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The latest news & reviews from the industry

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*Bringing a Freight Line Back
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Issue Three 2019 – Rail Live Special



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Letter from the Editor

Dear Readers, Rail Live 2019 will take place later this month (19–20 June). It will take place at the Quinton Technology Centre in Warwickshire.

On our front cover you will see Porterbrook's FLEX trains – a project converting British Rail Class 319 electric multiple units into Class 769 FLEX trains, which are bi or tri-mode multiple units. As Class 769 trains they can run on electric (overhead AC or third rail DC power) and diesel power. At InnoTrans in September 2018 it was announced that one Class 319 unit would be converted into a hydrogen train – the HydroFLEX. This unit would get a fuel cell instead of diesel engines. Developed in conjunction with the Birmingham Centre for Railway Research and Education (BCRRE), this train will aid the future development of hydrogen trains across the British rail network. This HydroFLEX will be on display at Rail Live. Hydrogen technology for the rail sector is becoming an increasingly established avenue to explore. The railways started with steam, and now, thanks to hydrogen technology, with steam being one of the emission products, they are coming full circle.

BCRRE, together with the Rail Alliance, will give a talk at Rail Live entitled "Driving Practical Innovation in Rail". You can attend this on 20 June at noon in Theatre 1. Another major organisation speaking at Rail Live will be HS2. They will give a presentation under the heading "Project Update and Supply Chain Opportunities". Listen to this at 2:30pm on 19 June, also in Theatre 1.

And why not hear about HS2's view on hiring and workplace EDI? In "Equality. Diversity. Inclusion. This Is Not Altruism." (p.34) we summarise the key points made by Mark Lomas, Head of EDI at HS2, at Railtex.

Another very interesting launch occurring at Rail Live 2019, in addition to the HydroFLEX, is Vivarail's fast charging system. The company developed it to recharge the batteries of its D-Train, meaning the process only takes a few

minutes. Like the FLEX trains, Vivarail's vehicles are converted from old stock, in this case London Underground Class D78 units. Vivarail says its battery-powered train has a range of 60 miles between charges.

Last month, the new Hitachi Class 800 trains entered service for LNER under the brand name 'Azuma'. Assembled at Hitachi's Newton Aycliffe plant, these trains are part of the Intercity Express Programme. These trains also operate for Great Western Railway as Intercity Express Trains, where they are Class 802 trains, in part to cope with the greater gradients along the route and with the longer stretches of non-electrified track. At Rail Live, however, we will get to see one of LNER's Azuma trains on display. If you want to read more about what's happening at Rail Live this year, look no further than p.6 of this magazine!

We are publishing issues 4 and 5 of our magazine in close conjunction. On 2 September we are publishing our Railway Interchange (USA) magazine, followed by our Trako (Poland) magazine a week later. If you would like to be represented on our website or in either of these magazines, please contact Andrew Lush at al@railway-news.com.

Please enjoy our 3rd issue of 2019!




railway-news.com

ANDREW LUSH

Director
al@railway-news.com

JOSEPHINE CORDERO SAPIÉN

Editor-in-chief
jcs@railway-news.com

NICOLA BROWN

Head of Sales
nb@railway-news.com

AMBER GUY-KEMP

Head of Client Content
agk@railway-news.com

GUY RAYMENT

Graphic Design

FIONA FLYNN

Digital Marketing
ff@railway-news.com

A2B Global Media Ltd

Third Floor
11–15 Dix's Field
Exeter EX1 1QA
United Kingdom

Office: +44 (0)1392 580002

Mobile: +44 (0)7432 725001

Email: info@railway-news.com

Website: www.railway-news.com

If you would like to submit editorial content, or you are interested in giving an interview for the magazine, please contact **Josephine Cordero Sapién**.

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Tommaso Spanevello discusses the new European rail supply industry’s vision on digitalisation

p.22 Holdtrade Atlantico – Bringing a Freight Line Back to Life in Colombia

Leonardo Suarez, the co-founder of Holdtrade Atlantico, spoke to Railway-News about his company’s plans to reinstate a freight railway in Colombia, a country that’s had more than its fair share of political struggles

p.34 Equality. Diversity. Inclusion. This Is Not Altruism.

Mark Lomas from HS2 spoke engagingly at Railtex why EDI was good business, why it was necessary and why it wasn’t about replacing one cohort with another. Our editor, Josephine Cordero Sapién, was in the audience

p.45 UPCOMING EVENTS

June 2019 – July 2019



The UK's 'premier hands-on rail event'

June 19/20 will see a unique array of new products, plant and speakers all in one place for an exhibition designed to showcase the entire rail industry.

Ground-breaking innovation, live demonstrations and an address by the Transport Secretary are all planned for the only exhibition bringing together the entire UK rail industry in a live environment.

Rail Live on June 19/20 will see the debut of Britain's first full-sized hydrogen train - Porterbrook's HydroFLEX - among a range of rolling stock, plant and equipment. More than £0.5bn of equipment is expected to attend, allowing visitors to evaluate thousands of products 'back to back' in one place. Now in its 11th year, Rail Live is expected to draw more than 250 exhibitors and 6,000-plus people.

As well as Secretary of State for Transport Chris Grayling, Rail Live speakers are to include Network Rail's Chief Executive Andrew Haines and Managing Director of Route Services Susan Cooklin, and AECOM Director of Strategic Advisory Shamit Gaiger.

The event's exclusive seminars cover subjects including opportunities offered to the supply chain, not least through NR, the Rail Sector Deal and through using data.

Held at the Quinton Rail Technology Centre, this year's Rail Live is also to include a dedicated Apprenticeship Zone, supported by Young Rail Professionals, Rail Forum Midlands and the National Skills Academy for Rail. The British Transport Police is to hold live demonstrations, with attendance including from the firearms and dog sections, and the Rail Accident Investigation Branch is also among organisations attending.

Network Rail is to be strongly represented, bringing its Kirow crane and a High Output Ballast Cleaner, as well as its unique Class 950 Track Recording Unit; switches and crossings refurbished at its Whitmoor facility; and a survey helicopter. Its input is also to incorporate a dedicated signalling zone, and supply chain village, with drop-in sessions on how suppliers can work with NR.

'Yellow Plant' on display is to include Pro Rail Services RRV Drainage Suction Unit and Doosan 270 Heavy Lift RRV Excavator, with Balfour Beatty, Vp plc and SRS all also among companies expected to attend.

Train operator Great Western Railway plans to run dedicated train services from London Paddington straight to the venue, the QRTC at Long Marston.

As well as its HydroFLEX, Porterbrook is using Rail Live to launch its 'Innovation Hub' train, which showcases more than 30 innovations from within the supply chain. Vivarail's battery-powered Class 230 will also be on show.

Why attend Rail Live? This is NR chairman Sir Peter Hendy's take on the event: "Rail Live is the premier hands-on rail event of the year – rolling stock, plant, people, techniques – unmissable. Be there!"

Rolling stock forms a key part of Rail Live. DRS 88004 Pandora was exhibited in 2018



JACK BOSKETT/RAIL



"As we invest in the most significant upgrade of the UK rail network since Victorian times, it is vital we make use of the expertise and innovation that the industry has to offer. Rail Live showcased the very best of the UK's thriving rail industry, and it was fantastic to see so many exhibitors and visitors at this year's event."

*Chris Grayling, Secretary of State for Transport
(speaking about the 2018 event)*

FOR MORE INFORMATION...

Regular updates and more information on attending Rail Live is available at www.raillive.org.uk

■ For more information on visiting the show, contact Katie Gordon-Hill at raillive@bauermedia.co.uk

■ To enquire about exhibiting or for information about sponsorship opportunities, contact Julie Howard (julie.howard@bauermedia.co.uk)
Rail Live is a trade show for individuals working in the rail industry. You will need to register with a verified industry email address to attend

Quinton Rail Technology Centre, Long Marston.
www.raillive.org.uk

CONFIRMED
SPEAKERS
INCLUDE:



Secretary of State for Transport
Chris Grayling
 (subject to parliamentary business)



AECOM Director of Strategic Advisory
Shamit Gaiger



NR Chief Executive
Andrew Haines



NR Chief Rail Technology Officer
Andy Doherty



NR Director of Supply Chain operations, Route Services
Rob Morton



InnovateUK Innovation Lead Rail
Kelvin Davies



MD of Route Services, Network Rail
Susan Cooklin

"Rail Live is where the people with solutions get together with the people with problems, which all adds value to Network Rail as the client. Day 1 of Rail Live, including the Plant Awards, is my favourite day of the working year."

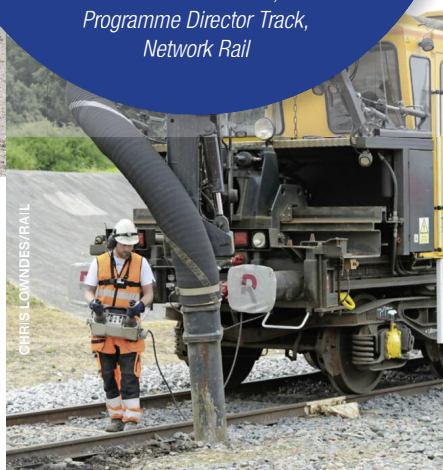
Steve Featherstone,
 Programme Director Track,
 Network Rail



'Yellow Plant' at
 Rail Live 2018



JACK BOSKETT/RAIL



Demonstrations are a key part of the Rail Live experience. Railcare's Railvac OTM Ballast Vacuum Extraction System was at the 2018 show



At Rail Live 2018, the BTP policing at heights team demonstrated the skills need to safely remove a protester from a train roof

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Beyond the Digital Buzzwords:

The New European Rail Supply Industry's Vision on Digitalisation

By Tommaso Spanevello, UNIFE

In recent years, digitalisation has been advancing at increasing speed across all industrial sectors, public entities and society at large; and the rail sector is no exception. While sometimes perceived as being conservative, the truth is that rail transport has always been a frontier of technological progress, with the supply industry leading the way. With digitalisation, the pace of change in the sector has moved up a gear. There is a tangible confidence and optimism, shared by all rail actors, in the way digital technologies have the potential to create new growth, more efficient transport networks, strengthened safety, more efficient logistics and better use of the existing infrastructure.

Back in September 2016, UNIFE launched its first 'digital manifesto' for European railways, outlining the necessary steps for the rail sector to keep pace with disruptive technologies and services. Three years on, the most recent advances of rail in the digital arena have certainly shown that there is a remarkable level of engagement by the whole sector. Therefore, a new digital vision from the European rail supply industry – with new priorities and ambitions – was deemed necessary in order to embrace the latest digital concepts & trends. On 15 April this year, UNIFE released its new Vision Paper 'Digital trends in the rail sector', highlighting once again how vital it is for rail transport to maintain its commitment to making digitalisation not merely an objective in itself but rather a means to achieving more ambitious and overriding goals.



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Concurrently, we continue to pay a high degree of attention to the initiatives taken at EU-level by the European Commission, European Parliament and Council. The European rail supply industry is confident that EU legislation and regulations shall support and facilitate the process of digital transformation in transport and the rail sector in particular, whilst also providing the necessary tools to safeguard this process.

A Comprehensive Look at UNIFE's Vision Paper

In order to present the Vision Paper, we must start with the end-customers, namely the final user of the rail transport chain – either the individual passenger or the freight load. UNIFE believes that the ultimate benefit of the 'final transport user' remains at the heart of every digital transformation within the rail sector. That is the core around which the European suppliers and manufacturers have built their new digital vision.

Five majors interrelated 'focus areas' have been identified as key for enabling Europe's rail sector and its supply industry to achieve the ambition of enhancing the experience of rail passengers and optimising logistics and boosting capacity for carrying freight:

- **1) Big Data**
- **2) Cybersecurity**
- **3) Artificial Intelligence (AI)**
- **4) New mobility services**
- **5) Digitalisation of freight logistics services**

The first two subjects, Big Data and cybersecurity, can be assessed together due to their strong mutual interlink. On the one hand, the importance of effectively collecting, managing and processing data is being increasingly acknowledged in the rail sector. In fact, the huge amount of data produced by the rail system can be turned into relevant information which, subsequently, can be used for targeted, effective decisions. Data gives actionable insight, providing the business intelligence to enhance performance and optimise strategies. On the other hand, if processing data contributes to making rail transport safer and more efficient for both passengers and freight, it also exposes it to cybersecurity risks. Indeed, as rail exploits the benefits of digitalisation, cyber-attacks become ever-more sophisticated, versatile and dynamic.

