Railway Gazette
GROUP EVENTS

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DIVERSIFICATION AND SUSTAINABILITY:

The culture shifts that are changing the landscape of the rail industry

Breaking the stigma: Changing gender perceptions through a modernized railway industry

Is rail sustainability running out of steam?

Driving Europe's commuters mad: the benefits of comfortable trains as a daily journey option

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"Every day you may make progress. Every step may be fruitful. Yet there will stretch out before you an ever-lengthening, ever-ascending, ever-improving path. You know you will never get to the end of the journey. But this, so far from discouraging, only adds to the joy and the glory of the climb."

Those are the words of Sir Winston Churchill, the British Prime Minister whose vision and tenacity held the Nazis at bay for nearly two years at the start of the Second World War - and ultimately led the UK to victory after six long gruelling years of conflict.

Unlike what most would expect, that quote does not refer to war itself – it is about painting and self-improvement, an intrinsic truth that applies to warfare and hobbies just as much as it does to companies and processes.

The world is changing, and in many ways, it's for the better. Technology advances, speeds increase, travel capacity enlarges, and every day trains get bigger, faster, and better. But as the hardware gets better so do the people behind it, and one of the great questions those people are asking is how to attract the best humanity has to offer – and not wreck the planet in the process.

In this industry guide, we bring you some of the ways the world's top operators and suppliers are handling diversity and sustainability. Gender gap, workforce, environmental protection – all those topics and more can be found within these pages, with input and direct contribution of the sector's experts and decision makers.

For a more personal experience, meet us at **SmartMetro Madrid on November 25-27th** for a three-day conference dedicated to networking, presentations, and the sharing of knowledge. Our last event of 2019 reunites some of the best companies and individuals from across the globe and is an opportunity that cannot be missed.

Marcello Perricone
The Editor
www.RailwayGazette.com

Is rail sustainability running out of steam?

Rail represents one of the cleanest ways to travel, second only to walking or cycling. Across EU countries, less than one per cent of all transport gas emissions come from railways. Yet UK rail operators still face a serious challenge; last year, the Government challenged them to achieve carbon neutrality by 2040, and while the sector has boarded its sustainability journey, the service is likely to be delayed.

The sector has taken major steps to decarbonise and improve efficiency on its lines, but more needs to be done. To cut emissions and deliver power efficiency and reliability, operators need intelligent solutions to monitor, control, and optimise electrical assets on the network. At the same time, efficiency does not have to be costly. Intelligent solutions that deliver consistent monitoring will also allow operators to identify efficiencies, optimise repairs and maintenance – which will save considerable costs in the long run.

Be smart, be sustainable

The electrification of the country's railways goes hand in hand with efforts to reduce the industry's carbon emissions. Operators have made great strides in upgrading rolling stock and major parts of the line, yet only 40% of the network is electrified compared to Europe's average of 60%. Operating companies may still be too reliant on diesel-guzzling rolling stock, but electrified railways are better for the environment and generate 60% fewer emissions compared to diesel trains, while producing zero pollutants at the point of use.

Yet electrification of the trains alone won't be enough. Rail industry emissions are not generated solely by rolling stock, but also other crucial infrastructure including train stations. Indeed, any part of the rail network that takes electrical power to run – from signalling systems to depots – is contributing to the industry's carbon footprint. Just because pollutants aren't being emitted from a train's exhaust does not mean damage isn't being done.

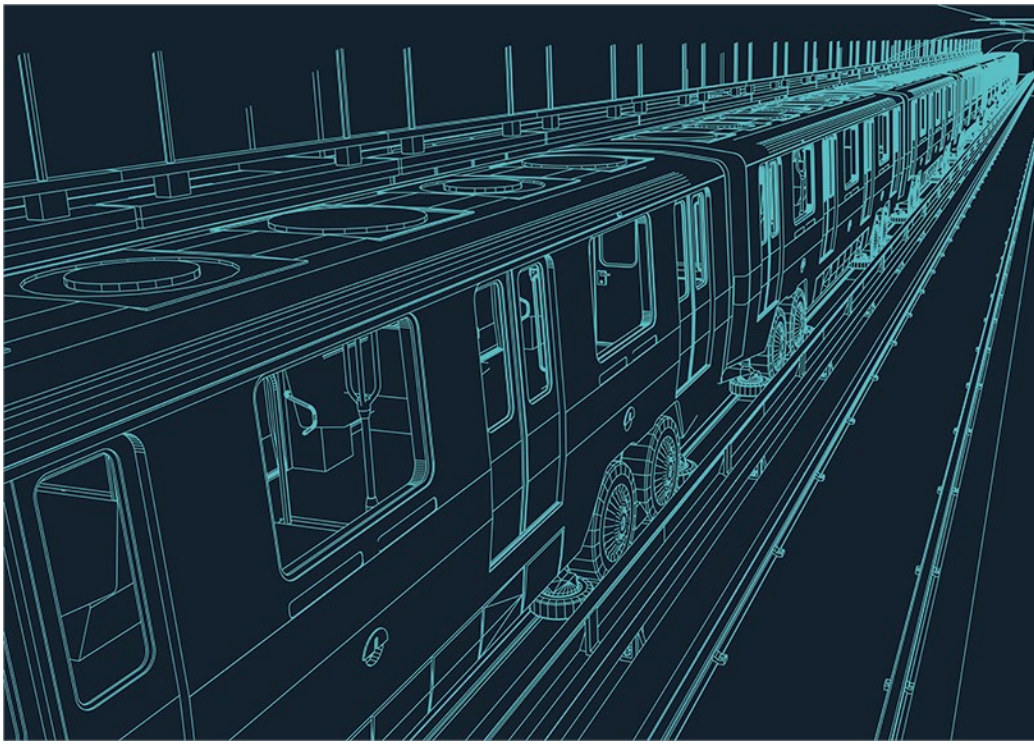
If we are to achieve a truly sustainable rail network over the next few decades, there is an urgent need to reduce the industry's energy consumption as a whole. This can be done by reducing energy waste and improving the efficiency of electrical assets embedded in the infrastructure. What's more, it's possible to do this without jeopardising the quality of rail services – between 2000 and 2016, rail energy consumption fell by 23 per cent thanks to greater energy intensity and utilisation, all without impacting service levels or passenger numbers.

