED ON PAGE 2

CONTINUED COMMENT

experts, start-ups and young talent/career topics all the way to the latest innovations and social media stars.
Visitors can also explore InnoTrans digitally on the InnoTrans Plus platform. Whether live streams or videos on demand, networking or event hopping, making appointments or much more, InnoTrans Plus offers the ideal way to prepare for and follow up on your visit to the trade fair.
We look forward to welcoming you here in Berlin!

More efficient mobility thanks to AI

The new exhibition area showcases innovations based on artificial intelligence (AI) and robotics.

The AI Mobility Lab in Hall 7.1a in the Public Transport segment is the first dedicated exhibition area for AI-based solutions at InnoTrans this year. 42 exhibitors specialising in artificial intelligence, robotics, data protection and cybersecurity will be represented here.

Exhibitors include Google Cloud (Hall 7.1a | 230), Next Generation Robotics (Hall 7.1a | 570) and the CRRC Academy (Hall 7.1a | 231). While Next Generation Robotics will be presenting its new multimodal modular robot platform for the automatic inspection of railway vehicle running gears, the CRRC Academy will be showcasing its Industrial AI Open Platform.

Exhibitors will also include companies such as DRAIVE GmbH (Hall 7.1a | 205), which specialises in data and information fusion systems. Nextérité (Hall 7.1a | 235) offers multimodal solutions for passengers and public authorities. Other exhibitors include the specialist for test and simulation technology Tritem Microsystems GmbH (Hall 7.1a | 235), the full-service design and consulting company Ostirion (Hall 7.1a | 203), which specialises in AI, and the AI scale-up Konux (Hall 7.1a | 370). The latter offers solutions for predictive maintenance, network utilisation and traffic monitoring as well as for railway infrastructure management planning. Isarsoft will be presenting AI-based video analysis solutions for planning, operation and safety (Hall 7.1a | 204).

Find out more in the AI Mobility Corner

In addition to the exhibition, trade visitors can look forward to a varied supporting programme at the AI Mobility Corner on the topics of AI, robotics, data analysis/protection and cybersecurity. One highlight will be the presentation by cybersecurity expert Mirko Ross, CEO of Asvin. Further information on the exhibitors and the programme can be found at **InnoTrans Plus**.

AI Mobility Lab ⚑ Hall 7.1a

Social media stars meet big names from the mobility industry

At the first international Railway Influencer Festival, content creators will network with representatives from transport companies and the rail industry.

The stage is ready, the awards are gleaming on the podium and the smell of popcorn is in the air. In a festival atmosphere, on Friday 27 September, selected exhibitors will meet influencers, bloggers and YouTubers from all over the world in the Marshall-Haus. At the Railway Influencer Festival at InnoTrans, influencers and industry professionals will discover the latest trends in the mobility sector.

The festival is the perfect place for the invited Railway Influencers to share their passion for trains and technology with others while helping to shape the future of travel. The exhibitors on site will benefit by increasing their visibility and publicising their products.

Around the world on rails

Participants will include, for example, the blogger **Lasse Stolley,** who has been travelling for two years and lives aboard a train. There will also be **@die.lokfuehrerin**, who posts about her everyday life as a train driver on Instagram. Numerous YouTubers will be represented, such as the **channel Eisenbahn in Ö, D, CH** which has almost 70,000 subscribers and **Tom Thornton**, who is travelling the world on a shoe-string budget. **Central City – World Public Transport Videos**, the largest video encyclopaedia of underground railways and trains from all over the world on YouTube, and many other influencers will also be appearing at the festival. There will be photo boxes on the exhibition grounds for anyone who is looking for a spontaneous and original snapshot.

The Railway Influencer Award goes to...

A high-calibre jury will select the best in three categories from the wide-ranging Railway Influencer community. The members of the jury are: Sarah Stark, Managing Director of the German Railway Industry Association (VDB), Andrei Ciufu, Head of Unit – Communications of the European Rail Industry Association UNIFE, Lars Wagner, Head of Department Strategy and Communications and Press Officer of the German Transport Association (VDV), Azar Mottale, Director Mobility Division of the German Electro and Digital Industry Association (ZVEI), and Constantin Lehnert, responsible for European policy, rail technology and rail transport of the German Transport Forum (DVF). Parts of the Railway Influencer Festival will be streamed on InnoTrans Plus. Further information can be found at **InnoTrans Plus**.

Live the future of mobility

133 vehicles for passenger and freight transport will await trade visitors on the Outdoor Display with its track area. Photo: Messe Berlin GmbH

Trade visitors can discover technical innovations at the Outdoor Display and the Bus Display in the Sommergarten of the trade fair.

The centrepiece of every InnoTrans is the Outdoor Display with 133 vehicles. This is where trade visitors can appraise technical solutions at first hand directly adjacent to the exhibition halls. On the 3,500 metres of running track, one innovation follows the next. From high-speed trains to hybrid locomotives, from road-rail vehicles to trams.

Siemens Mobility will be there with a total of five vehicles. These include, for example, the Velaro high-speed train for Egypt (Outdoor Display T7/40). The vehicle is built to withstand extreme temperatures and features desert-proof equipment while at the same time ensuring maximum passenger comfort. Also on display is the Mireo Smart regional train, which is designed for a constantly changing transport landscape and the growing popularity of rail mobility (T6/40).

Alstom will be exhibiting the Coradia Max™ regional train for Landesnahverkehrsgesellschaft Niedersachsen mbH (LNVG), which combines single and double-decker architecture. Another exhibit will be the Flexity™ tram for BVG, Berlin (T5/45). Berlin's longest tram is spacious and sustainable, with reduced energy consumption and noise impact. The ODAS system prevents collisions and accidents.

This year, Stadler will present eight vehicles. For the first time, the company will exhibit the RS ZERO to the public at InnoTrans (T9/40). The RS ZERO facilitates CO_2-free operation on branch lines using hydrogen or battery traction. With the CITYLINK TramTrain for Saarbahn, the company will show a mobility solution that links cities and their hinterlands without the need to change trains (T9/45).

Other vehicles on the tracks of the Outdoor Display will include the ETR1000 high-speed train from Hitachi Rail, which is compatible with various power supplies and signalling systems across Europe (T1/40). Trade visitors will also be able to inspect the CINOVA regional train from CRRC and the hydrogen fuel cell tram from Hyundai Rotem (T2/19). Both the Modula BFC hydrogen-powered hybrid locomotive from Vossloh Rolling Stock (T2/34) and the 360-degree multi-sensor platform from DB Bahnbaugruppe (T11/40) will be presented on site.

In the Sommergarten, the Bus Display will show buses in action. On a 500 metre long test track, trade visitors will experience numerous vehicles with alternative drive systems in live operation. Ten buses are currently registered. BYD will be one of the exhibitors showing three buses. These include the BYD eBus B12, which has a range of up to 600 kilometres on a single charge. Ikarus will be showing two buses: the latest V4 version of the 12-metre city bus, the Ikarus 120e, and the Ikarus Midi bus, an 8-metre electric bus. Other buses on site include for example the hydrogen bus from ARTHUR Bus, the ARTHUR ZERO, the E-Bus 3.0 from EBUSCO as well as the Mercedes-Benz Citaro C1, which will be presented by Ferrovie dello Stato Italiane. Other exhibitors will include K-Bus and Neso Bus. Furthermore, exhibitors such as SBRS and Mont-Ele will be showcasing their latest solutions for charging infrastructure.

The exhibition will be accompanied by presentations and debates, such as the International Bus Forum, organised by the German Transport Forum (DVF), on the topic of "Roadmap Future for public transport: strategy, benchmark and rollout" on 26 September from 2:00 to 4:00 p.m., after which trade visitors will be able to take part in a guided visit to the bus manufacturers. All events are free of charge. Further information can be found at **InnoTrans Plus**.