Arguably, understanding how Big Data and

cybersecurity interrelate can lead the rail sector to assess how it can take full advantage of the available data, whilst also protecting that data effectively. First and foremost, we believe that increased transparency regarding the categorisation of data in the rail sector is necessary, therefore promoting a more collective view about which data may be shared among stakeholders. Moreover, adequate rules to provide a framework for data and information-sharing across the whole sector should be established, in order to fully harness the benefits of Big Data. At the same time, UNIFE considers essential the development of targeted cybersecurity-related skills, notably when it comes to the detection of and response to cyber-threats, as well as increasing the cyber-awareness regarding cyber-threats within each company and organisation. Eventually, security-by-design would be another crucial element for an effective cybersecurity strategy. In practical terms, this means increasing the focus on security aspects during the design process of a product, giving them the required priority and ensuring compliance with relevant regulations and standards at an early stage.

Following further across UNIFE's new vision, as the ongoing changes in land transport systems enter the next phase in their evolution, few emerging technologies offer as many opportunities for the future of rail transport as Artificial Intelligence (AI) promises to do. In this context, UNIFE believes that rail should become a priority area for strategic investments in Artificial Intelligence. Arguably, given that rail is the most efficient mode of land transport – providing low-carbon mobility combined with high levels of energy efficiency, safety and capacity – we consider that rail transport offers unrivalled potential for realising the societal benefits of Artificial Intelligence. As a matter of fact, AI-related applications can be employed in a number of different segments of rail transport systems. European rail suppliers and manufacturers identify, in particular, enormous potential for AI-based technology to be applied in the areas of train operations & autonomous driving and mechanisation & robotisation.

The implementation of AI solutions in the area of autonomous driving is of particular importance for the European rail supply industry. Autonomous trams, metros and trains (passenger and freight transport) can indeed contribute to significantly increasing the capacity of rail networks. Assessable and certified AI-based technologies for safety-critical applications will be necessary to unlock the potential for autonomous driving – notably, this step would be carried out through new standardised certification

processes and the possible creation of extensive open benchmark data sets. Furthermore, the European rail supply industry sees a significant scope for further mechanisation and robotisation in the building and maintenance of rail infrastructure. In this regard, AI-based technologies, fostered through machine-learning, could be used during maintenance execution and eventually become an essential element in multi-purpose equipment.

Nevertheless, UNIFE is fully aware of the regulatory complexity linked to the deployment of AI applications – even beyond our sector – which may ramp down the commercial use of AI-based products in the market. Accordingly, the relevant standards and regulations should be carefully reviewed and revised as necessary, taking the emerging role of AI-based technologies into account whilst also ensuring the highest-possible levels of safety. The importance of rolling out AI-based solutions in a responsible and fully transparent manner must be highlighted, to help advance their usefulness vis-à-vis society and consumers (overcoming the ‘trust’ issue) while at the same time promoting their uptake.

Another part that UNIFE’s new Vision Paper tackles is the emerging mobility market in which transport services are offered in an integrated way, beyond the ‘one single-mode’ solution, covering many regions and countries simultaneously – for a fully seamless mobility experience. New mobility services, which are particularly visible in cities and urban/regional areas, are fostered by digital technologies. In this regard, the increased availability of data on users’ travel patterns will allow transport authorities and service providers, across all modes, to better predict the demand and also understand their customers’ behaviour – driving targeted commercial and operational actions.

As digital technologies pave the way for new tools and services that can provide a seamless door-to-door mobility chain, based on integrated multimodal transport systems, the role of rail assumes a particular significance. Rail transport solutions, including metro tramways, tram-trains and suburban trains, already offer a number of assets in terms of capacity, CO2 emissions, land use and safety. Through the combination of these traditional assets, together with the opportunities brought in by digital mobility trends, including the effective collection and management of the data available that we mentioned earlier, rail will be able to provide innovative, multimodal and tailor-made tools for customers based on flexibility, high performance and minimum environmental impact.

Finally, the traditional freight and logistics business is another area which is being deeply transformed by digital applications. Indeed, digitalisation would enable logistics actors to maximise benefits from a digitised logistics process with intelligent services – e.g. end-to-end logistics planning & visibility with efficient sharing of information within the supply chain. The European rail supply industry is keen for rail freight to be seen as part of a global digital logistics ecosystem, through the swift deployment of advanced technologies. In this regard, UNIFE and its members have developed the European Rail Industry Freight Agenda (ERIFA), highlighting the most important current and emerging technologies which could contribute to driving change in the rail freight and logistics business.

The Role of Research and Innovation

No vision on digitalisation would ever be complete without stressing the fundamental role of Research and Innovation (R&I) in driving ahead the digital transformation in rail transport. In its ‘Rail 2050 Vision’, the European Rail Research Advisory Council (ERRAC) outlines how transformative scientific advancements have the possibility to change technology dramatically. Digitalisation is at the core of this vision, notably targeting the automation of the railway system and intelligent assets lifecycle management.

The five focus areas explored by UNIFE in our new Vision Paper are also at the core of the work carried out by the Shift2Rail (S2R) Joint Undertaking which – by supporting numerous R&I projects – is enabling Europe’s railway sector to develop various value-adding products and services. Notably, it is worth mentioning Shift2Rail’s Innovation Programme (IP) 4 ‘IT Solutions for Attractive Railway Services’, and Innovation Programme (IP) 5 ‘Technologies for Sustainable & Attractive European Rail Freight’. The objective of S2R IP4 is to build a digital mobility ecosystem combining different travel segments, offering intermodal transport journeys customised to users’ preferences – with seamless access to all relevant services related to their journeys. The activities within S2R IP5 aim at the optimisation of the overall rail freight transport time, for example by stepping up the average speed for rail freight operations whilst ensuring that rail freight is able to better operate in conjunction with passenger traffic, in order to maximise the utilisation of existing networks.

Building on the success of Shift2Rail, a refocusing of collaborative rail-related research activities is needed

for the post-2020 programming period. In particular, the increasing need for shared mobility, customer-focused, digital and intermodal transport tools – as well as the roll-out of new technologies – should be guiding principles for an extension of the Shift2Rail JU (or a 'Shift2Rail 2'). This is why UNIFE strongly advocates an extension of the Shift2Rail Joint Undertaking within the forthcoming Horizon Europe Framework programme (2021–2027). 'Shift2Rail 2' should become the hub of the breakthrough innovation streams of the rail sector in the future.

Co-operation as the Pivotal Factor for Successful Digital Transformation

UNIFE is convinced that co-operation among all rail stakeholders is the one overarching element playing a pivotal role in ensuring that our sector successfully embraces the digital transformation and masters the latest trends and services. A co-ordinated approach towards digital and technological development within the rail sector is therefore necessary. In this regard, rail suppliers and manufacturers are keen to engage in the European Commission's recently established 'Digital Roundtable' gathering the key players in rail transport.

First and foremost, close co-operation between suppliers, operators – including public transport operators – and infrastructure managers will be vital in order to eradicate barriers to data sharing in the rail ecosystem. Following this further, exchanging knowledge and strengthening synergies with other concerned businesses on cybersecurity will help rail stakeholders to develop and implement effective measures to protect their systems and services against cyber threats. Co-operation and collaborative research are also at the heart of the Shift2Rail JU model, bringing together the whole of rail innovation. Finally, as much as in the case of cybersecurity, we understand that close and transparent co-operation between suppliers, railway undertakings and infrastructure managers will be needed in order to maximise the contribution of AI-based technologies to the rail sector.

With its new Vision Paper, UNIFE commits to a twofold purpose: to bring the European rail supply industry's views and objectives into the centre of the digital debate; and to effectively engage in a fruitful dialogue with decision-makers and other key stakeholders – in the rail sector and more widely. Always acknowledging that all products and services making use of digital technologies must be developed for the benefit of our customers, economy and society.

Rugged AIoT Platforms Enable Smarter, Safer and More Reliable Railway Operations



Railroad Intrusion Detection



Onboard Video Security



Train Station Surveillance



Railroad Hazard Detection



PIS-5500 Series

High Performance, Fanless, Real-Time Video/Graphics Analysis Platform Powered by Intel® Core™ i7 Processor and NVIDIA GPU MXM



HPERC Series

Extreme Rugged, VITA 75 Intel® Xeon® Processor Based, Small Form Factor Computing Platform with NVIDIA GPU MXM for Enhanced Graphics Processing

As a global provider of advanced Edge Computing products, ADLINK is adding new AI & IoT (AIoT) platforms to its extensive rugged rail portfolio, aimed at enabling smarter, safer and more reliable railway operations. By delivering GPU accelerated computing, these EN 50155 compliant platforms are designed to not only meet harsh operating environments for both wayside and onboard deployment, but also provide ideal solutions for real-time video/graphics analysis applications that are vital to today's increasingly complex operations. ADLINK's application-ready AIoT platforms help system integrators effectively shorten development cycle, speed time-to-market and gain competitive advantage.

Transforming the Rail Industry with AI and IoT Technologies

Artificial Intelligence (AI) technologies are being adopted globally by all industries to drive efficiency, improve productivity and reduce costs.

The rail industry is no exception. Fuelled by intelligence from AI-driven systems and applications, railway operations are becoming safer, smarter and more reliable, significantly enhancing the passenger travel experience and freight logistics services. For rail transportation, AI can provide improvements including fast and



convenient ticket-free check-in, and accurate arrival-time predictions, personalised infotainment and on-board services, real-time track health diagnostics, and rapid response in an emergency.

These AI-driven applications only function with proper data input that is collected by massive numbers of Internet of Things (IoT) devices installed in stations, on trains, and along tracks. A successful implementation of



such rail applications requires a seamless integration of AI and IoT technologies. By leveraging more than 20 years of expertise in developing highly reliable and available embedded computing systems, ADLINK brings advanced AIoT (AI and IoT) solutions to rail transportation, enabling customers in developing a variety of applications that can deliver true value and performance. ADLINK is committed to helping customers gain competitive advantages by allowing them to focus their development efforts on differentiating their end applications.

Rugged AIoT Platform for Real-time Video/Graphics Analytics

Powered by an Intel® Core™ i7 processor and integrated NVIDIA Quadro GPGPU module, ADLINK's EN50155-certified PIS-5500 AIoT platform is not only ruggedised for both wayside and on-board deployment with its

wide range DC input and isolated I/O design, but also provides an ideal edge solution for real-time video/graphic analysis applications that are vital to today's increasingly complex railroad operations. The target applications include but are not limited to:

- **Passenger information systems**
- **Railroad intrusion detection**
- **Train station surveillance**
- **On-board video security**
- **Railroad hazard detection**

ADLINK's PIS-5500 is being deployed commercially by leading rail system integrators worldwide. In one application, the intelligent platform is installed on special rail inspection trains to process captured images of key wayside equipment in real-time. With a sophisticated algorithm driven by parallel computing and deep learning, the application can effectively identify potential equipment faults at a train speed of 120km/h, and raise the alarm to notify maintenance crews. In another application, the PIS-5500 is used in a train station control office to analyse the real-time

video stream received from the platform. The application is able to not only detect suspicious behaviours and trigger alerts, but also conduct post-event analyses. To meet varying application requirements, the PIS-5500 is also available in variants featuring an additional two USB 2.0 via M12 connectors and two 2.5" SATA 6Gb/s drive bays, as well as a version supporting +12VDC power input only.