In a train station for example, a facility management system collecting and analysing data from the lighting, heating, cooling, and ventilation functions can provide a detailed breakdown of energy usage. The station manager can use this insight to identify areas where energy is being wasted - such as during off-peak times when the station isn't at full capacity - and the manager then has the insight to intervene positively, putting certain functions into a low-power state to cut down on energy waste.

To create a more efficient and sustainable rail network, operators need insight. They must have unprecedented visibility across services, and the power to intervene to cut waste and optimise operations. The Internet of Things (IoT) can share a great deal of this information through connected sensors, but operators will also need analytics tools and software to turn it into actionable insight.

Digitisation pays for itself

One refrain against further electrification and digitisation of British railways is cost. Indeed, the recent failure of the Great Western Electrification Programme to stay within budget has put future electrification initiatives in question. However, purely focusing on upfront investment doesn't tell the full story -- it's far better to keep in mind the considerable cost savings and returns digitisation can grant.



Connected maintenance is particularly fertile ground for cost savings. A signal failure can easily ruin a passenger's day, but the knock-on effects to the rest of the network are even more severe. An interruption to the power supply can cause signalling systems to break down and train services to be disrupted. Customer satisfaction is impacted, but so is reputation and profitability as the operator and train company often has to pay compensation for ruined journeys.

A reliable and efficient power supply is critical for success, but it isn't possible without smart technology. IoT-connected sensors can communicate invaluable field data to operators, letting them plan ahead or respond immediately when maintenance becomes necessary.

Whereas traditional maintenance practice mandates scheduled check-ups and costly emergency repairs when equipment fails, the IoT enables automatic status monitoring and preempting early signs of failure. Intelligent circuit breakers and insulation monitoring devices give an accurate picture of equipment and circuit health. Connected monitoring tools can collect and track equipment status data and alert supervisors to detected faults before they snowball into larger breakdowns and potential crises. Ultimately, following an insight-driven, predictive maintenance strategy means fewer failures, less downtime, and greater profits.

As the railway network continues to grow, it's crucial operators stay committed to new technologies and innovative practices. Digitisation and automated processes will provide faster, safer and more efficient services for users while reducing both the costs and carbon debt of the industry. Sustainability is a win-win for rail.

PETER SELWAY IS THE RAIL SEGMENT MARKETING MANAGER AT SCHNEIDER ELECTRIC., A FRENCH MULTINATIONAL COMPANY SPECIALIST IN ENERGY MANAGEMENT AND AUTOMATION WITH A MASSIVE RESEARCH & DEVELOPMENT ARM.

Breaking the stigma: Changing gender perceptions through a modernized railway industry

In the 1851 UK census, there were just three women listed as 'railway labourers' working in the industry. Whilst trains overall have gotten faster since then, the number of women working on or with them has travelled at a more pedestrian pace.

An extensive survey of the UK by industry group Women In Rail found that as a whole, 84% of men and the vast majority of the 16% of women workers were working in junior lower paying positions. Only 0.6% of women in the rail were at C- or director level in the UK, and the picture is similar in other nations.

But times are changing, and an evolving industry is shifting perceptions and increasing diversity. To learn more, I spoke to three women working at BAI Communications -- a company at the forefront of industry change -- to learn what has brought them to their positions, what the work looks like, and what advice they'd offer other women looking to follow in their footsteps.

For **Rebecca Rajan**, Project Engineer at Transit Wireless (a majority-owned BAI Communications company), it wasn't just the corporate world experience which was new to her, but the whole city of New York and its subway: "I was a fresh engineering graduate when I saw an opportunity at Transit Wireless", Rebecca says. "Since then, I have been able to grow continually with the help of some amazing mentors and now I am Project Engineer of Execution leading multiple projects, including the ones in NYCT subway stations."

Nupur Sutaria, a Design Manager at Transit Wireless in New York, had a similar experience; "I began as an intern, as I was finishing up my master's degree in mechanical engineering. I was using and developing the skills I learned in school to create engineering drawings for the wireless networks inside New York City subway stations", she says. "Currently, I am a Design Manager, a position in which I supervise a team of engineers that design new equipment enclosures; devise structural equipment mounts; and create electrical, fiber, and antenna network plans for transit environments."