IMPRINT

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Equal opportunities in the workplace

This year, the Women in Rail Award will be conferred for the first time at InnoTrans. Photo: EU-Rail

Various initiatives at InnoTrans are campaigning for gender equality in the mobility industry.

When it comes to management positions in the mobility industry, women are still in the minority. Several initiatives want to change this, among them Women in Mobility. Once again, they are organising their lunch event at InnoTrans 2024. On Tuesday, 24 September 2024, tables will be set for 340 people from 12.30 p.m. to 2.30 p.m. at palais.Berlin. Doors will open at 12 noon and access is only granted to registered guests with an InnoTrans ticket.

After a welcome by Dr Kerstin Wendt, Berlin Hub Manager at Women in Mobility, several high-ranking women will give input presentations. Magda Kopczyńska, Director General for Mobility and Transport of the European Commission, will speak, as will Paloma Iribas Forcat, Vice-Chair of the Executive Board of the European Union Agency for Railways (ERA). Speaker Noemi Jiménez-Redondo is Director of Research & Innovation at the Spanish company CEMOSA.

The participants then split up to gather at themed tables. Susanne Weller from DB Cargo AG will be talking about "Cargo 4.0 – Rail as innovation driver for a mobile future". Sylvia Lier from TAF mobile GmbH will come along with the topic of multimodality in public transport. Further round tables are being planned. For registration and further information, visit **www.wim-luncheon.de**.

Honoured commitment

The "Women in Rail Award" will be conferred for the first time at InnoTrans on Wednesday, 25 September 2024 at 12.30 pm at the EU-Rail booth (Hall 27 I 511). The prize is awarded by an association of EU institutions. These include the European Commission's "Women in Transport" platform, Europe's Rail Joint Undertaking (EU-Rail), the European Union Agency for Railways (ERA), the Community of European Railway and Infrastructure Companies (CER), the European Rail Supply Industry Association (UNIFE), and the Federation of European Train Drivers' Unions (ALE).

Women and companies will be honoured in three categories. The "Women Empowerment Award" is given to a company for its commitment to gender equality. The "Leadership and Mentoring Award" will honour a woman who has distinguished herself through outstanding leadership and mentoring, thereby advancing the European rail industry. The "Research and Innovation Award" goes to women who have distinguished themselves through their work in research and development, thereby contributing to the competitiveness and attractiveness of the railway sector.

Campaign with strong women

There are also many exhibitors who are committed to gender equality, such as the German Railway Industry Association (VDB). The association will show exciting role models in its campaign "Strong women, strong railway industry", where it will present more than 100 women from the railway industry.

They describe their experiences and careers in interviews. VDB is setting a good example with its Chief Executive Officer Sarah Stark, an engineer who has been in office since 2023.

DB Cargo AG CityCube Hall B | 140
ERA Hall 27 | 511
TAF mobile GmbH Hall 7.1c | 218
UNIFE Hall 27 | 630
VDB Hall 2.2 | 105

Eurailpress Career Boost: A unique opportunity for recruiters and young talents

Young talents present themselves to the audience in 90 seconds. Photo: Messe Berlin GmbH

Young talents pitch on stage and recruiters can select directly.

Pupils in their final year, apprentices, students and young professionals will be given 90 seconds to present themselves to potential employers at the Eurailpress Career Boost - a unique and efficient way for both sides to apply for a job or to fill vacancies. This opportunity is only available on 25 September 2024 at 2 pm on the Talent Stage of the InnoTrans Campus in Hall 7.2c.

The job seekers are classified into five different professional areas. These include technical professions such as plant mechanics or site managers for railway construction; engineers and IT specialists, for example software architects and geoinformatics specialists. Representatives of operational professions such as professional vehicle drivers, train drivers or shunting attendants and commercial professions such as controllers, dispatchers or strategic purchasers will also be on stage.

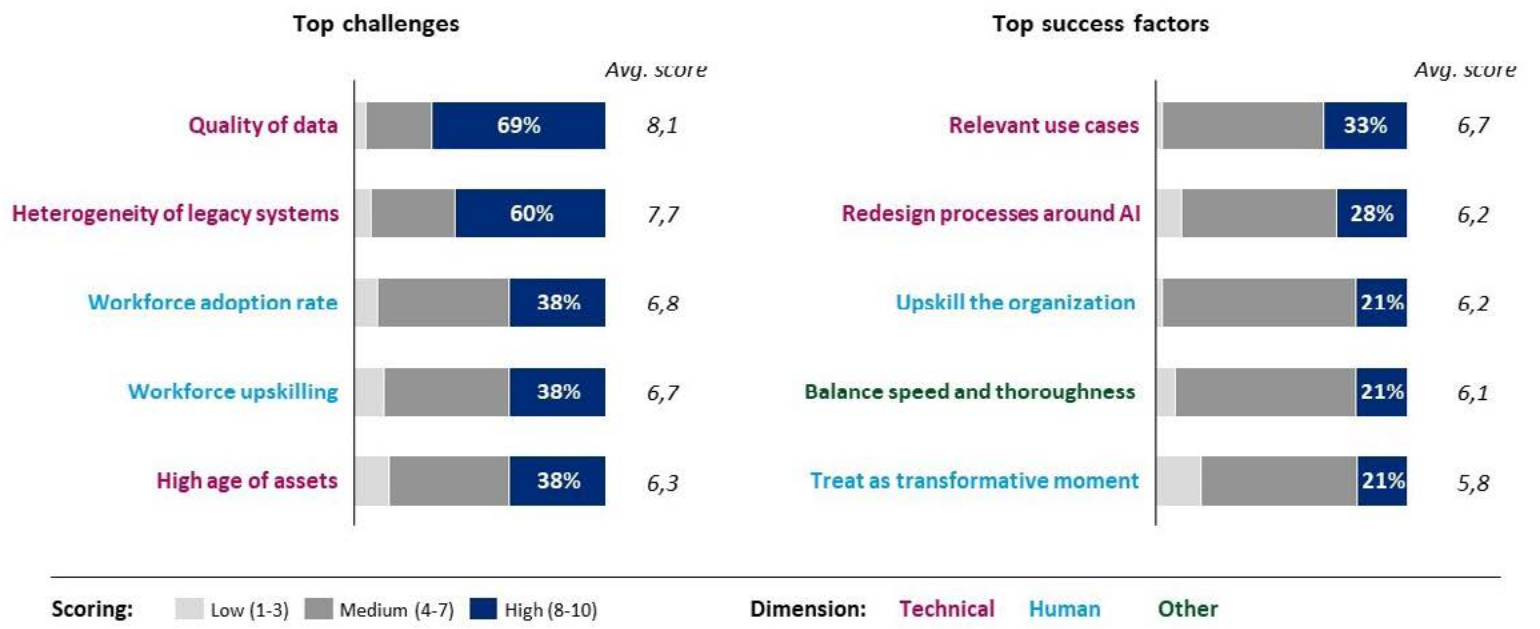
For recruiters, the Eurailpress Career Boost is an outstanding opportunity to get to know a large number of applicants in person and see them "in action" in a very short space of time. Recruiters do not need to register separately; any trade visitor can take part.

InnoTrans Campus Hall 7.2c

Clean and safe travel to destination

CMS Berlin, the leading trade fair for cleaning and hygiene (23 – 26 September 2025), will once again focus public attention on the topic of cleaning in the mobility sector at InnoTrans 2024. The aim is to raise awareness for cleaning and hygiene. There will be a Mobility Cleaning event at InnoTrans on Wednesday, 25 September 2024. If you are interested or have any questions, please send an email to **cms@messe-berlin.de.**

Humans, the decisive factor for AI transformation



Top 5 challenges and success factors for AI in the railway environment

Source: Oliver Wyman survey

With capacity bottlenecks, labour shortages and escalating costs while customer expectations are also changing, the railway sector is undergoing a radical change. One of the ways to pave the way to a successful future for the industry is artificial intelligence (AI). In a survey conducted between May and June, the consultancy firm Oliver Wyman asked representatives of European companies in the rail industry about the key challenges and success factors for the implementation of AI.