EN 50155-Certificated Driver-Machine Interface Panel Computer

Powered by the Intel Atom® x5-E3930 processor (formerly Apollo Lake) and featuring a 12.1" (4:3) high-resolution colour display, 5-wire resistive touch screen and securable I/O interfaces, ADLINK's DMI-1210 is its latest Driver-Machine Interface (DMI) touch panel computer, designed specifically for deployment as a Human-Machine Interface (HMI) unit for driver's desks, control panels for passenger information systems, surveillance system control/display units or in railway diagnostics and communications applications.

The DMI-1210 is an EN 50155-certificated, cost-effective, commercial-off-the-shelf (COTS) driver interface that offers train radio display, electronic timetable, and diagnostic display functions and additional functionality such as train data recorder. The DMI-1210 supports full range DC power input from +16.8V to +137.5V DC. Optional MVB, GNSS, 3G/LTE, WLAN, and Bluetooth through add-on modules give system integrators the necessary tools to expand use case possibilities.

With ADLINK's built-in Smart Embedded Management Agent (SEMA) featuring management and status LEDs on the front panel, the DMI-1210 provides easy and effective health monitoring and system maintenance. In addition, system robustness and reliability are provided by careful component selection for extended temperature operation, isolated I/Os, conformal coated circuit boards, securable I/O connectors and high ingress protection rating (IP65 front, IP42 rear).

ADLINK's Expertise and Commitment to Rail Transportation

ADLINK is a premier supplier to the rail market, enabling both wayside and on-board applications, such as Communications-Based Train Control (CBTC), Automatic Train Protection (ATP), Automatic Train Operation (ATO), Automatic Train Supervision (ATS), Computer-Based Interlocking (CBI) and Train Control Center (TCC), Passenger Information, and Passenger WiFi. ADLINK offers not only a field-proven, cost-effective and extensive COTS portfolio, but also a variety of fast time-to-market custom solutions with best-in-class ODM capabilities. Designed to meet harsh operating requirements, ADLINK's industry standard-compliant products provide customers with a great level of flexibility in technology and roadmap planning.

ADLINK's long-held support of COTS technology and open standard systems enables flexible platforms that are modular, scalable and rugged enough for extended deployment in both brown and greenfield projects. By leveraging its long-standing



strategic partnerships with major hardware component and software vendors, ADLINK ensures best practices in product obsolescence and lifecycle management to deliver the supply longevity required by the industry. In addition, ADLINK offers design services in every major geographic region, benefiting customers with increased responsiveness, short

delivery lead-times and ease of doing business. ADLINK focuses on continued development to build an even more comprehensive and cost-effective product portfolio to help customers effectively mitigate budget constraints while smoothly and seamlessly taking on technology migration and product integration.



Innovation from Unipart Rail delivers:



Optimised Cost



Reduced Risk



Increased Performance



High Levels of Safety



Product & Service Innovation



Digital Systems



High Social Responsibility



Unipart Rail: Value through Innovation



Innovation for innovation's sake is not a good position to take.

It's critical that innovation delivers value, helping the railways to improve and deliver a better service to operators and passengers. Our value in innovation is added though:

- **Increasing safety**
- **Optimising cost**
- **Reducing risk**
- **Improving performance**
- **Incorporating digital solutions**
- **Increasing corporate responsibility**

At Unipart Rail we carefully assess both our own innovations, and those of the innovators we partner with, to ensure that there are many good reasons to make the change. This article takes a look at some of our innovations – many

of which will be at Rail Live in June. Come along to the show and see them for yourself.

DiBloC

Park Signalling has developed a Digital Block Controller to allow a section of single line railway to be controlled without the need for end-to-end cabling or on-board equipment. The product shares many of the same operational and safety concepts of traditional electric key token machines, which have been in operation on railways around the world for many years. It is designed to communicate digitally (optionally wirelessly) through IP-based systems, and include provision for TPWS and section signal release.

- **Values: improving performance, reducing risk, incorporating digital solutions**





MT04S Technician's Terminal

The new MT04S Technician's Terminal has recently achieved Network Rail acceptance, and provides the means of applying and removing technician controls, such as to control the stop / start interlockings, track circuit occupancy, route barring, aspect / points disconnection / disablement and temporary approach control. The terminal can display data link telegram contents and panel requests. It provides additional functionality over the original terminal, such as built-in event analysis and the labelling of trackside functional module input / outputs when monitoring. This is far easier to use than with the original terminal.

- **Values: improving performance, reducing risk, optimising cost, incorporating digital solutions**

REMITdetect

Another piece of clever innovation from Park Signalling is the REMITdetect system to monitor and report missing and corrupt

telegrams. The system provides not only a continuous count of missing telegrams but also a count for individual telegram addresses which is particularly helpful in diagnosing the location of specific data link faults.

- **Values: improving performance, reducing risk, optimising cost, incorporating digital solutions**

Power Products

Over recent years, the requirement for signalling power has evolved, with the introduction of Class II and the Functional Supply Point – the FSP. To support this evolution, we have developed a complete range of signalling power products, which includes applications for new installations through to legacy upgrades and SIN 119, positioning us as a single source partner for all signalling power requirements.

Our acquisition of Samuel James Engineering also extended our capabilities throughout the power supply sector, now giving us end-to-end power management solutions for the railway. The full range of products now covers:

- **Functional Supply Points – FSP01/02, FSP03 and FSP04**
- **Terminal and earth continuity boxes**
- **Transformers, enclosures & pedestals**
- **Earthing products**
- **Cable products**
- **PowerU annex**
- **Values: improving performance, reducing risk, increasing safety, optimising cost**

Aqueous Guard

When protecting the exterior and interior hard surfaces of trains there is no room for compromise. That's why train operators and maintainers are using Aqueous Guard, an innovative ceramic clear-coat that is designed to protect surfaces from dirt, grime and graffiti. Trains spend less time being cleaned and more time in traffic.

- **Values: improving performance, optimising cost**



McCulloch

The range of on-track lifting and handling equipment from our partner, McCulloch, means that sleepers, rail panels and rail lengths can be quickly and safely lifted into position with fewer operatives, greater accuracy and much more quickly than through more manual methods.

- **Values:** *improving performance, reducing risk, increasing safety, optimising cost, increasing corporate responsibility*

TrackPan

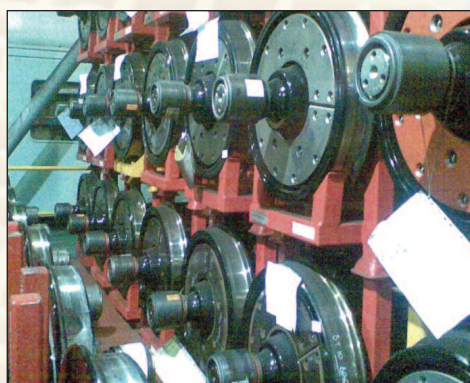
The Unipart Rail TrackPan system is designed and engineered to protect the environment from contamination caused by spillage and leaks on the rail network. It significantly reduces the risk of costly clean-up and regulatory fines.

The TrackPan collector system is modular and fits into existing track without the need to lift or modify the track.

- **Values:** *improving performance, optimising cost, increasing corporate responsibility*

Ferrartis

The conventional method of stacking train bogies is to have each bogie positioned on top of



another bogie. This means the wheels cannot be regularly turned – this could lead to brinelling of the bearings, ultimate failure and expensive replacement. The Ferrartis solution consists of a base frame and intermediate levels resulting in a dynamic stacking system which is 3 units high, to provide storage capacity for a total of 27 tons, and allowing the wheels to be mounted on custom-made Ferralon 2TX rollers so that the wheels can be rotated at regular intervals during the storage period. The design of the stacking frame is adaptable to a range of wheelbase dimensions and can be adapted to be used by different bogie manufacturers and maintenance organisations.

- **Values:** *improving performance, reducing risk, optimising cost*



OilAway

Oilaway from Unipart Rail provides a solution to streamline the recovery, recycling and replenishment of oil to and from heavy-duty powertrain components. The OilAway QuickDrain and Refill Systems provide an automated and safer end-to-end, oil drain, storage and replenishment process to support maintenance operations, thereby reducing costs. Savings can be generated through reduced cleaning and labour costs, improved service times and enhanced train performance and longevity.

- **Values:** *improving performance, reducing risk, optimising cost, increasing corporate responsibility*

UNIPART
RAIL

Bringing a Freight Line Back to Life in Colombia

Colombia is a country that has seen more than its fair share of political struggles. At the same time it is filled with opportunities, including for the rail sector. Railway lines in the country have fallen into disuse. One company, Holdtrade Atlantico, wants to reinstate a freight railway line in the country. Holdtrade Atlantico's co-founder Leonardo Suarez spoke to Railway-News about his company's plans, their benefits and the opportunities from Colombia as a whole.

Railway-News:

You have plans to operate freight trains in Colombia. What gave you the idea and can you go into a bit of detail about your vision?

Leonardo Suarez:

In 2011 the former president of Colombia visited the UK and made an open invitation to British companies to take advantage of the infrastructure opportunities that were coming up in all sectors.

We realised the Colombian

government was keen to bring back to life strategic portions of the former state-owned railway network, hence, decided to set up a local operation and with the assistance of the British government, investigate further.

Colombia is a country where the big cities are located inland, high up in the Andes mountain range. For instance, Bogotá – a city of over 8 million people – is isolated on a plateau at 2,500 meters above sea level and 1000km from

either the Atlantic or the Pacific.

Colombia's dependency on imported goods is astonishing. Despite being a country blessed by year-round sunshine, being located in the tropics, it imports a great amount of agricultural products. However, the country is finding niche markets for agricultural products where it can compete against well-established players; good examples of this are coffee, avocados, flowers, and bananas, to name a few. Those goods are harvested inland with distances of over 1,000km to the main ports, so their export requires a competitive transportation solution.

On the other hand, Colombia is a country of 45 million people that relies on imported manufactured goods. Moreover, it is a country where social mobility is taking place at a fast pace. For instance, between 2002 to 2017 the middle class increased from 10% of the



population to almost 35%, hence, the demand for imported products is rapidly increasing, increasing demand on reliable and competitive modes of transport for them.

Furthermore, almost three quarters of Colombia's population lives in big cities, creating focal points for transportation in certain areas of the country.

Recently, the country was accepted as the 37th member of the OECD, hence it needs to tackle its challenges to render it more competitive. Reducing transportation costs is a key part of these challenges. We realised that being at the forefront of changing the logistics systems in Colombia was a great opportunity, as trains are not only the most cost-effective, but also the most environmentally friendly way to move cargo over long distances!

Our vision is to become the number one freight rail operator in country and a key actor in the revival of the much-needed countrywide railway network.

RN: *You're planning on using an existing railway line. When was it built and what is its current status?*

LS: The state-owned Colombian railway network reached its peak in the mid-seventies when the country had almost 3,500km of track connecting the country's major cities and the two oceans. Today the country has less than 400km of operational track.

The great majority of the national railway network in the country goes up and down the Andes mountains, where tight curves and steep gradients are the norm. This is actually the reason why Colombia has 3 feet narrow gauge track. One needs to remember



that in the middle of the 19th century narrow gauge was the most cost-effective way to build railways for those challenging topographical conditions.

In the 1950s a 767km section of railway track was built over flat terrain between La Dorada and Santa Marta. La Dorada is only 200m above sea level, hence, this track section is extremely flat. This section has been known since as the Central Railway.

Due to bad public policies and the lack of safety outside the big cities the railway infrastructure countrywide was abandoned. In 1999 a group of coal mining companies located at the northern part of the Central Railway realised that they could make use of that abandoned infrastructure and negotiated with the government to become the concessionaire of almost half of the national railway network in exchange for being able to use the 245km they needed to move their coal between Chiriguana and Santa Marta.

One of the concessionaire's obligations was to rebuild and maintain almost half the former national railway network. They went for the low-hanging fruit, which was the flat section of track

between Chiriguana and La Dorada south of the section they use to haul their coal. Unfortunately, weather-related damage from the heavy rainy seasons in 2010–2011 curbed their enthusiasm, at which point they renegotiated their railway concession and handed the unused infrastructure back to the Colombian government.