But working in transport telecommunications is not all about engineering, as **Nichola Easton**, Client Director of Business Development at BAI Communications in London tells me: "After graduating with a degree in politics, I took a job in telecoms as the industry was going through the dot.com bubble. From there I moved into sales and commercial roles within the sector which evolved into a focus on transport," she explains. "One of the most exciting projects I worked on was in Virgin Media, on the delivery of public wi-fi services on the London Underground. It was the first time I could really see how the technology and service that we created was making a difference to the travelling public in London."

Rebecca, Nupur, and Nichola have all taken different routes into the industry, but whereas they have found opportunities, women in rail are still very much in the minority. A big part of it is due to the perception of the roles available, and that applies to the recruitment of men, too -- the idea that working on the railways involves being in a fluorescent jacket in the cold and rain fixing a broken rail is no longer the case. Education opportunities are another issue to overcome, with girls often steered away from STEM subjects, whilst flexible and family supportive working practices are also likely to both recruit -- and most importantly -- retain staff. In light of this, I asked what advice our three stars from BAI have to offer to other women looking to follow in their footsteps. "Gone are those days when people used to say that being a woman in tech is odd," says Rebecca. "It can be tough at times, but as ambitious women, we should take up challenges and be able to shatter the glass ceiling."

"Don't be afraid to ask questions!", adds Nupur. "One of the best ways to improve your knowledge and skill set is to learn from a supportive mentor."

"It's difficult to often find yourself as one of very few women in the room, but women have a big role to play in this industry -- so don't shy away from that," concludes Nichola. "Be confident, know your subject and don't be afraid to challenge the way things are currently done."

Rebecca Rajan

Nupur Sutaria

Nichola Easton

Driving Europe's commuters mad: the benefits of comfortable trains as a daily journey option

In Germany, France and the UK, over two thirds of commuting to- and from- work takes place via car. While commuting by car may be the norm, that doesn't necessarily mean it's the best option.

The Inrix Global Traffic Index states that Parisians spend an average of 65 hours a year stuck in traffic. That's right – 65 hours of irate drivers, endless beeping, whirring aircon, and listening to the same songs on the radio. Those that have ever attempted to drive from the **banlieues** of Paris to the inner city will have asked themselves time and time again, is there a better way?

The downsides to travelling by road are not limited to waiting, bored, in traffic. The emissions generated by idling engines are a major contributor to global warming. As the global interest in the latest carbon neutral voyage over the Atlantic proves, this is no longer a fringe issue. Commuters increasingly care about reducing the carbon footprint of their trip to work.

Surely this would be enough to make anyone wish for a different transport method? Maybe, but wishing for change won't help anything – finding a suitable substitute will. Sadly, across many European locations, the alternative option of rail travel isn't necessarily that attractive either.

Ageing carriages with old, worn seating are not likely to lure those commuters away from their cars. Culture is a fickle thing – commuting by rail used to be a status symbol. When train carriages looked like hotel suites, people wanted to be in them. Somewhere along the way, in the search for cost efficiency and space, that aspect was lost and train interiors became functional rather than pleasing. Now it's cars that carry the status. But that can change.

A renewed focus on traveller experience in trains may require a small investment in the short term, but the medium-term benefits of greater passenger numbers and increased revenues should make this a key consideration for rail operators. By working with contractors and

OEMs to build trains that will inspire a new generation of European commuters, carriers can recapture the golden age of rail, brighten their customers' days and help reduce the impact of climate change.

Customer-centric design

The key question for train companies is how to match functional needs like cost and durability with the need to improve passenger conditions. Traditionally 'luxurious' materials like wood and standard leather come with hefty price tags and don't age well – your first few thousand customers will have a great experience, but over time these materials wear out. A modern equivalent is required – a way to make customers feel special without risking durability and cost efficiency.

Fortunately, new manufacturing technologies are emerging that can help bridge the gap. By engineering organic materials to last longer while retaining their tactile and aesthetic qualities, train makers can satisfy customer and accountant alike.

Modern materials such as engineered leather provide the natural look and feel of more expensive, fragile materials but last far longer without showing signs of wear – ensuring that the rail commute stays every bit as pleasant as the car. The use of reclaimed and engineered materials also has a positive impact on the environment, reducing waste and the impact of new acquisition on natural resources.

It's also important for train interiors to reflect the branding of the carrier. Brand loyalty is an increasingly powerful tool across industries as consumers come to identify with the image projected by their chosen providers. Engineered leather can be coloured to match the carrier's brand, creating a more unified experience for customers and subtly connecting the quality of the experience with the company itself.

New regulations

Train operators and manufacturers also need to be aware of the impact of upcoming EU regulations. These are aimed at opening up competition across borders by allowing operators and manufacturers to operate across borders, creating a more integrated European railway. This will radically change the market in EU countries, as previously secure monopolies are challenged and competition becomes more fierce. Manufacturers will need to ensure they can stand out in a far more crowded field – which means that customer experience is going to be more important than ever.

The use of superior materials in interior design will be an essential component of a successful strategy for succeeding in this competitive environment. Cost alone will no longer be enough of a differentiator – companies need to be able to offer a premium experience to go with it. Modern technology is helping to make those two opposing goals work together. Materials are changing – it's now possible to provide a constantly excellent train environment without having to then charge first-class fares for the whole carriage.

