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SENIOR MANAGEMENT POSTS INSIDE

Rail Professional

THE BUSINESS MAGAZINE FOR RAIL

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Ticking all the boxes

Nick Hughes, sales director at Hitachi Rail Europe on a 'very good 12 months'

HIGH SPEED RAIL

A view from all angles

THE SHAW REPORT

Evolution or revolution?

CONSUMER RIGHTS ACT

What does it mean for Toc's

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Contact us

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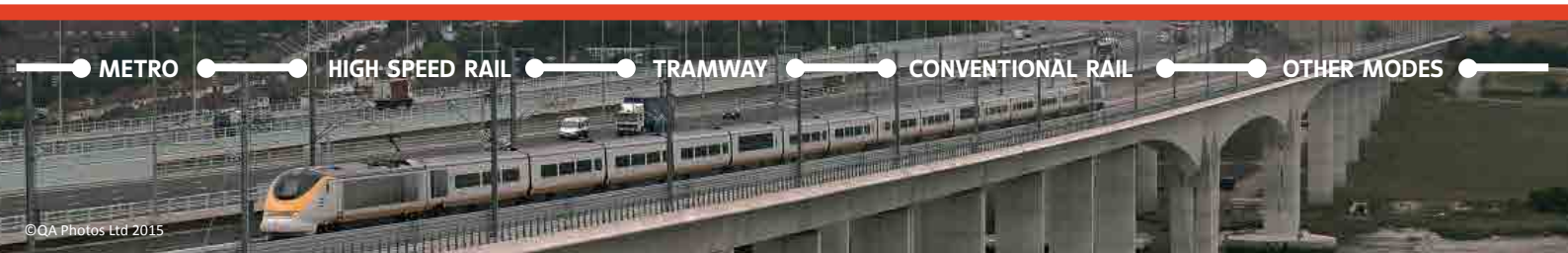

PUBLISHER
RAIL PROFESSIONAL LTD
Hallmark House, Downham Road,
Ramsden Heath, Essex CM11 1PU
Telephone: +44 (0)1268 711811

EDITORIAL
EDITOR
LORNA SLADE
editor@railpro.co.uk
ASSISTANT EDITOR
DAVE SONGER
editorial@railpro.co.uk

ADVERTISING
CHRISTIAN WILES
chris@railpro.co.uk
HANNAH CARRATT
hannah@railpro.co.uk
LYNDSEY CAMPLIN
lyndsey@railpro.co.uk
ELLIOTT GATES
elliott@railpro.co.uk

SUBSCRIPTIONS
BEN WARING
ben@railpro.co.uk

ADMINISTRATION
CHERIE NUGENT
info@railpro.co.uk
LISA ETHERINGTON
admin@railpro.co.uk
JODI PRESSWELL
jodi@railpro.co.uk

DESIGN & PRODUCTION
MILES JOHNSTONE
production@railpro.co.uk

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editor's note

With this the high speed issue, *Rail Professional* caught up again with the company on many people's lips when HS2 is mentioned: Hitachi Rail Europe.

Much has changed for the company since Lorna spoke to Alistair Dormer two years ago and this time I met with its sales director Nick Hughes, who spoke about the latest contract wins, its high speed pedigree, listening to critics' concerns and the use of private-sector money to finance upgrades on the UK network.

On the latter topic, I attended a keynote speech at this year's Infrarail delivered by Peter Hendy, chairman of Network Rail. Giving details of various infrastructure projects, Hendy called for the companies carrying out the upgrades to foot the bill as, in the future, the Treasury won't have the funds required for all the planned work.

While at Infrarail I ran into representatives from a group promoting an initiative that will use the UK's train stations to help with the Queen's 90th birthday celebrations on 11th and 12th June. Nothing work-shy about the team behind the plans: when it's up and running there will be a range of festivities including live music, family picnics and art displays. We'll be running an interview with the organiser, Chris Leech MBE, in the June issue.

Still on the subject of The Queen, I was privileged last month to be given a guided tour of the line that in February officially took Her Royal Highness's name, the Elizabeth Line. Engineers working on it demonstrated the latest 'floating' track system that will dramatically reduce noise levels on sections of track in the West End. Required to lessen the impact on music venues and recording studios in the area, it will achieve it using an improved configuration of bearings and springs first used on HS1.

The London Underground station I used to get there, Holborn, was in the news recently after it began its strategy to cut commuter congestion. The mandatory system requires passengers to stand still when using stipulated escalators, with no one on them allowed to walk. The theory is it'll be quicker for everyone by reducing the queues that create congestion. However, with many not aware of TfL's latest plan, it's caused widespread confusion. I was told of one particular gentleman who was shouted at by staff for walking and, upon stopping, was then rounded on by his fellow commuters for holding them up.

Measures to alleviate train overcrowding on some of the busiest lines were looked into at Tomorrow's Train Design Today competition that took place in April. Among the proposals was a plan for a European-style double-decker train to operate on HS2. It's been picked up by Network Rail and talks have already taken place between German transport engineers to look into its feasibility. However, one idea that may not make it from the drawing board is a 'bouncy castle' train equipped with seats that deflate in the rush hour to free up 40 per cent more room. Seems like hot air to me.

Enjoy the issue!

Dave Songer, assistant editor

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> They've seen what we've done, which has been applauded around the industry, and I think it's kind of set the bar at a new level. I think others will follow

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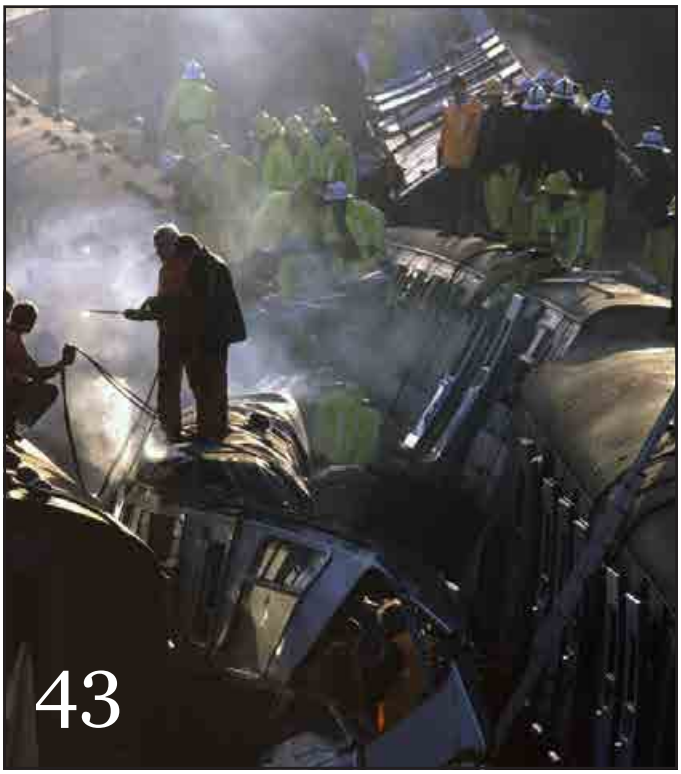

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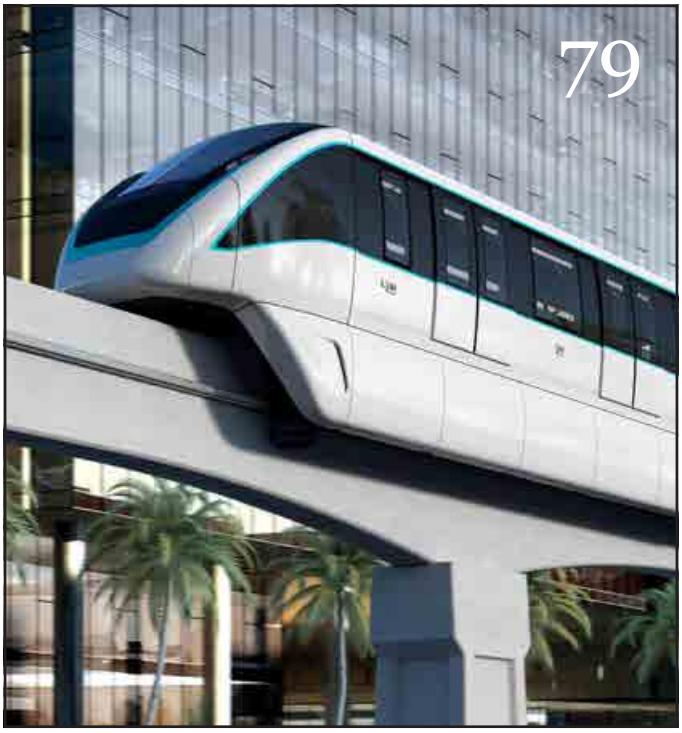

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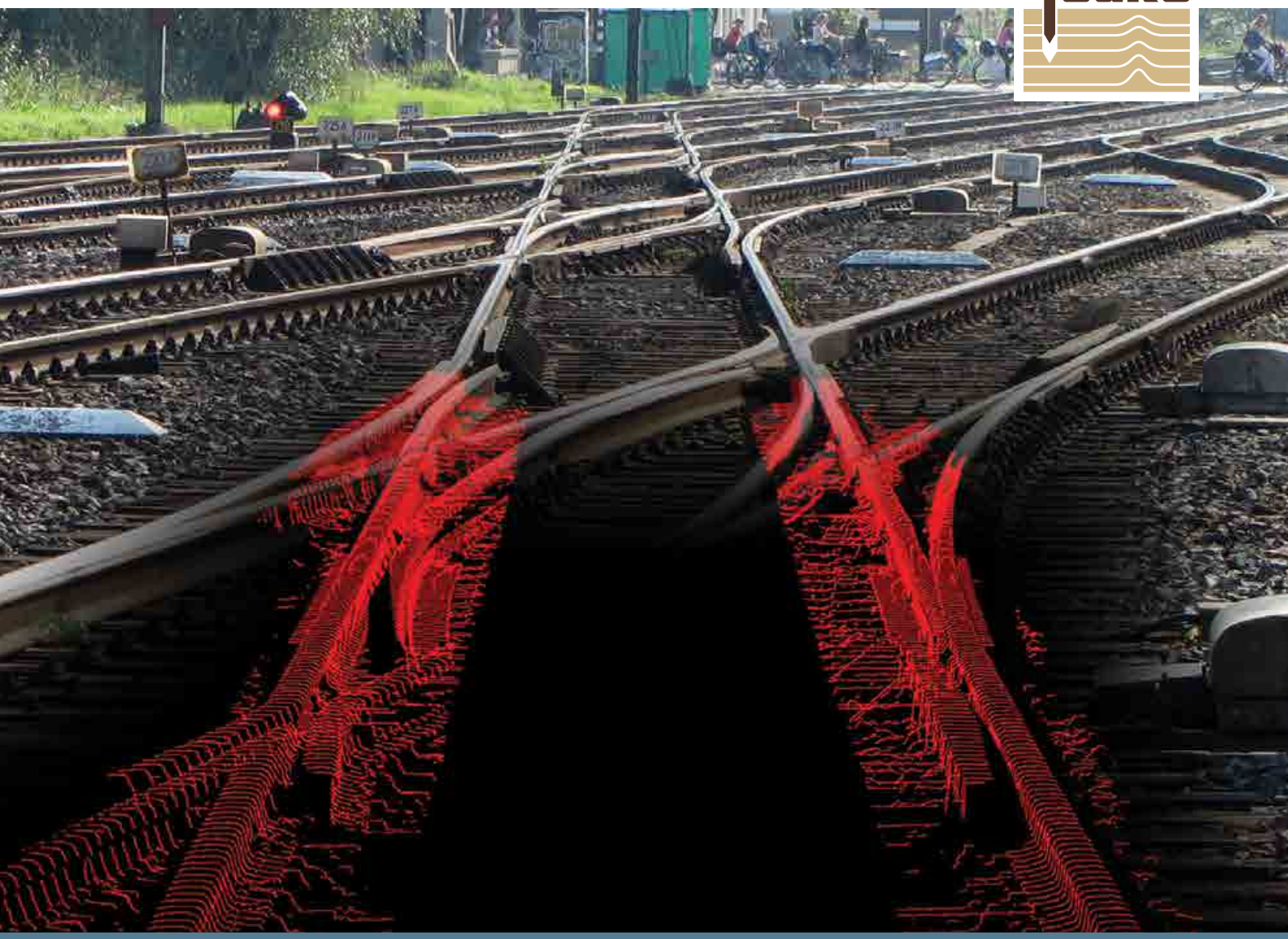

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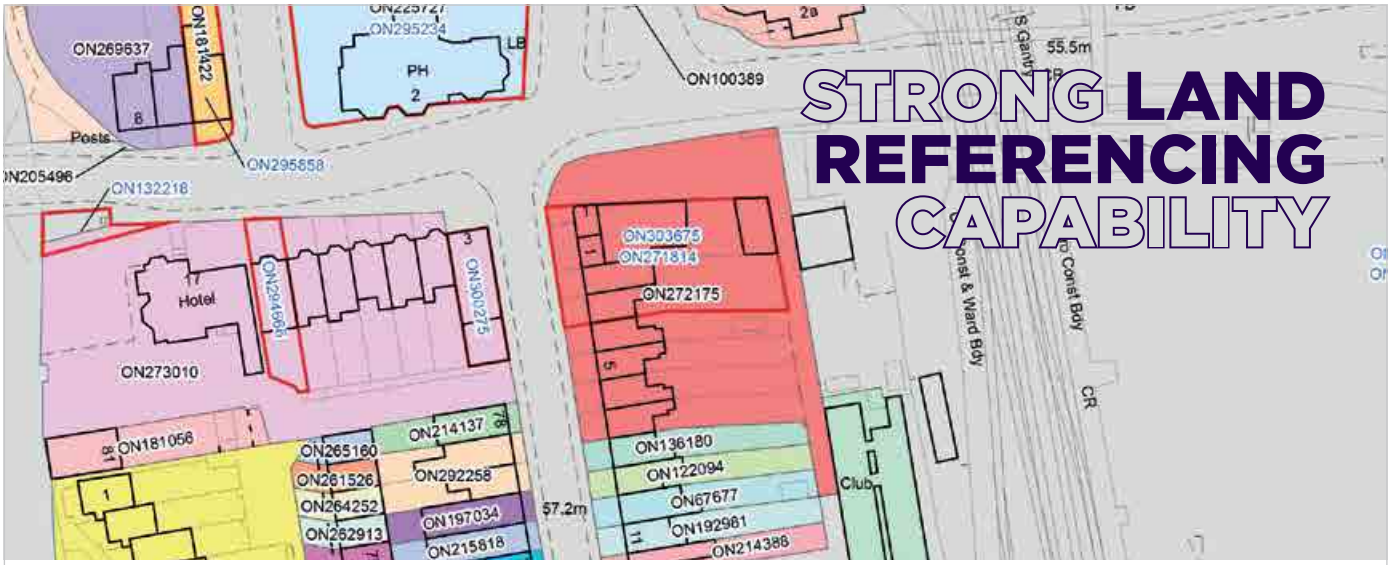

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News in brief...

EU pays a pittance

UKIP MEP Jill Seymour said the EU's contribution of £30 million towards HS2's £55 billion cost is an 'insult', after transport minister Robert Goodwill revealed the figure in a parliamentary answer. Describing the line as a 'vanity project which does not have a valid business case', Seymour believes pressure from the EU is one of the main reasons it is being built. 'If the Brussels bureaucrats want HS2 in Britain to fit into their grand plan for a Europe-wide rail network, the least they could do is put their money where their mouths are.'

No claim brings gain

Campaign for Better Transport has welcomed MP Joan Ryan's Improvement of Rail Passenger Services (Use of Disruption Payments) Bill, recently introduced in Parliament.

The Bill, which has cross party support, aims to require that any net profit Toc's make from unclaimed compensation due to passengers as a result of Network Rail disruptions is used to improve services.

'To solve the problem we need simplified and automatic compensation through Oyster-style ticketing. Meantime the Bill is based on a good principle and we're glad this issue is getting attention,' said a spokeswoman.

Real deal for Network Rail

NR has appointed BNP Paribas Real Estate as principal adviser across its 2.5 million square foot corporate office portfolio to help drive operational efficiency.

The three-year contract will see BNP PRE provide estates management, professional and transactional services across approximately 140 NR properties. It marks the first time NR has appointed a single adviser across its corporate office portfolio.

→

Govia Thameslink Railway launches legal action to operate new trains

GTR has issued proceedings at the High Court to seek an injunction to enable the operation of new 12 car train services on Gatwick Express. This follows the refusal of drivers, at the instruction of the ASLEF union, to drive the first two services that had been due to operate in 12 car formation over the past ten days.

Gatwick Express services presently operate with either five or ten carriages, but with the introduction of brand new trains this will increase to either eight or 12 carriages over the next two months.

ASLEF is opposed to the introduction of the new trains in 12 car formation, arguing that this amounts to an extension of 'driver-only-operation' because the doors on the new services are operated by the driver aided by CCTV, rather than a conductor. This is despite the fact, says GTR that the driver operates the doors on Gatwick Express already, and has done for 17 years since 1999. Furthermore, the exact same rolling stock already operates in driver-only-operation in 12 car formation on the same infrastructure, operating as Thameslink services.

A GTR spokesperson commented: 'We launch legal action very reluctantly, but we have been left with no choice because of the position adopted by ASLEF. Drivers have safely operated the doors on Gatwick Express services for many years so passengers will find their refusal to drive the new trains baffling. We will take any reasonable steps we can to defend the interests of our customers and maintain the Gatwick Express service with the new 12 car trains.'

At the time of going to press, the drivers' refusal had led to the cancellation of two services. GTR said the 12 car trains are due to make up 50 per cent of all Gatwick Express services by June, 'so this legal action is necessary at this stage to ensure the roll-out of these services over the next couple of months is possible without major disruption to services.'

SNP to allow public operators to bid

The Scottish National Party will allow a public sector rail operator to bid for franchises in Scotland.

The move was announced by Nicola Sturgeon during an address to the Scottish Trade Union Congress (STUC) annual conference in Dundee, and follows new powers being handed to Holyrood in the Scotland Bill.

The SNP leader said the policy would help address the current anomaly that allows foreign public-sector operators to bid to run Scottish rail services, but not public-sector operators based in Scotland.

Sturgeon said: 'One of the recommendations of the Smith Commission was that Holyrood should have the power to change that. A re-elected SNP government will put in place the necessary changes to the legislation to ensure that in the future, a Scottish public-sector body can bid to run Scotland's railways. The new powers coming to the Scottish Parliament mean that this is the most important election since devolution.'

The move follows concerns about the performance of Abellio in running the ScotRail contract.