When the government got the railways back it decided haphazardly to fix them and bring them back to life, starting first with two sections of track, with La Dorada to Chiriguana being the most important one. This section is strategically located: 90% of the population of the country live less than 200km away from it, making this transportation axis the spine of the country!

RN: *Colombia has had decades of political instability and unrest. How does an environment like that affect your plans? The Colombian government still has trouble with FARC dissidents, for example.*

LS: This project would have not been able to take place 20 years ago. No one will argue with Colombia being at the verge of being a failed state at the turn of



the century, but luckily the country changed its trajectory since 2002. Thanks firstly to a government that was adamant to decimate the insurgent groups, and secondly to a subsequent government that had its focus on rebuilding its institutions. This change has put the country in the world's spotlight for things it had not been known for before, such as a place to visit and to invest. As an example, Colombia was named by the Times as second destination to visit worldwide last year!

A proof of this is that by 2011, when we started looking at this opportunity, Foreign Direct Investment in Colombia had boomed to US \$13.5 billion from around \$2.4 billion in 2000.

Colombia has come a long way since, but it is true that there are still key challenges. We firmly believe that the current government will continue building on the success of its two predecessors and that it will keep learning from their mistakes and will work even harder on strengthening the present law enforcement outside the big cities, consequently making Colombia a place even more attractive to foreign investment.

It is also true that Colombia has still a long way to go to be a fair and equal society, however an opportunity to run trains over such a long distance – to put this in context we are talking about the same distance than from Dover to Edinburgh – will never again materialise in the developed world. Consequently, we weighed the pros and cons and reached the conclusion that having the first mover advantage is an opportunity one cannot miss.

Finally, we truly believe that this project is a big contributor to assist the country to overcome its challenges, railways worldwide are assets that unify people. Moreover our goal is not to focus exclusively on moving mineral resources but to carry a wide range of general cargo instead. We see this as a project for the benefit of the people of Colombia and to assist in improving the country's competitiveness.

RN: *What are the key benefits of reviving this railway line over how freight is currently transported in the country?*

LS: Cost is a key benefit, a multimodal solution that involves trains will provide customers with

a transportation solution that is between 5 and 12% cheaper than current alternatives.

Pollution is also a key aspect, moving cargo by train will mean cutting fuel consumption by almost 90%. Less diesel burned by trucks equals fewer contaminants being released into the atmosphere.

Efficiency is another key aspect; one train will carry the same cargo as 67 trucks. Those are 67 sets of cargo documents that need to be processed coming in and out of the port, with the train requiring only one, so it will make logistics more efficient and will help to decongest a rather busy port.

Another important benefit is being able to have a more reliable service. Trains will have a regular timetable, which means customers will have a more reliable service which will allow them to plan their supply chain better and reduce inventory.

RN: *Where are you at with this project? Have you received much support? In particular, how have you made use of the UK Prosperity Fund? What support have you had from the Colombian government?*

LS: The refurbishment of the railway track by the Colombian government has been taking its time. The plan was for it to take a maximum of two years, but it looks like it is going to be more like six years in the end.

After spending several millions of pounds over five years it looks like finally, we have lined up all the ducks in a row. We are only awaiting some key aspects of public policy to be clarified by the Colombian government.

We have already run a trial train demonstrating it can be done (*you can watch a video here* <https://youtu.be/SMlzm8oKuaw>).

Rebuilding a railway to allow any private company that has the technical and operational expertise to run trains – not only us, as we truly believe that competition and not more monopolistic positions is precisely what Colombia needs – brings its own challenges. Frankly, Colombian public institutions are not up to speed as far as running a railway network with multiple operators is concerned; therefore, the UK government has been instrumental in assisting its Colombian counterpart to build capacity in the relevant institutions and learn from the UK's vast experience and also its mistakes.

It was precisely the UK Prosperity Fund that allocated around £7 million to support the Colombian government to structure their long-term plans on the railway sector. Without this investment a project like this would be impossible.

RN: *What are your next steps?*

LS: We are currently raising funding to commence operations. The amount required is in the region of USD \$5 million in exchange for equity in the company.

To achieve that we have appointed a winning team, technical advisor is TIL (Transport Investment Ltd), a group of transport specialists with first-hand, high-level experience of rail operations in the UK, Asia, the EU and North America.

London-based fintech company Envestors – a FCA regulated corporate adviser in the UK – is

managing the planned fundraising, whilst one of the UK's top legal firms, CMS Cameron McKenna Nabarro Olswang LLP, has been retained as legal adviser.

Should anyone be interested in being part of this, they can find further details at our investment platform via holdtrade.envestry.com

RN: *What are the most difficult hurdles you still have to overcome?*

LS: The Colombian government has secured funds to look after the track in the short term from the Colombian treasury. A tender covering these works was to be awarded at the end of May.

However, this is not enough as anyone planning to run trains in Colombia needs to have certainty that the Colombian government has in place the mechanisms that will guarantee that the track remains operational and well looked after in the long term whilst making this mode of transport cost-competitive against other means of transport such as the river. The question is: how to define the mechanisms to ensure this is the outcome we expect from the outcome of the project funded by the UK Prosperity Fund.

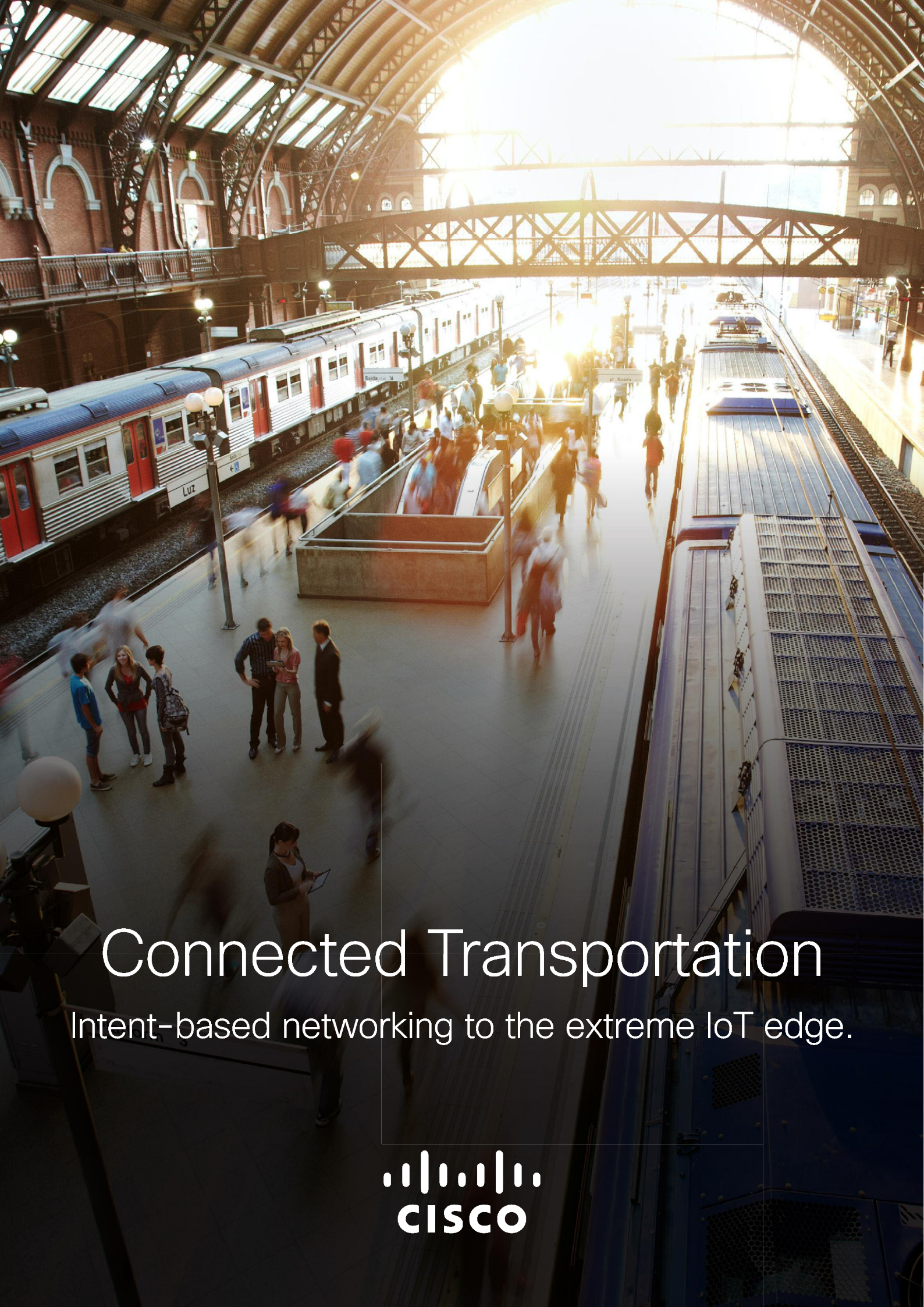
A key milestone is a new track usage tariff resolution by the Colombian government, which will incentivise the use of the railway, which is expected in the coming months.

In addition, we have seen that the Colombian government is finally taking steps in the right direction. In April this year FDN, a state-backed financial corporation that specialises in infrastructure project finance and structuring, launched a tender where world-class transport consultancy firms bid to assist the government in devising the mechanisms guaranteeing the long term viability of the railway infrastructure. We are looking forward to seeing the outcome.

RN: *What rolling stock do you intend to use?*

LS: A fleet of rebuilt diesel locomotives (EMD GT22) plus a mix of container flats and open gondola wagons has been obtained from South African rail engineering firm Genrail Pty Ltd who will provide the rolling stock and will be in charge of in-country maintenance. Initially two locos and 51 wagons will be used, rising to 13 locos and over 600 wagons by 2026.





Connected Transportation

Intent-based networking to the extreme IoT edge.



The Network in Transit(ion)

Global demand for transportation is on the rise.

Co-authored by:

Kyle Connor, IoT and Transportation Industry Principal, at Cisco

Dani Schrakamp, Global Government Market Manager, at Cisco

The past year turned out to be a success for the rail industry – outperforming the original projected growth rate, rail traffic grew at 2.9 percent for the year with virtually all segments seeing improvement.

And currently, passenger and freight are slated to more than double activities by 2050. The onslaught of connected devices and the novelty of technology trends like the Internet of Things (IoT) have opened up a new world of possibility to improve productivity, service reliability, accessible mobility, passenger connectivity, and operational cost-savings. However, the answer is still not a simple one. Siloed solutions, overwhelming vendor choice, the often-unmanageable pace of technology change, and evolving security challenges all pose some – yet, not all – very real roadblocks to achieving tangible outcomes through digital transformation.

What Does the Rail Industry Need?

Today, disruption is driving economic growth and opportunity. But organisations are feeling increasingly unsettled about their future as they are in the midst of an already dramatic transformation in the way people and goods move around.

Outlook for the future shows more integrated transportation systems that are faster, cheaper, cleaner, and safer than the conceivable options of today. In that, there is one certainty that will remain just as true tomorrow as it does today: the safe and effective movement of people and goods centres critically on foundational infrastructure. Complementary digital infrastructure will be every bit as imperative as roads and bridges.

Organisations that fail to approach networking as an integrated investment are more likely to face significant struggles or succumb to failure. The focus on interoperability to ensure effective connectivity among increasingly interdependent devices and systems will be more critical than ever before with the implementation of complex connected vehicle and automated transportation systems.

With the pace of technological advancements, standards and architectures must similarly continue to evolve and reflect required retrospective compatibility and interoperability. This presents a profound business challenge in which organisations must consider future-proof development for entirely new and currently unknown capabilities. Prudent technology investment will keep doors open

to more choice for scalability, competitive and sustainable business viability, and future success.

The beauty – and the challenge – of digital transformation is that no singular technology or vendor can meet all the needs of transportation systems. Implementation and maintenance feasibility, along with highly productive performance of network technologies are strategically important considerations. Failure to properly vet and understand the ramifications of network and communications technology choice can inadvertently lock organisations to a vendor that can impede future flexibility and growth.