More than 50 industry representatives from over 25 companies, including railway companies, infrastructure managers, OEMs and Tier 1 suppliers as well as start-ups, took part in the survey in more than ten European countries. They are active in a wide range of roles in the industry, from C-level decision-makers and founders to heads of technology, digital transformation, strategy, operations, sales and supply chain. The consultancy firm Oliver Wyman asked them to evaluate a variety of criteria which encompass core challenges and success factors along three main dimensions: technical, human and other factors.

Humans: success or stumbling block?

The study states that the greatest challenge is currently the provision of high-quality data. There is a surprisingly high discrepancy between this and the feedback on the challenges associated with change management and, more generally, the human factor. This seems contrary to intuition, given the difficulties which both the railway and the wider transport sector have had to contend with in digital transformations so far.

After all, implementation within the organisation and the struggle for its acceptance have usually been the decisive hurdle in this context. This suggests that the transformation to AI is still in its infancy and that the sector is primarily concentrating on creating the necessary conditions, such as the provision of data of sufficiently good quality.

In terms of success factors, the interviewers particularly received responses related to technical or content-related topics, such as the prioritisation of use cases. Overall, however, the Oliver Wyman study concludes that the picture of success factors appears more balanced, with the human factor being accorded a similar importance as the technical aspects. "At the end of the day, the introduction of AI will fail because of people or it will lead to success in conjunction with people," predicts Thilo Grunwald, project manager of the study and partner at Oliver Wyman.

New E³ series for sustainable track construction.

Photo: Plasser & Theurer

Yellow machines go green

Plasser & Theurer Export von Bahnbaumaschinen Gesellschaft m.b.H. has been building track-laying machines with alternative drives for ten years. The company is now focusing on series-like development.

Track construction can be quiet and low-emission today. The first step towards this significant turnaround was taken in 2015, when Plasser & Theurer focused on three goals for its new generation of E³ machines: economic, ecological and ergonomic. Since then, 14 of these E³ machines have gone into operation, paving the way for a new era in track construction.

They are deployed in Germany, Austria, Switzerland and Italy. More than 60 of these machines are in production or on order, including the new maintenance fleet for ÖBB. A few years ago, they were still highly tailor-made, one-off solutions, but today climate change and political targets for CO_2 reduction demand answers like E³ – and this is becoming increasingly urgent. At the same time, the time and effort required for approval in Europe is increasing dramatically. Plasser & Theurer is therefore committed to a series-like development. A modular design enables customised solutions to suit the area of application.

Green traction power for track maintenance

There is a good basis for this: in Germany, the share of renewable energy in electricity used for traction is increasing significantly, reaching 65.2 percent in 2022. In Austria, traction current is generated entirely from hydropower, solar and wind. The catenary is the perfect energy provider for track maintenance. A company which pioneered Plasser & Theurer's E³ technology in 2016 is Krebs Gleisbau with a Unimat 09-32/4S Dynamic E³ for Switzerland. This tamping machine provided data which quickly proved that environmentally friendly operation can also be economical. In 2022, the DB Bahnbau Group presented an all-electric Unimat 09-4x4/4S Dynamic E³. The machine was named after the green superhero "Hulk". "Fully electric" because the tamping units and axle drives already do their work with electric power.

Environmentally friendly is also economic

The advantages of the new E³ machines are obvious: their considerably quieter operation improves quality of life and work and lowers stress factors for local residents and operators – an aspect which should not be underestimated with increasing societal importance. Depending on the application scenario, electric drives can reduce pollutant emissions to as low as zero. The ecological footprint of green track maintenance machines is emerging as a sustainable investment in the future.

Plasser & Theurer Export von Bahnbaumaschinen Gesellschaft m.b.H.

Outdoor display T3 | 50 · Hall 26 | 270

Zero-emission maintenance in urban areas

RORUNNER E³ electric railcar for the Munich underground railway Photo: ROBEL

The transport turnaround requires more frequent intervals between trains as well as new lines. The Munich public utility company Stadtwerke München (SWM) is creating the necessary capacity by converting its maintenance fleet to modern underground railway operation. One focus is on reducing air and noise emissions in order to noticeably improve environmental and working conditions in the tunnel. The ROBEL Group is supplying the corresponding track motor vehicles.

ROBEL is building ten four-axle track construction machines (RORUNNER E³) for SWM. They are equipped with a tri-modal drive solution: the approach to the construction site is emission-free using the lateral conductor rail and a current collector. A battery storage unit supplies the energy for working movements and crane operation, while a diesel generator is also available for long-term operation. The new vehicles are designed for bidirectional operation, allow multiple unit traction and can be radio-controlled.

More safety in the workplace

Within a few years, Munich's underground work vehicles will be largely electric, quiet and clean. The advantages of emission-free and low-noise operation in tunnels and stations as well as in urban areas are obvious for all users. The operating staff also benefit significantly, as working on the track becomes safer and more ergonomic. The cranes operate independently of each other by radio remote control, the loading platforms on both sides are at platform level, the cab has two identical driver's desks with visibility across a wide area in front of the vehicle and space for five persons.

The track vehicles are also used to move underground trains and to push or pull several trailers on gradients of up to 40 per mille, as well as to manoeuvre mainline freight wagons on the connecting line. Apart from the latter, operation takes place without the use of the diesel engine. This is made possible by driving on the conductor rail to conserve battery power, travelling and working with battery energy and recuperation during braking. The Real-life operation in the Munich network will show whether in the long term it will be possible to replace the combustion engine with additional battery storage. The technical requirements for this are already in place.

The fleet's digital data recording system stores information such as battery status, operating mode, traction and crane movements. This enables analyses for follow-up projects as well as remote diagnosis of all operating Modes. The manufacturer's specialists can intervene at any time to provide support in the event of an incident. This results in short downtimes, fast delivery of spare parts and greater availability.

ROBEL Group
Outdoor display T2 | 60 · Hall 26 | 480

Synthetic cable ducts

The new cable duct generation 'Cable Duct' is available in two sizes with many accessories. Photo: Wirthwein SE

Deutsche Bahn AG (DB) has approved the new generation of universal cable routing systems from Wirthwein SE for permanent installation. Thanks to their low weight, they reduce CO2 emissions by up to 50 per cent compared to solutions using concrete.

The product approval for the cable duct systems was granted for both sizes in accordance with DB's current specifications. With the 'Cable Duct', the plug connectors are integrated into the trough to simplify installation on the construction site. The new cover design increases the load-bearing capacity and a special locking system enhances safety. Furthermore, the connector system ensures a stable, force- and form-fit connection – it also compensates for expansion and contraction forces.

The basic matrix of the cable ducts is made from UV-stable polypropylene copolymer. Special attention was paid to fire protection and mechanical strength in the new development in order to make the synthetic ducts as resistant and durable as concrete products - with a much lower weight.

The new generation of cable ducts provides a wide range of extensive and proven accessories. These include angle elements, dividers, end plates, inlet and outlet pipes which can be attached to the pre-perforated side walls, as well as ground and cover screws.

Up to 50 per cent less CO2 than a concrete cable duct

A synthetic cable duct cuts CO2 emissions by around half compared to a conventional concrete solution. In production, Wirthwein uses resource-saving materials with an optimised proportion of recycled material, while continuously optimising and developing energy-efficient production and considering all aspects of installation and operation in terms of their service life. The low weight also increases the density of the packaging and thus reduces CO2 emissions during transport to the construction site.

The CO2 equivalent (CO2e) per metre is 8.96 kilograms for Wirthwein cable duct size I and 13.42 kilograms for Wirthwein cable duct size II. For the conventional concrete cable duct size II, this value is around 22 kilograms of CO2e.