Last year the international arm of the Dutch national rail company was fined more than £250,000 for late trains, dirty toilets and litter on platforms after being awarded the £6 billion contract in April last year.

Figures released by Transport Scotland last November also showed the company failed to meet standards for trains in eight out of 17 categories including toilets, graffiti, passenger information displays and the seat reservation system.

'Rail has a bright future in Scotland, with major improvements to our network taking place the length and breadth of the country', said Sturgeon.

News in brief...

Come fly with me

ScotRail has launched a £20 fare for passengers connecting with Flybe flights within Scotland.

The Toc's one year pilot scheme will allow passengers using Loganair's network to connect to any ScotRail operated service for the fixed fare (£10.00 for children).

Passengers will be able to purchase the add-on ticket at station booking offices or on-train by showing a valid flight boarding pass and photo ID.

Cathy Craig, ScotRail commercial director said: 'It offers a real benefit to customers when transport providers work together to offer seamless ticketing options.'

Loganair chairman David Harrison said: 'We appreciate the positive impact greater transport connectivity can have, particularly to our passengers from the island communities.'

No time to waste

Thameslink's London Blackfriars station has become 'zero-to-landfill', meaning none of its waste ends up in landfill sites.

Blackfriars was constructed to be the world's largest solar bridge with 4,400 solar panels on its roof that generate up to 50 per cent of its energy needs. Now, the station ensures waste that cannot be recycled is sent to a facility to be incinerated to create energy.

Station manager Mark Powell said: 'We have worked with our station, tenants and on-train cleaning staff to get them in-the-know with everything. It's remarkable the difference that can be made when everybody pulls together.'

Champion needed

South East passengers need a champion on the TFL board if changes go ahead to give London's Mayor control of rail services outside the capital, according to South East England Councils. The body believes that South East councils should have →

Shaw conclusions broadly in line with widely-held views

A newly published document provides a breakdown of the themes that came out in the consultation phase of the Shaw Report.

A total of 10,000 responses were received in some form, comprising 3,441 from individuals, 91 from organisations, and 7,231 from an online petition – Bring Back British Rail.

Last November the Department for Transport published a scoping document on the future shape and financing of Network Rail which framed the problem the Shaw Report was trying to solve, and posed 29 questions on which the report team requested the feedback in order to inform its analysis.

The new document states that while the organisational responses were varied, the vast majority of individual responses were focused on a small number of consistently expressed themes:

- a rejection of the wholesale break-up of Network Rail which would further complicate an already fragmented industry
- opposition to privatisation of Network Rail
- a desire to maintain the historically high current levels of investment in the railway.

A number of other themes arose, both explicitly and implicitly:

- a frustration with the quality or reliability of passenger railway services, and in some places a sense that private train operators abstract profit that could otherwise be reinvested into the railway
- a perceived lack of accountability or answerability in the railway: with many respondents asking who is accountable for the railway – the government, Network Rail, train operators, or a combination of all or none of these
- a sense of disempowerment whereby customers and end-users expressed frustration that decisions are taken in places where they do not have a say, and where they feel the railway operates in spite of them not for them. Many responses suggested a deep scepticism with the status quo and that customer needs are not best represented in the current structure.

The consultation process also yielded a consistent set of messages from the railway industry and the supply chain, many of which were also borne out by responses from members of the public. These centred around a number of themes:

People

Responses that mentioned the railway's workforce were almost exclusively supportive of the commitment and professionalism shown by Network Rail's people. They were highlighted as a vital resource for which more needed to be done in terms of workforce planning and investment. There was also a general concern over capability development, particularly ensuring that sufficient specialist rail and engineering skills are available to execute industry plans.

Safety

Maintaining the high level of safety inherent in Great Britain's railway was a near-universal theme. This came with an implied challenge: that any changes arising as a result of the Shaw Report should either increase safety or, at the very least, not decrease the current levels of safety in the industry.

Corporate devolution

Of those who commented on this theme, the majority believed that Network Rail is moving in the right direction to devolve power from the corporate centre to the routes. There were some issues raised around local implementation of devolution and questions over how more devolution within Network Rail would work in practice, and how it would relate (if at all) to political devolution. Responses also varied depending on the type of organisation. Local bodies were more likely to embrace devolution (and indeed ask for more of it) whereas national operators (in particular freight companies) were inclined to support national structures that reduce the number of organisational interfaces or that had mitigations in place to ensure national operators were supported.

Customer focus and accountability

Of the responses that talked about customers, almost all felt that Network Rail could have a greater focus on this group. Local authorities and regional transport bodies generally supported more accountability of NR at a local level, whereas other organisations (in general) spoke about the need for it to focus more on its customers and end users. In many cases, it was unclear whether respondents were defining 'customer', as the report team did in the scoping document (those who pay Network Rail for services, so primarily government and train and freight operating companies), or the ultimate end users (passengers and freight shippers). The point still stands, however, that Network Rail is not seen as a particularly 'customer-friendly' organisation, with many groups (such as local authorities, train operating companies and passenger groups) looking for ways to make Network Rail more responsive to their needs. →




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Excellence In All We Do

News in brief...

a seat on the board to ensure future transport plans support passenger needs and economic success in both London and the South East equally.

SEEC also says there needs to be a democratic link for South East residents as they have no say in electing the London Mayor.

Not as grand

Grand Central had the biggest PPM decrease for 6th – 31st March (period 13) at 84.2 per cent compared to 91.6 last year.

However, only 11 per cent of the Toc's delays were judged to be its own fault with 67 per cent attributable to Network Rail.

The other Toc's with the biggest PPM decline were c2c (98 per cent down to 93.8), Virgin East Coast (90 per cent down to 87) and Virgin West Coast (86.1 per cent down to 83.3). Grand Central received the highest passenger satisfaction rating in the recent *Which*? survey.

No, Luton Airport

Luton Borough Council is set to submit an application proposing a light rail link between Luton Airport and Luton Airport Parkway, reducing journey times from the airport to St Pancras International to 30 minutes.

The airport claims that it would make travelling between Luton and Central London quicker than flying via Gatwick. Luton Airport is currently spending £110 million redeveloping its terminals to expand capacity to 18 million passengers per year by 2020.

To be expected

Camden Council is petitioning the House of Lords for more compensation for residents living on the planned HS2 route.

People in rural areas living between 120m and 300m of the high-speed line can claim up to £22,500. But Camden Council leader Sarah Hayward said it was not fair this was not available in London, despite residents facing disruption until 2033. Minister for

→

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Growth

In this context growth includes planning for the future of the railway and making better use of the existing network as well as delivering enhancements. The importance of the railway being a growth industry was underlined by most respondents who touched on the topic, with many of the responses looking wider than Network Rail itself. In particular, respondents were worried that recent high levels of investment in the railway may not continue in the future, that longer-term planning is not as effective as it might be (or that any changes to Network Rail may harm industry planning), and that the ability for third-parties to suggest smaller initiatives that may make a significant local difference is inhibited.

Different sources of funding and financing

Respondents talked largely about two distinct areas where the railway might be funded and financed differently. Firstly, through additional sources of funding and financing for enhancements (for example through local authorities or via private sector capital); and, secondly, through the introduction of private sector capital to parts of the infrastructure manager (such as the routes). The majority of voices recommending the introduction of private capital were from organisations. Funding for operations, maintenance and renewals (OMR) and for enhancements were seen as conceptually different by most respondents, with a broader preference, particularly among individuals, for private financing and funding of enhancements rather than for OMR.

System operation

Most respondents noted the necessity of treating the railway network as a whole and to ensure that it operates cohesively and effectively. Responses sent in through the Campaign for Better Transport website generally included the following text that explains many respondents' desire to balance increased corporate devolution with maintaining national coherence: 'There are some important functions that will still need to be national. This needs to include safety standards as well as timetabling and engineering work from the 'system operator' role at a national level to keep disruption to a minimum and help reduce waste.'

Broadly speaking, there were two distinct proposals from different respondents. Firstly, some form of nationwide co-ordination needed to maintain system integrity, especially with regard to day-to-day operations; and, secondly, some form of 'controlling mind' which would ensure that the right decisions are being made for the long-term future of the railway, especially with regard to planning.

To view the document: The future shape and financing of Network Rail Consultation summary and analysis March 2016 Visit: www.gov.uk/government/uploads/system/uploads/attachment_data/file/515517/shaw-consultation-summary-analysis.pdf

Government puts a new figure on NR's worth

The government's balance sheet will be boosted by at least £100 billion this summer because of an accounting change that will significantly increase the value of Network Rail.

NR's current value of £54.1 billion is based on an accounting quirk of privatisation from the 1990's that was based on estimated future passenger fares.

Now, the government has asked its accountants to value NR, which became a public sector body in 2014, at the amount railways, stations and equipment would cost to replace, bringing it in line with the way in which Highways England is valued.

Accounting to the *The Daily Telegraph*, NR would now be valued considerably greater than Highways England's strategic road network, at a figure 'in the low hundreds of billions'.

This will inflate the national assets figure on the Whole of Government Accounts. The change is being made to meet standards set in the Government Financial Reporting Manual, known as FReM. Minutes from a meeting of the Financial Reporting Advisory Board, which is responsible for advising on government financial reporting and standards, confirm it has been working with the DfT and the National Audit Office on the revised valuation.

A DfT spokesman told *Rail Professional*: 'Valuing the rail network on a Depreciated Replacement Cost (DRC) basis is considered appropriate by the Financial Reporting Advisory Board. We are working with Network Rail on valuing the rail network on this basis, and the valuation will be published within the Department's accounts in summer 2016. This change will not affect Public Sector Net Debt, or Public Sector Net Borrowing.'

A Network Rail spokesman told *Rail Professional*: 'This isn't really one for us. Nothing has changed here. This affects the DfT's accounts, not ours and will have no impact on any of our plans.'

General secretary of the RMT Mick Cash said: 'The revaluation exposes again the whole twisted nature of rail privatisation that systematically under-prices public assets to load the dice in favour of the private sector.'

Network Rail will retain the old accounting methodology for its own annual report.

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News in brief...

Transport Robert Goodwill said one of the reasons for the discrepancy was because in a city like London there was an expectation there would be a 'lot of construction going on from time to time'.

At the hub

Preparatory work on what form an HS2 super-hub station in Crewe might take has begun.

Network Rail said work on initial designs will be done in a way that supports both regional and HS2 services.

Rachel Bailey, leader of Cheshire East Council confirmed it is working with NR and HS2 Limited on the concept, but said 'we are not expecting a decision until the autumn'.

Lot to trot

Commuters needing to change from Crossrail on to the tube or other services could find time savings eroded by the distances they need to cover within stations, according to Andrew Adonis, chairman of the National Infrastructure Commission. 'The interchanges are not great. There are going to be a lot of passengers walking a long way to change between trains – and they are very long trains,' he told an infrastructure conference.

The former transport secretary, who held office in the last Labour government when Crossrail was officially announced in 2009, said: 'I tried as a minister at the last minute to unpick this, but it was too late.'

Northern Powerhouse 60 seconds away from £1.6 billion economic boost, says new report

Reducing travel times to key services such as doctors' surgeries, hospitals or supermarkets by just 60 seconds could give the Northern Powerhouse an annual £1.6 billion economic boost, according to new research by Mace.

The report, *National infrastructure, local benefits*, says that there is 'enormous potential' for transport infrastructure investment to drive not only growth and productivity, but wellbeing and living standards. Using official 'value of time' research from the Department for Transport, the paper reveals how reducing journey times by just one minute could lead to £4.7 billion of economic benefit across all regions outside London, and £1.6 billion to the regions covered by the Northern Powerhouse.

The paper says that although the UK has historically lagged behind other developed countries in terms of the quality of overall infrastructure (27th in the World Economic Forum's assessment), the government's new approach to devolution and infrastructure should start to close the economic gap between the Northern Powerhouse and London.

It highlights how the amount added to the economy (GVA) by the Northern Powerhouse today is approaching £300 billion, compared to £338 billion for London. But in the North of England, less than 60 per cent of the population is within 30 minutes of an area where more than 5,000 jobs are available by public transport. In London the figure is 80 per cent.

David Brown: To transform the North's economy we need to focus on transport infrastructure

The report also highlights how the quality of infrastructure and levels of connectivity can have a major impact on both levels of productivity and a person's wellbeing, stating that too often infrastructure schemes are sold on national economic benefits. It recommends that , in order to receive the backing of local communities, those promoting the schemes need to focus on how infrastructure will improve quality of life and bring local job opportunities.

Jason Millett, COO for major programmes and infrastructure at Mace, said: 'Transport infrastructure is vital for boosting growth and increasing wellbeing yet the UK has a history of slow progress in delivering what is required to attract business investment, creating jobs and regenerating towns and cities across the entire country.

'Reducing journey times by just 60 seconds could lead to significant benefits, especially to regions outside London. At the same time, joining up our major cities and improving the quality and amenity of our transport hubs under the leadership of local leaders could really accelerate the government's devolution revolution.'

David Brown, CEO of Transport for the North, said the new analysis 'Backs up our position. To transform the economy of the North we need to focus on transport infrastructure.'

ORR's sets out priorities for 2016-17

The ORR has set out its Business Plan for the coming year, to protect the interests of road and rail users. The focus includes:

- A safer railway: ORR says it will continue to hold industry to account to deliver safety improvements, focusing especially on level crossings, the train-to-platform gap, and through overseeing better design at the outset.
- Better customer service: ORR says its response to the *Which*? super-complaint highlights more which can be done to deliver a better deal for passengers in respect of compensation for delays. It promises to monitor operators' progress closely here and around complaints handling; provision for disabled passengers, and information provided during disruptions.
- Value for money from the railway: ORR wants to see Network Rail, Toc's and Foc's work together to improve efficiency and boost value for money for taxpayers, fare payers and funders.
- Promoting a dynamic and commercially sustainable rail sector: ORR's vision for the future will be set out in its first core document outlining the next Periodic Review, 'PR18', which it will consult on later in the Spring, and which builds on the recommendations of the Shaw Report.

Visit: www.orr.gov.uk/__data/assets/pdf_file/0013/21613/business-plan-2016-17.pdf

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Batteries from parked electric vehicles could reduce costs for train commuters

Engineers have received £1.5million in funding for a new battery energy storage project that could mean more efficient and cheaper trains.

The TransEnergy project, led by the University of Sheffield, will work with Network Rail to investigate how battery storage could be used to power the railways.

As train companies try to increase the frequency of trains on existing railway infrastructure, electricity supply is under greater pressure to be available at peak times.

Engineers will study whether batteries from electric vehicles parked at train stations could supplement the system at busy periods.

Commuters could receive free parking in return for their electric cars being used as back-up batteries, providing road to rail energy exchange.

The use of batteries would reduce the demand for electrical energy supply in these periods and could mean rail operators benefit from more efficient and frequent services. Passengers could in turn benefit from reduced costs and more train services.

Funded by the Engineering and Physical Sciences Research Council, the project involves partners from the University of Leeds and the University of Southampton.

The team will develop a purpose-built energy storage test facility at a site alongside a train line, the first of its kind in the UK. The facility will investigate two types of energy storage – batteries and supercapacitors as a hybrid solution for the high levels of electricity needed to power trains accelerating and charge from trains braking.

Dr Martin Foster from the University of Sheffield's Department of Electronic and Electrical Engineering said: 'Similar energy storage systems are already being used on the electricity grid during peak times and by translating these to our railways, we could deliver real benefits to both rail companies and consumers, bringing down the costs of travel and improving services.'

Three Holmes into one

Network Rail has a new home in Birmingham – historic Baskerville House in Centenary Square – after it announced plans to bring three separate Birmingham offices together.

According to the *Birmingham Post*, the organisation has agreed to take 85,000 sq ft over three floors in one of the largest office deals in the region so far this year.

Network Rail currently has a large presence in The Mailbox and a date for the move is yet to be confirmed.

The Birmingham office of property consultancy JLL led the search for the new offices. Director Jonathan Carmalt said: "The timing was right for Network Rail to make the move and re-assess its property needs as several leases came to a close. This did make for fairly complex negotiations to ensure the smooth exit out of three office buildings."

Innovation competition creates customer benefit

£4 million is up for grabs as part of the latest innovation competition being launched by the RSSB.

TOC'16 challenges train operators and suppliers to work together to develop new and innovative ways to improve performance, reliability and safety on the railway while also enhancing the customer experience of travelling by train.

RSSB's innovations programme director, Neil Webster, said: 'We have found a number of common challenges facing train operators. The door-to-door journey of the customer, punctuality and reliability at stations and disruption management are just a few and are additional to the industry-wide challenges of increasing capacity, safety and security.

'The TOC'16 competition has been designed to help operators and suppliers work closely to find solutions which will overcome specific challenges which can be implemented on the railway.'

Proposals for TOC'16 must be submitted by consortia containing at least one train operator and at least one supplier. Four to six consortia projects will be chosen and each will be provided with up to £1 million funding to progress the proposal.

The competition will open at a launch and briefing event on 19th May and close on 16th September. Further collaboration events will take place throughout the summer.

To attend the briefing event register here: *www.cvent.com/events/train-operator-competition-2016-toc-16-/event-summary-c7d06201834d4089819b71e62482f190.aspx*

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Virgin gets in the zone

Commuters were invited to relax and enjoy the feeling of grass beneath their feet in the Zen Zone in Virgin Trains' refurbished First Class Lounge at King's Cross. The Zen Zone joins meeting, working and resting zones in the revamped lounge, which includes a resident masseuse.

SmartRail Europe Innovation Awards 2016 winners announced

After a three month process the continent-wide search for the most innovative new products and solutions for rail and metro in Europe has been concluded with the winners receiving their awards at SmartRail Europe in Amsterdam.

Winner of the Product of the Year was Cubic Transportation Systems (CTS) and Abellio – with their world first 'video ticket office' NextAgent™ at Stansted Airport. Runner up was Virgin Trains' Automatic Delay Repay (ADR), with EAMS Group's Metro Mobile App for Signals Maintenance at London Underground being voted Highly Commended.

Project of the Year 2016 was secured by Virgin Trains for its new customer information screens at Euston Station in London. Runner up was NedTrain's HealthMeter project, with Trafikverket's (UPPSAMT) 'Connected2Rail' project being Highly Commended.

One of the judges, Oliver Drewes, director European Union Liaison Office at Dutch national rail operator Nederlandse Spoorwegen (NS) said: 'Only through smart innovation can the rail sector reinvent itself time and again and remain fit for its ultimate purpose: moving people and goods timely, sustainably and efficiently around in an ever more interconnected world.'

A snapshot of last month's Infrarail show...