One of the most visible and prevalent technology challenges pertains to network and data security. The cyber threat landscape is changing, and attackers are taking full advantage of security teams having difficulty defending both IoT and cloud-based environments. In fact, a majority of countries and regional groups expect to see, or have already experienced, cyber-attacks that extend beyond IT into OT. The implementation of security programs and system architectures must be guided by internationally recognised regulatory standards to ensure the trustworthiness of the growing numbers of connected devices that drive today's critical transportation infrastructures. Adherence to compliance will promote comprehensive cybersecurity efforts to properly assess potential vulnerabilities, implement protective and

proactive defence measures, and recruit and train specialised staff.

These trends are redefining the railway industry. How organisations respond to these opportunities and challenges will determine whether the sector remains reliable and sustainable for the foreseeable future.

Moving the World Forward

Currently, industry best practices feature fragmented networks and siloed solutions. At Cisco, we see our customers wanting more and more to move away from isolated solutions to a single multiservice architecture approach that supports all their goals and desired outcomes. And there is no denying a different approach is needed to address the growing number of connected services, systems, devices, and their mountainous volumes of data. Intent-based networking and secure IoT solutions for transportation answer that call to action.

An intent-based multiservice network can deliver diverse use cases all while treating network traffic differently based on data and service priority. Using software-defined access, a single, physical network infrastructure can be securely shared and segmented into multiple virtual networks on a per-service basis or as needed by department. Each respective network hosts its own policies, service characteristics, and security needs, which enables

consistency for simplified management. By building business and IT goals through this intent capture, organisations play a more strategic role in nurturing their day-to-day productivity, innovative development, and future growth. This allows IT to move on from acting as the intermediary and allows for automation to fine-tune the network to ensure that it meets the needs of organisations both today and as they evolve in the future. As applications, data, and user identities move to the cloud, security teams must manage the risk involved in losing control of the traditional network perimeter. Automated service segmentation works to continuously verify network users and traffic to give unprecedented insights that help to simplify complex security practices. While uniform policy deployment enables critical resiliency and redundancy of the network, the integrated approach allows for the scope, scale, and reliability to outpace evolving cyber threats.

With present and future challenges in mind, a new multiservice connectivity approach allows for the flexibility of technology choice. Open standards using varying connectivity options, whether they be MPLS, fiber, or 5G will support multiple access technologies and meet the needs across transportation use cases. The modularity of an intent-based multiservice network allows for plug-and-play deployment so that customers can adopt what they need, where and when they need it simply and efficiently. In

line with IT's growing need for a more dynamic and efficient infrastructure, networking and communication technologies will adapt with changes and evolving goals. Shared infrastructure across departments, public services, and smart solutions offsets the burden of cost for more attainable and sustainable growth. This safety net of future assurance will give organisations the confidence to expand their networks and focus on delivering tangible outcomes for their businesses.

The Big Picture

The thoughts captured here are illustrative and not meant to be exhaustive. However, it is clear that the network has never been a more critical enabler of new technologies. Networking is at the centre of connecting to the cloud, supporting the rise of the mobile revolution, and leading to a world made up of an Internet of Things. You will not be alone in pursuing success by opting into these new opportunities. Many players are already making their moves. Success will require significant transformation of business models and IT systems alike. The future need not take the rail industry by surprise, however. Between where you're going and where you want to be, there's a bridge.

We'd love to hear from you.
Email us at
connected_trans@cisco.com.

WATCH OUT! EYES SPEAK VOLUMES



SILEX, THE NEW MODEL WITHOUT COMPROMISE

Bollé Safety continues to innovate, again and again, offering you solutions adapted to your needs while preserving the optimal quality of its products.

- **No compromise on comfort:** FLEX 160° technology that fits every face perfectly, flexible bi-material temples and absolute support without any pressure points.
- **No compromise on performance:** anti-scratch / anti-fog coating, panoramic vision and ultra-wraparound protection.
- **No compromise on style:** lenses with a refined design and coloured temples by Bollé Safety.
- **No compromise on affordability:** SILEX is suitable for everyone with an excellent price/quality ratio.



SILEX

Available in clear and smoke versions.

Bollé Safety – A World Leader In Lens Technology

Life is normally full of compromises but not anymore with a new range of high-tech lens developments from Bollé Safety for the rail industry.

For any condition, in any working environment Bollé Safety has the lens for you.



PLATINUM

Bollé Safety has revolutionised eye protection with an innovation that exceeds the requirements of all international standards, especially the EN 166 K (resistance to fogging) and N (resistance to damage by small particles) options. The new, exclusive double-sided anti-fog and anti-scratch PLATINUM coating is now available on the Baxter, Cobra, Contour, IRI-s, Ness+, Rush+, Tryon, Slam+, Silium+, Atom, Backdraft, Coverall, Masterall, Pilot, Super Blast and Tracker models. It also guarantees greater safety, reliability and comfort. This

permanent coating on both sides of the lens gives the safety glasses a high resistance to scratching and to the most aggressive chemicals. It also prevents fogging. In all circumstances and at all times the PLATINUM lens innovation guarantees improved protection for your eyes.

Bollé Safety are also the only company to offer an anti-scratch and anti-fog coating on their prescription lenses as standard at no extra charge. With a range of over 20 styles to choose from the Platinum polycarbonate double-sided anti-scratch and anti-fog

lenses are the perfect solution for your prescription wearers. Also unique to Bollé Safety is the Contour – the world's first base 8 prescription wrap-around safety eye shield with Free Form Digital HD safety lens technology. Based on the market-leading Contour eye shield, the prescription version gives the wearer sports styling combined with safety and protection, while still meeting the highest European standard EN 166 / Class 1 / strength rating F. All this without the complications and distractions of an insert. A truly unique product.

This is combined with the latest pioneering lens technology, Free Form, which uses one single-point diamond to customise both lenses to each individual prescription. The diamond strikes the lens 40,000 times, re-calculating every 0.01mm using CAD technology, thus creating a higher definition with much improved peripheral vision, providing superior levels of protection.

CSP (Comfort Sensory Perception) –

A revolutionary new lens coating that provides maximum protection against UVA and UVB rays and blue light. This innovative coating is an effective solution for all activities that alternate exposure to bright light and low light, while also being suitable for extremely hot and cold temperature environments. CSP is also combined with the exclusive PLATINUM double-sided K and N anti-scratch and anti-fog coating that sustainably combats fogging.

TWILIGHT

The new Twilight technology offers the advantages of ESP but with a double anti-fog coating (on both sides of the lenses) to prevent fogging in the most challenging conditions. The technology is also anti-scratch. Designed and used in low-light conditions,



it improves contrast. Its light transmission rate is perfect for indoors or outdoors, particularly during the early morning and late evening. Twilight filters 76% of blue light.

POLARIZED

A polarising filter contains perfectly aligned crystals, which block horizontally polarised light. Acting like a vertical blind, it makes it possible to eliminate the cause of dazzle and only allows useful light through. Polarised lenses offer incomparable comfort from all reflective surfaces. The lens highly improves visual comfort by eliminating glare, reducing eyestrain/visual fatigue and improving both colour and contrast perception. Ideal for driving and all other outdoor activities.

ESP (Extra Sensory Perception)

A revolutionary new lens coating that provides maximum protection against UVA and UVB rays, that filters out over 70% of blue light (380nm to 500nm) but that still transmits over 60% of visible light. It is applied to Bollé's high-impact but scratch-resistant optically correct material based on polycarbonate with a quartz crystal coating on the front of the lens. This new lens should be provided to all outside workers to improve their level of protection and comfort.

CONTRAST

A graduated coating that gives the wearer optimal protection through improved accuracy and greater comfort. It also reduces visual fatigue. It is applied to Bollé's high-impact but scratch-resistant optically correct material based on polycarbonate with a quartz crystal coating on the front of the lens. Contrast absorbs UVA and UVB light up to a wavelength of 400 nanometres and also filters out more than 30% of blue light. Contrast Technology – total protection and long-term comfort.

HD HYDROPHOBIC

A unique lens that combines two coatings, a Hi-Definition multi anti-reflective coating and a water-resistant Hydrophobic coating. The Hi-Definition increases the amount of visible light passing through the lens and therefore improves definition while the hydrophobic coating repels water and liquids, improving clarity and vision. The perfect lens for anyone working in dimly lit areas or working outside in inclement weather.

All Bollé Safety lenses are independently tested and approved to the highest EN standards and as with the whole range of products from Bollé Safety they also offer our rail industry customers excellent value for money and world-renowned optical lens quality and coatings.



Contact: Rebecca Francis

Bollé Safety | Unit C83 | Barwell Business Park
Leatherhead Road | Chessington | Surrey | KT9 2NY

Tel No. **0208 391 3194** | Fax No. **0208 391 4733**

Email. **Rebecca.francis@bolle-safety.com**

Web Site **www.bolle-safety.com**

bolle
SAFETY

Equality. Diversity. Inclusion. This Is Not Altruism.

Rail exhibitions are always great events to attend. Meet up with customers, network, get inspired, find out what the cutting-edge developments in the sector are.

At Railtex this year I attended the talk The Shape of Things to Come, given by Mark Lomas, Head of Equality, Diversity & Inclusion at HS2. This, for me, was the most engaging and thought-provoking moment of the show. He explained why EDI is not altruism and how companies are screening out the workforce they desperately need from the get-go:

"HS2 is a massive, massive infrastructure programme. So why is diversity important to us? I'm sure you're familiar with the research that says diverse workforces are more innovative and the McKinsey research

that says that private sector companies are more profitable.

In a very short amount of time we're going to have a lot of people out on site. What we've been able to establish through our research, through our new method of embedding diversity into health and safety is: diverse sites are safer.

There are a number of critical reasons why for us, actually, a huge programme like we have presents a massive opportunity.

The first one is that **a long-term**

programme like HS2 enables long-term change. And if we're honest with ourselves, and we look at construction and the infrastructure industry generally, we're about twenty years behind the curve in most areas. We look at media, or the efforts around diversity that have gone into banking, financial services etc. and they far outstrip those in construction.

The philosophy behind how we design our EDI work is quite simple. If people have done what they've done for the past twenty years and, bluntly, it hasn't worked, given the time-frame



Curzon Street station visual – © HS2

that HS2 has, why would we do the same thing and expect a different result? We might as well approach things a little differently.

And I'll talk to you about what we'd like to achieve – our goals and our measures of success. We have twenty-odd years from basically a standing start, maybe 2009–12, but **if we don't have the most diverse workforce in leadership in the infrastructure sector by the time we get to the end of the programme I don't think we'll have done our jobs properly.** We're well on the way there already. We want to ensure that a much broader base of skills gets into the construction industry and I'll talk to you about why.

It's not a zero-sum game with a programme like HS2 and other investment going on in infrastructure. We actually are losing the talent pool required to make this thing sustainable. So **this isn't about moving one cohort of people out to move another cohort of people in.** We just need more people. And it's a lovely situation to be in and diversity is one of the answers to that problem. It's not a problem for companies to pick over, it's the answer to a sustainable sector. At the moment every HS2 major contractor is well over-representing the industry in terms of diversity and inclusion, so what we're doing so far is working.

The next step is really important to me. We have to deliver vastly improved levels of accessibility compared to current rail services.

HS2's Success Measure for Its EDI Strategy

We can't get away from the fact that we operate in communities up and down this country. If you were born last year, or 2012–13, in actual fact, by the time the programme finishes, depending on where you live, you could have seen HS2 for the next ten, fifteen years. We're going to be judged by those communities on how we engage them in the project. And

for me that means being able to measure the business opportunities – supply chain opportunities that go into that community. That's why we measure supplier diversity, SMEs, diverse businesses from across the programme. The programme has spent £20 million already with diverse companies up and down the UK and that will increase as the programme expands. How we get involved in education, training and deliver employment opportunities – all of those are hugely important. And that's the story that I'd like to be able to tell at the end of the HS2 programme: number 1 – we had the most diverse workforce in leadership; number 2 – in actual fact we broadened the skill base in construction and infrastructure significantly. You can get on an HS2 train and go around the station in an accessible and inclusive manner. And up and down this country there are communities that have benefitted in terms of education, training, business and employment. That's the story, that's the success measure for our EDI strategy.