When commuters ask themselves if there's a better way to travel than car, the answer is almost certainly yes. However, this cannot be achieved if manufacturers and operators continue to stick to their old standards. Instead, they should prioritise searching for innovative solutions that will make daily commutes far more enjoyable.

NICO DEN OUDEN IS THE GLOBAL SALES & MARKETING DIRECTOR AT SERVICE PROVIDER ELEATHER, WHICH SPECIALISES ON COMFORT SOLUTIONS FOR THE TRANSPORTATION SECTOR.

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Jacob Teter, Energy Analist at the International Energy Agency (IEA)

"The future of rail will be determined by how it responds to both rising transport demand and rising pressure from competing transport modes. Rising incomes and populations in developing and emerging economies lead to strong demand for mobility, but social considerations and the need for speed and flexibility tend to favour car ownership and air travel."

Transportation moves the world, and there are very few things as important to the industry as energy.

Ahead of SmartRail Munich on June 17-19, we sat down with **Jacob Teter**, Energy Analyst at the International Energy Agency (IEA) to talk about how the organisation is looking at the future of rail, from sustainability and affordability to investment and logistics.

SRW: Can you tell us more about the International Energy Agency (IEA)?

JC: An autonomous intergovernmental organisation originally dedicated to prevent and address disruptions in the oil supply, the IEA acted as response of the "rich countries" club to the 1973 oil crisis and related OPEC embargo. In large part the brainchild of former US Secretary of State Henry Kissinger in 1974, the four main areas of IEA focus are: energy security, economic development, environmental awareness, and global engagement.

The agency still works on topics related to oil and other fossil fuels, but its mission and scope has evolved considerably since those days. Today, the IEA looks at the full spectrum of energy issues, including oil, gas, and coal supply and demand, as well as renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management, and much more. The agency advocates policies that will enhance the reliability, affordability and sustainability of energy in its 30 member countries, and beyond.

SRW: What role does the IEA play in the transport industry, especially when it comes to rail?

JC: Our team in the IEA focuses on all the motorised modes of transport, and their current and potential contribution to the four areas of IEA focus mentioned above. As the transport sector is responsible for 24% of direct CO_2 emissions from fuel combustion, this boils down to collecting, checking, and analysing detailed global data for all modes, from rail, shipping, and aviation to road modes (2 and 3-wheelers, cars, light commercial vehicles, trucks of various sizes, and buses).

On the basis of these data, we endeavour to build detailed policy and technology scenarios for how the transport sector might develop in the future. Answering questions like "What technologies can help to decouple transport services from CO and local pollutant emissions?" and "What policies can harness the most energy efficient and diverse modes of transport, and promote using them instead of more carbon-intensive modes (like aviation and private cars)?"

In the case of rail, we partner with the UIC, UITP, ITDP and others to collect, harmonise, and make sense of rail activity, energy intensity, and how rail fits into the bigger picture of multimodal (passenger and freight) services. Our resolution of rail is at the country level, our scope is global, and we look at metro, light-rail, and high-speed rail, as well as commuter and intercity rail.

SRW: What does your position of energy analyst entail?

JC: I am in charge of developing and updating the IEA's mobility model and overseeing various other projects. I was among the main authors of two major reports in the IEA "blind spots" series, which focused on important but too often neglected sectors of the energy system: The Future of Trucks, and the Future of Rail, both of which are available for free. I have also contributed to reports like the Energy Technology Perspectives Series, the World Energy Outlook, and the Global Electric Vehicles Outlook.

SRW: You're due to speak at SmartRail Munich on June 17-19th – what do you plan to cover at the event?

JC: I will talk about the highlights of our "Future of Rail" report, focusing on the following elements:

- The data work: collaboration with rail and transport sustainability experts on collecting, harmonising, and analysing data;
- Current plans and policies for rail development in different countries/regions of the world;
- The costs, benefits, and opportunities for rail to contribute to mobility, and to energy, economic and environmental goals;
- Main policy messages and the potential for rail to reduce GHG emissions and save energy, while also contributing to economic growth and opportunities;
- The scope for further follow-up and more detailed research and collaborations in the area.

SRW: What does that "Future of Rail" report cover?

JC: The Future of Rail explores the current and potential future benefits of the area, as both urban and non-urban rail systems can complement and provide high quality, efficient, equitable substitutes

to other transport modes such as cars, trucks, and airplanes. Strategic investments in rail infrastructure can further support these benefits, enabling countries to diversify energy sources for transport, cut consumption of oil for other transport modes, and reduce greenhouse gas and harmful particulate matter emissions.

The report explores the benefits of metro and light-rail networks that operate in densely populated cities today, and the potential for such systems to reduce reliance on more energy- and carbon-intensive modes in an era of urbanisation. It shows how conventional and high-speed rail can perform a similar role in reducing reliance on cars, buses, and planes, leading to oil savings and emissions reductions.

Finally, in a country focus on India, the report shows how a country where rail is the lifeline of the nation can ensure that rail networks continue to play an integral role in providing affordable, equitable, and efficient passenger and freight movements until at least 2050.

SRW: You're involved in work concerning Advanced Fuel Cells (AFC) and Advanced Materials for Transportation (AMT). Can you tell us a bit more about that?