Images: Ben Savell Photography

In the passenger seat | David Sidebottom

The gift of time

They say that the ability to do something useful on the train is a key factor in supporting the growth of rail. So how useful is your journey, asks **David Sidebottom**

A recent Centre for Transport & Society Annual Winter conference talk about the appeal of rail travel suggested that it was linked to putting time 'in the hands of passengers'. And this got me thinking.

Driverless cars could now create the opportunity to free up people's time when travelling, as rail has historically done. The value of journey time spent on trains also appears to be changing and so are passengers' expectations. Our National Rail Passenger Survey offers a glimpse of how passengers are using their time on board trains. Increasingly it is Wi-Fi that enables productive use of time on train journeys. The number of passengers spending their time checking their emails or browsing the internet is on the rise, fewer and fewer are merely gazing out of the window or even feeling bored.

Our research into passengers' priorities for improvement found that free Wi-Fi on trains was tenth highest for all users, but if you look at particular groups it can get even higher. For 16 to 18-year olds Wi-Fi on trains was their second highest priority

> Our research into passengers' priorities for improvement found that free Wi-Fi on trains was tenth highest for all users, but if you look at particular groups it can get even higher

right after value for money, and for business passengers it was their fourth highest priority.

So what does a rail journey of the future look like? And what implications will passengers' use of time have on current franchises? When new franchise deals are let we want to see passenger views at the heart of decisions about their services. New trains being designed should reflect passengers' needs and build in features such as Wi-Fi and power sockets. Within franchise specifications free Wi-Fi ought to be seen as basic and not a premium.

But we also mustn't forget about the basics. With many passengers facing crowded trains and struggling to get a seat on their commute, the rail industry must continue to increase capacity on trains and passengers' ability to simply get a seat.

Greater emphasis on the quality of the passenger experience and enhanced communication with customers in the franchise process is to be welcomed. It is important these promises are brought to life in the plans for future franchises and that passengers can see these ideals visible in the services they receive.

HS2 must understand passenger needs

Through our online passenger panel we have been looking at the railway of the future

> HS2 has the potential to transform travel between our major cities, but this can only be achieved by really understanding the needs of passengers. From booking tickets, finding their way around the station, locating a seat on board and receiving real-time journey updates, we are exploring what passengers want in order to help build a better railway

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updates, we are exploring what passengers want in order to help build a better railway.

Our research, *High Speed Two: putting the passenger at the heart of design* reinforces that passengers now expect to be treated as valued 'customers' who have needs beyond simply getting from A to B. The panel felt the rail industry could improve its customer service to match service levels found in other sectors such as retail, technology and on airlines. HS2 should prioritise customer needs to ensure its experience is 'designed for the customer'.

Innovations presented to the panel such as delivering an experience that matches your mood and journey purpose through smartphone access would bring a new meaning to rail's ability to put time in the hands of the passenger. Our HS2 passenger panel is continuing and further insight will be published later this year.

What is clear is that these findings are vital, not only for the building of HS2 but also for today's rail services. Franchises with passengers' needs and expectations at their heart will create better rail services and ensure rail continues to be an attractive option.

David Sidebottom is passenger director at Transport Focus

May - June 2016

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CORE 2016
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Scandinavian Rail Development 2016
24/05/2016
The Brewery, Stockholm,
Sweden

Rail Depots & Workshops Modernisation 2016
25/05/2016 / 26/05/2016
London
+ 44 (0) 800 098 8489

Rail Power 2016
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Business Design Centre, London
0207 092 1166

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Delivering the goods | Chris MacRae

Continue the conversation

So what does the Shaw Report mean for freight, asks **Chris MacRae**

FTA's response around the original scoping document had been to produce the public policy lobbying document *Rail Reviews – The Institutional Needs of Rail Freight* to articulate the policy lobbying position on the needs of rail freight. Nicola Shaw's report on the future funding and structure of Network Rail, published on the day of the Budget, raises a number of issues for freight. It recommends fuller autonomy for Network Rail's routes and potentially hiving-off of some as long-term concessions.

FTA is supportive of the case for greater efficiency and responsiveness by the infrastructure provider in the operation, maintenance and renewal of infrastructure, but we are concerned about the potential implications that this form of structural change could cause to long-distance freight services operating across Britain and across Network Rail route borders.

> A positive outcome of the report is that these articulated fears of the freight industry do appear to have been listened to. The creation of a 'Freight Route' with a 'Freight CEO' is a positive and will hopefully lead to a strengthened freight team for the co-ordination of possession planning across routes…

FTA had said that the practical outcome of the Shaw Report must be a strong central System Operator, to avoid a situation where the UK's key supply chains could be endangered.

A positive outcome of the report is that these articulated fears of the freight industry do appear to have been listened to. The creation of a 'Freight Route' with a 'Freight CEO' is a positive and will hopefully lead to a strengthened freight team for the co-ordination of possession planning across routes – this needs to come out in the detail of the System Operator work. The report recognises the concept of the Britain-wide freight operator and the customer hierarchy.

On the more negative side, the concept of route-based charging appears to be coming in and so there are challenges for how this will fit with freight as a Britain-wide activity. There are also potential challenges in the sale of Network Rail land and how the Freight Route will manage freight land. Shaw is of course only a report and not binding, but the government is committed to responding in full to the report later this year while still disentangling what itself and Network Rail has to do with an implementation plan.

Still detail to be done

A challenge will be to work out how the Freight Route interacts with private sector investment and strategic capacity work and the Strategic Freight Network/ Long-Term Planning Process, Freight

> There is still detail to be done on the Bowe Review and Hendy re-plan, but the ORR role appears safe following the false fright of Bowe. A further key challenge will be how the Toc's and Foc's are being seen as the mouthpiece for end customers and shippers…

RUS and Rail Industry Planning Group. There is still detail to be done on the Bowe Review and Hendy re-plan, but the ORR role appears safe following the false fright of Bowe. A further key challenge will be how the Toc's and Foc's are being seen as the mouthpiece for end customers and shippers, with the implication that the voice of the freight shipper will be heard through Foc's despite the text of the Shaw Report talking of shipper needs (obviously some have contractualised access rights anyway). More private freight investment could see the demand for more track access options to protect longer-term private shipper investment with different types such as bulk/shipping line/LSP – the Scotland Freight Joint Board has end-users represented but the Strategic Freight Network (England & Wales) Governance Group traditionally has not.

The DfT describes the Shaw Report as the 'start of the conversation' so there is more work to do.

Chris MacRae is rail freight policy manager at the Freight Transport Association
Email: cmacrae@fta.co.uk
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Not to be trifled with

Rail businesses should review their Health & Safety programmes as a new regime of far larger fines for non-compliance takes effect, warns **Martin Fleetwood**

Under the new regime, introduced under the Legal Aid, Sentencing and Punishment of Offenders Act 2012, but not effective until March 2015, rail businesses will now find themselves exposed to penalties five or even ten times higher than under the previous regime. For offences committed after 12 March 2015 there will no longer be a cap on fines issued in the magistrates' court and the way fines are calculated has been revised.

Fines will be determined by a combination of harm, culpability and company turnover. Fining a company on the basis of its turnover rather than its profitability could have a significant impact on those whose profit margins are already under increased pressure.

There will be plenty of rail businesses, though, that are not fully aware of quite how big an impact this new regime could have if they fall foul of current regulations.

The government's intention to clamp down on indiscretions in this space, pursuing both organisations and individuals, is laudable. Aligning the fines to company turnover – as the new guidelines do – is significant as it ratchets up financial pressure, especially on medium and large-sized organisations.

A medium-sized company, according to the guidelines, is defined as having turnover between £10-50 million. Such an organisation may operate in a very low margin sector but could nevertheless be subject to a fine for corporate manslaughter of between £3-7.5 million (up from a starting point of £0.5 million under the previous guidelines). That should get the attention of most organisations.

Even the more frequent, routine safety breaches which may not have life-changing effects will become more costly affairs. Such a breach, considered to be in one of the lower harm categories, for the same medium-sized organisation will carry a fine starting at £100,000. Under the previous guidelines such an amount was what you

> Even the more frequent, routine safety breaches which may not have life-changing effects will become more costly affairs. Such a breach, considered to be in one of the lower harm categories, for the same medium-sized organisation will carry a fine starting at £100,000. Under the previous guidelines such an amount was what you expected to be fined for a breach which resulted in death

> For those organisations that do find themselves in court regarding H&S failings, there is the sobering realisation that prosecutions in this space enjoyed a 96 per cent success rate last year

expected to be fined for a breach which resulted in death.

Unequivocal message

Safety is the rail industry's number one priority and the intention of these harsher penalties is to send an unequivocal message to management and stakeholders that safety failures will not be tolerated. Nevertheless,

the impact of a fine, especially for some of the lesser offences could, in some cases, be seen as disproportionate.

For those organisations that do find themselves in court regarding H&S failings, there is the sobering realisation that prosecutions in this space enjoyed a 96 per cent success rate last year. The majority of the legal argument therefore will not focus on guilt and liability but on placing the offence into the appropriate categories for both harm and culpability. The difference in the size of the fine from one category to the next could be significant.

Senior individuals should be aware too. Between 1975 and 2009, just eleven people were imprisoned or given suspended sentences relating to H&S breaches. Since 2009, when the legislation was last tweaked, 157 people have been sentenced, including 26 alone in the six month period up until October 2015.

There is no doubt that the government is doing a fine job of making it perfectly clear that H&S is not something to be trifled with. The new regime represents a seismic change in terms of the financial penalties – and there is no accounting provision for being able to put funds aside for the possible payment of future fines.

Martin Fleetwood is corporate partner at Shoosmiths
Email: martin.fleetwood@shoosmiths.co.uk

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Passenger rights: all change?


Tammy Samuel


Zoe Harris

Tammy Samuel and **Zoe Harris** explore what the new Consumer Rights Act 2015 could mean for train operators and their passengers

On 6th April 2016, certain provisions of the Consumer Rights Act 2015 came into force which provide railway passengers with a number of statutory rights if railway services are not performed with reasonable care and skill, for a reasonable price, within a reasonable time, and in accordance with any statements or information made about the train operator or the services (if these are taken into account by the passenger). Passengers may now therefore make a claim against a train operator not only where a train service is delayed or cancelled, but also where certain 'add-ons' to the service are not available – for example, complimentary Wi-Fi catering or even provision of a seat.

In addition to a claim for damages, a passenger may be entitled to require repeat performance or (more likely in a rail context) to seek a price reduction or refund from the train operator. Any refund must be given without charge and undue delay. Train operators are unable to contract out of these statutory rights and remedies.

These new provisions could have far-reaching consequences for train operators, particularly in relation to how existing compensation schemes operate and how train operators advertise and sell their tickets with complimentary services.

Delay and cancellations

The Department for Transport undertook a consultation late last year proposing to exempt train operators from certain provisions of the Act – specifically those provisions which grant passengers the right to make a claim if a train service is delayed or cancelled. The DfT considered that the existing compensation schemes available (such as the National Rail Conditions of Carriage and the Delay Repay scheme) are 'well-established and can be used without needing to resort to the courts to seek redress'. The DfT also suggested that 'An exemption would help to keep costs down, which would otherwise be passed back to customers through increased ticket prices'. DfT's public consultation ran from 29 October 2015 to 30 November 2015 and remains under review.

The Office of Rail and Road did not agree with the DfT in all respects. In responding to the DfT consultation, the ORR pointed out that the current rights of passengers are potentially inadequate in two important ways: (1) train operators are able to exclude their liability for compensation for delays beyond the price of the ticket, so that passengers are limited to the original price of the ticket and not able to claim additional damages; and (2) there is a lack of awareness and utilisation of the compensation currently available. ORR also questioned whether the introduction of the new rights would indeed increase costs to the industry.

The ORR therefore considered that there are good reasons for the DfT not granting

an exemption to train operators and maintaining the new statutory rights and remedies alongside existing compensation schemes.

Other related services

The Act opens up the possibility for wider claims where a train operator fails to meet the expectations of passengers. If a passenger makes a seat reservation but there are no reservations on the train, or if perhaps on-board Wi-Fi or catering services have been advertised and are not available, the passenger may be able to make a claim for a refund against the train operator. This will apply even if the additional service is 'complimentary' and therefore not charged for on the face of the ticket.

Train operators will therefore need to exercise caution in things said about their services, as these representations may be considered as terms of their relevant ticketing contracts. Under the new Act, adverts or hypothetical phrases such as 'Never miss a Wi-Fi connection' and 'Complimentary Dining in First Class' could be considered to be contractual terms that are potentially vulnerable to passenger claims if the service is not available.

If the new statutory rights and remedies continue to remain available to passengers alongside existing compensation schemes, train operators may receive parallel claims for a delay or cancellation or unavailable services both under their Delay Repay procedures and under the Act. Operators may have to speed up the time in which they deal with such claims (to 14 days) and they will have to pay any refund in the same way that the initial payment was made (and not in vouchers – although many train operators already offer this option).

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Importantly, train operators may also need to assess how their liability for delay, cancellation and wider claims may impact upon their bids for franchise agreements – and reflect the potentially increased risk in their fares, subsidy or bid premiums.

Tammy Samuel is a partner and Zoe Harris is an associate in the rail team at Stephenson Harwood LLP

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Women in rail | Adeline Ginn

Flexible working – or the lack thereof

Adeline Ginn looks at the importance of flexible working and encouraging it as part of removing barriers to working in rail

The UK has recently been described in the *International Business Times* as having an 'archaic' attitude towards flexible working. There is some truth in this statement although a little harsh in my view. As a country we are not as open to the idea of flexible work hours as other countries. France, for instance, has offered flexible working arrangements since 2000. Today, flexible working is not a 'nice to have', it is a necessity, and we need to accept that the landscape of the family and work dynamic has changed.

A recent study by Timewise found that currently 14.1 million people in Britain want flexibility in their working hours, with seven in ten parents wanting flexible working. Our modern day society, with the realities of the school run, is in need of a more fluid routine. Often described as a generation expected to 'do it all', couples are expected to work full-time, have a clean house, a perfect family and ironed shirts and generally juggle all aspects of their life seamlessly. A report discussed in *The New York Times* found that 65 per cent of parents find it difficult to balance job and family without the support of flexible working. The answer is clear enough – our population is under more

> Clare Burles, people director at Virgin Trains East Coast…thinks the reason for [women's] natural attraction to customer service is due to the availability of flexible hours among these roles

‘It is a subject that is often raised at Women in Rail conferences; women find it a challenge to balance raising children with working full-time. They claim they are frustrated by the lack of options given the flexibility that their job could offer. In some cases a lack of flexible working can even deter women from contemplating certain roles’

stress than any before them and society needs to make a change.

According to the report released by The Women and Equalities Select Committee last week, it would be to the UK's advantage. The report looked at the UK's gender pay gap and how our society can best rectify the problem. One area they highlighted was to what extent the UK economy would benefit from an increase in productivity if flexible working was integrated into our businesses.

A recent survey of 8,000 global employees and employers conducted by Vodafone found that 61 per cent said flexible working increased their company's profits.

A subject often raised

It is a subject that is often raised at Women in Rail conferences; women find it a challenge to balance raising children with working full-time. They claim they are frustrated by the lack of options given the flexibility that their job could offer. In some cases a lack of flexible working can even deter women from contemplating certain roles.

Women in Rail conducted a report at the end of last year that highlighted the need for more women to pursue a career in rail. A more forward thinking attitude to flexible working across the board would certainly lead to more women contemplating rail as a legitimate career option. It found that currently only 16.4 per cent of the total workforce in the rail industry is female and among that group the majority (83 per cent) are in junior roles such as customer service. Clare Burles, people director at Virgin Trains East Coast, discussed this in detail. She thinks the reason for this natural attraction to customer service is due to the availability of flexible hours among these roles. There are structural challenges for women seeking a career in our industry, and to create a balanced workforce we need to ensure careers are flexible across the board.

We should be actively encouraging our women to reach for those more senior roles and make the industry as a whole more gender equal and inclusive. By utilising all skills available, businesses will not only financially benefit, but their work environment will become a hub of productivity.

We need to work to remove internal barriers and make the industry more attractive to women. Ask yourself, could your job be flexible? And speak to your manager. The amount of talent potential business could tap in to, both male and female, is huge if flexible working is on offer.

Adeline Ginn is general counsel at Angel Trains and founder of Women in Rail

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The Institution of Railway Operators

News

Performance improvements through remote condition monitoring

Members of the North East Area recently enjoyed a presentation by David Bishop, Ricardo Rail's business manager, intelligent rail, titled Performance improvements through remote condition monitoring.

Paul Snowden, a North East Area council member, provides an account of the event:

David started his presentation by giving us an insight into the background of Ricardo Rail, which was formed by the transfer of Lloyd's Register Rail to Ricardo plc in July 2015.

Ricardo is a global engineering and strategic, technical and environmental consultancy business, which has a wide-ranging portfolio of products, including the design and manufacture of high-performance motor car engines.

Recent advances in information technology have made the acquisition and sharing of an unprecedented range of condition monitoring data feasible across both technical and operational aspects of rail systems, which can help customers improve performance as well as reduce cost.

David explained the principles of data acquisition – measuring infrastructure and train from sensors mounted on both trackside and rolling stock. The concept is to move towards doing the monitoring from regular passenger trains, with the aim of taking as many measurements as possible. This enables the monitoring of trends and detection of emerging issues with, for example, track, OLE and train wheels.

The presentation showcased some case studies of how recently-installed systems are used in the UK and overseas, on rolling stock and rail infrastructure, to improve both safety and train service performance. These include:

- Gotcha wheel impact load detection system to detect wheel faults and avoid damage to both vehicle and track
- TADS acoustic axlebox detection, which can detect various abnormalities before the axlebox starts to heat up
- PanMon pantograph monitoring applications, which can help avoid potentially disastrous dewirements
- SmartFleet analytics – using existing on-train management systems to detect potential failures before they happen.

A lively question and answer session ensued, and those attending agreed that this was a most informative and enjoyable presentation.

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The hidden lessons

> … if the Treasury is indeed cash-strapped once more, then the rail industry must seek alternative sources of funding to facilitate its continued growth…

The Shaw Report offers evolution, not revolution: a sensible, gradualist approach which ought to retain the goodwill of the industry and its management

The death in March of Sir Anthony Hidden QC was a timely reminder of the disastrous consequences that can follow when railway enterprises get things wrong. Sir Anthony is best remembered for leading the public inquiry into the Clapham Junction rail disaster of December 1988 and for his robust criticisms of the safety culture (or lack of it) in British Rail. The collision of three trains during the morning rush hour cost the lives of 35 passengers, and injuries to another 500.

Coming on top of the King's Cross fire the year before, the public's confidence in its public sector transport providers was badly shaken. Politically, it was a wake-up call: continuing the policy of benign neglect towards infrastructure assets enforced by a cash-strapped Treasury was no longer an option. A twin-track approach of reform and the leveraging-in of additional funds via the Private Finance Initiative followed, and meanwhile the Treasury was persuaded to loosen the purse strings a little.