The Skills Shortage in Rail

But this is not altruism. If we look at what's required to build a project – and at peak level there'll be well over 30,000 people working on the HS2 programme; at the moment we have around 7,000 people working in the supply chain for the programme – but a quarter of the workforce is due to retire in 2028. That's a big problem. Now let's add Brexit to the mix and we don't know what's going to happen with that but around 13% of workers on construction sites are migrant labour. Now we're getting upwards of 40% potential workforce disappearing. So we have to attract new groups into the industry in order to make the industry sustainable and this is where the issue of doing the same thing for the last twenty years gets us into the problems we're in. I presume most of you work in the industry so maybe your kids come home and say 'I want to work in rail!', but how many people do you know

who've called you up and said, 'do you know, my kid came home today and said the number one thing they want to do is work in construction or work in rail or work in infrastructure'. How many proud parents have you had go, 'oh, so-and-so wants to be a doctor, a lawyer, a financier!' Anybody heard that conversation ever? Exactly. So this is the problem that we are in. Number 1: we have an ageing workforce that is going to retire in the next ten years and we're not replacing them.

The second is, even when we do look at apprenticeships and skills, we are by no means getting to the groups that we need to. One in eight engineering occupations are women and when you look at apprenticeship numbers and conversion rates, it's still really, really poor. So let's have a look at why that happens. Why is it that efforts to attract groups into infrastructure and construction tend to fail?

'The reality is, women just don't want to work in construction'

Well, about a year and a half ago I was giving a talk and a senior leader in a construction business came up to me and said, 'I love what you were saying and whatever, but the reality is women just don't want to work in



Sarah Trinder, Lead Geotechnical Engineer – © HS2

construction and there's nothing that you can say that's going to change that.' So I thought, let's have a go at seeing if that's true. We did a survey with mumsnet. And we looked at women who had left the sector or were interested in the sector and within two weeks we got over two thousand responses. The number one barrier why people didn't want to return to the sector or why they left was that working conditions weren't flexible enough. **Now, HS2 is going to build a railway that can be seen from space. And it's got to be accurate within millimetres. It seems a little silly to say that the best engineers in the UK can't figure out flexible working.** It doesn't seem like that's too difficult. Construction sites work on shifts. And yet we can't change the industry to accommodate better flexible patterns. Doesn't make sense. HS2 has already changed both the way we procure consultancy service contracts and the hourly requirements embedded into contracts to enable more flexible working. We have that on-going at the moment. But it's industry standard to have contracts that say you cannot get paid if you don't work at a nominated office, regardless of the agile technology we have. So there's no point in inviting diverse groups into the industry to screen them out. And then we get to some of the other things that we've seen. Who knows the Spanish word for 'bridge'? El

puente. It's a masculine word. Who knows the German word for 'bridge'? Die Brücke. It's feminine. And researchers asked a thousand Spanish people and a thousand German people to describe the bridge. And the Spanish said, 'strong, sturdy, resilient, copes under pressure'. And the Germans said, 'sleek, elegant, beautiful, curvy'. All the same kind of words. And now, when you go back today, download some job descriptions from your website and have a look at the language in them and then delete everything that's not an adjective. And what you will get is a personality-related descriptor. 'Strong, outgoing, ambitious, drive, determined' – actually very little about objective skills. These sorts of things create an image in the mind of the person looking at the job and the person doing the selection.

Changing Recruitment Strategies

My first day at HS2 when I looked and we were having trouble recruiting community engagement people, I said, let's have a look at what we're asking. Number 1 criteria: 'must be educated to degree level'. In what? Home-baking? Microbiology? What? It's so broad, it's meaningless. I thought we wanted people who could talk to the community. The second: 'must have experience in the transport or infrastructure sector'. Well if you know anything about the sector, there are only about 13–17% women in the sector, so there went one diverse group, only 6–9% BAME groups, so there went that diverse group. Only 2% disabled people, so there went that diverse group. And yet, we wanted people to talk to the community and nowhere were we assessing them on knowledge of that community. So failing at the first hurdle is something that organisations around the sector are very good at. If your recruitment website has not been tested for accessibility, it's not accessible. And therefore you're cutting out a whole swathe of people who can't even get to the starting line. And then we get CV-based

selection. No research in the world shows that CV-based selection is an objective measure of selection. DWP sent out over a thousand applications for 3,000 jobs in 2009 and to cut a long story short, if your name was a little different, you had a much lower chance of success. For an English name it was 1 in 9, African or Asian it was 1 in 16. So we have been piloting a type of recruitment called blind auditioning. And that removes CVs and application forms entirely and replaces it with an anonymous test. When we introduced this form of recruitment, success rates for women in shortlisting jumped 20% minimum. BAME groups by 20% minimum, disabled groups by 15% minimum. Why? Because it is competency and skill-based selection. And we're testing that. So if you get into the interview room it's because you're competent to do the job. I don't know how many of you have seen on how many CVs in the sector people 'delivered Crossrail'. But I've seen so many CVs saying people 'delivered Crossrail' single-handedly, it led me to believe CVs can be embellished somewhat.

We also take this approach with our early years. And we've replaced CVs and applications with situational judgement testing in a blended assessment centre. And it's no mistake that our apprenticeship programme is really a diverse group. 35% BAME, 40% women in a sector where, remember, 1 in 8 as a whole is the best that we do. Why? Because you don't need to chase down people endlessly. There are those who are interested. But once they're interested, we screen them out. **If we were looking at it as an engineering problem, you would look at the point of failure and you would change the point of failure. Instead of changing the point of failure, people seem obsessed with trying to change the people. And that's never going to work. It's not worked for 20 years.** It's a failed approach. You wouldn't take a failed approach over and over and over again in engineering.



Mark Lomas – © HS2

Inclusion by Design

We've run over 1,000 experiments this year alone on the platform-train interface and how people independently can get on and off trains. Now, actually, there is really poor data for disabled travellers because it in the main relies on assistance being booked. What happens to the business case for disabled people around the UK and for business based around HS2 stations when the train and station environment is accessible and millions more disabled people can travel around the UK easily and access employment opportunities? Well, let's have a look at a piece of design [passenger seat information signs]. What happens if you can't see? Woops. Design failure. Why? Because actually, the people you tested the design with wasn't broad enough. That kind of issue we don't really want to have. That's why we have a built environment accessibility plan and a customer plan. People all across the UK, with different abilities, disabilities help us test designs. Interestingly enough, in my research I wasn't able to find one train operating company around the world that has a packaged solution for this simple thing, which is a visually impaired person being able to find their reserved seat on a train. I'd love to know if there is. But I haven't found one yet.

Why Language Matters

Which then brings us to talking to people in the language that they want to be spoken to. We spent a long time trying to figure out why diversity in construction fails and so we went to the construction site and we talked to operatives and we talked to construction managers, who were very polite but also very rude about diversity. They thought it was all the HR police etc. But in our conversations we did manage to identify that what they cared about was safety. And actually, we've come up with a methodology of hiding diversity in health and safety. Both in the languages, the practices and the assurance measures. Which means



we're able to talk effectively with people who are on a construction site about diversity and inclusion. For example, the safety briefing: in English. Well, if you know how construction sites work, the person who's best with English for this group translates. In fact, on another high-profile programme there was someone who was killed precisely because of that. They went into the wrong area and were killed. Well actually, that's about your inclusive health and safety practices. We've identified those key risks across construction and with our early works contractors and now our main works contractors we're putting in a new method of implementing diversity at a construction site level. Early findings are very good but we have much more to do.

Community Engagement

Which brings us on to how we engage with communities. We tend to have the ability to make language translations but we also use a form of communication called 'easy read'. Easy read was designed for people with learning difficulties but in fact it's a fantastic way of getting across a message really quickly. A picture accompanied by a simple text which makes the point. And we find that a load of people like to interact with our easy-read communications.

We're getting more and more

sophisticated with how we talk to our communities. We created digital tools which at the touch of a button can tell you everything from internet usage in a local authority area to socio-economic bandings to religious demographic make-up. So our teams can engage with people in the way people need them to be engaged.

That's just a quick tour through why diversity is important to us as a programme. And we can see it happening. Less than 2.5 years into the programme a majority of our Tier 1 contractors have achieved their EDI accreditations. And I firmly believe HS2 will be the first infrastructure programme in the world to have a Tier 1 construction supply chain which is fully EDI-accredited. We're winning awards for the way we're inventing new methods of practice. But this is only the beginning. As the programme expands, we will get more innovation through SMEs, more innovation through understanding. And at the moment all HS2 contracts are outperforming industry averages in terms of diversity and inclusion. But this is just the start for us. We have another 17 years in which to help the industry fundamentally change the way it practises diversity and inclusion. So I'll leave you with a quote by another Mark: ***'Diversity is not political correctness, it is the solution to the talent problem facing our sector. And it is the shape of things to come.'***



Made for travelling in style.

Camira designs and makes fabrics for rail interiors. From stocked to custom made, our design studio creates and inspires new colour, pattern and textured textiles including moquette, flat-woven and wire-woven capabilities. With the addition of leather and coordinating trims, we provide total fabric solutions for designing a transport interior.

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Made for Travelling in Style

With the ever-increasing demand on rail networks and operators striving to design trains that offer more for passengers, suppliers are being put to the test and asked to up their game in what they can provide to the rail sector.

It all comes down to what defines a good train journey and creating the optimum passenger experience for travellers and commuters on public transport. The contributing

factors are based on a combination of efficiency and reliability, customer service, cost, safety, the interior look and feel as well as the comfort of the train they are travelling on. These all need to be considered as they can impact the first and lasting impression of a passenger's experience on any journey.

As a global textile manufacturer, Camira's priority is to create an interior fit for purpose with design,

comfort and performance in mind. Camira designs and manufactures fabrics for seating, piping and headrests, curtains and wall sides, bringing interiors to life with different capabilities to suit any requirement and specification.

We work with many fabric constructions and techniques to design and make moquette, wire-woven, flat-woven textiles and have a portfolio of complementary vinyl and leather ranges.



Our Design Approach

Our design studio is brimming with textile talent – textile designers, colourists and technical experts – who not only understand the intricacies of fabric design and construction, but are immersed in the latest trends in colour, pattern and material textures and finishes.

The company's in-house design team understand the textile capabilities for rail interiors, the importance of design and aesthetic appeal whether this is through colour, design and pattern or the weaving construction to create distinctive surface effects. The fabrics can define the overall design and presentation of the interior, with durability and performance built in at the design stage.

Working in close partnership with professional design houses and operators, Camira's designers and technical team create specific fabric solutions. The designers use their weaving expertise and manufacturing skills to interpret design briefs into what is possible in textiles, reflecting a brand identity, priority designs or features, developing new designs and colours to elevate the design of an interior and meet the necessary standards. This allows manufacturers, designers and operators to push the boundaries on the future of rail travel.

Fabrics Made to Last

Camira has been making fabrics for Transport for London for over 150 years, since the London Underground began. Custom-made moquette fabrics are used across the Underground and on several overground train routes throughout England's capital and are part of the well-known Transport for London brand.

One of the most recent developments is for Crossrail (the Elizabeth line), named in honour of the Queen, which is the new east-west railway set to transform travel across London. Running for more than 60 miles, the new Elizabeth line promises to cut most journey times by at least half and bring an extra 1.5 million people within 45 minutes of central London. The 14.8 billion GBP project, one of the biggest infrastructure projects in Europe, sees the addition of 10 new stations to the network and major upgrades to another 30 in order to cope with the extra passenger demand.

In keeping with the royal name of the line, regal purple is the dominant colour on Elizabeth line

branding which is carried right through to the new fabric design which came from British design studio Wallace Sewell. The fabric is woven by Camira on wire looms to create a moquette with both cut and loop textured pile.

About Camira

Camira are makers, designers and manufacturers of textiles, developing fabrics for passenger transport on bus, coach and rail, as well as commercial interiors.