Furthermore, the resource-saving advantages of the synthetic cable trunking are particularly evident in logistics. The CO2 emissions per 100 kilometres are almost ten times higher when transporting concrete cable ducts (CO2 equivalent in logistics per 100 kilometres of transport: Wirthwein cable duct size II: 97 grams CO2e versus conventional concrete cable duct size II: 918 grams CO2e).

The cable ducts are durable, maintenance-free and fully recyclable, thus making a significant contribution to the sustainability of synthetic cable ducts. This protects the environment and also benefits the budget thanks to the high level of cost-effectiveness.

Wirthwein SE Hall 26 | 460

Into the future with low maintenance

Arianna® slab track system in Marlengo Photo: WEGH Group

The Arianna® slab track system from the WEGH Group is characterised by its long service life and low environmental impact.

The ballastless Arianna® system is based on prefabricated platforms made of prestressed reinforced concrete. For the renovation of railway lines, it is easy to switch from a ballasted to a ballastless system and the need to interrupt line operations is reduced. The grass and stone asphalt versions and the floating slab system allow ballastless Arianna® slabs (Arianna® T-Slab) to be used for tram tracks as well. In urban tram networks, the M-slab system offers solutions for vibration damping and noise protection. Based on intensive research and studies, they ensure high performance in reducing vibrations in sensitive areas. The WEGH Group has taken all design measures into account to ensure that the system has a nominal service life of 90 years – three times that of a conventional track – in accordance with the technical standards for construction. Reduced maintenance and lower costs for renewal, replacement and levelling reduce the life cycle costs of the product compared to conventional tracks.

The Italian WEGH Group designed the Arianna® system in 1984 with the aim of helping to shape a sustainable future for all. Since then, it has been used successfully on major railway lines. It is certified according to the Environmental Product Declaration (EPD) in accordance with EN 15804 and ISO 14040/14044. Life cycle assessment analyses carried out in collaboration with the University of Parma showed that for every kilometre of track laid with Arianna® instead of conventional track, 263,000 square metres of land were saved - the equivalent of 37 football pitches - emissions of carcinogenic substances were reduced by 46 percent and 109 tonnes less carbon dioxide were emitted.

WEGH Group S.p.A.
Hall 26 | 225

Understanding the benefits of composite sleepers

Installation of KLP® low-profile sleepers in the KiwiRail Maoribank tunnel. Photo: Kiwi Rail

Lankhorst Rail, the developer of KLP® hybrid polymer composite sleepers, part of Lankhorst Engineered Products B.V., predicts that the choice of sleepers will become an increasingly important factor in railway tunnelling projects.

"Tunnels are an important part of many railway infrastructure modernisations. When outdated, high-maintenance infrastructure needs to be replaced and higher axle loads and larger wagons need to be accommodated, extensive civil engineering work is often required. The time and high cost of tunnelling is causing railway operators to look for more cost-effective alternatives,' says Samuel Buxton, Sales Manager at Lankhorst Rail.

This problem is illustrated by recent tunnelling projects in which KLP® hybrid polymer sleepers were used. As part of the modernisation of Rotterdam's Willemsspoortunnel, they are replacing wooden sleepers in those parts of the tunnel where settlement is a risk or has already occurred due to the overall weight of the tunnel structure. A total of 6,000 KLP® sleepers were used in the modernisation – probably the largest single installation of composite sleepers in Europe. Concrete sleepers are generally larger and up to three times heavier than hybrid polymer sleepers. They therefore require more ballast. If the subsoil is weak, for example a peaty soil with potentially poor drainage, less ballast can be used with the KLP® polymer sleepers, thus reducing the load on the subsoil.

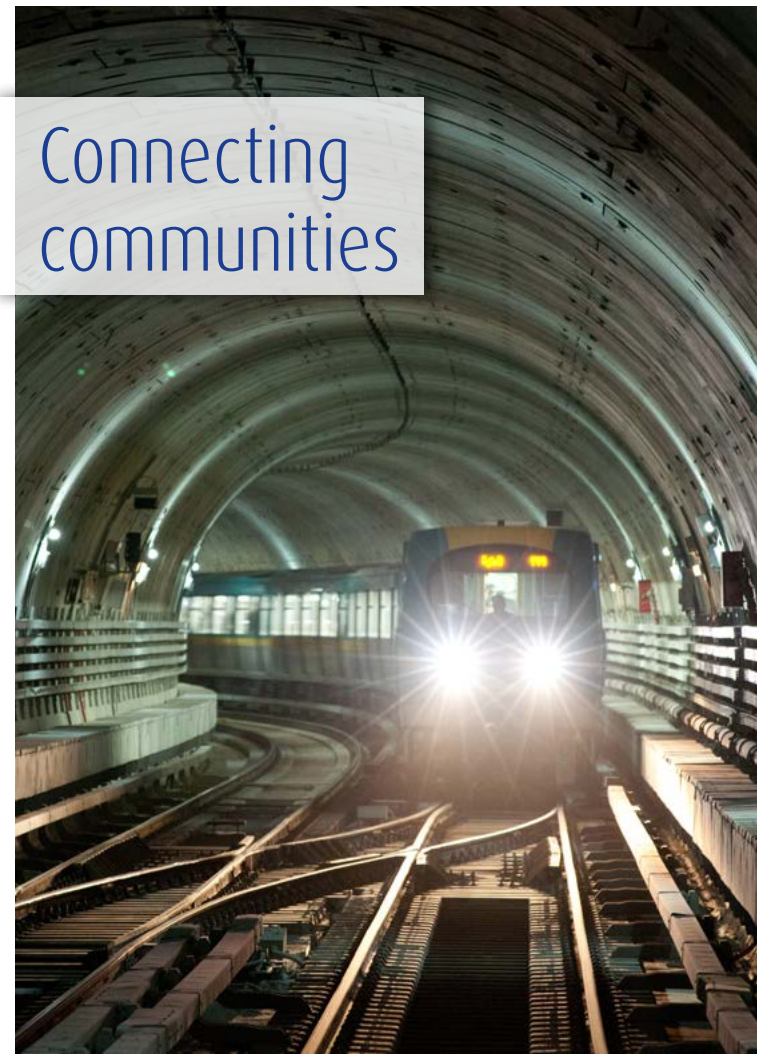
Example New Zealand

New Zealand's KiwiRail commissioned the Dutch manufacturer to develop a sleeper which is particularly suitable for the existing tunnels dating back to 1954. The aim was to increase both the axle load and the train speed and to facilitate the transport of high-cube containers despite the existing ballast bed conditions and the tunnel height. The 20,000 KLP® sleepers with a low profile which were supplied allow higher containers to pass through the tunnel without the need to modify the tunnel structure. They also made it possible to increase the axle load of the tunnel track from 18 to 22.5 tonnes and the maximum speed in the tunnel from 50 to 70 kilometres per hour.

Sleepers should not be perceived as a 'stupid' component which has hardly changed in the last 200 years, says sales manager Buxton. Next generation moulded sleepers, such as the KLP®, might add a new dimension to the use of railway sleepers, not only in tunnels but also on level tracks, turnouts and bridges.

Lankhorst Engineered Products B.V.
Hall 21 | 225

Connecting communities



Greater Cairo Metro: an important means of transport for the more than 22 million inhabitants of Greater Cairo Photo: Orascom

Orascom Construction (OC) is playing a key role in the development of Egypt's transport infrastructure.

OC was involved in the development of all four lines of the Greater Cairo Metro. As the first project in which the use of tunnel boring machines led to new construction methods, Line 2 with a length of 50.5 kilometres was a milestone in the Middle East. OC completed more than 34 kilometres of metro tunnels, participated in civil, electromechanical and track works, and partnered with international joint ventures and consortia to deliver transformative transport solutions.

Currently, OC is carrying out Cairo's Metro Line 4, which aims to reduce traffic congestion. Phase 1 will extend over 19 kilometres and 16 stations, connecting the centre of Greater Cairo with the pyramid area in Giza. It will also become an important metro line for tourism in Egypt, extending to the pyramid area and the Grand Egyptian Museum.