JC: Sure! Part of the broader IEA network is engaging with communities of researchers working on cutting edge applied science and engineering, and I am the desk officer of two of these so-called "Technology Collaboration Partnerships" (TCPs). Me and my colleagues engage with both of these communities, and they provide valuable input to our policy work.

In the case of the AMT TCP, they provided feedback on the role of materials efficiency in clean energy transitions for a recent report I contributed to, and experts in the AFC TCP have provided valuable feedback to a current IEA draft report on Hydrogen which has been commissioned by Japan on the occasion of their presidency of the G20.

SRW: What has been your biggest career challenge to date?

JC: Working at the IEA is always a varied and stimulating experience. As my responsibilities at the IEA evolve, I find that the challenge is about how to increasingly engage with all the interesting opportunities, information, projects, analysis, and politics, while keeping abreast of administrative duties and modelling work. This is a nice challenge, to be passionate about your work, but it certainly brings with it difficulties in enjoying the benefits of being "An American in Paris"!

"There are also a lot of opportunities to harness digital technologies to integrate rail into logistics and supply chains in urban (and non-urban) freight -- these digital innovations could be harnessed by the rail sector to cater to people's travel needs and desires in very efficient and interconnected way."

SRW: What do you think are the biggest challenges facing the rail industry?

JC: The future of rail will be determined by how it responds to both rising transport demand and rising pressure from competing transport modes. Rising incomes and populations in developing and emerging economies lead to strong demand for mobility, but social considerations and the need for speed and flexibility tend to favour car ownership and air travel. Freight demand has also grown due to higher incomes and digital technologies, which have sharply increased the demand for rapid delivery of higher value, lighter goods.

The rail sector has important advantages to exploit in competing for business, but this will require additional strategic investments in rail infrastructure, alongside further efforts to improve its commercial competitiveness and technological innovation -- like all modes of transport, rail is very capital intensive.

To that end, large sums will need to be invested to keep rail competitive, and even increase its attractiveness vis-à-vis other modes. I believe doing so will require identifying corridors where investment in rail has the greatest economic, environmental and societal benefits; capitalising on "land value capture" to finance urban, commuter, and high-speed rail developments; and finally, passing policies that ensure that all forms of transport pay adequately for the impacts they generate.

SRW: Where do you think the next big changes will come to the rail industry in the future?

JC: I am quite eager to see how digital technologies will impact urban mobility in general, and rail in particular. I think that machine learning, sensors, and "big data" could -- if harnessed wisely -- make travel in cities more convenient, cheaper, more pleasant, and more reliable, as well as give urban travellers more diverse options in terms of modes and real-time flexibility.

There are also a lot of opportunities to harness digital technologies to integrate rail into logistics and supply chains in urban (and non-urban) freight -- these digital innovations could be harnessed by the rail sector to cater to people's travel needs and desires in very efficient and interconnected way.

SRW: Finally, we like to ask interviewees about their favourite rail journey ever; where's yours, and why?

JC: I lived and worked in rural China from 2003-2008, and over there, I travelled in some of the most luxurious and also the most exhausting train trips of my life. For instance, I once took a 28 hour standing journey, sandwiched shoulder-to-shoulder with Chinese commuters coming back from their Spring Festival holidays, with the lights on the entire time. I woke up at some point lying on the floor, with people's feet all around me.

Another time I was seated for an even longer trip (30+ hours) across from a very loquacious Chinese guy who entertained the entire train with my complicity, by engaging me in a long chain of cigarette smoking, politics, cross-cultural joke-cracking, and card playing.

Jeff Davies, Managing Director of Andromeda

"We believe by working alongside our industry partners, we can provide cost effective and innovative solutions for the rail industry, driving the right behaviours for the betterment of the industry, and ultimately, the passenger."

Electrification and signalling are as intrinsic to rail as tracks themselves, being a major part of the infrastructure that is in constant need of maintenance, care, and innovation to keep up with modern consumer demands.

To talk about these topics, we sat down with Jeff Davies, recently appointed Managing Director of Andromeda UK. An engineering company specialised in railway electrification, LV signalling design, and specialist consultancy, Andromeda and Jeff have been involved in some high profile projects across the British Isles.

SRW: First off, a bit of background: How did you start your current career path, and what does your new position as managing director entail?

JD: I was proud to work for Network Rail for 14 years. I worked various roles both on projects and in Asset Management across the UK, learning from some of the leading experts in the rail industry, and in 2015 I was delighted to be appointed Director of Safety and Asset Management for the Wales route.

After almost four great years with the Wales route, I ended my time at Network Rail by supporting Andrew Haines in re-shaping the business to "put passengers first". I wanted to continue to challenge myself further and take full accountability for the profit and loss of a business, however, and joining Andromeda not only provided that opportunity, but the team shared a collective passion to make a positive difference to the rail industry which was extremely important to me when making the decision to join. It's an exciting time for the company and my role as Managing Director is to continue our success in railway infrastructure consultancy and electrification design, while developing our Low Voltage and Signalling capability to compliment our sister company Amaro, offering a design and build solution for Signalling, Electrification and Low Voltage works.

SRW: How has the rail industry changed since you started working in it?

JD: The level of investment has increased phenomenally since I started as a graduate. Even 15 years ago, a £50m project was considered large, but now that's a mere stagework of Billion pound schemes. This rapid and substantial growth has challenged the capability and competence of the industry.