Camira is a privately-owned UK textile group founded in 1974 under the name Camborne Fabrics. In 2007, the company acquired John Holdsworth & Co Ltd, a West Yorkshire textile manufacturer specialising in transport fabrics. This acquisition strengthened Camira's expertise and capabilities in producing textiles for bus, coach and rail, and it has continued to grow this area of the business.

Today, Camira has an annual turnover of around 100 million GBP and employs over 800 people. It produces more than 9 million metres of flame-retardant materials annually and markets them in over 80 countries. Headquartered in Mirfield, West Yorkshire, England, the company has manufacturing facilities in the UK and Lithuania, offices and showrooms in Europe, North America, Australia and China and a global network of account managers and specialist dealers.

The name behind a number of iconic transport designs, Camira's fabrics are installed in cities across the globe – from Queensland Rail to the London Underground – and it has firmly established its position as leader in the transport textiles industry.

Camira has received numerous awards to date. The company has won five prestigious Queen's Awards, including the Queen's Award for Sustainable Development for the second time in 2015 and for International Trade in 2016.

For further information, please contact:

E: info@camirafabrics.com

T: **+44 (0) 1924 490591**

Mosaic Rail

Your Solution Provider for Signalling and Track Design

Mosaic Rail are a newly established signalling and track design provider founded in 2017 based in Crewe, UK. The company was born out of the directors feeling the need to approach railway infrastructure projects in a more customer focussed way. The company aim is to provide high-quality infrastructure design whilst maintaining a professional, friendly and flexible approach. This approach aims to encourage further investment in the UK rail industry by ensuring transparency and cost effectiveness.

We provide support to a variety of customers regardless of the size of the project or task. Whether the requirement is a signalling or track assessment, scheme plan, sketch or even full-scale detailed design service, we can provide the necessary expertise to deliver either as a delivery partner or embedded within an existing project team.

We are happy to work alongside your project to deliver cost-effective design solutions anywhere in the world and we have experience in delivering projects in the UK, mainland Europe, Asia and Australasia.

Our core aim is to provide a high-quality service whilst simplifying signalling design interfaces and alterations in order to maximise cost-effectiveness.

Whatever your requirements, Mosaic Rail Ltd can support you in a variety of capabilities for single-discipline or multi-disciplinary schemes.

We have experience of delivering multi-discipline projects and signalling renewals through to large scale re-signalling schemes. We pride ourselves on being proactive in the development of projects, in order to minimise future scope alterations to allow a smooth transition into delivery and commissioning on time and within budget.

With Network Rail's Control Period 6 now underway within the UK, the onus is on smaller organisations, like ourselves, to step up, manage and deliver the huge investment provided by Network Rail as well as supporting customers further afield.

Our ethos as a business is to provide cost-effective design solutions working closely with our

clients to their budget and timescales whilst delivering high-quality output.

The following key signalling design activities are provided by Mosaic Rail:

- **GRIP 1–4 signalling scope determination including assessments, calculations, reports and technical advice**
- **E810 interlocking assessment reports**
- **Signalling scheme plans and extracts**
- **Braking and TPWS calculations**
- **CBI/RR1 control tables**
- **CBI interlocking data preparation**
- **CBI/SSI trackside design incl. TFM and axle counter schematics**
- **RR1 free-wired interlocking detailed design**





- Panel and signaller interface design
- TSR/ESR design
- Signalling bonding design
- Level crossing design
- Remote control design including TDM and FDM
- TPWS trackside design
- Fringe specifications
- Signalling design specifications
- CT-S/CR-T production to clients requirements
- ETCS design and technical advice

The following key track design activities are provided by Mosaic Rail:

- Plain line and S&C design
- Geotechnical guidance
- Project staging strategy
- Through alignment design for tamping and renewals
- On-site technical support
- Bill of materials generation
- Stressing plans
- Handback file review
- Tamping schemes
- Track surveying and asset reports
- Heavy maintenance guidance

Other services provided by Mosaic Rail include:

- Contractor's Responsible Engineer capability
- Contractor's Engineering Manager capability

- Project Engineering Manager capability
- Project Manager capability
- Project Engineer capability
- BIM modelling
- IDC/IDR assistance and multidisciplinary coordination
- Safe work planning
- Sponsorship of UK-based site staff

Get in touch with Mosaic Rail

www.mosaicrail.com

+44(0)800 924 7922
contact@mosaicrail.com

Mosaic Rail Ltd, 1 Solway Court
Electra Way, Crewe Business Park
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Upcoming Railway Events & Exhibitions

June & July 2019

27th Annual Rail Freight Group Conference

04 Jun 2019

The 27th Annual Rail Freight Group will provide the latest, leading insights on the challenges, opportunities and disruptors facing the rail freight industry. Attend to hear essential insights on the support and plans for freight development and review the growth opportunities for the sector.

Event Code: 375RWN (10% Discount)

Event website: <https://bit.ly/2Gx6Zfe>

Location: Dentons, London, UK

5th Wheel Detection Forum

05–07 Jun 2019

The 5th Wheel Detection Forum is an ideal platform for a wide range of railway experts from across the globe. It is the perfect occasion to share their latest insights and exchange their experiences. More than 200 senior decision makers from international railway operators and system integrators, as well as manufacturers, consultants, researchers and association representatives will come together.

Event website: <https://www.wdfvienna.com>

Location: Radisson Blu Park Royal Palace Hotel, Schlossallee 8, 1140 Vienna, Austria

Rail Electrification: Rebuilding Confidence

05 Jun 2019

Address the cost and engineering issues facing the industry, and how these are being managed by

operators and contractors alike at Rail Electrification: Rebuilding Confidence. Hear lessons learned from implementation projects to take back to your organisation. This year, presentations will address challenges from the past, how these experiences are shaping current projects and the future of the rail industry and electrification policy.

Event website: <https://bit.ly/2KWzYyt>

Location: 1 Birdcage Walk, Westminster, London, SW1H 9JJ, UK

UITP Global Public Transport Summit 2019

09–12 Jun 2019

On 9–12 June 2019, the international public transport community, mobility decision makers and industry suppliers will come together in Stockholm for the UITP Global Public Transport Summit that proudly remains the world's biggest event dedicated to sustainable mobility. Covering all urban and regional transport modes across the globe, the summit combines a diverse programme of leading congress sessions and an outstanding exhibition full of the latest innovations, solutions and products.

Event website: <https://uitpsummit.org>

Location: Stockholm, Sweden

RailWorx 2019

11–13 Jun 2019

RailWorx2019 is a new-for-2019 outdoor exhibition for the rail civil engineering and systems industries. Co-located with PlantWorx, the Construction

Equipment Association's biennial show that attracts over 15,000 visitors on its own, the new joint show will take place at the East of England Arena, Peterborough, on 11–13 June 2019.

Event website: <https://www.railworx.co.uk>

Location: East of England Arena, Oundle Road, Alwalton, Peterborough, PE2 6XE, UK

Critical Communications World

18–20 Jun 2019

Critical Communications World is TCCA's flagship event. It takes place in Kuala Lumpur on 18–20 June 2019. The event has now been running for over twenty years across the globe, bringing together users, in both the private and public sector, the latest technology services, regulators and many more, to give them unparalleled access to authoritative content and unrivalled networking opportunities.

Event website: <https://bit.ly/2VkJpZ>

Location: Malaysia International Trade & Exhibition Centre (MITEC), Kuala Lumpur, Malaysia

Rail Live 2019

19–20 Jun 2019

Rail Live is the most comprehensive outdoor event for the rail industry where you can: meet more than 5,000 visitors representing all aspects of the rail industry, connect with more than 235 exhibitors from the UK and Europe, attend the only event in the UK to have rolling stock on display in a real-world environment and more. There will be more than half a billion pounds of rail plant equipment on display and in live demonstration.

Event website: <https://www.raillive.org.uk>

Location: Quinton Rail Technology Centre, Warwickshire, UK

Transport-Led Development in Wales

20 Jun 2019

Transport-Led Development in Wales returns this year with the latest update on key transport-led projects under development and new areas due to benefit from investment, and it discusses future solutions for further unlocking connectivity and growth in the region. Featuring expert insight from the rail, road, port and bus sectors to define a joined-up transport strategy for all of Wales and

promoting connectivity throughout the whole transport network.

Event Code: 381RWN (10% Discount)

Event website: <https://bit.ly/2UBjJ9u>

Location: Cardiff, Wales, UK

REIS 2019

01–04 Jul 2019

Electrifying a railway is difficult; it's complicated, time-consuming and expensive, with individual projects often throwing up their own unique challenges. REIS has been specifically designed to provide you with the fundamentals of railway electrification, equipping you with the necessary skills, knowledge and project management experience to tackle even the most complex of railway programmes.

Event website: <https://bit.ly/2UBjJ9u>

Location: Crowne Plaza City Hotel, London, UK

UK Rail Station Development and Regeneration

04 Jul 2019

UK Rail Station Development and Regeneration brings together the rail and property sectors to explore how to deliver station projects of all scales that maximise the related commercial and development opportunities, and create local growth. The event will bring together all parties involved with delivering station improvements to provide insights on how to improve delivery, better align timescales and manage risk throughout the process.

Event Code: 377RWN (10% Discount)

Event website: <https://bit.ly/2Xz1tPY>

Location: Addleshaw Goddard, London, UK

Evening at the Plaza

11 Jul 2019

Millian are proud to link up with the Crowne Plaza hotel to provide an excellent black tie event with great networking opportunities, a motivational and focused guest speaker and a full package of follow-up information to enhance your communications.

Event website: <https://bit.ly/2JlqLdL>

Location: Chester (Crowne Plaza), Trinity St, Chester, CH1 2BD, UK



GOLDSCHMIDT

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Our new database solution **DARI®** – Data Acquisition for Rail Infrastructure – enables us to make our products smarter, more effective and sustainable. Goldschmidt has therefore taken the next logical step and has combined a collection of **modern, high-performance stand-alone solutions** into a **digital network consisting of intelligent products**.

DARI®

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This innovative edge, based on the future-oriented technology of DARI®, is the special and unique added value offered by our Goldschmidt products. Experience new dimensions at the track construction site. With **DARI® by GOLDSCHMIDT**.

New standards for quality, reliability, transparency and efficiency place increasing requirements on the construction and maintenance of modern railways every day.

The digitalisation of work processes has become indispensable on the track construction site. In the course of our digital product initiative GOLDSCHMIDT GOES DIGITAL we have further developed our ideas and solutions into a digital network of intelligent devices: DARI® BY GOLDSCHMIDT.

Our database solution DARI® – Data Acquisition for Rail Infrastructure – enables us to make our products smarter and more effective and your track construction projects sustainable, more efficient and safer.

Our modern, high-performance stand-alone solutions create a digital network of intelligent products with completely new advantages and added value for your track construction site. All DARI®-compatible products from Goldschmidt, which in future will include many of these new functions, are still conveniently using the GOLDSCHMIDT DIGITAL APP.

- » **DARI® centrally archives work and measurement data in real time**
- » **Linked measurement and control data allow immediate forecasts and automated inspection processes**
- » **Intelligently linked devices create a globally accessible network of knowledge and key figures**
- » **The always-available track history, the “life story for the track”, enables a predictive supervision for tracks which are subject to intensive maintenance**

EFFICIENT DOCUMENTATION OF THE PREHEATING PROCESS FOR THERMIT® WELDS



A big priority within 2019 for Thermit Welding is to increase the utilisation of digital solutions.

The SMARTWELD RECORD is one such device that highlights our answer to this requirement for digitisation. The SMARTWELD RECORD records and documents the preheating parameters for THERMIT® welding via the GOLDSCHMIDT DIGITAL APP. The welder is given the specific individual steps for the THERMIT® welding in a user-friendly way and without errors. This ensures both optimum use of welding materials and that welding is performed to standard. Process parameters can be saved centrally using the GOLDSCHMIDT DIGITAL APP. The data is uploaded directly to our database solution DARI® so that data can be analysed and accessed globally.

EFFICIENT TOOLS AND MACHINES FOR TRACK WORKS

Following along with our focus on both safety and efficiency Thermit Welding offers new enhancements to our range of rail tools.