In September 2023, OC announced the construction of a new 22-kilometre, 20-station metro line as part of a consortium. The line will connect the city centre of Alexandria with the north-eastern city of Abu Qir. In the same year, OC began work on Egypt's first high-speed railway system, which will be the world's sixth longest with a length of 2,000 kilometres and which is expected to reduce carbon emissions by 70 percent. OC is also building the Egyptian monorail, which will be the world's longest monorail system with a length of 96 kilometres.

As part of a consortium, OC has begun work to modernise and upgrade the Cairo-Beni Suef railway corridor in Egypt, which includes the signalling system and tracks over a length of around 125 kilometres as well as the complete modernisation of the electronic interlockings at the stations. These modernisations will result in higher speeds while also improving safety and efficiency.

OC has completed work on the Light Rail Transit project in Cairo, which stretches over 140 kilometres and will carry an estimated one million passengers per day.

In 2019, Orascom Construction completed the Port Said Tunnels, which are part of the development plan for the Suez Canal region. These two road tunnels are each 3.9 kilometres long and 50 metres deep and have a capacity of 2,100 mixed vehicles per hour in each direction, significantly improving regional connectivity.

Despite the unfavourable ground conditions such as soft clay, high salt concentration in the groundwater and the presence of dissolved methane gas, OC was able to successfully complete the project.

Orascom Construction S.A.E
Hall 5.2 | 710

InnoTrans Convention 2024 – join the discussion!

The InnoTrans Convention highlights the topics of the future in the mobility industry, such as sustainability, digitalisation and automation. International decision-makers from business, politics and transportation will meet for high-calibre presentations and panel discussions and debate the mobility of the future. Participants will have the opportunity to ask questions and network – for a dialogue between equals.

DIALOG FORUM · Location: palais.Berlin, North Entrance · Conference language: German/ English

The thematic focus is the Dialog Forum under the auspices of the Deutsches Verkehrsforum (German Transport Forum, DVF), the European Rail Industry Association (UNIFE), the German Railway Industry Association (VDB), the German Electro and Digital Industry Association (ZVEI) and the Association of German Transport Companies (VDV).

- **25 September 2024 10.00 a.m. – 12.00 noon: Digital Boost: Enhancing Productivity through Digitalisation in Rail Freight Transport**
  2.00 p.m. – 4.00 p.m.: From idea to implementation: What do we need to drive innovation in rail?
- **26 September 2024 10.00 a.m. – 12.00 noon: Driving Efficiency and Performance in Railway Systems through ERTMS**
  2.00 p.m. – 4.00 p.m.: Future Mobility: How Generative AI is Transforming the Industry
- **27 September 2024 10.00 a.m. – 12.00 noon: Spotlight on Talent: Attracting skilled workers, maximizing potential, shaping rail transportation**

INTERNATIONAL DESIGN FORUM · Location: CityCube, M1-3 · Conference language: German/ English

Organised by the International Design Center (IDZ), this event focuses on contemporary interior design in trains and buses.

- **25 September 2024 10.00 a.m. – 12.00 noon Designing attractive passenger experiences: innovative interiors for the public transport of today and tomorrow**

INTERNATIONAL TUNNEL FORUM · Location: CityCube, M8 · Conference language: German/ English

The International Tunnel Forum accompanies the Tunnel Construction segment of the trade fair and includes various compact discussion forums with international participants. The organiser is STUVA e.V. (Research Association for Tunnels and Transportation Facilities).

- **25 September 2024 2.00 p.m. – 4.00 p.m.: Sustainability in Tunnelling**
- **26 September 2024 2.00 p.m. – 4.00 p.m.: Challenges in Tunnelling**

PUBLIC TRANSPORT FORUM · Location: hub27, beta 8-9 · Conference language: German/ English

The Public Transport Forum is all about developments in local public transport. The forum is being realised by ETC Solutions GmbH.

- **26 September 2024 10.00 a.m. – 1.00 p.m.: Funding - Networking - Personnel: Indispensable for the public transport of the future**

DB INNOVATION FORUM · Location: CityCube, M1-3 · Conference language: German/ English

Deutsche Bahn AG is organising its Innovation Forum on innovative technologies in the rail industry at InnoTrans.

- **26 September 2024 10.00 a.m. – 6.00 p.m.: Next Station: RailSuccess - Digital, Connected, Automated and Climate Resilient. How are we leading the railway into a prosperous future?**

INTERNATIONAL BUS FORUM · LOCATION: hub27, beta 8-9 · Conference language: German/ English

The International Bus Forum is organised by the German Transport Forum (DVF).

- **26 September 2024 2.00 p.m. – 4.00 p.m.: Roadmap Future for public transport: strategy, benchmark and rollout**

(R)evolution of braking: how trains will brake in the future

What matters: braking systems which stop trains safely. Photo: Knorr-Bremse

The development of the electropneumatic brake has been ongoing for decades and has proven itself millions of times over. With the digital-electromechanical braking system from Knorr-Bremse Systeme für Schienenfahrzeuge GmbH, the age of a new technology is now dawning.

Optimised braking systems make multiple-unit trains run more punctually, require less safety headways and arrive earlier at their destination. Two things were considered as given: a braking system must be customised to its specific application. And it has to be based on the electropneumatic approach.

This approach has decades of technological and evolutionary progress behind it. Numerous steps to improve design, material and control are adding up to measurably greater reliability and safety, longer operating times and ever better braking performance.

But real technological leaps have also been made. For example, with the AirSupply Smart, which for the first time adapts its air-supply performance to real-time operating conditions. Or the 'CubeControl' brake control system, supporting even more intelligent interaction between electropneumatic systems, mechatronics and software. Knorr-Bremse has thus turned the electropneumatic brake into a digital-electropneumatic brake, including virtual validation for short time-to-market.

Paving the way for higher frequency

This brake in turn paves the way for the Reproducible Braking Distance (RBD). This technology significantly reduces braking distance dispersion, particularly under adverse track conditions, and in turn lays the foundation for increased train frequencies as well as improved timetable stability and punctuality. At the same time, braking to a precise position is one of the basic requirements for extensive automatic train operation (ATO).

Meanwhile, the major lines of development in the transport industry are moving in the direction of increasing capacity, saving energy and optimising life cycle costs. A further technological leap is required. At Knorr-Bremse, this has begun with the electromechanical braking (EMB) system.

It transmits braking force and signal purely electrically via brake-by-wire. The improved braking dynamics shorten braking distances by eliminating the physical limits of compressed air during force build-up. The replacement of compressed air as an energy supplier and storage unit also leads to significant energy savings. The elimination of pipework and the no longer necessary air reservoirs creates space, saves weight and gives new freedom in vehicle design. Due to the reduced number of individual components, installation and maintenance costs are also reduced.

The EM brake will not replace pneumatic systems in the foreseeable future. But it will provide an attractive alternative for certain areas of application.

Knorr-Bremse Systeme für Schienenfahrzeuge GmbH **Hall 1.2 | 250**

Safe, modular, digital control

PSSrail - Paving the way for digital rail Photo: PILZ GmbH & Co. KG

With PSSrail, the automation company PILZ GmbH & Co. KG presents a safe and modular control system for the digital railway. The system is approved for railway applications, meets safety requirements up to SIL-4, is compatible with the standard of the Organisation of European Railway Infrastructure Managers (EULYNX) and features a modular design for flexible use.

The PSSrail railway control system consists of the actual SIL 4-compliant controller and various hardware modules, including a CAN module for easy integration of existing systems. PSSrail also has a software suite for programming or configuring user programmes. Rail-certified function blocks are stored in a programme library and enable simple and fast implementation. The modular principle allows users to customise their solutions as required.