This process of reform and change to the safety culture took a long time, and further lives would be lost in the meantime. The pain that those events caused – to families, friends and the industry staff involved – was profound, and it is comforting to believe that all the lessons went deep.

Network Rail is an organisation forged in the heat of the aftermath of those events – and particularly the crashes at Ladbroke Grove and Hatfield. This means that the management of safety risks must inevitably figure highly on any reform agenda. Such risks will also feature highly on the agenda of any bidders for future devolved contracts or franchises: risks that are transferred have to be priced – and that includes reputational risks – always important, but never more so than in this social media age.

Clapham rail disaster

Something must be done

I mention all this as an important context for Nicola Shaw's report on the future of Network Rail. Memories can be short these days, but they will go deep with two of the principals involved here: Network Rail chairman Sir Peter Hendy was a senior executive with FirstGroup's UK bus division in the late 1990's: he saw at first-hand what deep effects the Southall and Ladbroke Grove accidents had on the group and its senior managers; later he experienced at first hand the management of the aftermath of the 7/7 attacks on London's transport system. Similarly, Ms Shaw's career has included spells at both TfL and the SRA, as well as with FirstGroup, during the crucial years around the turn of the century.

In that context, it is perhaps not surprising that both individuals would take a cautious approach to reform. The 'something must be done; this is something; let's do this' approach to institutional change has been all too prevalent in the recent history of public policymaking, with disastrous consequences for organisations such as the Passport Agency, the Child Support Agency and the sprawling empire of the Home Office. At the same time, however, it is clear – not least from the Shaw Report's own careful analysis – that something must indeed be done. This is particularly true of the whole question of funding: and here the lessons provided by the history of those years after 1987/88: if the Treasury is indeed cash-strapped once more, then the rail industry must seek alternative sources of funding to facilitate its continued growth. As the report puts it: 'The private sector therefore has a part to play in supplementing the resources available to invest and grow the railway to meet social

and economic needs.'

The failure of the industry to develop a robust and attractive mechanism for private sector funding in railway infrastructure has been one of the great failures of the privatisation regime. This is ironic, really, since the need for such investment was one of the primary reasons that John Major's government embarked upon the whole privatisation process in the first place – in the wake of the very Clapham Junction accident to which I referred at the beginning of this article.

Probably no perfect structure

In its other recommendations, the Shaw Report can be seen as the latest chapter in a 70-year long struggle since nationalisation to get the organisation of the railways right. Reading the history of British Railways and Railtrack as well as Network Rail, the arguments have gone on for years: centre versus region, geographical organisations against vertically integrated specialist divisions. BR reorganised itself roughly every five years between 1948 and 1993, and there was one famous occasion where senior managers simply refused to implement a structure which the chairman sought to impose.

This tends to lead me to the conclusion that there probably is no perfect organisational structure. The market-based sectors established in 1981 and the train service profit centres which evolved into today's train operating companies have now stood the test of time and generally performed well (with occasional notable exceptions, usually after mergers or the creation of unmanageably large units). On the infrastructure side, many still hanker for the 'Organising for Quality' regime introduced in 1991, under which those same train operating units took responsibility for the infrastructure on which they operated. There needs to be an element of caution about this, though: the structure only lasted two years before the creation of Railtrack, which probably represents too short a period for its true effects to be judged.

Devolution is certainly flavour of the month in terms of both the politics and management – and certainly there is much common sense in having units which are both manageable and accountable – both to the centre and to their customers. At the centre, being able to compare and contrast performance, and to establish an atmosphere of creative tension based on benchmarking, are immensely valuable tools.

As to whether such devolution could lead to eventually franchising or privatisation, I remain sceptical. There may indeed be efficiency gains and some cost savings, but inevitably transfer of risk has to be priced, and it is an open question whether the one may not outweigh the others.

> The failure of the industry to develop a robust and attractive mechanism for private sector funding in railway infrastructure has been one of the great failures of the privatisation regime

The Shaw Report offers evolution, not revolution: a sensible, gradualist approach which ought to retain the goodwill of the industry and its management. Above all, it is rooted in the hard lessons which history has taught us about what happens when we get things wrong.

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Ahead of steam

Is UK's rail network on the brink of the biggest shake up since privatisation, asks **Charles Johnson-Ferguson**

At first glance the Shaw Report did not offer much that was really new – certainly not a headlong charge towards privatisation of Network Rail (NR).

However, a closer read reveals a range of views which, if properly addressed, could go a long way to helping reinforce the UK rail industry's role as a driver of growth. In short, it has the potential to deliver what could perhaps be the biggest shake up of the organisation in recent years. In particular, the implications of the call for devolution could have profound implications for how NR is structured, financed and works with the private sector regionally.

Critically, Shaw cuts through the noise and diagnoses four core problems in the way that services are delivered by Network Rail:

- lack of local flexibility and autonomy which, means that there is limited responsiveness (and accountability) to customer and end-user needs
- ensuring the interoperability of services while meeting national as well as local economic and social needs
- arrangements surrounding Network Rail's financial control, incentives, accountability and governance are no longer fit for purpose
- Network Rail is struggling to attract a new generation of employees with the key skills and expertise it requires to deliver services using 21st century technology. In addition, the culture of the workforce needs to change if it is to become a truly customer-focused organisation.

While this diagnosis does not introduce any new challenges, the value of getting Network Rail, the wider industry and the Department for Transport focused on solving the same problems should not be underestimated.

This is particularly important where, as Shaw points out, actions to address these problems will take time and will need careful planning and coordination. Moreover, some of the pain of addressing these problems in the short to medium-term may actually be borne by parties other than Network Rail.

Wheels in motion

Against what is clearly an extremely complex and challenging backdrop for delivering change, NR must still:

- deliver continuously safe and reliable infrastructure on which rail services can be operated
- fulfil its CP5 commitments as quickly and efficiently as possible; and
- prepare properly for the process of agreeing deliverables and budget for CP6 (funding period 2019 – 2024) and learn from the mistakes of CP5.

In addition, gaining a better understanding of how risk is managed at the centre of NR and negotiating what this will look like in future will be vital, as will reconsidering and optimising incentives within the existing regulatory regimes for the new structure.

Resolving the problems identified by Shaw is critical to justifying the faith the Treasury has placed in the rail sector, with unprecedented levels of funding provided in recent years.

Devo-tracks?

One significant recommendation contained in the report is to implement a 'deeper route devolution supported by independent regulation'. This is certainly an ambitious one that would enable the organisation to mirror a regional regulated utility model, such as the water industry, without quite committing to it.

Sensibly, however, the report recognises that the issue of combining central guiding functions such as the procurement of large equipment with devolved autonomy will need to be solved, implemented and tested first. And therein lies the real challenge.

A successful solution will give NR or the Department for Transport a number of options in the future: the status quo, re-centralise, or even go the whole hog and set up independent regional utilities. And many will already be questioning what route they may take.

Route devolution supported by independent regulation requires different stakeholders to act in a unified way over a relatively short period of time. And if

> When it comes to 'deeper route devolution', I'd suggest that a smart move would be to focus on creating only one relatively simple devolved route to begin with, supported by independent regulation. Careful consideration should also be given to the crossing point with operations and the potential to attract private finance

this model is to be implemented in the government's 2019 – 2024 funding cycle, some serious work will be needed – and fast.

Building up steam

So what can NR do in the short to medium-term? The development and implementation of actions to address the problems needs to reflect the complexity of the industry, the dependencies of parties on each other and the scale of the industry and therefore the impact on timescales.

The approach also needs to reflect that, with NR back on the government's balance sheet, the DfT will have a key governance role to play. Critically this role will need to balance proper assessment of evidence and plans with timely decision making.

Setting up a joint implementation team, with oversight from both DfT and NR, who can identify what can feasibly be delivered within this timeframe will be critical. Equally important will be to clear milestones and monitor progress in order to learn lessons for subsequent implementations.

When it comes to 'deeper route devolution', I'd suggest that a smart move would be to focus on creating only one relatively simple devolved route to begin with, supported by independent regulation. Careful consideration should also be given to the crossing point with operations and the potential to attract private finance. As well as providing a crucial window in which to learn lessons ahead of a wider roll out, it could also be promoted as a catalyst for change, attracting investors and future skilled employees alike and encouraging communities to get on board and embrace this new rail transport model.

It's clear that in compiling this report, the team has had to tread carefully through some pretty contentious issues and, as a result, they've done well to deliver such a wide ranging, detailed and complex package of recommendations.

With these now under consideration by the DfT, and an outcome not expected until later this year, many will be hoping it will be full steam ahead for UK rail development in 2017 – and that Shaw's recommendations don't hit the buffers.

Charles Johnson-Ferguson is PwC transport partner

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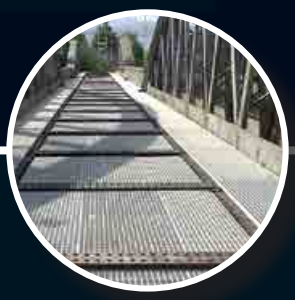

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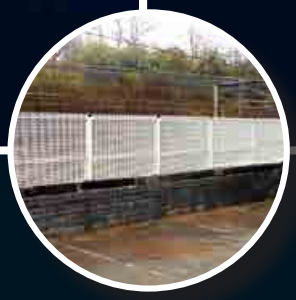

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Steady as she goes

Shaw is right to place passengers and freight shippers as central to change. But improving skills is one aspect where the UK cannot afford to stall, says **Adrian Shaw**

The recently published Shaw Report rightly advocates steady improvement rather than the radical change many had anticipated. Taking a measured approach rather than breaking up the rail network is certainly the right decision. Nicola Shaw has reached a reasonable compromise, suggesting the need for innovative ways to attract private sector investment.

Given the scale of transformation needed, the report's focus on innovation and technological advancement is welcome. The introduction of technology has stalled in the past due to the complexity of integrating it into the UK's aging rail system. Industry now needs more detail on how and when this may happen.

Further detail is also needed on how deeper route devolution, supported by independent regulation, will work in practice given the level of devolution already in place. This could potentially involve further changes to the flow of funding. Currently, Toc's are reliant on revenue from passenger fares, which can dictate how investment is spent. If Toc's and infrastructure owners took a shared approach to station oversight development, additional funds could be made available and directed back into service improvements.

In addition, redirecting control of infrastructure projects to route managers would lead to more localised knowledge of the work that needs to be delivered. However, too much devolution may cause difficulties for the supply chain. Under Network Rail, there are centralised procurement control standards and everyone understands how the organisation operates, awards and controls upgrade works. Excessive devolution could result in different routes using different approaches to contract awards, which could be very confusing for the firms bidding for work.

While industry awaits further clarity on some of the report's recommendations, it is reassuring to see a focus on improving freight routes. This will help ease the current reliance on heavy road haulage. But the current network cannot cope with a significant increase where mixed use with passenger services will be the only outcome. Dedicated freight lines that run parallel to passenger lines should also be considered. Existing passenger lines should only be used in very constrained areas and this should be considered an exception rather than the norm.

Also welcome in the report is the creation of a route for the North. This will be an important move towards making the Northern Powerhouse a reality. Drawing on Shaw's recommendation for attracting private investment will be crucial to the success of the Northern Powerhouse as the levels of funding needed are far greater than

> '...too much devolution may cause difficulties for the supply chain. Under Network Rail, there are centralised procurement control standards and everyone understands how the organisation operates, awards and controls upgrade works. Excessive devolution could result in different routes using different approaches to contract awards, which could be very confusing for the firms bidding for work'

> Investors obviously want their best bet of getting a return and that means having certainty around planning issues and the length of time a project will take to be delivered. The Northern Powerhouse cannot risk being jeopardised by multiple different planning authorities creating uncertainty for potential investors

the government or city regions can afford. Private sector investment will be needed to achieve the truly transformational change required to turn individual cities and towns into a connected economy.

Foreign direct investment should play a crucial role in fuelling the Northern Powerhouse. Local, regional and planning authorities will therefore need to create the right conditions to attract this inward investment. Investors obviously want their best bet of getting a return and that means having certainty around planning issues and the length of time a project will take to be delivered. The Northern Powerhouse cannot risk being jeopardised by multiple different planning authorities creating uncertainty for potential investors.

The North has to prove that it is a good place to invest. Competing for investment will therefore require thinking beyond transport infrastructure. Other important enablers such as housing, employment, schools and hospitals all play a crucial role in ensuring that people will want to live and work in an area. As a result, real estate values will rise making infrastructure projects an attractive investment proposition. Given George Osborne's prediction that the Northern Powerhouse could generate 100,000 new jobs by 2020, making it easier for people to live close to employment opportunities is an obvious advantage of better connectivity.

Action on skills

But for the success of such an ambitious scheme, it is crucial that there are enough skilled workers to deliver the work.

Investment in nurturing the UK's skillset is equally – if not more – important than attaining investment in infrastructure. With a huge pipeline of work including Transport for London projects, as well as HS2 and Crossrail 2, Shaw's recommendation that an industry-wide approach to addressing the skills pipeline cannot be overstated. This is particularly the case as many of the rail industry's most experienced engineers are approaching retirement.

With steady improvements and hard yards, the UK can set its sights on a prosperous future for its rail network. Shaw is right to place passengers and freight shippers as central to change in her recommendations. But while this slow and steady approach is certainly the right way forward, there is one aspect where the UK cannot afford to stall. Action on improving skills needs to happen now.

Adrian Shaw is senior vice president, global programme management and rail sector head, Europe, Middle East, India and Africa at AECOM

The real goal

Future funding for UK rail – easy money or legal nightmare, asks **Jon Hart**

It is often said that the one thing that is worse than bad publicity is no publicity at all. For UK rail however, it may be that a period of quiet might be welcomed. Fat chance. In the twenty-three years since privatisation there have been innumerable policy reviews and structural changes to the way the industry operates. Some of these have been ineffective political tinkering, some have been beneficial, and occasionally some have had a profound impact. The latest contribution to the debate about what a future industry might look like is Nicola Shaw's long-awaited review of the funding of Network Rail. Is this going to usher in a further era of change?

A new era for finances?

In the run-up to the release of the report, there were dark mutterings about further privatisation. As many suspected, Shaw's recommendations have included nothing of the kind. Where the report does represent fresh thinking is to highlight the role that private capital might be able to play, whether through the introduction of project-financed solutions or concession-type contracts for the delivery of certain aspects of the rail network. Those with very long memories or an interest in the history of public transport in the nineties may recall that this was last mooted back in the days of Sir Alistair Morton and the Strategic Rail Authority.

Rail has struggled with the concept of project finance for infrastructure from the earliest days of privatisation. At present, PFI-style solutions to most kinds of infrastructure remain a political anathema. Rail is no exception, not helped by the backlash to the project-financed solution use for the Thameslink rolling stock and the most recent attempt at a heavy rail PPP – Borders Rail in Scotland – which ultimately was scrapped.

Even so, attracting private sector investment must remain on the agenda. The recent success of the launch of Thames Tideway and the Scottish experience of the so-called not for profit model, which succeeded the UK PFI approach, has shown how project finance can be detoxified, while the disposal and subsequent operation of HS1 has shown the application of a concession model to rail infrastructure, as Nicola Shaw knows only too well.

A challenge is going to be identifying what assets and services could be subject to this kind of arrangement, and what this might really mean in terms of providing optimised solutions and value for money, as opposed to further work for lawyers and consultants. There is also the regulatory burden to consider. Changes to funding for the industry could possibly have knock-on consequences for legislation and other regulated arrangements. It could require some fairly hefty additional work for the Office of Rail and Road. The Regulator is already the subject of a significantly increased remit in terms of looking over the numbers for Highways England: how great an appetite is there going to be in terms of looking at a range of micro-financial models for concession companies working with Network Rail on CP 6, 7, 8 and beyond?

Asset stripping?

Linked to this (and possibly consistent with doomsayers' views of rampant privatisation) is considering the way forward with some of the initiatives that Network Rail is looking at in terms of asset disposal. Mark Carne's announcement prior to the release of the Shaw Report in relation to the divestment of the power network is one example of this. Station ownership and development has already been the subject of significant scrutiny and this in turn has led to consideration of making greater use of the significant property estates of which Network Rail is owner, and which critics argue represent undervalued and utilised assets.

There will be a missed opportunity if this is addressed on a piecemeal and uncoordinated fashion. Lessons can be learned from the experiences of both the MoD and NHS (each significant landowners in their own right) which have worked with new legal models under which land is released to generate longer-term financial

> Any attempt at divestment of parts of the Network and/or introduction of private finance is going to run against the statutory framework under the Railways Act. From a regulatory perspective there will need to be clarity as to where responsibilities begin and end

returns rather than an immediate 'hit' of asset disposal. A hived-off rail property company could also help to deliver similar benefits and could, perhaps, help provide a contribution to the on-going search for solutions to the UK's affordable housing crisis.

Progress has already been made. Recently, the Department for Communities and Local Government (DCLG) launched a new initiative to sell off land owned by rail stations to support the provision of housing across the UK. While such a move could be valuable for many communities it is hard to avoid a degree of cynicism. Any overall approach to property divestment needs to be properly linked in to targets on what is trying to be achieved, together with an appropriate plan for execution.

Devolution revolution?

It has been a shibboleth for the rail industry since nationalisation in 1948 that there should be a single national rail network. Shaw's recommendations highlight the need for a very difficult balancing act between the need to maintain network integrity with devolved responsibility for operations and project delivery. Network Rail's own increasingly decentralised management system has come a long way in shifting more powers to local routes, but further devolution of powers must be managed with care.

Any attempt at divestment of parts of the Network and/or introduction of private finance is going to run against the statutory framework under the Railways Act. From a regulatory perspective there will need to be clarity as to where responsibilities begin and end. For those who have had experience of the cottage industry of fault attribution in relation to franchise or track access agreements, there will need to be a concerted effort to make sure that an already complicated picture is not subject to further complexity. Shaw's report is right to focus on the skills shortage and lack of diversity within the industry: it would be a shame if energies needed for bread and butter issues, such as better project management and breaking down the 'master-servant' relationships between employers and contractors on the network, are diverted into chasing wooden dollars around the legal framework.

It is important to remember that funding and finance are a means to an end, not an end in itself. If the ultimate aim is to improve passenger (or customer) experience, then ownership should be a secondary concern. The real goal should be about delivering funds to help finance much-needed improvements, and if the Shaw Report can create a greater willingness for those involved to reconsider how this can be achieved, then it will have made a major contribution to the industry.