The numbers of experienced railway men and women have also declined, so depth of competence now relies on a few senior, highly experienced individuals.

SRW: Are there any past projects you're proud of? Are there any upcoming ones you're excited about?

JD: On a personal level, it's not a big value, headline grabbing project, but one involving our most important asset – people. A conversion programme for electrical and mechanical engineers to join the railway and help support the delivery of and management of the changes to the infrastructure. Engineers were recruited from various industries and the armed forces, provided with specific training in electrification skills as well as formal learning through Sheffield Hallam University -- in total, the programme supported 45 engineers over several years, and it was extremely rewarding to be a part of it.

"The significant improvements planned for the Valley Lines in Wales are also tremendously exciting. As a proud Welshman, it is really great to see this generational level of investment to transform the valley's network as well as improving the reliability and performance of the entire network. I am looking forward to being a part of this and supporting Transport for Wales in achieving their vision."

I am also extremely proud of the Cardiff Intersection Bridge project. This was an innovative, collaborative solution utilising the latest insulation coating technology to provide an electrically insulating layer to the bridge to support reduced electrical clearance, saving millions of pounds and avoiding the risk of delaying the electrification programme on the South Wales Mainline.

I was Director of Route Asset Management for Wales and Borders at the time, and I was extremely impressed with the team at Andromeda who approached us with this design solution. It was a first of its kind for new electrification, and it went on to pick up an award at the Railway Industry Innovation Awards 2018. The significant improvements planned for the Valley Lines in Wales are also tremendously exciting. As a proud Welshman, it is really great to see this generational level of investment to transform the valley's network as well as improving the reliability and performance of the entire network. I am looking forward to being a part of this and supporting Transport for Wales in achieving their vision.

SRW: What's Andromeda's key business priorities?

JD: Maintain our market leading electrification design expertise, whilst diversifying into a multi-discipline design business. Forming complimentary partnerships with other SME's to challenge existing practise and drive down costs is also a key priority for us. We have recently partnered with iLECSYS Rail and Amaro to provide a comprehensive signalling power supply solution. We believe by working alongside our industry partners, we can provide cost effective and innovative solutions for the rail industry, driving the right behaviours for the betterment of the industry, and ultimately, the passenger.

SRW: What industry challenges do you identify as the most pressing ones, and how can Andromeda help the sector overcome it?

JD: One of the biggest challenges is competence across the industry. At Andromeda, we are committed to ensuring that we invest time with our apprentices and graduates and provide the right mentorship and training.

We have senior engineers with over five decades of experience and expertise -- young engineers spending quality time learning from these industry experts is key to educating the next generation of rail engineers and ensuring the highest levels of competence.

SRW: What's the biggest professional challenge you've ever faced?

JD: Leading the Control Period 6 (CP6) funding bid for the Wales and Borders, which culminated in a record funding settlement of £2bn. I worked alongside a great team and I was very proud that together we secured a record settlement for the route. When you have a fantastic team of people who come to work committed to doing the best thing for the railway, it really feels that no challenge is insurmountable.

SRW: Finally, a question we ask all our interviewees: what's your favourite rail journey in the world, and why?

JD: Until I get to take a trip across Canada, I would have to say riding on the Caroline inspection saloon through mid-Wales and the Cambrian lines -- extremely picturesque, with plenty of time to soak up the beautiful views!

How Gothenburg is environmentally constructing new metro tunnels

The West Link is an eight kilometre long double track railway, including a six kilometre railway tunnel, underneath the city of Gothenburg. Scheduled for completion in 2026, the £2.5 billion development - which also involves the creation of three new underground stations - will increase accessibility to the city, boost capacity and improve travel times.

The construction involves a large amount of tunnelling and concreting, generating considerable volumes of potentially polluting waters. To handle that, Siltbuster systems are being used to treat the waters generated during construction of the West Link project on the Gothenburg Metro in Sweden. This is the latest in a long line of high profile national and international rail projects to call on the Monmouthshire firm's equipment and expertise.

The contractors, Nordic Construction Company (NCC), are excavating through granite, limestone, and clay for the tunnel and stations. During this work, the site's surface water runoff and ground water can come into direct contact with the exposed soil, creating waters with a high concentration of suspended matter including fine, slow-settling, clay particles. If a significant amount of this material enters nearby drains and watercourses, it can block the gills of fish and smother aquatic plants and invertebrates, starving them of light and oxygen. The extensive concreting works during the construction phases will also create highly alkaline, cementitious construction waters with an elevated pH of 12-13 -- akin to oven cleaner -- again highly polluting to the environment if left untreated.

To deal with that, the required system needs to be not only capable of treating the high incoming flows to a verifiably high standard, but also offers a large treatment capacity for a small footprint. This is a key consideration, as the West Link is being developed within the centre of Gothenburg, next to the biggest amusement park in Scandinavia, The Swedish exhibition centre, the World Culture Museum, Gothenburg World Trade Centre, plus ice hockey and football stadia.

"With the construction work taking place in a high profile, densely populated, built-up area, and with a main highway linking Malmo to Oslo running nearby, space is at an absolute premium," explains Kristian Downs, Export Sales Manager, Siltbuster. "There's limited room on site for additional plant and equipment. That's why our iHB40R ticks all the boxes. It's a highly effective, easy-to-use treatment solution, that's agile and space efficient."