One example of these tools is the **RD 300 B**, the newest rail drill from the Goldschmidt Thermit Group. The battery-driven rail drill makes it possible to drill rails with zero emissions and without fuel. The extremely low noise and vibration emissions as well as a battery which makes over 100 drill holes possible per cycle make the RD 330 B one of the best machines available on the market. Moreover, the machine has a digital Bluetooth® interface for communicating with the GOLDSCHMIDT DIGITAL APP. The android application is used to record machine data, such as number of holes, GPS tracking, time stamp per hole, indication of maintenance intervals, battery statuses and machine hours. This makes it easy to keep track and document the work done. These data are uploaded directly to our database solution DARI® so the data can be analysed and accessed globally.

One of the latest devices, pioneered by Thermit Welding (GB), is the SMARTWELD ACE (Accelerated Cooling Equipment) that has been designed to decrease the overall cooling time of a weld. The SMARTWELD ACE is a purpose-built battery-powered water misting system, engineered to be placed on top of an aluminothermic weld following the shearing of the weld. By removing a greater proportion of the weld waste material (via the Gull wing shear blade) and then applying a fine water mist to the cooling weld an approximate time of 15 minutes can be saved per weld. Through careful development and testing Thermit Welding is able to



SMARTWELD ACE

fully endorse that this method of time saving will have no effect on the high quality that a Thermit weld is known for. Further to this, cost savings are also possible with this device as it allows for more welds to take place in existing possession times.

RAIL MEASURING SYSTEMS

The Goldschmidt Thermit Group specialises in the development and production of computer-controlled geometry measurement devices and systems for tracks, switches and for the rolling stock wheels. We manufacture portable devices and also develop real-time systems for track geometry vehicles as well as stationary wheel geometry systems. Furthermore, we have extensive experience in the development of software for the collection, processing, analysis and storage of measurement data.

TRACKGAUGE DIGITAL



The portable measuring device TRACKGAUGE DIGITAL (TGD) evaluates the track and switch geometry. The device is lightweight, reliable, easy to use, and measures very accurately the track gauge, the cant and horizontal and vertical irregularities, and the left and right flangeways in switches; it also checks gauge values. It is operated by an application on Android smartphones. The measurement data is displayed immediately, additional information on the infrastructure, including the results of the visual inspection is recorded in a digital format. The measurement reports are created on the smartphone by the GOLDSCHMIDT DIGITAL APP. The measurement data is uploaded directly to our database solution DARI® so the data can be analysed and accessed globally.

TRACKSCAN COMPACT

The TRACKSCAN COMPACT (TSC) trolley measures track geometry automatically. The measurement results include values for track gauge, cant, and



horizontal and vertical irregularities along with the calculated gradient and twist parameters. Thanks to its user-friendly and modular design the trolley can be transported by one person and fixed on a track in less than 5 minutes. The device is operated with an Android application on a tablet, on which all measurement data are displayed immediately. The GOLDSCHMIDT DIGITAL APP records the measured data as well as the covered distance, the GPS position and the visual inspection of the track condition. The measurement data are uploaded directly to our database solution DARI® so the data can be analysed and accessed globally.

ROAD-RAIL VEHICLES: UNBEATABLE MOBILITY ON THE TRACKS

The road-rail vehicles from the Swedish group company SRS Sjölanders AB can be used both on rail and on the road and are custom-made to meet your needs and requirements thanks to different attachments and superstructures. Road-rail vehicles are available for the installation, inspection and maintenance of overhead lines, bridges and tunnels and welding as well as for the deployment of cranes and rescue applications. We can also offer special road-rail vehicles in modular construction, with heavy cranes and trolleys and road vehicles for different applications.

Please visit us at our booth E21 at Rail Live to get more information on our product range and see our products demonstrated live.

Thermit Welding (GB) Ltd
87 Ferry Lane | Rainham
Essex | RM13 9YH
Phone **+44 (0) 1708 522626**
info@thermitwelding.co.uk





Manufacturer of Sensors, Switches and Converters for Railway Vehicles

www.railwayvehicles.com

SENSIT s.r.o. has been producing temperature sensors since 1991. The company has been engaged in the development, production and supply of special sensors, switches and converters for railway vehicles since 2004.

TEMPERATURE SENSORS WITH DIGITAL OUTPUT FOR RAILWAY VEHICLES

We have extended the range of temperature sensors for rail vehicles with the type of sensors with the **RS 485 / MODBUS** and **CAN protocol / CANopen** digital output. By this, we continue to expand our product range after adding combined temperature sensors, sensors of relative humidity, CO₂, atmospheric pressure and VOC sensors with digital outputs.

- MODBUS/RTU communication protocol, communication via the RS 485 bus
- CANopen/CiA DS 301 communication protocol, communication via the CAN bus

Thanks to this step, we are able to offer a complete range of temperature sensors with plastic heads with different outputs – resistance, current (4 to 20 mA), voltage (0 to 10 V, 0 to 5 V) outputs and newly also with digital outputs **RS 485** and **CAN protocol** in the design:



For the **INDOOR** use

These sensors are designed to measure temperature of gaseous substances in spaces protected against water. In the application segment of rail vehicles, the sensors are mainly used to measure temperature in passenger compartments of train units and carriages and are a part of the temperature control system.



For the **INDOOR / OUTDOOR** use

These sensors are designed to measure the outdoor air temperature or the indoor air temperature. In the application segment of rail vehicles, it is used for example to measure temperature of the air in locomotive engine rooms; it can be a part of the temperature control system in passenger compartments or is used to indicate temperature in the engine room as a part of the fire protection system.



With a **MEASURING STEM**

These sensors are used for temperature measurement of liquid or gaseous substances. In the application segment of rail vehicles, it is used for example to measure temperature of the outdoor air under the vehicle floor. For this purpose, the sensor is equipped with a stem with high mechanical resistance.

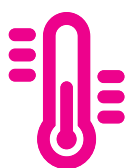


All products of SENSIT s.r.o. designed for application in the rolling stock segment meet the specific requirements defined in so-called railway standards:

- Insulation test in accordance with **EN 50155**
- Shock and Vibrations test in accordance with **EN 61373**
- Electromagnetic Compactibility in accordance with **EN 50121-3-2**
- Fire Protection on Railway Vehicles in accordance **EN 45545-2** and **NFPA 130**

In the near future, we will also be presenting you with the following new items:

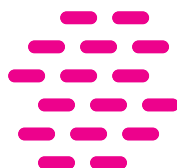
- Converters Temperature - RS 485
- Converters Temperature - CAN protocol
- Temperature switch with output RS 485
- Combined temperature and humidity sensor with stem - with the RS 485 / CAN protocol output



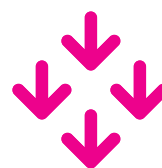
temperature



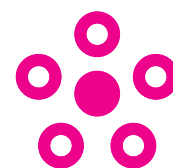
humidity



CO₂



atm. pressure



VOC

Complete range of sensors with the RS 485 / CAN protocol digital output

- Temperature sensors
- CO₂ sensors
- Combined temperature and relative humidity sensors
- Combined temperature and CO₂ sensors
- Combined temperature, relative humidity and CO₂ sensors
- Combined temperature, relative humidity, atm. pressure and VOC sensors
- Combined temperature, relative humidity, CO₂, atm. pressure and VOC sensors

With use of the sensors for railway vehicles, with digital, current, voltage or resistance sensors is secured, e.g.:

- an efficient system for measuring and regulating temperature, relative humidity, CO₂, atmospheric pressure and VOC in train units
- creation and preservation of comfortable climate for passengers in railway vehicles
- establishing and maintaining high quality of air
- removal of mists of windows and wall of train units
- energy savings based on evaluation of measured values by the air conditioning unit
- higher control system efficiency
- costs savings



CUSTOM MADE SENSORS

SENSIT s.r.o. also produces custom made sensors. Based on customer requirements, we are able to develop sensors for specific applications with a minimum quantity requirement of 1 piece and with all required railway certificates.

For more information about SENSIT s.r.o. sensors, switches and converters, please visit **www.railwayvehicles.com** or contact us directly at **randysek@sensit.cz**



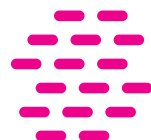
Czech Producer of Sensors for Railway Vehicles



temperature



humidity



CO₂



atm. pressure



VOC

Combined Interior Sensors



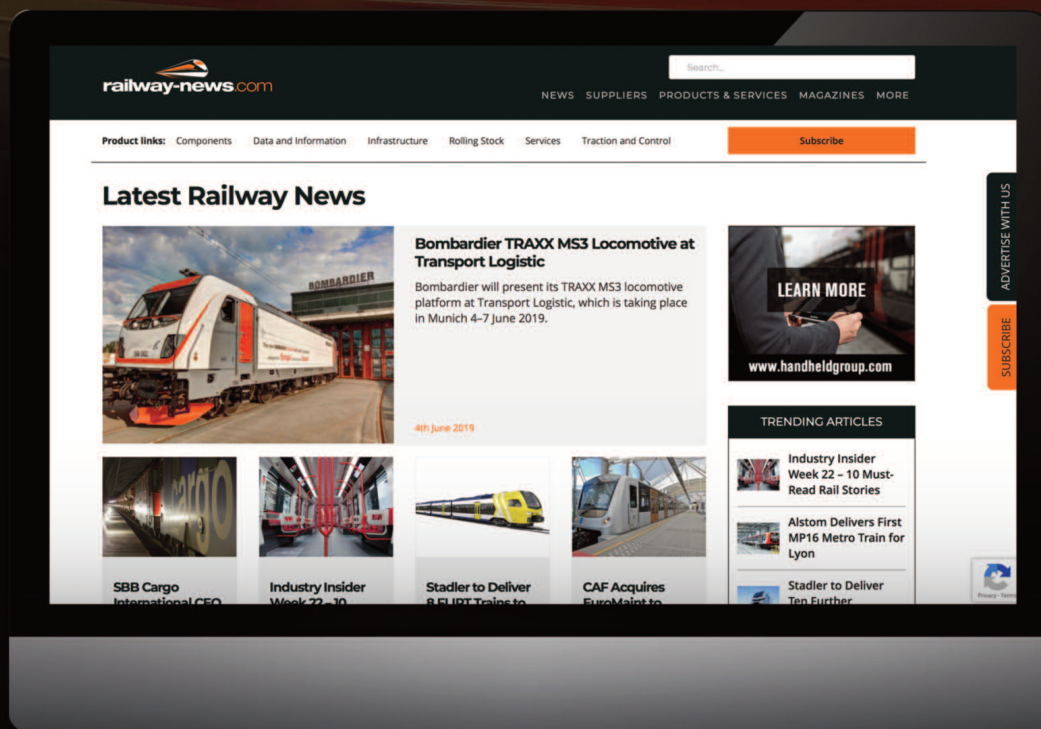
EN 61373
EN 50121-3-2
EN 50155
EN 45545-2
NFPA 130

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DESIGNED FOR
A GREENER TOMORROW

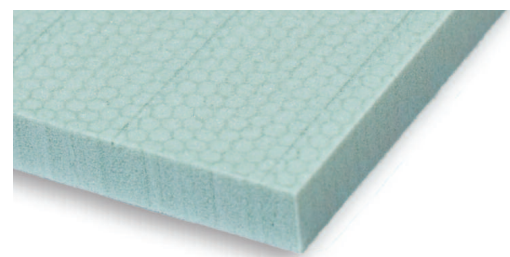
ArmaForm®

Made entirely of recycled PET bottles, ArmaForm is the benchmark for a sustainable, 100% recyclable alternative to legacy foam core materials.

Thanks to its unique combination of saving potential, environmental benefits and its excellent mechanical and FST properties, it is ideal for usage in railway composite structures.

- // Very low smoke & toxicity levels
- // EN 45545-2 compatibility
HL2 foam alone
HL3 with skins
- // Excellent thermal insulation properties
- // Optimum long-term stability

info.armaform@armacell.com
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