Economic thanks to standardisation and openness

PSSrail is based on standardisation and openness. The control system is compatible with the latest EULYNX standard, paving the way for the implementation of digitalisation projects. PILZ has developed the railway control system as a COTS product (Commercial Off The Shelf). Users receive a ready-to-use product and can minimise their obsolescence management.

Paving the way for digital rail

System providers and integrators can use PSSrail for a wide range of signalling applications, including electrically locally controlled turnouts or level crossings as well as in digital interlockings. For example, it can be used as an object controller platform to control the components in the field along the line digitally and therefore reliably and economically.

PSSrail is a control solution which can also be used to digitise during ongoing operations and upgrade to the EULYNX standard, for example. Operators can gradually modernise outdated, relay-controlled interlockings and increase the reliability and performance of rail transport. Thanks to standardisation and openness, the conversion time is reduced and considerable cost savings can be made.

PILZ GmbH & Co. KG
Hall 27 | 550

Ropeways as integrated transport systems

Visualisation of the 'La Végétale' ropeway station for the Île-de-France region: ropeway specialist Doppelmayr is involved in its execution.

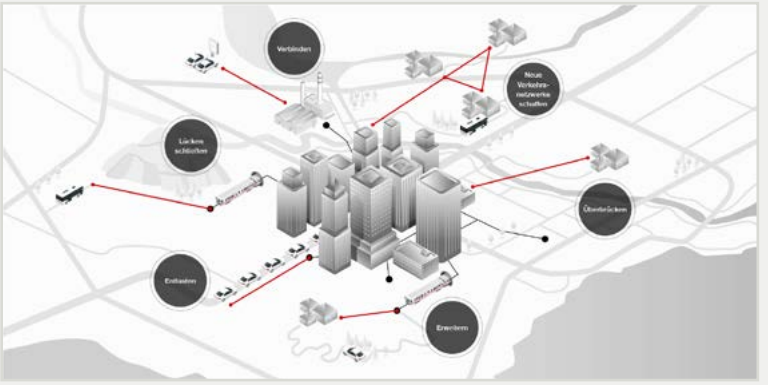
Graphic: Île-de-France Mobilités/Doppelmayr France

Mobility is one of the most important issues of our time. On the one hand, this concerns multimodal concepts for local passenger transport and, on the other, the means of transport used must be sustainable. With its ability to easily close gaps in the system, the aerial ropeway opens up completely new opportunities for transport planners.

Aerial ropeways are reliable means of transport which offer low operating risks, easy network integration, fast and cost-efficient construction, a small environmental footprint, minimal land use, accessibility and digital control systems for autonomous operation.

Relieving the burden on urban transport systems

One pioneering project which demonstrates how ropeways can be integrated into public transport networks is the Câble C1 ropeway line, which is being realised with Doppelmayr in the greater Paris area in the Île-de-France region. The new line has a total length of 4.5 km and five stations, which are directly connected to other public transport services such as the metro, bus or regional railway. Designed to carry 3.2 million passengers a year, the cable car connects four different communal areas in the Val-de-Marne department with an immediate catchment area of around 20,000 residents and around 6,000 jobs. The new line will relieve the pressure on feeder traffic to the public transport network close to the centre of Paris. As part of the regional transport system, it will be integrated into the region's existing ticketing system.



Functions of urban cable cars as part of a multimodal infrastructure

Graphic: Doppelmayr

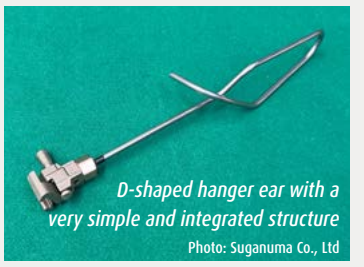
Compact land use – short construction time – sustainable mobility

Thanks to their small footprint on the ground, ropeways can also be integrated into densely built-up neighbourhoods. In addition, the construction process is optimised through the use of prefabricated elements for pillars and stations. This enables short completion times and significantly lower costs than inner-city tramway lines, track extensions or newly built tunnels. Aerial ropeways are almost noiseless and therefore contribute to a better quality of life in the city. They score points with their low CO_2 footprint. Thanks to their centralised electric drive, there are no local emissions such as nitrogen oxides (NOx) or fine dust. By using renewable energy, ropeways are CO_2-neutral. Their accessibility allows them to be used by all groups of citizens and also supports micromobility for the last mile by allowing bicycles, scooters, etc. to be taken on board.

Doppelmayr
Hall 2.2 | 100

NEWS

Overhead line fittings installed quickly and easily



D-shaped hanger ear with a very simple and integrated structure

Photo: Suganuma Co., Ltd

The D-type overhead line hanger ears from Suganuma Co., Ltd. consist of a round bar made of Japanese SUS ('steel use stainless') stainless steel or polybrominated biphenyl (PBB) and a metal fitting to clamp the contact wire. The round bar and the clamp of the metal fitting are made from a single piece. The D-type hanger ear is easy to install, thus enabling a high working speed. The contact wire can be easily gripped by simply hammering in the wedge, which is held in the clamp. The hanger length can be adjusted on site using a hanger bending tool. This simplifies installation and reduces maintenance work. The quality of the catenary wire sets, including the D-type hangers, complies with the norms of the Japanese Industrial Standard (JIS). Suganuma's commitment to quality management has been certified in accordance with the international ISO 9001 standard. The company supplies products to high-speed and conventional railways and is actively involved in overseas infrastructure projects. The company is therefore also very aware of the global standards of the International Electrotechnical Commission (IEC) from an international perspective.

Suganuma Co., Ltd. Hall 7.2a | 500

Reducing graffiti cleaning expenses

After years on tracks, the surface condition is identical to that immediately after repainting Photos: DB

S-Bahn Berlin GmbH says it spends around five million euros a year on graffiti cleaning. This puts a strain on the budget, the environment and the surface of the trains. Thanks to the graffiti protection coating from KANSAI HELIOS Austria GmbH, Berlin's S-Bahn is no longer facing one of its biggest challenges in the form of 'terminal loss of asset value'.

In February 2018, two car bodies of Berlin's S-Bahn were treated with a special graffiti protection coating system (water-based 2C PUR primer, water-based 2C basecoat and innovative transparent 1C graffiti protection topcoat) before being put into operation. After more than a million kilometres, 46 graffiti stains and 130 exterior washes, the Berlin subsidiary of Deutsche Bahn (DB) describes the paint system as the 'best coating system ever used on the S-Bahn'.

Protection through coating

DB only considers coating systems with high resistance which fulfil the requirements of DBS 918 300. It requires that a conventional 2K PUR clearcoat withstands graffiti removal agents, which act like paint strippers, for at least 15 minutes without softening, weakening or swelling. Even after an exposure time of up to 4.5 hours, the tested 1C clearcoat from KANSAI HELIOS protects the coated surface and thus exceeds DB's requirements by a factor of 18. The product is suitable for aluminium, steel, zinc, stainless steel and glass fibre-reinforced plastic (GRP). It prevents the penetration of ink, spray paints and other contaminants into the coated surface. It is currently the only product on the market which fulfils the requirements of DB Sheet 39 – water-dilutable primers ('fillers', 'base coats') and top coats based on polyurethane – as well as Sheet 50 - graffiti protection coatings.

Longer intervals for refresher coatings

Thanks to the colour stability and gloss retention in combination with the high graffiti protection, the value and thus the advertising potential of the vehicles can be maintained for years despite frequent cleaning and graffiti removal. Extending the intervals for refresher painting saves costs. There is further potential for savings thanks to shorter process times and faster drying at room temperature as there is no need for forced drying. This also applies to cleaning and graffiti removal, as the clear coat enables smaller spot repairs and can also be polished.

In 2021, S-Bahn Stuttgart also selected this protective coating system for the refurbishment of its vehicles. KANSAI HELIOS is also planning to use it in other industrial sectors, such as the automotive and ACE sectors.