"To be involved in yet another prestigious international project is a great endorsement for the expertise of our team, the robustness of our systems, the size of our fleet, our technical back-up and our growing reputation within the world's construction sector," he adds.

Siltbuster's iHB40Rs units - part of a fleet of over 400 systems routinely hired out at short notice to construction companies around the world – were supplied for the Gothenburg project through its local distributor Clean Water Engineering, and will be on site for the next few years with estimated completion in 2026.

"The scale of this project is immense, and the requirements are very strict," says Johan Magnusson, CEO at Clean Water Engineering. "Siltbuster was the number one choice -- it has supplied four units to date, but there will be more on site soon. With space limited, it is great having a system that is not only compact and nimble, but more effective and efficient than any other system on the market."

Siltbuster is recognised as a world leading authority on water treatment. Its systems are used in over 33 countries and have been deployed on a range of international rail and tunnelling projects including the Grand Paris Express (GPE), the Doha Metro in Qatar, the Northern Line extension, Crossrail, Thames Tideway Tunnel and Stuttgart S21.

SILTBUSTER IS RECOGNISED AS A WORLD LEADING AUTHORITY ON WATER TREATMENT. ITS SYSTEMS ARE USED IN OVER 33 COUNTRIES AND HAVE BEEN DEPLOYED ON A RANGE OF INTERNATIONAL RAIL AND TUNNELLING PROJECTS INCLUDING THE GRAND PARIS EXPRESS (GPE), THE DOHA METRO IN QATAR, THE NORTHERN LINE EXTENSION, CROSSRAIL, THAMES TIDEWAY TUNNEL AND STUTTGART S21.

World Cities Day: promoting urbanisation with sustainable development in Smart Cities

31 October is the United Nations' World Cities Day, which promotes the international community's interest in global urbanisation: encouraging cooperation among countries to meet the opportunities and address its challenges, and contribute to sustainable urban development globally.

The general theme of World Cities Day is 'Better City, Better Life'. This year's sub-theme is 'Changing the world: innovations and better life for future generations.' I see this as the United Nations General

Assembly throwing down the gauntlet to challenge private and public organisations to raise the bar in how we contribute to and shape urbanisation. BAI and, I believe, the organisations with which we work are certainly willing to take it up.

This year, the World Cities Day goals are to:

1. Increase awareness of how digital innovations can be used for urban service delivery to enhance the quality of life and improve the urban environment
2. Show new frontier technologies that can create more inclusive cities
3. Present opportunities for renewable energy generation in cities
4. Explore how frontier technologies can promote social inclusion in cities.

An international perspective on urbanisation.

According to the United Nations, more than half the world's population now live in cities. Expected to increase to 68 percent by 2050, urbanisation is one of the world's most transformative and challenging trends.

We help enable economic growth and fast-track development of world-leading connected communities. We do this by designing, building and operating the connectivity and communications infrastructure on which they depend.

BAI's particular perspective is that digital enablement, through connectivity, is changing our idea of what a city can offer its citizens. In fact, we argue that innovative transport systems are a defining feature of 'smart', world-class cities and citizens require continuous connectivity to realise the benefits of living in such cities.

Therefore, continuous connectivity helps transform cities, helping citizens to be more productive and happier, and organisations to be more innovative and prosperous. A decent contribution to urbanisation and sustainable development.

A better life through digital enablement

A smart transport network contributes to the economy by enabling commuters to get to work and, importantly, spend their travel time productively, whether that's working, studying, or keeping in touch with each other. Games, videos, podcasts and books, among other apps, are the relaxation and entertainment option. It also unlocks potential housing options in (usually) more affordable areas away from city centres.

According to the Moovit Public Transit Index, the average weekday commute exceeds 80 minutes in New York, Sydney, and London. So, it's no surprise that commuters want to make the most of this otherwise idle time. Other than getting more done and being contactable, work-related benefits of connected travel provide an opportunity to change working hours and job location, in support of career improvement.

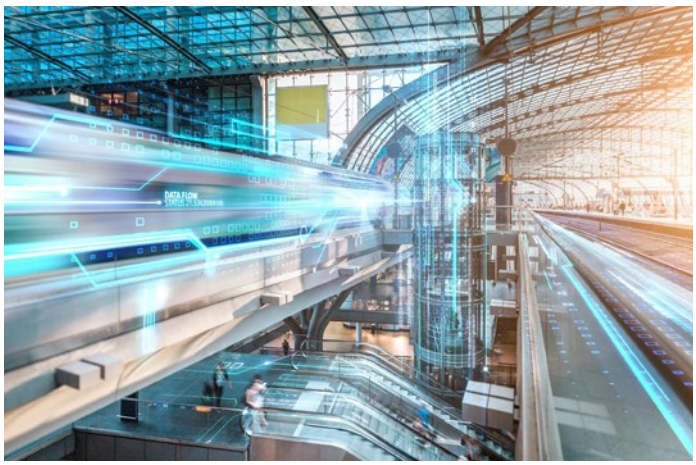
Being digitally enabled on public transport means that we can achieve more, while leaving work earlier to get home before its late and use that extra time at home to do something for ourselves. Something as simple as being able to work and study or pay bills and watch videos on the train can lead to a more enriched life. At worst, commuters arrive at their destination relaxed and happy in seemingly less time.