Jon Hart is partner at infrastructure law firm Pinsent Masons LLP

> There's a very, very healthy manufacturing base here in the UK now, I think it's one of most competitive markets for rolling stock and maintenance in the world

Nick Hughes

Dave Songer spoke to Nick Hughes, sales director at Hitachi Rail Europe, about the company's contribution to the Northern Powerhouse, the ROSCOs new approach to business and its HS2 aspirations

As I sat at the head of Hitachi's huge 30-seat boardroom conference table waiting for Nick Hughes to greet me, I thought how much had changed for the company since its last meeting with *Rail Professional*. Back then I sensed nervousness; perhaps an unwillingness to divulge too much, lest it scupper any future deals.

All evidence of this was gone when I met Hitachi Rail Europe's sales director. A little more than a week after confirmation of the deal with TransPennine Express, Hughes cut a figure that seemed pretty satisfied with the way things are going. I began by asking him if things were indeed going to plan.

'Yeah, very much so. We signed the contract with First Group and Angel on March 31st for 19 new train sets for the latest TransPennine Express franchise, which will bring new intercity services for the Northern Powerhouse. We're very pleased with that contract, as it also includes a maintenance package to support the trains in service, which is an important part of our business model. We prefer that approach, where we're in charge of the maintenance to ensure train performance is right.'

Hitachi has a lot of work now; will there be sufficient capacity at its County Durham manufacturing facility, Newton Aycliffe? 'It will reach capacity in the second half of 2018, which is good because that's where we'll do the main assembly of the TransPennine sets, so it works quite well. Up to that point we're delivering the IEP trains and we've also got the contract up in Scotland with Abellio ScotRail.'

The Northern Powerhouse

The prime minister and the chancellor hailed Newton Aycliffe at its opening for 'returning manufacturing back to its British birthplace' and for the government's commitment to The Northern Powerhouse. I wondered what Hughes made of that.

'Well, it was certainly a great day for the company. We looked at 41 sites in total around the UK and decided on the north east for three principal reasons: the resources of manufacturing process that are on the doorstep; the logistics – Tees Port is nearby; and the passion of the people and the workforce. We thought we could really connect into the region and create something very special.'

Referring to the opening of the plant as 'the final piece in the jigsaw', Hughes confessed that although Hitachi hadn't foreseen that level of political profile, he could understand why it received the coverage it did. 'Employment, advanced manufacturing, transfer technology, whichever way you want to badge it, they're important political messages and we got the wholehearted support from David Cameron, George Osborne, secretary of state for transport Patrick McLoughlin and rail minister Claire Perry – it was quite front row.

'I can't remember when the last train manufacturing site was built anywhere in the world, I think you've got to go back 30 or 40 years. It certainly wasn't in the UK. It created a fantastic vibe around the facility and that's what you need when you're opening factories: momentum.'

Now Hitachi has put down its roots, does it have any more plans to get more deeply involved in the region's enterprise activities?

'Yes, we're co-sponsors of South Durham University's Technical College', an approach that is 'very much the Hitachi way of doing things'. 'We take a very long-term view of strategy and this is us investing in the youth of today, giving them the opportunity to learn some skills and to become engineers and technicians in the rail industry – whether mechanical or electrical.'

Certainly, the local supply chain is reaping the benefit of Hitachi's new foothold. Hughes told me that 70 per cent of the various elements sourced for the IEP train come from within a 50-mile radius. 'It's about Hitachi putting down very firm foundations. Yes, of course it's about the factory, because they're going to build the train, but it's also about investing in youth and making sure the supply chain supports the factory as well.

'We're very active in the North East Chamber of Commerce, so I think we've made a very good impression in the region. I think people can see that we're here to stay and that we've got some very big plans to develop the whole region on the back of this factory.'

Bringing it home

Mentioning a meeting he had with employees of another major Japanese company based in the area, Nissan, Hughes alluded to Hitachi's aims to follow in the car manufacturer's footsteps and export into continental Europe.

But what of its imports, specifically the trains currently designed and built at its

> I don't see any reason why we need to continue with the process of those first few trains being built at Kasado

Kosada manufacturing plant in Japan before they're delivered to England and produced here?

Describing Kasado as 'the mother factory', Hughes said that while it remains an important part of the company's manufacturing strategy it won't necessarily always be that way. 'Kasado sets the standard on what we used to call pre-series trains but I think that over a period of time, when Newton Aycliffe is an established facility that is regularly producing, I don't see any reason why we need to continue with the process of those first few trains being built at Kasado.

'We do it so that when we do start manufacture and final assembly on the series production in the Newton Aycliffe facility we've got some ready-made units that we can familiarise ourselves with.'

If that does happen, Hitachi's confidence in its trains will be at a high following the Human Factors and Ergonomics Society design award it and DCA won for the Class 800/801. What, I wondered, would HS2 trains look like and include, should they win the bid – captive and classic compatible? Not able to provide many details on the eventual design, he did confirm that a classic compatible would work on HS2 and the conventional network and that a captive train would be labelled the British Bullet Train, part of a process to 'take the Japanese concept and apply it to the UK network'.

'In terms of big projects there's none bigger than HS2, the project is on everybody's radar and there are seven or eight manufacturers all very keen to offer products for HS2.'

To demonstrate 'Hitachi's expertise in other markets', and its ability to work with the competition, Hughes gave me details on its involvement in Italy's high speed network, where his colleagues are building the ETR1000 for Trenitalia out of its Pistoia manufacturing facility – one of the new plants it acquired when it purchased Italian train manufacturer AnsaldoBreda in November 2015.

'Building these trains in consortium with Bombardier and Trenitalia they are, like the HS2 requirement, 360kph (223mph) trains that are fully TSi (Technical Specifications for Interoperability) compliant, meaning they're up-to-date and compatible with all the other European standards and norms. Operating between Milan and Rome, nearly three quarters of the trains are now running, with the rest in service by the end of the year.'

The best bid

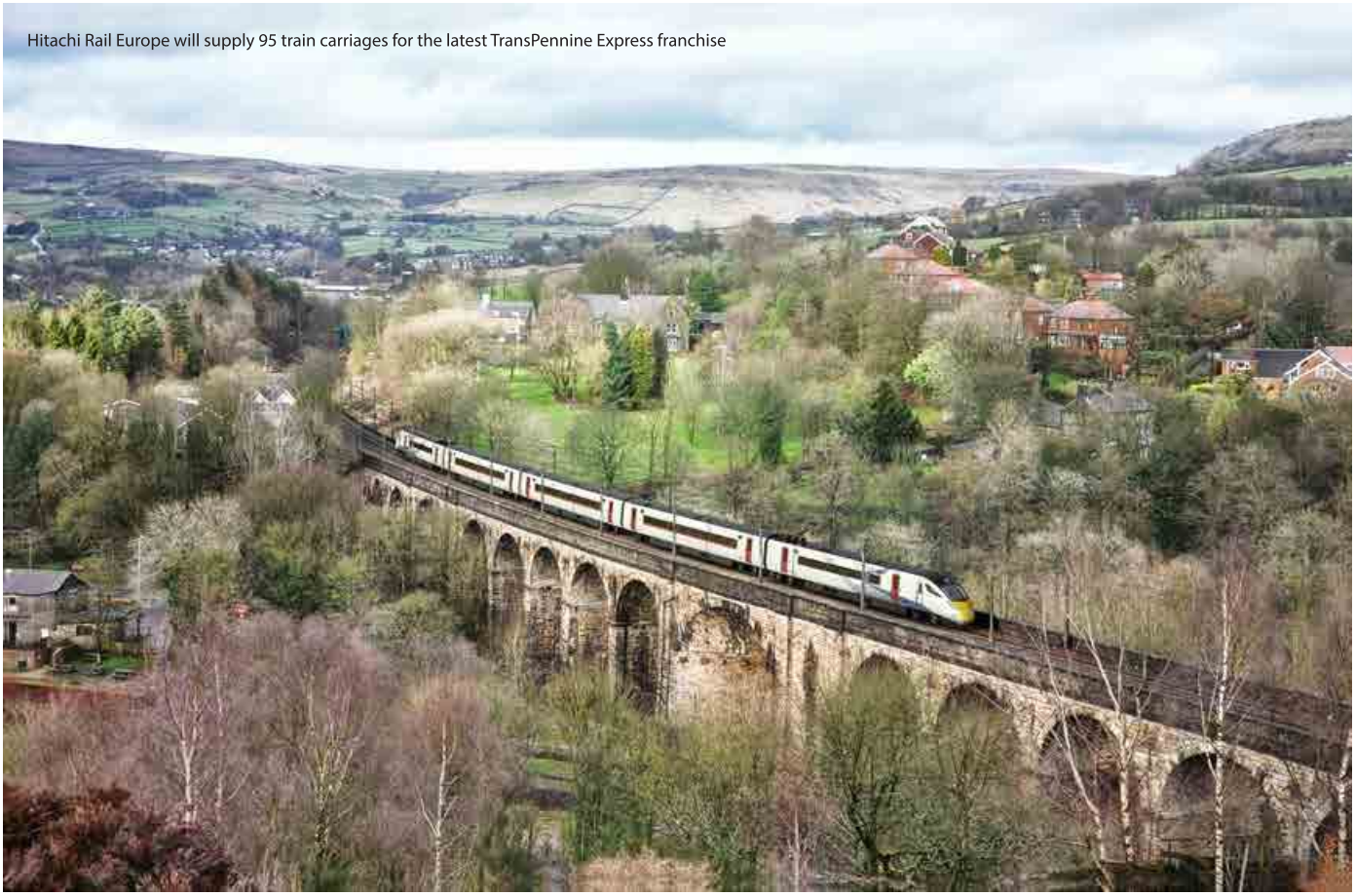
Far from complacent that Hitachi will be top of HS2's list, Hughes repeated an excerpt from the talk he gave at Manchester's TransCityRail North last year, when he said he firmly believed the award would go to those with the best bid, as 'government procurement processes are carefully scored and evaluated and have to be transparent, visible and auditable'.

Keen to provide some of the reasons that could put Hitachi on top of the pile, Hughes told me that a lot had changed in a relatively short period of time at the company. 'We've got a UK footprint now. We've set up a UK business and by the end of the year we'll be employing 2,000 people across all our sites and depots.'

Armed with Hitachi's 'high speed pedigree from Japan' (the country used the 1964 Tokyo Olympics to introduce high speed rail into Japan) and its belief that it can 'adapt to the UK market to build the trains', Hughes said it has the capability to 'put together a compelling offer for HS2.'

'With the facilities that we've got and our maintenance track record, I'd put us against anyone. We're building depots, we're building brand-new facilities at Doncaster, Stoke Gifford and Doncaster Carr and we're also upgrading existing facilities. I would like to think that we tick a lot of boxes for HS2 but the proof will be in the pudding when the procurement evaluation is finished.'

Asked whether competitors for the franchise would have anything that could worry Hitachi, Hughes was diplomatic. He



Hitachi Rail Europe will supply 95 train carriages for the latest TransPennine Express franchise


The Class 800 won the Human Factors and Ergonomics Society design award

said everyone had an equal chance of being successful and pointed out how far China had come, bringing about a situation where 'four, five or even six players could win it'.

'People can see HS2, they can see a new tube for London, they can see all the franchising bids and that attracts manufacturers from around the world. There's a very, very healthy manufacturing base here in the UK now, I think it's one of most competitive markets for rolling stock and maintenance in the world.'

Perhaps referring to his former employer, Alstom, which 'promised' to bring production to the UK if it wins the HS2 contract, I asked Hughes if that would give Hitachi an advantage. With another chuckle, he said he 'wasn't surprised' that a number of manufacturers were making statements about additional capacity and suggested that much of that was down to Hitachi. 'They've seen what we've done, which has been applauded around the industry, and I think it's kind of set the bar at a new level. I think others will follow'.

What sort of contract with HS2 would Hitachi be looking for, then? 'Well, obviously the rolling stock and maintenance contracts and the depot but we'll probably also compete for the signalling and rail control systems', an area Hitachi reinforced when it purchased Finmeccanica's 40 per cent stake in signalling and train control company, Ansaldo STS. 'I think that's given us more of the multidisciplinary approach that is used on more and more procurements; more of a total package.'

Perhaps unsurprisingly, Hughes urged caution on having too many cooks. 'If you've got an organisation with a very strong engineering, procurement, project management capability as a buyer then it makes sense to go out and buy the system. If you break up that system into its individual lots and components somebody has got to do the system integration and somebody else has got to manage the interfaces and the integration.'

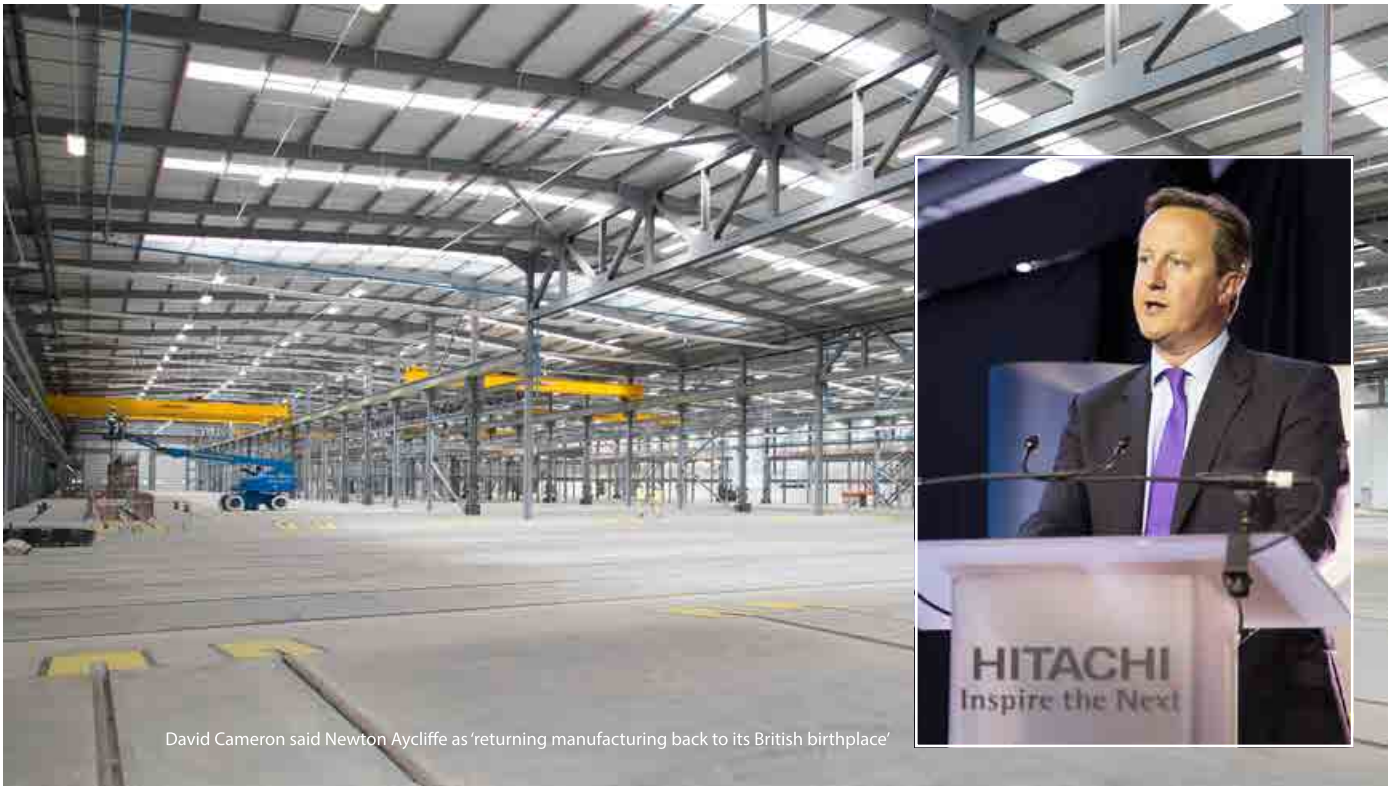
'Exceedingly high speeds'

Of course, not all parties have such confidence in HS2 as Hughes. What does he think about Professor Peter Woodward's claim that is at risk of track failure and derailing due to the exceedingly high speeds trains will travel at? 'Exceedingly high speeds?' Hughes asked, as though it was a concern that had been raised for the first time. 'I think, when you go through any process of this type you're going to get supporters and detractors and you're going to get views from across the spectrum. The great part about the way we do business in the UK is that we consult all parties and get views from across the industry and I think it's one of the few industries that works in this way.'

A strong advocate of such concerns being taken on board, Hughes was unequivocal about the safety of high-speed networks, primarily down to their prevalent use across the world. 'By looking at the lessons learnt on the continent we should be able to produce a high performing, safe and reliable railway. Until it gets Royal Assent I'm sure you'll get some negative comments but I think in the main there is wholehearted support.'

Wholehearted support isn't there from

> Asked whether competitors for the franchise would have anything that could worry Hitachi, Hughes was diplomatic. He said everyone had an equal chance of being successful and pointed out how far China had come, bringing about a situation where 'four, five or even six players could win it'



David Cameron said Newton Aycliffe as 'returning manufacturing back to its British birthplace'

all corners for the IEP contract. Christian Wolmar described it as the 'Worst train deal in history – they [the trains] are way overpriced'. Hughes disagreed and pointed out that the IEP deal was done at a time where there was close scrutiny on the ROSCO's traditional procurement method. He added that it was important to look at the whole package when considering critical comments like Wolmar's.

'We lease the trains onto the two operators, we've invested in new depots and upgraded existing facilities and we're staffing this organisation so that it can deliver the high level of performance that IEP trains will require.'

A major plus for IEP, said Hughes, is how it reduces the public's liability and places more responsibility on the operator. 'I've heard people say that it's a very successful deal as it will transfer full risk to the private sector, something the DfT in particular are pleased with. Others from around the world look at that model with great interest,' he said passionately.

'In the early days of privatisation everybody was worried about risk allocation. Who was going to manage all those processes, introduce new trains and where was the money going to come from? IEP answers a lot of those questions. Not many companies' balance sheets are strong enough to do what Hitachi did.

'You need to have significant strength in this area and financial support from the banking community because the way it was financed meant we had to arrange debt finance. We did that as part of the deal but people probably don't talk about that as much as they do about the actual headline train price. It's important to look at it in the broader context, the whole deal.'

Aftercare package

And the £5.7 billion aftercare included in the IEP deal? Roger Ford, editor of *Modern Railway* magazine, said the 27-and-a-half year deal has 'lumbered us with huge costs twice the cost of a lease train'. 'Costs again, you see. I think that what you've got to look at here is that first and foremost it's a 125mph train, so the specification is above what you would normally see in the UK market, where 80 per cent of trains run at 100mph or less. Secondly, in order to provide outstanding levels of performance for the fleet, Hitachi has taken on risk by investing in facilities and recruiting staff.'