KANSAI HELIOS Austria GmbH | Hall 8.2 | 370

Trend-setting technologies for public transport

The current capacities of railway power grids are not sufficient for an expansion of public transport

Photo: PSI Transcom GmbH

Global challenges, including the shortage of skilled workers and the zero-emission approach, require sustainable solutions in the transport industry. PSI Transcom is therefore presenting new-generation technologies based on artificial intelligence (AI) for buses and trains which are the basis for environmentally friendly and cost-efficient passenger transport.

PSI Transcom GmbH has developed an integrated overall system by expanding its PSItraffic/TMS control and train management system. It combines all areas of a railway operation – from project planning and modelling, visualisation and conflict detection to operations scheduling and simulation. Thanks to the integrated track planner used for modelling, it is now possible to create and export track diagrams and import railML schemes with automatic creation of plans. The simulation environment can be used as a training and simulation instance for developing and testing software and external interfaces.

Interconnected – operational and energy management

As part of the expansion of rail networks and shorter train intervals, it becomes necessary to expand railway power grids and save electricity. To this end, PSI is working on the expansion of its control system, which combines and optimally coordinates operational management and control of the entire electrical infrastructure in a single system. First results will be presented.

AI-supported – software for vehicle depots

The digitalisation of processes in depots along with automatic vehicle scheduling are the basis for efficient operational e-bus operation when they are combined with load and charging management. This is provided by the AI-based depot and charging management system, which will be demonstrated on the basis of use cases and simulations. In addition, there are results from research projects on autonomous driving and the use of vehicle data.

Optimised – rostering and dispatching

The shortage of drivers requires a quick response to driver unavailability and a more efficient use of resources. This is achieved with Profahr software for planning, dispatching and payroll accounting of drivers. Among other things, PSI will be showing new graphical employee dispatching.

PSI Transcom GmbH
Hall 2.1 | 515

Energy-saving automatic platform screen doors

Platform screen door system for high-speed platforms up to driverless rail transport.

Photo: Panasonic Industry

In railway technology, all installed components must meet special challenges with regard to extreme environmental influences. This applies in particular to durability, quality and safety. The automatic platform screen door system from Panasonic Industry addresses these requirements.

Passenger call buttons with an 'on-demand function' ensure a better temperature balance on the platform and enable communication with train signals, which can reduce energy consumption at stations – especially when commuter traffic is low or at night. A new intelligent operating and maintenance system has been developed for efficient maintenance and repair. The key components are defined as monitoring objects and the platform screen door (PSD) components in all stations are networked to form an information service centre. This enables real-time localisation and reporting of failures, as well as the provision of suggestions for maintenance and repair. The system also links the spare parts database and the maintenance personnel management system. It can also be equipped with augmented reality glasses and other smart devices to visualise faults and provide expert troubleshooting solutions remotely.

Panasonic Industry
Hall 7.1b | 370

Data value chains to modernise public transport

Data refinement turns railway companies into modern data companies. Photo: T-Systems International GmbH

A unified data strategy is essential for railway companies to streamline processes and maximise efficiency while also complying with legal requirements at national and EU level. T-System International GmbH complements the existing data refinement chains of its customers with data product and data service management, thus completing their information and data management capabilities as well as governance within the data domain.

The data strategy of a company responds to questions about the handling of data, the necessary skills and principles for implementation and the contribution to the creation of value. T-Systems has created an end-to-end concept for a public railway company which expands the existing strategy into an integrated strategy for data and artificial intelligence which includes a roll-out plan and suggestions for training programmes. The concept includes data products and services from their implementation to introduction both in internal and external markets in a data domain.

Railway companies see data as a decisive resource for shaping the mobility transition. These data respectively their refinement are intended to design data-driven service and product innovations, increase value creation and open up new or existing business models for their monetisation. The integrated concept of T-Systems gives equal consideration to data refinement and product management. This includes the full lifecycle starting with the analysis of requirements, design, implementation, provision, operation, change and deprovisioning, as well as outlining the introduction of data product and data service management.

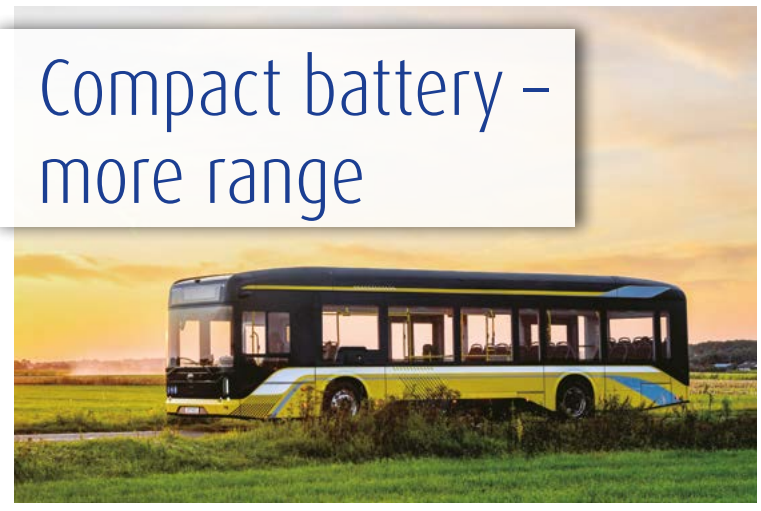
Lifecycle management improved

The introduction of a data mesh architecture is the centrepiece of T-Systems' strategy. This is designed to foster the decentralisation of data management and autonomy across business units, while ensuring a coherent and integrated approach to data management and usage. By integrating DataOps practices, T-Systems aims to improve the lifecycle management of data. This ensures that data is more accessible, of higher quality and more effectively integrated into daily operations. The creation of data products and services based on the principles of data mesh as well as DataOps supports customised AI-driven solutions for operational requirements and improves data utilisation.

As a provider of data marketplaces and infrastructures for data spaces, T-Systems is a founding member of the European GAIA-X initiative to build a powerful, secure and trustworthy data infrastructure including Gaia-X Trust Anchor (ID Wallet).

T-Systems International GmbH
Hall 2.1 | 210

Compact battery – more range



BYD eBus B12 Photo: BYD Europe

The new all-electric bus chassis from BYD improves safety, energy efficiency and performance and offers bus fleet operators in Europe a solution which is easy to maintain and environmentally friendly. Starting with the B12, all BYD eBuses will use the new generation of Blade Battery Chassis technology, which BYD has developed one hundred per cent in-house.

The 'BYD eBus Blade Battery Chassis' incorporates a series of new technologies and integrates the lithium iron phosphate blade battery (LFP blade battery) into the underframe structure. This progress in thermal and structural safety reduces both weight and energy consumption.

The integrated long-life LFP blade battery withstands the rigorous nail penetration test and improves the structural integrity of the vehicle. Each cell of the blade battery acts like a structural beam, increasing torsional rigidity to more than 55,000 Newton-metres per degree (Nm/°) and reduces the height of the vehicle's centre of gravity by 40 per cent. The tilt angle is improved by 47 percent and therefore improves both stability and manoeuvrability. The blade battery is extremely resistant to extreme temperatures and supports numerous charging and discharging cycles, thereby optimising strength and thermal stability. In addition, the space efficiency of the battery has been increased by more than 50 per cent compared to conventional batteries. The higher energy density ensures a greater travelling range.

The overall weight of the bus has also been reduced by ten per cent, which increases the operating range and reduces energy consumption. Its design ensures lasting efficiency, performance and a longer life cycle.

The BYD eBus Blade battery chassis benefits from an efficient 6-in-1 control unit with silicon carbide (SiC) technology which integrates six key electrical elements into one plug-and-play set (drive and steering motor control, high-voltage distributor, air compressor control and DC/DC converter), enabling quick changeovers at the roadside and less downtime. SiC modules reduce the weight of the control unit by 15 per cent, improving vehicle efficiency. In addition, the dual-hub hairpin motors also reduce weight and improve power delivery for a quieter and more comfortable ride.