In short, a connected and evolved transport network digitally enables commuters, and this improves productivity and contributes to well-being.

Technology risk and sustainable urbanisation

In a world where it is increasingly cities, rather than nations, competing for trade, investment and reputation, a city's smart transport infrastructure contributes significantly to its 'world-class' status.

Communications infrastructure is a key consideration for urbanisation with sustained and inclusive economic growth. Thus, city planners are incorporating wireless infrastructure and related innovation into their plans at the outset, as they understand how integral this technology is for a world-class city.



Additionally, with technology advancing at such a rapid pace, city planners, developers, and utility providers, as well as transport authorities, must "future proof" all design and development to reduce the risk of it becoming outdated.

Accommodating the technology of the future is no easy task. It is also important to account for its 'requirements' and factor in space for equipment (such as poles, wires or fibre) that will likely be needed for system upgrades, as well as access to installation sites that will need to be revisited. This becomes more difficult with extensive projects due to the positive relationship between this risk and the project duration.

Contributing to the evolution of our digitally dependant world

The transport industry is in a period of change that is delivering important benefits for commuters and society and transforming our cities. Therefore, there is much more to this change than simply technology's contribution to convenience. Public transport innovation is becoming increasingly important, with users expecting connected, sustainable networks. BAI's international expertise is in designing, building and operating state-of-the-art communications technology—cellular, Wi-Fi, broadcast, radio and IP networks.

Moreover, we are known for being able to do this in confined, complex and challenging environments; BAI Communications connects people, enriches communities and advances economies through its innovative communications infrastructure and technology. Thus, we contribute to the evolution of our digitally dependant world.

"As we become more reliant on technology and connectivity, we are changing and – dare I say – improving the way we live and work in cities around the world, thus changing the world through innovation and sustainable development."

As such, we are a catalyst for unlocking new services and revenue streams for our customers. We deliver the connectivity and technology that enables them to provide better experiences for commuters and communities, every day.

We digitally enable more than 4 billion rail passengers annually, across transit systems in New York, Hong Kong and Toronto. In Australia, we own and operate one of the most extensive transmission networks in the world, delivering 59 million broadcasting hours to 99% of the population.

The cellular and Wi-Fi connectivity we deliver includes dedicated public safety bands and connected public safety systems. In times of crisis, broadcasters rely on us to maintain their connection with citizens and emergency services teams rely on us to keep them informed.

Sustainable urbanisation considers future generations

Sustainability is a key issue for many aspects of government; featuring in functions such as city planning, procurement, and waste and utility management. A party's stance on sustainability is under increasing scrutiny on both sides of government. This is also a key election issue in many developed countries. Simultaneously, the private sector is increasingly much more considerate of sustainable practice in its business operations and strategy formulation.
It's also clear to me that private and public sector collaboration is essential to advancing smart cities in the future. Furthermore, government and the private sector must collaborate on a range of considerations and mechanisms, in addition to the financials. This is the way to successfully deliver infrastructure projects that withstand time and measure up to anticipated needs of future generations.

One of World Cities Day's goals this year is to explore how frontier technologies can promote social inclusion in cities. Inclusion – digital, demographic, disability, as well as social – is a notable example of an important consideration for future generations. Collaborating on inclusion will contribute to project outcomes that reflect – and serve – our diverse communities and their diverse needs.

A brave new world?

We are in an era of technology development and convergence that constructed smart devices, systems, homes, workplaces, and smart cities. Industry players are now innovating with advanced technology and making 'smart' even smarter.

Accordingly, as we become more reliant on technology and connectivity, we are changing and – dare I say – improving the way we live and work in cities around the world, thus changing the world through innovation and sustainable development.

STEPHEN MATTHEWS IS THE GROUP CHIEF FINANCIAL OFFICER AT BAI COMMUNICATIONS. HIS OPINIONS ARE INFORMED BY BAI COMMUNICATIONS' RECENT STUDY OF COMMUTERS IN HONG KONG, LONDON, NEW YORK, SYDNEY AND TORONTO, WHICH TESTED THE HYPOTHESIS THAT CONTINUOUS CONNECTIVITY ENRICHES CITIZENS AND CITIES AND SOUGHT TO UNDERSTAND HOW A DIGITALLY CONNECTED PUBLIC TRANSPORT SYSTEM CAN IMPACT CITIZENS' LIVES.

SMART METRO

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Editorial calendar

EDITORIAL	DEADLINE FOR CONTENT AND ADVERTS	RELEASED WEEK COMMENCING
SMARTMETRO MADRID (25TH - 27TH NOVEMBER)		
Industry Guide: How the United State's $2 trillion transportation infrastructure package will impact the American rail industry	Monday, November 18th	Friday, December 6th
SMARTTRANSIT EAST: BOSTON (17TH-19TH MARCH)		
SMARTRAIL ROME (18TH-20TH MAY)		
TRANSPORT SECURITY CONGRESS USA (8TH-10TH JUNE)		

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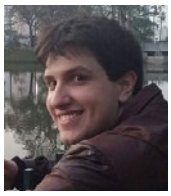
TO DISCUSS HOW WE CAN WORK WITH YOU!



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