'You've also got to consider that the fleet includes some bi-modes; that's two trains in one, which means the cost of maintaining it will be higher. Maintenance is for the long-term and you have to have a view of investment and train performance over a long period of time. We've taken a twenty-seven-and-a-half year risk and it's not without risk because if you get the calculations wrong you'll be wrong for a long time.'

On the bi-modes' performance, if electrification is delayed will it be fully up to the job? 'Well, we know that the Great Western Main Line electrification

> When the train's running at full speed you can stand over the diesel engine when it switches from electric power and you don't notice that it's started up, it's that smooth

is going ahead, those that use the line can see the posts going up every day. As for the bi-modes falling short, I can't see that happening.

'This is now our third bi-mode order and when we go through a procurement there's a fairly rigorous exercise conducted by the customer on wait and journey times compared to stopping patterns and diagrams, involving some quite detailed calculations. If we weren't meeting the journey times or providing the service that's expected then I don't think they would buy the trains.'

Particularly proud of the train's technical ability, Hughes said: 'When the train's running at full speed you can stand over the diesel engine when it switches from electric power and you don't notice that it's started up, it's that smooth. That's some technical achievement!'

ROSCO's

In regards to the purchase of trains, the DfT is said to be highly suspicious of the ROSCO's; how has it been to work with Eversholt? 'We've got a great relationship with Eversholt, as we do with all the other ROSCO's. They were integral in the 395 and they were behind Hitachi when it entered the UK back when they were HSBC rail, so that relationship goes back to 2004/05.

'Now of course, with the TPE deal, we're working with Angel, which we're very excited about – in terms of volume, they've done some of the biggest train deals.'

Hughes told me that what ROSCO's want is operational flexibility and to be able to trust the trains. 'Due to the fact that the bi-mode is able to operate in two modes, the ROSCO's can see a train with a very good leasing life for the privatised market with almost go-anywhere capability that's helping to connect our cities up more.'

On whether Toc's should have a bigger role to play in train procurement, rather than the ROSCO's, Hughes explained that the system he first witnessed had changed, with ROSCO's now brought in at the end of the process rather than the beginning. 'When I first came into the industry, the most popular model of procurement was when the operator would appoint the financier, the ROSCO, first of all and they would help the operator select the best train. Obviously the financier had an interest because it was going to be on their balance sheet and they would own the train for the next 35 years, so they were involved with the whole process: the selection, the contract negotiations, everything.'

Now, though, that's changed. 'Since privatisation, operators have gained lots of experience and they're more confident to take on the whole process themselves. They make their own selection and preferred bidder selection and then run a financing process on the train to identify who the preferred financier is.'

Shaw Report

In the Shaw Report's latest recommendations on the future shape and financing of Network Rail, Nicola Shaw outlined a need to improve financial discipline, develop skills and improve diversity. Did Hughes care to comment on any the report's findings?

'Well, what I would say is that Network Rail are very good in this situation as they've given a number of industry briefings leading up to the report's release. I think I went to two with Nicola and maybe two with Pete Hendy, so there were no real surprises for me or anyone in this organisation.'

Hughes believes that for Network Rail to receive its largest ever funding for Control Period 5 showed 'huge confidence' in its operations but that now is probably the time for more outside help.

Progress, he said, has been made in this area by Hendy and Shaw, 'both of whom have looked at the TfL model', which uses third-party financing, with a view to applying it to the UK rail network.

'As a result of this external funding TfL isn't as indebted to public funds and I think that has probably driven a lot of the thinking in the report,' said Hughes, who held his arm at a 45° angle to demonstrate the chart that Hendy often produces to illustrate the rapid growth in passenger numbers. 'It's been year-on-year-on-year growth for the last 20 years and I think that is investible. The demand side is growing all the time. It gives confidence.'

'Pete Hendy has commented on a number of occasions about the strength of the management structure at Network Rail but, like any business, they've got their problems and they need to improve and we're very supportive of them – they're an important customer, particularly on the Thameslink TMS (traffic management system).

Finishing up our meeting, I asked Hughes what his personal hopes and aims are for the company. Blowing out his cheeks as he weighed up the question, he told me it had been a 'very good 12 months. We set out with a number of objectives last year across different parts of the business. Order intake is one that I'm obviously very involved in and to keep Newton Aycliffe busy for the foreseeable future,' he laughed, 'so I'm very happy the TPE order came through – our third contract for rolling stock. We can see some great opportunities coming up in the next three years, with TfL and the tube a big one for rolling stock and signalling.'

Pointing to a picture of Hitachi Rail Europe's first award, the HS1 Javelin, Hughes said to be part of something special Hitachi needs to maintain momentum. 'There's a legacy of success that's been passed on to the management and winning big projects and we want to continue that.'

As I packed up to leave the room I suggested, with tongue firmly in cheek, that perhaps we should pencil in another interview; *Rail Professional* seems to be a good omen. This released the biggest laugh of the day. 'Well, you must be. Twelve months on from now, yeah there may be a couple of contract wins.'

Get baking

Jon Kerbey discusses future-gazing and why HS2 is embracing BIM

As director of BIM at HS2 Ltd, I'm often asked what the future will hold. How can we plan now for construction work that will happen ten or fifteen years into the future? How can we specify processes, technology and systems that will still be relevant in fifty years' time, well into its operational life?

It's a tough challenge, but it's important because at HS2 Ltd we're not just building a railway. We're building an asset with a usable life of a hundred years and more. That's why it's so important that we efficiently manage our physical assets, and that requires reliable and accurate data.

> I still think we have some way to go to achieve a true digital transformation to capitalise on the power of procuring and working with data, particularly in the infrastructure sector. We are also struggling with a lack of mature open standards which adds to the complexity of data exchange and increases the risk of being truly software-agnostic

That's where BIM comes in.

We know that our supply chain will be generating enormous amounts of data – plans, survey results, information about ground conditions, the location of utilities and much more besides.

But when everyone's working to the principles of BIM, it allows us to specify information requirements in a consistent way, enabling us to understand and deal with the huge volumes of re-usable and assured data we will be getting back through design and construction. It enables us to integrate it in the most effective way.

Having consistent inputs enables us to optimise our processes. That's because BIM isn't a new technology, a new framework. It's a way of ensuring that everyone in the supply chain can access and interpret the same core data sets and make sense of everything coming at us

By allowing us to focus on information, BIM gives us the opportunity to separate data from technology and helps us become software-agnostic. With a project as long as HS2, this is critical, so we can be sure our data will fit whatever technology comes along.

Indeed, there can't be many people in our industry who are unaware that as of 4th April, BIM Level 2 is now mandated on all government-funded projects. Many contractors are enthusiastically embracing the new approach, some are just dipping their toes into the water and for some, it will be a challenge to adapt to a new way of working.

Just over 18 months ago we carried out a supply chain 'Upskilling' survey. The results were mixed, but since then I've seen some great examples of how BIM has been applied to and is helping projects and organisations baking BIM processes in to their ways of

> Through the specification of data and therefore the ability to exploit it, greater understanding of construction optioneering is possible, the cost estimating process can be streamlined, construction machinery can be used and operated in more intelligent, data-driven ways, to name but a few

working. There seems to be a real drive to raise awareness, educate and train using a holistic and also role-based approach.

That's great, but I still think we have some way to go to achieve a true digital transformation to capitalise on the power of procuring and working with data, particularly in the infrastructure sector. We are also struggling with a lack of mature open standards which adds to the complexity of data exchange and increases the risk of being truly software-agnostic.

At HS2, we are working with a number of bodies to really test the processes and resources available to understand if there are any gaps and if there are, what it would take to fill them. For us, the real test is going to be when we go out to procure the Main Works Civils Contract.

That's why, as part of our strategy, we will provide the framework in which BIM will be implemented. We will specify information requirements and work with the supply chain to ensure those requirements are understood and can be implemented down through the various tiers of the chain.

What BIM means to us

To assist with this, we will be launching a BIM Upskilling Platform to coincide with the release of the main works ITT to help our suppliers' understanding of BIM and what it means to us. This will be continually updated to provide more educational content.

In return we'll expect our contractors to provide a BIM execution plan as part of the procurement process that outlines how they, and their supply chain, will meet our requirements and deliver the benefits that HS2 has attributed to the successful implementation of BIM.

That will benefit contractors too. They will get the assurance that their supply chain is working in a consistent way, through the use of the principles and processes outlined in the BIM Level 2 standards. Through the specification of data and therefore the ability to exploit it, greater understanding of construction optioneering is possible, the cost estimating process can be streamlined, construction machinery can be used and operated in more intelligent, data-driven ways, to name but a few.

And of course, valuable experience to take on to their next projects. Because from here on in, BIM will be an ever more essential part of all our tool kits, helping us manage and interpret the increasingly huge amounts of data that our ever evolving modern construction methods put before us every day.

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A seismic shift

Stuart Brunton looks at the California High Speed Rail project and what we can learn from the 1,300km long line

With California's population expected to rise by a further 12 million residents in the next 30 years, the need for a high speed rail has never been so great. California's highways are the busiest in USA and it is calculated that an impressive $19 billion is spent on lost time and wasted fuel each year. Airline travel between Los Angeles and the San Francisco Bay Area accounts for five million passengers a year but the 600km air route experiences more delay than any other in the USA.

California High Speed Rail (CHSR), with its operating speed of 350km/h, will transform the way Californians travel, making the commute from San Francisco to Los Angeles a swift two hours and forty minutes instead of the current six hours drive.

> The project represents a turning point in public and private transportation policy in a country whose essence is engrained in the car industry. It also indicates willingness to look outwards, learn, and then embrace change at home

The 1,300km route linking San Diego, Los Angeles, Sacramento and San Francisco, will connect the economically important regions of the state, contribute to economic development and a cleaner environment, create jobs and preserve agricultural and protected lands. CHSR will carry at its peak 26,000 passengers per hour in each direction with the system designed for trains to run at five minute intervals.

Benefits for the region

CHSR will help to revitalise the cities of California by encouraging high density, mixed-use real estate development around the 24 new stations. In particular, businesses in the 'knowledge industry' are expected to greatly benefit from the high speed line; which is important as these industries contribute 18 per cent of jobs and a huge 40 per cent to the state-wide income. This is an area where many politicians see the value. They see a national high speed rail network will create millions of jobs, stimulate the economy and create entirely new industries. It will reduce dependence on oil, reduce the annual $700 billion trade deficit (from purchasing foreign oil), and significantly increase national security.

The CHSR will especially benefit the Central Valley region. Indeed, the almost immediate $6 billion plus of infrastructure investment in the region from the construction of high-speed rail infrastructure will provide a much-needed infusion of capital into the regional economy and can help lay the groundwork for the Central Valley to catch up with the rest of the state. Additionally, the Central Valley might see some development of knowledge industry back offices or manufacturing activities thanks to its cheaper land and labour costs and improved connectivity from high-speed rail.

Benefits for the environment

The CHSR Authority has committed to using 100 percent renewable energy for powering the system. This will be achieved by procuring or producing enough renewable energy to offset the amount of energy it takes from the state's power grid to operate trains and facilities. This 'net-zero' approach will increase the environmental benefits of the rail system and reinforce California's renewable energy economy while providing the railway Authority with a cost-stable source of electricity. By offering an alternative to airline and highway transport, it is estimated that the system will save up to three million barrels of oil annually by 2030.

In 2006, the California Legislature passed the Global Warming Solutions Act, directing the state to reduce greenhouse gas emissions to the level they were in 1990 and to achieve that target by 2020. This represents a 17 per cent reduction. When the first section between San Jose and Bakersfield opens in 2025 the reductions in anthropogenic CO2 2022 will be approximately 300,000 tonnes in the first year. This is the equivalent of taking 31,000 passenger vehicles off the road. Between 2022 and 2040 the cumulative reduction of CO2 is estimated to be between five and ten million tonnes.

A hotbed of innovation

The project represents a turning point in public and private transportation policy in a country whose essence is engrained in the car industry. It also indicates willingness to look outwards, learn, and then embrace change at home.

The Federal Railroad Administration is

creating a new set of standards for high speed railways together with new national safety criteria for high speed rail. WSP | Parsons Brinckerhoff provided assistance to FRA in developing these new standards. These new safety criteria will be developed into template regulations for future USA high speed projects.

Construction is now underway between Fresno and Merced (to the west of Yosemite) in the Central Valley with two additional design-build contracts now awarded between Fresno and Shafter and further packages to be let leading to the opening of the first phase in 2025. WSP | Parsons Brinckerhoff has been helping the Californian Transportation Authorities to develop this project since the mid-1990's and is currently leading Rail Delivery Partner (RDP). In this role, our team, which has grown to 200, is overseeing all phases of the development of the high-speed line from planning through design to commissioning, with key responsibilities including engineering and design management, risk assessment, quality management and assurance, project accounting and budgeting, program delivery strategies, construction support, testing and commissioning and environmental review.

Learn from both sides of the Atlantic

High speed rail, which is of course now in the UK, is an increasingly global business. This

means we can share knowledge, skills and expertise across borders. For example, one of the main challenges with CHSR is the seismic ground as California sits on a fault line. WSP | Parsons Brinckerhoff is well versed in seismic resistant design having experienced it at first hand during construction of Taiwan High Speed Railway.

High speed rail still remains as new a concept in the US as in the UK, and with the projects being delivered simultaneously, we can learn a lot from both sides of the Atlantic. Back in the UK, the population is on course to hit 70 million over the next 16 years, with London alone forecast to gain one million more residents by 2020. Rail journeys are at an all-time high with train passenger numbers set to double over the next 30 years. High speed rail is the way forward. HS2 promises to set a new standard for rail travel in the UK as CHSR will do for USA. Both projects will lead to frequent, high-capacity trains dramatically reducing journey times between key cities and providing much needed capacity for the existing network.

The proliferation of high speed rail across the globe means rail professionals, wherever they are, will get to witness first-hand the benefits of our work, and the challenge will be for future generations engineers to continue to renew our ageing infrastructure, and continue to bring new transformational lines to connect our global cities.

Stuart Brunton is rail and transit technical director at WSP | Parsons Brinckerhoff

A sensitive area

Victor Krylov looks at ground vibration boom – the phenomenon to be reckoned with when developing HS2's railway lines

Development of high-speed railways brought into consideration new environmental problems that were unknown for conventional trains travelling at lower speeds. One of the most serious problems associated with high train speeds is a dramatic increase in the level of railway-generated ground vibrations that can occur when the train speed exceeds the velocity of Rayleigh surface waves in the supporting ground.

This phenomenon was first predicted theoretically more than 20 years ago (Krylov, 1994), and it is currently known as 'ground vibration boom', because it is similar to the well-known phenomenon of 'sonic boom' from supersonic aircraft that occurs when the speed of aircraft exceeds the velocity of sound in air.

There is currently much speculation surrounding this phenomenon and circulating within the communities that may be affected by the construction of HS2 railway lines. Sometimes it is even considered as a reason to abandon the development of high-speed railways altogether. Is this phenomenon really so dangerous? To understand the situation better, it is useful to look back at the developments of supersonic jet aircraft in the 1940's. Initial concerns about the possible destruction of aircraft when passing through the sound barrier turned out to be exaggerated. However, the sonic boom phenomenon, that can be perceived by observers on the ground as a very loud bang, did happen, and it still remains the main environmental obstacle that affected and continues to affect the developments of passenger supersonic aircraft, like Concord. Because of the sonic boom, Concord flights were banned over continents, and only transatlantic flights were permitted. Such restrictions made Concord commercially unsustainable, which led to the eventual termination of its services.

"There is currently much speculation surrounding this phenomenon and circulating within the communities that may be affected... Sometimes it is even considered as a reason to abandon the development of high-speed railways altogether. Is this phenomenon really so dangerous?"

Similar destiny?

Can a similar destiny await high-speed trains because of the ground vibration boom? I do not think so. The essential difference between sonic boom and ground vibration boom is in the fact that, whereas sound velocity in air is roughly the same in all locations above the Earth's surface, Rayleigh wave velocity in the ground is different in different locations, depending on the local geological properties of the ground. In some locations, where the ground is soft and marshy, Rayleigh wave velocity can be very low, such that it can be exceeded by high train speeds. And it is these 'sensitive' locations that may represent the risks of occurrence of ground vibration boom from operating high-speed trains. Some preliminary estimates show that the proposed HS2 high-speed routes connecting London with Northern England via Birmingham at speeds of up to 400 km/h may present a possibility of ground vibration boom in some sensitive locations. Therefore, there is no point in banning high speed trains over the entire country because of ground vibration boom. As a rule, train speeds even as high as 400 km/h are still lower than Rayleigh wave velocities in the ground in the majority of cases. However, in some sensitive locations characterised by low Rayleigh wave velocities the phenomenon of ground vibration boom will represent a serious environmental hazard to be reckoned with.

Note that, in addition to the above-mentioned ground vibration boom, which is caused by train-generated Rayleigh waves propagating away from the track, another type of elastic waves, called 'bow waves' and propagating in the system track/ballast, can be also generated by high-speed trains if their speeds exceed the so-called track critical velocity. The latter is indirectly related to Rayleigh wave velocity in the ground and is usually higher than Rayleigh wave velocity by 10-20 per cent. This means that for train speeds larger than track critical velocity the ground vibration boom and the bow wave effect will take place simultaneously. However, they should not be confused with each other. Unlike ground vibration boom, the bow wave phenomenon only indirectly affects local residents and buildings as it is confined to the track, but the associated vertical dynamic displacements of the track may exceed static displacements by two to three times, which may adversely affect the train stability and even cause train derailment.

Thoroughly investigated

It is clear from the above that the proposed HS2 routes should be thoroughly investigated on Rayleigh wave velocities that should be measured in all locations along the routes before any construction works begin. Such investigations would reveal sensitive locations, with low values of Rayleigh wave velocity, where the occurrence of ground vibration boom and of the closely related bow wave effect is likely. After that, decisions should be made on how to mitigate the ground vibration boom problem in the identified sensitive locations. The easiest way to do so is to reduce train speeds in sensitive locations. However, this may be undesirable for operational reasons. Therefore, other possibilities can be considered, such as stiffening of the supporting ground or using different means of ground vibration screening, such as open and in-filled trenches or embedded rigid barriers.

Victor V. Krylov is Professor of Acoustics and Vibration at Loughborough University

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Back in the premier league

Henrik Anderberg looks at grasping the opportunities in the UK's new high speed network

There's never been a more exciting time to be working in the UK rail industry. Across rolling stock, infrastructure and signalling, the sector is resurgent.