The modern and spacious BYD B12 eBus utilises the Blade battery chassis and features an active suspension system for greater comfort. With its long range (up to 600 kilometres on a single battery charge) and fast, flexible charging solutions, it is ideal for high-traffic bus routes.

BYD Bus Display B | 412

On-train dishwashing: efficient cleaning of tableware and machine

Large quantities of crockery are washed in a train galley in an instant and at a rate of seconds. At the end of the day, the heavily soiled machine has to be cleaned so that it is clean and ready again the next morning. To simplify the cleaning process, HOBART has further developed its new generation of undercounter dishwashers with a self-cleaning washing system.

Smart solution for high washing volumes with a low machine height Photo: Hobart GmbH

The new combined wash and rinse system from HOBART features a clever self-cleaning function for the wash arms, which have been registered for patent. This is performed with every rinse cycle, so that dirt particles are removed with every programme start. Dirt particles are rinsed out at every programme start. The CLIP-IN system allows kitchen staff to remove and maintain the wash and rinse system in a single operation. An automatic self-cleaning programme flushes dirt residues from the machine interior immediately after each working day so that it is clean again for the next day of washing.

The integrated TOP-DRY drying system ensures that crockery or reusable containers are so dry when they are removed that they can be immediately put away in the cupboard. The VA-POSTOP² machine feature eliminates hot steam from the machine and thus guarantees a comfortable climate in the galley.

The HOBART SmartConnect app allows retrieval of comprehensive information about the status of all machines. This includes, for example, machine utilisation, error messages, hygiene regulations as well as an operating cost calculator. This enables caterers to quickly contact their own customer service or a qualified service partner in the event of machine disruptions. The app can be used free of charge for up to five years.

HOBART offers warewashing solutions for all capacity requirements: undercounter, bonnet and conveyor dishwashers as well as trolley washers. The smart machines quickly get crockery, trolleys and transport crates hygienically clean.

HOBART GmbH Hall 1.1 | 592

The self-cleaning washing arms make everyday dishwashing easier. Photo: HOBART GmbH

InnoTrans tours: Follow your interests!

Thematic tours on world premieres, artificial intelligence and careers will take interested visitors directly to selected exhibitors

A world-leading trade fair the size of InnoTrans can be overwhelming. All the better if guests have an expert guide at their side to lead them to selected booths. Anyone interested in world premieres should join the **World Innovation Tours**. They will be stopping at the booths of exhibitors who are presenting world premieres at InnoTrans. The **AI Tours** are a brand new addition to the programme. They focus on innovations related to digitalisation and artificial intelligence. Participants will be taken to exhibitors who will present their latest AI-supported solutions across the entire trade fair. Participants will learn interesting facts and background information about the exhibits from high-ranking company employees.

All these tours, which last around 90 minutes and take place several times a day in German and English, are free of charge. Registrations can be made by e-mail to **innotrans@spree-pr.com** and during the trade fair from 9 a.m. daily at the counter in the Business Lounge in the Marshall-Haus.

Those who want to get their career off to a flying start should participate in the **Career Tours.** They take interested parties directly to exhibitors who are looking for qualified talents. The companies labelled with the Career Point symbol provide an insight into career opportunities at their company. Potential applicants can talk directly to those in charge. Candidates can register on the InnoTrans website under **InnoTrans Campus**. **InnoTrans Plus** provides all the information on the thematic tours.

Your direct route to us: the online ticket shop

Day/permanent and discounted tickets for **InnoTrans 2024** are available at the ticket shop. The tickets are available on mobile devices and allow contactless access. They will also entitle the holder to use Berlin's public transport system (ABC) free of charge for the period of validity.

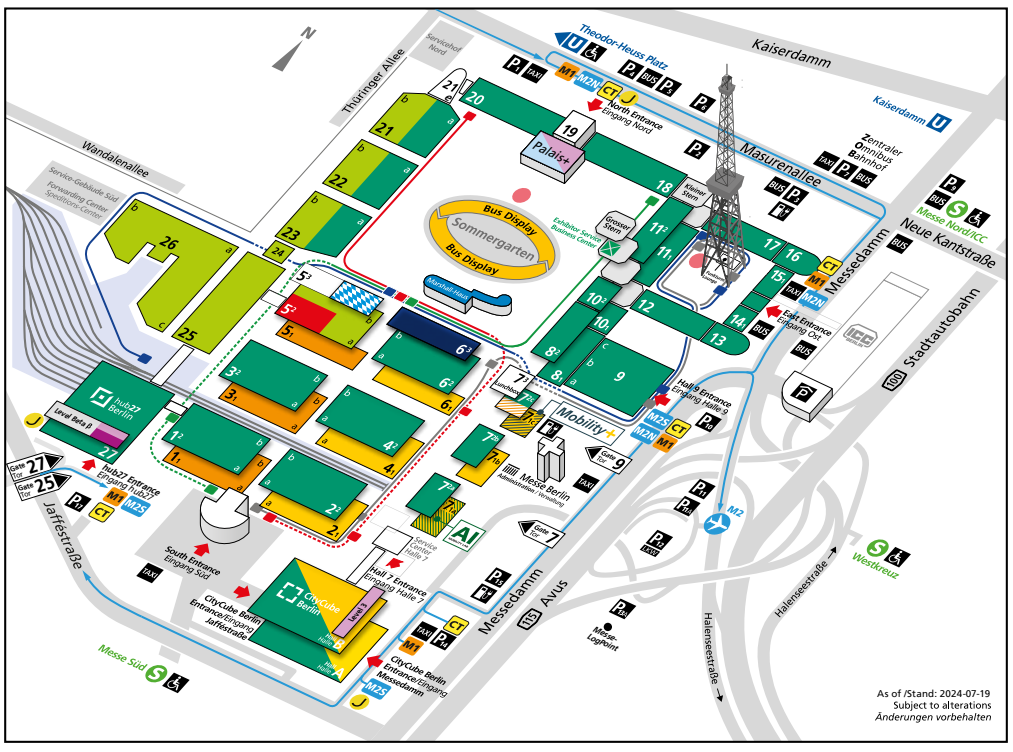
Trade visitor pass Online (9.00 a.m. – 6.00 p.m.)

Day ticket	60 euros
Day ticket Friday (9.00 a.m. – 4.00 p.m.)	50 euros
Permanent ticket	90 euros
Day ticket Campus*	14 euros
Permanent Campus*	30 euros

*for pupils, trainees and students

TICKETS ONLINE ONLY!

Ticket sales and voucher redemption will take place exclusively online. There will be no ticket office at the event.



Shuttle Lines · *Shuttlelinien*
- M1 Olympischer Platz P+R
- M2N BER – Expo North · *Expo Nord*
- M2S BER – Expo South · *Expo Süd*
- CT City Transfer

Fairground Shuttle · *Geländeshuttle*
- Fast Shuttle South Entrance – Hall 18 *Eingang Süd – Halle 18*
- South Entrance – Hall 20 *Eingang Süd – Halle 20*
- South Entrance – East Entrance *Eingang Süd – Eingang Ost*
- East Entrance – Outdoor Display *Eingang Ost – Gleis- und Freigelände*

Exhibition grounds InnoTrans 2024

- Railway Technology
- Interiors incl. Travel Catering & Comfort Services
- Railway Infrastructure
- Tunnel Construction
- Public Transport incl. Mobility+ AI Mobility Lab
- Outdoor Display · Gleis- und Freigelände
- Bus Display
- Opening Ceremony · Eröffnungsveranstaltung
- InnoTrans Convention
- Speakers' Corner
- InnoTrans Campus
- Business Lounge (Marshall-Haus)
- Press Center · Pressezentrum
- FoodCourt · Restaurant
- Jelbi hub shared mobility Pickup & Drop-off for rental two-wheeled vehicles Mobilitätsflächen für Miet-Zweiräder

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