Beyond the UK's classic rail network, HS2 steams ahead. The Phase One Bill has passed its Third Reading by 399 votes to 42 in the Commons and now begins its Lords' stages. And the recent agreement with the TUC shows HS2 is working hard to engage the wider workforce and supply chain.

In addition, while this year's Budget wasn't focused on big giveaways, it contained some clear and important commitments to our sector. High Speed Rail Industry Leaders (HSRIL) members warmly welcomed the chancellor backing Northern Powerhouse Rail (HS3) for example.

Our industry now knows that there is a significant pipeline of investment we can plan for. This long-term certainty allows the industry to plan and think strategically about how we can bring benefits to the country through the investments we make to deliver it.

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The role of HSRIL

HSRIL is a coalition of industry experts committed to supporting the successful delivery of a world-class high speed rail network in Britain. It represents a broad range of companies with relevant experience and an interest in high speed rail in Britain. By coordinating and sharing expertise and experience within the industry it aims to ensure that Britain's national high speed rail network is delivered efficiently and successfully to world-class standards, leaving a lasting legacy for growth, jobs and skills.

Sajid Javid: A strong rail sector supply chain is essential for our future productivity

HSRIL members successfully built HS1 in the UK, and are in the midst of delivering Europe's largest infrastructure project in Crossrail. Our member companies have significant UK-based operations, employ thousands of British workers and have built up an impressive record at home and abroad. We produced an important report last year called *Poised to Deliver*. By using real examples from member companies around the world, we demonstrated the capacity right here in Britain to successfully build our new high speed network.

This March we followed this report up with a new report on the benefits for SME's across the country of the HS2 work we are all doing. The new report *Grasping the Opportunity* was based on in-depth consultations with SME's, conducted in HSRIL member depots and facilities.

As the report says, HS2 is one of the biggest opportunities for Britain in decades. As well as providing the country with a new world class north-south transport link, the project provides opportunities for thousands of businesses, big and small, all over the UK. Launched at the House of Commons, cross-party support for the work was evident and Robert Goodwill MP, shadow transport secretary Lilian Greenwood MP and Labour peer Lord Snape all spoke at the event. I am particularly pleased that several HSRIL member companies have already taken the work further with their own supplier days organised across the country to engage new waves of small business in the opportunities that will be created.

An investment in people and their skills

The investment we are making will be about more than companies however. It will be about investing in our people. And that's why I believe the government's recent announcements on skills and apprenticeships are just as important for the rail industry as the headline projects themselves.

Apprentices and graduates will form a key part of that effort. As Sajid Javid, secretary of state for business, innovation and skills and co-chair of the Rail Supply Group has said: 'A strong rail sector supply chain is essential for our future productivity and the commitment to take on 20,000 new apprentices will provide opportunities for our young people to start successful careers in this vital sector.'

So beyond working with the supply chain, HSRIL members are also investing in new training facilities across the country and working extensively with schools, colleges and universities to build up our skills base and promote the rail industry as a career of choice. We will work hard as HSRIL to support this building up of world class expertise across the industry.

Grasping the opportunity

It's now widely recognised that HS2 offers opportunities for business large and small across the UK. It's not just about a new railway, the business opportunities are huge and HS2 could also represent a once in a generation opportunity to build the UK skills base and give opportunities to young people.

HSRIL members already have huge experience of delivering high speed rail projects all over the world, from bases in Britain. We will continue to work together to build UK talent and benefit the UK economy, putting the UK back into the premier league of rail industries and building our ability to export our technology and expertise worldwide.

Together, we will fully grasp the opportunities Britain's new high speed investment is creating.

Henrik Anderberg is director of High Speed Rail Industry Leaders (HSRIL) and acting MD and HS2 director, Alstom UK & Ireland

Consider the options

Colin Elliff and **Quentin Macdonald** talk about what they regard as the problems behind HS2 and their plans to shake-up the debate on high speed rail

The UK's debate on high speed rail has, to date, been relatively one-sided. MP's have only seriously considered one project – HS2 – yet its failings as a network, which have been obvious from the very start, have never been given serious scrutiny. The reality is that HS2 does not deliver the basic connectivity and capacity necessary for a modern, well-connected rail network that is essential for a prosperous Britain.

The highly politicised and chaotic plans put forward by HS2 Ltd have dominated so far. However, HS2 is neither the only, nor the best, option for high speed rail in the UK. High Speed UK (HSUK) is an alternative, holistic scheme that will connect the UK's major cities more effectively, cost the taxpayer less and have a much lower impact on the environment.

The core HSUK route follows the M1 up the spine of the country (four-tracked between London and Sheffield), with a trans-Pennine spur to Manchester and Liverpool. Birmingham and other Midland cities are served via upgraded existing routes. A new high speed line from Leeds to Teesside, Tyneside, Edinburgh and Glasgow completes the core network. All of HSUK's new-build and upgraded routes are designed to 1:25,000 scale throughout and its services are fully timetabled. HSUK interconnects more than 20 major cities with direct hourly or more frequent high speed services and provides low cost connections to Heathrow and HS1.

Although the task of designing a fully integrated national rail network is a highly technical matter, it is relatively simple to demonstrate HSUK's overwhelming technical superiority as a national rail network. The number of key centres that will be fully interlinked is proof enough. HSUK will provide direct high speed links between all 21 of the following locations: London, Heathrow, Oxford, Milton Keynes, Northampton, Birmingham, Wolverhampton, Leicester, Nottingham, Derby, Stoke, Stockport, Sheffield, Manchester, Liverpool, Leeds, York, Darlington, Newcastle, Edinburgh and Glasgow.

This level of connectivity is not possible on the existing rail network, and HS2 does little to improve the situation. Instead, through withdrawal of intercity services on existing routes, it will do much to make matters worse.

Looking at the current plans, there are a plethora of concerns that we need to be aware of at this crucial stage in the process. It's time to demand answers to 10 crucial questions – and at the same time confront HS2 Ltd with some very inconvenient truths:

Why has HS2 plus HS3 not been designed as a network?
HS2 plus HS3 is a hugely inefficient design which fails to interlink most regional cities. HSUK has been designed from the outset as a national network, and will interlink 20 of the UK's principal regional cities with direct high speed services.

Why has HS2 been designed with only two tracks between London and the West Midlands?
HS2's two tracks lack the capacity to provide high speed services to all cities served by the present intercity network – and cities bypassed by HS2 will lose intercity services. HSUK's four tracks from London to Sheffield have both the capacity and the correct routeing to provide high speed services to all major cities of the Midlands, the North and Scotland.

Why does HS2 fail to offer direct regional links to Heathrow?
Plans for a direct spur from HS2 to Heathrow Terminal 5 have now been abandoned, and there is no prospect of direct HS2 services from regional cities to Heathrow.

HSUK will offer direct services to Heathrow, and optionally to Gatwick, from most principal cities of the UK regions.

Why are HS2's station proposals so inadequate?
HS2 serves most regional cities with inefficient terminus or poorly-located parkway stations. This hugely restricts economic benefits and integration with local rail networks.

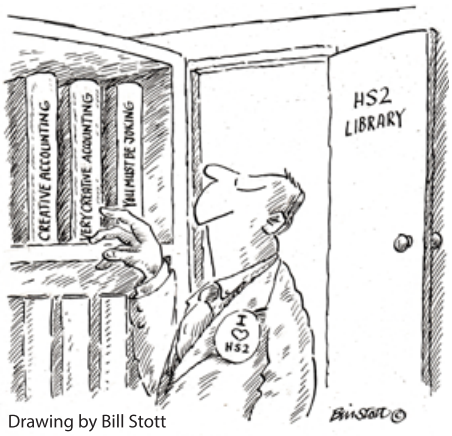
HSUK serves all regional cities at their existing central stations, with the single exception of a new station at Sheffield Victoria – in full accordance with the local authority's plans.

Why has HS2 Ltd failed to develop a timetable?
Without a timetable, HS2 Ltd cannot demonstrate efficient and integrated operation of the entire UK rail network, with HS2 and HS3 in place.

HSUK's timetable, based upon detailed design of nearly 1000km of new railway, shows 45 per cent average journey time reductions across the entire intercity network.

Why will HS2 do nothing to help the UK meet its CO2 reduction targets?
HS2's predicted 'carbon neutral' performance is completely at odds with the 80 per cent reduction target of the 2008 Climate Change Act.

HSUK's huge enhancement of network capacity and connectivity will enable step-



Drawing by Bill Stott

change road-to-rail modal shift and hence CO2 reductions – estimated at 500 million tonnes over 40 years.

Why is HS2 routed through the Chilterns AONB and other sensitive landscapes, when the nearby M1 corridor offers a far superior and less damaging route?
HS2 Ltd never gave detailed consideration to an M1-aligned route, and none of the reasons offered to dismiss this route stand up to serious technical examination.

The HSUK design shows clearly that a high speed line running parallel to the M1 is feasible and economic, vastly improving the connectivity of all M1 corridor cities.

Why will HS2 have no link to HS1?
Abandonment of HS2 Ltd's controversial and expensive (£700 million) link to HS1 has left no prospect of future direct links from the UK regions to Europe.

The HSUK link to HS1 follows the existing Midland Main Line to St Pancras and requires no new railway infrastructure. Costs are estimated at well below £1 million.

Why will HS2's proposed redevelopment of Euston require hundreds of homes to be demolished, 20,000 bodies to be relocated, and take over 20 years to complete?
HS2 Ltd has ignored obvious strategies to divert commuter flows away from Euston. These would avoid any need to expand the station and most of the associated disruption from prolonged construction activities.

HSUK's reconstruction strategy – based on diversion of Euston's commuter flows to Crossrail – will allow Euston to be rebuilt within its own footprint, in a much shorter timescale.

Why has HS2 Ltd not developed a strategy for rail freight to maximise the benefits arising from the building of new high speed passenger lines?
Any HS2 Ltd strategy for rail freight is disjointed, and reliant upon unrealistic 'trickledown' assumptions of released capacity on existing routes.

HSUK has developed a complementary strategy for a parallel national freight network on existing routes, upgraded to accommodate larger 'continental' sized wagons.

It is deeply worrying that only one option for a high speed rail line has ever been presented to Parliament, and that MP's have blithely nodded through a scheme that has been so ill-informed from the outset.

As the HS2 Bill approaches its Second Reading in the House of Lords, HSUK is calling on all Peers to take a look at the alternative approach to high speed rail and to demand an explanation from the government, for how and why the 'experts' at HS2 Ltd have got it so badly wrong.

It's time for the government to come clean, take the alternatives seriously, answer some crucial questions and stop wasting public money on the flawed and discredited HS2 proposals that are hugely unpopular with the UK public.

Colin Elliff and Quentin Macdonald are railway engineers and the experts behind High Speed UK

Mow the grass

The creation of a new high-speed route from London to Central Scotland would bring a 21st century transformation in rail travel. Meantime there is some urgent work that should have been done in the latter part of the 20th century, says **Paul Tetlaw**

On 15 February 1848 the first through railway route from London to Glasgow and Edinburgh opened. By 1st July of the same year it was possible to travel by train by this west coast route (WCML) from Euston to Glasgow in a little over 12 hours. At a time when many people never strayed far from their own town or village and most journeys were on foot, this was truly transformational. Over time regular journey times were gradually reduced, and by 1937 the LNER was able to introduce a new high speed train between London and Edinburgh – the Coronation, which brought the journey time on the east coast route (ECML) down to six hours. In the late 1970's the introduction of the Inter-city 125 diesel train to the ECML coupled with infrastructure improvements brought the journey time down by up to an hour compared to that achieved by the earlier diesel locomotives.

Subsequently, electrification brought the electric 225 trains to the ECML and the introduction of the Pendolino tilting trains to the WCML allowed journey times to rival those by the east coast. However the maximum speed of both these trains of 140 mph has never been realised and a step change in journey times is now long overdue.

Today, rail competes with both air and the car and we have long campaigned for improvements to Anglo-Scottish rail routes to allow rail to capture market share from both air and the car. Indeed, in 2008 we gave evidence to the Scottish Parliament inquiry and stressed the need for route upgrades[1]. We therefore welcome the development of Anglo-Scottish high-speed rail so long as its objective is to reduce the unsustainable levels of short-haul flights between Central Scotland and London. As well as helping Scotland hit its climate targets, getting rid of many of these unnecessary domestic flights would help alleviate pressure on the over-stretched London airports. Equally, reduced journey times will allow rail to capture modal share from the car between Central Scotland and the Midlands and North of England.

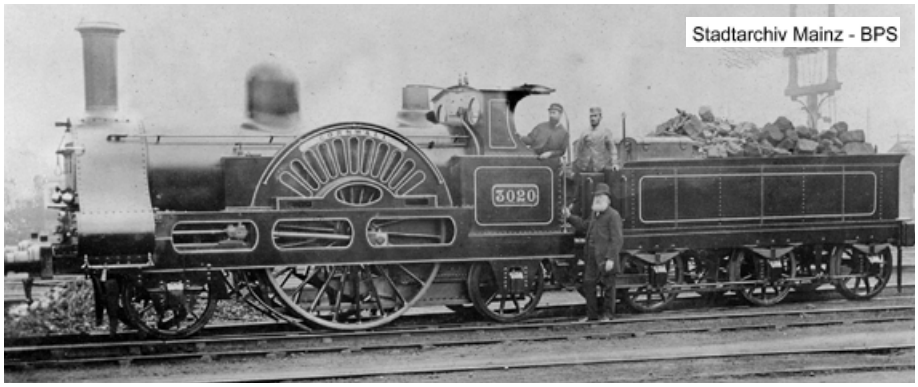
Timescales too distant

Rail patronage is booming and there is clearly an urgent need for more capacity on the network and reduced journey times. It is good to see that governments and agencies north and south of the Border are now working together to see how these twin objectives can be achieved; but timescales remain too distant and incremental improvements are meantime stalled.

On both the ECML and WCML there remain 15 mph speed restrictions – a situation that would be unthinkable on the road network. At Carstairs this impacts on both Edinburgh to Glasgow trains and those from Edinburgh to the south on the WCML. On the ECML at Portobello the single lead junction from the Borders Railway imposes a 15 mph speed restriction on trains crossing the ECML – impacting on both journey times and line capacity. Indeed, the eastern approaches to Edinburgh Waverley are

restricted to eight trains per hour, while in stark contrast those from the west have a capacity of 28 trains per hour. Set against this ECML capacity restriction is the desire to run many more trains: Virgin Trains East Coast, TransPennine Express and ScotRail have all been awarded franchises which aim to deliver more train services on the ECML, while there are two Open Access applications pending and a new train depot is to be built at Millerhill. Without urgent capacity upgrades many of these improvements simply won't happen.

There is therefore a danger that by focusing most attention on the construction of a new high speed line across the whole route length from London to Scotland, the very many incremental improvements



which could and should be taking place in the short-term are ignored and extra services and improved journey times are kicked into the long grass – or to put it another way 'the best becomes the enemy of the good'. National Infrastructure Commission chairman Lord Andrew Adonis recently argued that connectivity between the northern cities should be improved in stages, starting now, not waiting for the 2030's before making transformational changes[2]. We believe the same is true on the ECML and WCML routes to Scotland.

It is welcome news that work will be carried out in 2017 to identify options for getting the journey time between Central Scotland and London down to three hours – which should allow rail to capture at least a 50 per cent market share. Certainly the current market share of around 25 per cent for rail compares very poorly with that of other European countries for a journey of just 400 miles. However, a serious threat to this ambition is the Scottish government's declared intention to reduce Air Passenger Duty (APD). If this is introduced on such internal flights then not only will it seriously damage rail's market share but also the government's own climate change targets will be that much harder to achieve as emissions from air travel will increase still further. Virgin Trains has estimated that one-third of the southbound Edinburgh-London rail market could be lost to air if APD were removed altogether.

Classic routes remain vital

To return to the more immediate incremental improvements which are necessary to help grow the market for rail, we are pleased to hear that Virgin Trains and Network Rail (NR) are to form a cross-industry working group to investigate the work required to allow the new Class 800 Azuma trains to run at 140mph. It is however disappointing to read that NR says it will be beyond 2024 before this can happen. Whatever the long-term future may hold for a new high speed route all the way to Scotland, it is clear that the classic routes will still be a vital part of our rail network and now require upgrades in the form of cut-offs, line speed improvements, additional tracks and more and longer passing loops. Indeed from 2027 classic compatible trains will begin to run from the HS2 connection at Crewe northwards to Scotland so upgrades to the WCML are required before then. It is our understanding that it is not currently planned to equip the classic compatible trains with a tilt facility and so journey times north from Crewe will be inferior to those of the current Pendolino fleet. We believe this decision should be revisited.

In summary, since that transformational day in 1848 when London and Scotland became connected by rail, journey times have steadily improved. However, more recently, improvements have not kept pace with the growth in rail travel and the train now finds itself competing with both the plane and the car on journeys between Scotland and England. Demanding emissions and sustainability targets will not be achieved unless rail can capture a much greater market share. The incremental improvements that are needed to the rail network will not happen overnight – but the sooner we start, the sooner we'll get there. The building of new cut-offs to bypass bottlenecks in the rail network may well eventually lead to the creation of a new high-speed route all the way from London to Central Scotland and then we will have our own 21st century transformation in rail travel. Meantime, there is some overdue work that needs urgent attention and which should have been undertaken in the latter part of the 20th century.

Paul Tetlaw is a rail campaigner at Transform Scotland

Footnotes

1 Available on Transform Scotland website at www://bit.ly/1UWkHLQ

2 Rail magazine issue 797

Speed learning

Mark Raiss looks at lessons that can be learned from countries with established high speed rail networks

The high speed rail story in the UK has reached an exciting chapter. Enabling legislation for the HS2 line between London and Birmingham is nearing the completion of its passage through Parliament and construction is currently expected to begin at the end of next year. Given the scale of work to be delivered, the challenge is for the UK to develop the necessary skills to deliver this ambitious scheme. Building these skills now will open doors for exporting them overseas at a time when countries around the world are looking to expand their high speed rail infrastructure.

With benefits ranging from transport capacity building to sustainability, it is hardly surprising that the number of high speed rail projects around the world is growing. High speed rail also has a major impact on a country's economy, connecting isolated areas with lower job prospects

With benefits ranging from transport capacity building to sustainability, it is hardly surprising that the number of high speed rail projects around the world is growing. High speed rail also has a major impact on a country's economy, connecting isolated areas with lower job prospects with opportunities in urban centres

with opportunities in urban centres. High speed rail schemes are transforming the way people live, work and travel. In the Middle East, for example, the Haramain High Speed Rail project will connect the holy cities of Mecca and Medina with Jeddah and King Abdullah Economic City, helping facilitate transport for pilgrims to the region. The 320 kph railway line serves a population of nearly seven million and is the first high speed rail project in the Middle East.

In contrast, Spain has Europe's largest high speed network and is continuing to grow. The growth of high speed rail in the country stems from the government policy to connect all its major cities to Madrid to boost economic prosperity. The USA is investing in high speed rail to present an alternative to shorter air travel. Fast trains with city-centre stations are becoming an attractive alternative to short haul air travel as demonstrated by Eurostar. With a number of schemes in the pipeline globally, there will be good opportunities for the UK to export the knowledge it is gaining on HS2, such as early concept design, route alignment, documentation and environmental assessments.

Lessons from abroad

In addition to exporting expertise, the UK can benefit greatly from high speed innovations that have been developed in other countries. High speed rail design presents a number of different challenges compared to traditional rail. The pressures of high speed trains create shock waves in the ground that have to be catered for and bridges have to be stiffer to avoid vibrating under the dynamic influence of the trains. The alignment geometry has to accommodate higher speeds and porous tunnel portals help alleviate the air pressure waves from trains passing through them, which would otherwise cause discomfort to passengers and potentially noise disruption to the local community.

There are many lessons that can be learned from countries with established high speed rail networks, such as Spain. AECOM's high speed rail design centre in Madrid has worked on 25 per cent of the Spanish network. The team has developed a number of tools that aid the design including one that models power supply and predicts electrical performance to optimise electric train services for new and existing rail lines.

On a project in Madrid, the tool revealed that it was safe and feasible, from an electrical point of view, to reduce scheduled time between trains from five minutes to just 90 seconds. This was achieved by analysing the electrical consequences of the change and demonstrating that the time gap could be safely reduced.

A second tool developed by the AECOM Madrid team is used to calculate all of the information required to accurately place the overhead line equipment. It takes into account the possible variability in the position of foundations and material properties of the whole system, and enables all the components for the overhead line equipment to be pre-manufactured to precise specifications. The main advantages of this tool are that it leads to significantly simplified construction with cost savings due to fewer mistakes, reduced maintenance costs and a safer, reliable service for passengers.

The UK has the opportunity to develop home-grown skills, building strong high speed capabilities that will leave a legacy for future high speed programmes both nationally and internationally. Tools and techniques like those developed by AECOM in Spain can support high speed rail development in the UK. Attracting talent through a variety of different routes will be key to building capacity for 2017 when construction of HS2 ramps up. Apprentices and graduates will play an important role in building UK expertise. Those joining the industry now will have opportunities to work on projects around the globe as the high speed sector continues to grow.

Mark Raiss is engineering director – civil infrastructure, Europe, Middle East, India and Africa at AECOM

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Steely plan

Paul Payne looks at how he believes rail could help save the steel industry

The news is awash with reports of massive job cuts in the steel industry after Tata announced its plans to withdraw its investment in the UK. In the latter half of last year there were some encouraging, if rather hypocritical steps taken by the government to ensure that public sector bodies consider a number of factors, including social implications, when choosing steel suppliers. This was a positive move, but not enough is being done to utilise British steel in British projects and, after all, not many things have as profoundly a negative impact on society as thousands of jobs cuts. But why is the UK steel market in such a state and how could the rail industry help to salvage these positions?

The reasons behind the collapse of the industry are numerous; however one of the main factors is that the market is currently flooded with cheaper steel than the UK can produce. A decade ago, Chinese production accounted for 10 per cent of the global output, but it now contributes almost 50 per cent of the steel used around the world. This isn't going to be reversed in the immediate future: the national industry is essentially government controlled and any slowdown in production would create thousands of sudden job cuts that would likely have an even more negative impact on a possibly more unstable economy than in the UK.

> A decade ago, Chinese production accounted for 10 per cent of the global output, but it now contributes almost 50 per cent of the steel used around the world. This isn't going to be reversed in the immediate future

Other major producers such as Russia, Brazil and Japan are also in a similar boat. In addition, there's the simple fact that steel is cheaper to produce in China, not just because labour is less costly, but also because the UK isn't particularly effective at producing iron and coking coal, two of the main ingredients in the steelmaking process. There's not much point in importing these raw materials simply to send them back around the world again. The fact that the power used to run the steelmaking process in the UK costs double what it does in the likes of France and Germany, and considerably more than that in the USA and China, also plays a major factor.

On top of that, while there are highly productive facilities on these shores such as Celsa's Cardiff plant, there are also a number of major production plants that are outdated and inefficient. There are also factors related to the carbon taxes, the strength of the pound and high business rates which means that it's simply more expensive for firms to operate and trade with the UK.

Reasons to be cheerful

While all the above may sound like an awful lot of doom and gloom, there are reasons to remain positive. The industry, like many others, is cyclical and we'll likely see numerous peaks and troughs in output

which will be caused by external market factors in the not too distant future. Even China has reviewed plans to cut around 400,000 steel jobs over the next five years which could swing the pendulum back in the UK's favour. However, we can't sit back and wait for that to happen. Production plants can't just be turned on and expected to produce immediately, they need time to get up and running so the government needs to act quickly.

Here at One Way, we're in an interesting position straddling both the construction and rail industries and have noted the rapid growth of the latter sector where a number of major infrastructure projects have been given the go-ahead. Would it therefore not make sense for these programmes to utilise the steel already on these shores?

As we all know, the rail sector is in a particularly positive state and the amount of raw materials required to get these projects off the ground is surely likely to significantly raise demand for both products and the professionals that can help create them. This wouldn't only help to save the thousands of jobs that are presumably going to be lost, but the knock-on effects could even create more in rail and in other connected sectors. There are already a huge number of rail projects that have been given the green light in recent times including the obvious

ones such as Crossrail and Thameslink. In addition, there are also a range of major, but less well known projects including the upgrade of the Filton Bank railway from two to four lines and the expansion of Manchester Piccadilly station among many others.

Obviously there are other factors to keep in mind, but UK industry imported around 6.4 million tonnes of steel, 60 per cent of its required total in 2014 and making more use of the materials we produce here makes clear economic and social sense. None of us want to see a Full Monty type situation where steel professionals are made redundant and forced into other industries (least of all stripping), and using British steel to power our ambitious rail projects could potentially stave off the hugely detrimental effects that thousands of job cuts would have.

Paul Payne is managing director of rail and construction recruitment specialist One Way

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Justin Southcombe examines how 'Servitization' transformed the aircraft industry and how condition monitoring could help create similar supplier-client relationships in the rail supply chain

In the 1990's, the aircraft industry experienced a fundamental change in the sourcing and purchasing of its key products. Pressure was brought to bear on engine manufacturers to explain and fully understand why their engines were not performing as well as the reliability specifications had outlined in their contracts with airlines.

Over 10 years, manufacturers such as Rolls-Royce created a robust, constructive, condition-based maintenance strategy which they then deployed. It was not solely a technological achievement but a commercial one too, and a new business term was coined: 'Servitization'.

Rather than being merely a business school theory confined to textbooks, Rolls-Royce completely transformed and adopted 'Servitization' as a new business model. Today it advertises 65 per cent of its business around aftersales service and maintenance, with the slogan 'Power-by-the-hour'. It was truly a transformation, whereby the interests of the manufacturer and its clients became much more closely aligned.

Procurement moved away from its focus primarily on 'new build' engines. Rather, the engine manufacturer's interest now lies in the business of keeping jets in service, in the sky. This Servitization model drives and rewards performance which can be measured simply and easily in passenger numbers, and by the number of hours an engine is flying, servicing and meeting efficiency targets. Much of the new information that has enabled this model to be successfully deployed comes from the extensive remote condition monitoring that was carried out in the early years on the jet engine system.

There is an opportunity for the rail industry to learn from the Servitization model. The ability to utilise existing condition monitoring technology in a similar fashion to the aircraft industry, to save costs and create truly 'intelligent' products is within reach, but it is a transformation which will take understanding and coherence from suppliers and clients within our supply chain.

Perfect storm

It needs to happen, as there could be a perfect storm on the horizon created by increased demand, increased costs, all compounded by fewer skilled personnel to make it all happen. For instance, on the demand side, the Rail Supply Group (RSG) predicts that by 2020 we're going to see 20 per cent more passengers using the railways. Transport for London is also pursuing 24-hour operations and the requirement for trains and availability is moving significantly upwards. At the same time, the industry faces a significant skills shortage. We are not replacing people as quickly as they are leaving and it is estimated that by 2020, there will be an unfilled vacancy in 35 per cent of all rolling stock traction maintenance jobs.

There is also a huge amount of cost and waste. Looking specifically at wheelsets and bogies, the global industry spends about £8 billion worldwide every year replacing wheelset and bogie components using largely hard-time maintenance cycles. In the rail supply chain currently, like many products, a bogie is considered or purchased by its constituent products and that needs to change.

Without condition monitoring, finding out what is, or has been happening when a bogie is in operation is almost impossible … yet it can now be done. £8 billion is a very high figure, and in some cases up to 70 per cent of wheelsets and bogie are scrapped unnecessarily, instead of being effectively condition-monitored and potentially retained in continuous service.

Configuring and cataloging the system copy

Installation of sensor

In terms of utilising effective condition monitoring technology more smartly to create efficiencies, wheelsets and bogies are a good place to start as rotating metal components provide very robust data sets of early degradation through vibration. Companies like Perpetuum are putting intelligence into the bogie with continuous monitoring, which opens up a world of information and efficiencies for the train operator.

Self-powered technology and the rich data wireless condition monitoring produces means we are now in a position to see how products like bogies and wheelsets work as


Perpetuum onboard technology

a system, not just on the performance of its component parts. In this way the bogie can become truly 'intelligent'. Bogies fitted with condition monitoring can collect and send instant data on their condition. This data can be used to predict failures, increase asset management efficiencies and increase safety, meaning more time on the track for the bogie and a better chance of meeting the increased demands we addressed earlier. Vibration condition monitoring can be used on bearings, on motors, on gearboxes and, as with Network Rail currently, it is being used to monitor track condition too through the critical wheel/rail interface.

Not science fiction

It's not science fiction; train operators are already using information to drive down their maintenance costs and drive up their availability. It has been fully deployed on the trains of one of the UK's largest operators, Southeastern. In Kent alone, Perpetuum monitors more than 1.8 million data points per day. More than one billion service km from more than 5,000 sensors have been monitored on over 600 cars. This means significant statistical models are produced upon which to build and create powerful life cycle management processes, enabling asset managers across the rail industry to save costs, increase safety and plan more efficiently.

Furthermore, more than 100 Turbostar cars have been deployed with the system on the adjacent Sussex network with the respective train operator, Southern. In Australia, Metro Trains Melbourne ordered a pilot of Perpetuum's services on its Alstom X'Trapolis trainsets to effectively monitor its bearings and wheels as the company intends to significantly extend maintenance overhauls by moving to condition monitored maintenance.

Traction motor condition monitoring, using Perpetuum vibration sensor nodes, is also now being deployed on a metro fleet in London to extend motor overhauls safely. These operators are seeing at least 60 per cent increase in the mileage they're getting from their bogies. After 12 months of development work with Network Rail, Perpetuum also secured a contract to monitor track condition, calculated using vibration data from the thousands of Perpetuum-equipped wheelsets on Southeastern's C375 and C376 Electrostar trainsets.

In conclusion, train operators are already beginning to use their intelligent bogies as a system, to collect valuable data which have been proven to save cost and keep rolling stock rolling for longer, meeting passengers' service expectations. As we move forward, technology will enable us to move forward to a point where we no longer see wheelsets and bogies as separate components, but truly as a system.

Once this happens, perhaps we too could see these important subsystems as the 'jet engines' of the rail industry. Perhaps we can more closely align supplier and client expectations, with a focus towards Servitization and all the efficiencies that can bring.

Justin Southcombe is commercial director of Perpetuum

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A shared signal

Phil Sorsky looks at the challenges and benefits of connecting mobile commuters

We are currently undergoing a period of intense focus on the country's rail infrastructure, with significant investment in projects such as HS2 and Crossrail. And this focus goes beyond just the physical aspects of the rail network.

In February 2015, the UK government announced £50 million in funding to ensure the provision of free Wi-Fi on trains across England and Wales from 2017. This was followed by further consultation in June last year, exploring ways of improving 3G or 4G mobile connectivity across the nation's railways.

Mobile devices have become ubiquitous in every area of life over the past decade, and consumers now expect their smartphones and tablets to work perfectly regardless of where they are and what services they're trying to access.

As a result of this demand for connectivity, there has been unprecedented consumption of data over mobile networks, with many countries exceeding 100 per cent mobile saturation. Despite this, however, there are areas of high mobile subscriber traffic in these same markets where mobile connectivity is either severely limited or non-existent.

National rail networks are one such area, and one that has the potential to generate significant revenues.

> Ensuring mobile connectivity for rail commuters is a tricky balancing act. Toc's are aware of the demand for onboard coverage as part of their drive to improve their customers' experience and, while mobile operators are responsible for investing in trackside infrastructure, they may not prioritise supplying coverage capacity which can be used by businesses supplying different services such as Wi-Fi

Bringing the signal inside

Unfortunately, the typical features of an urban public transport system tend not to lend themselves to dependable, consistent mobile coverage. Operators are often faced with the challenge of providing coverage in trains sometimes deep underground or running through many miles of tunnels. Even above ground, perfect coverage along the track doesn't necessarily guarantee mobile connectivity within the train. The main challenges in providing mobile

coverage relate to bringing the available network signal into the train carriages from along the track side. Train structures, particularly the metallised windows of high-speed trains, can dramatically reduce the extent to which mobile signals are able to penetrate into the carriages. Therefore, even if coverage is perfect on the track side, mobile users inside the train will often not be reached by an outside signal at all.

Making headway in Europe

One country that has made great headway in developing mobile access across its rail network is Switzerland. One of the first countries to deploy mobile services onboard trains, Switzerland's leading mobile operator, Swisscom, has been working in partnership with the national rail provider to drive significant investment in train connectivity.

In Germany and Italy, manufacturers have recently started building new trains with on-board wireless systems already equipped, while mobile operators invest in track-side infrastructure.

And in the Nordics, one project is the Öresund train service; a rail link between Copenhagen in Demark, and Malmo in Sweden. Travelling across the Öresund Bridge and through around 12 miles of tunnels, the challenge of providing mobile connectivity is heightened further – especially when you consider that the inter-country train service is run in co-operation with seven train providers across Sweden's rail operator, Veolia Transportation, and Denmark's DSB Öresund.

Who should pay?

It's clear from these examples that current technology can be used to overcome the challenges of providing mobile coverage to public transport systems. But wireless systems on trains are still a far from common feature. Indeed, many major metro systems around the world don't currently offer mobile coverage across the whole network. The London Underground is a prime example of this, although Wi-Fi connectivity is available on its platforms.

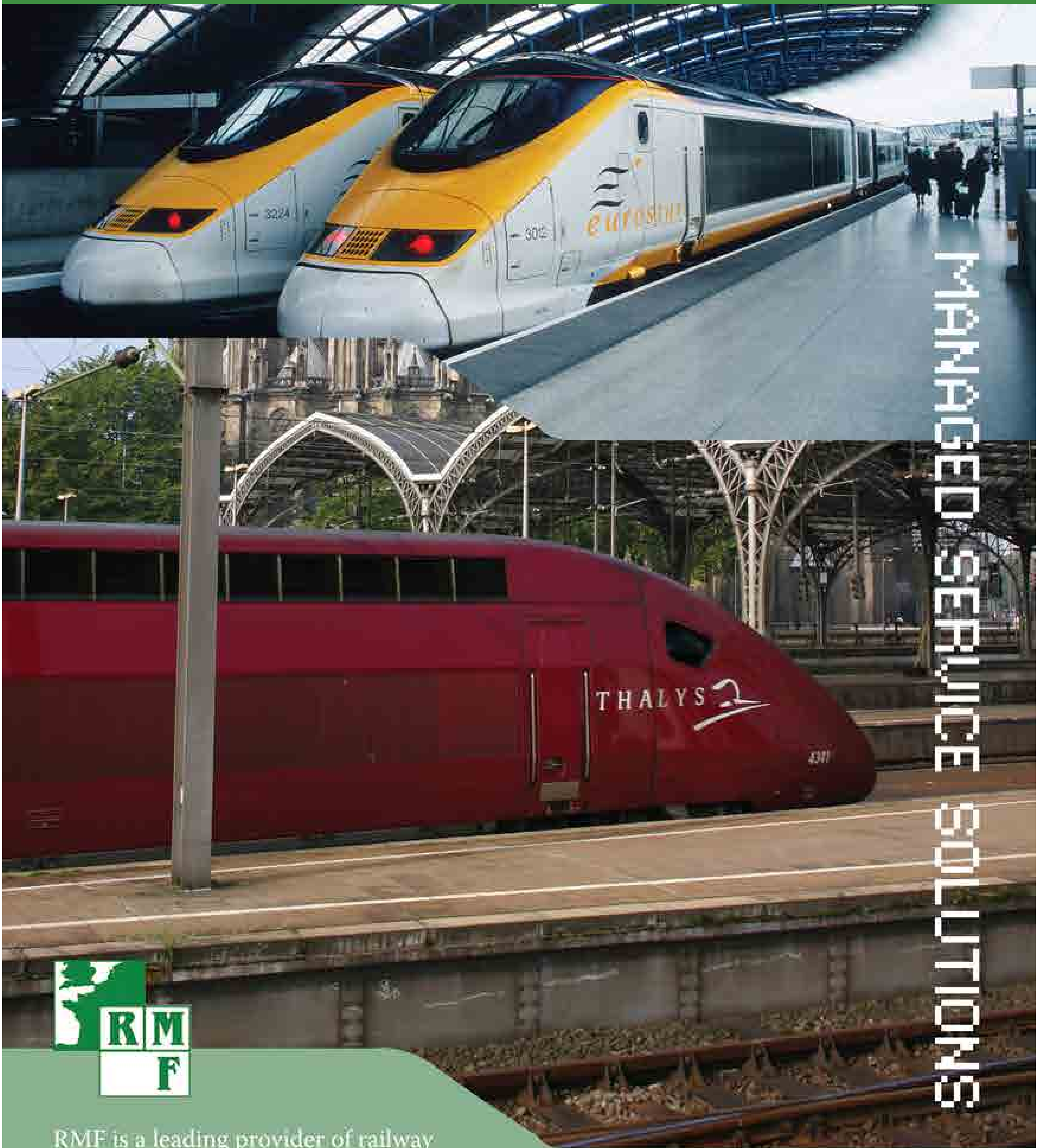
While part of the problem has been a question of engineering, there is also the question of who should actually pay for and install the system. Ensuring mobile connectivity for rail commuters is a tricky balancing act. Toc's are aware of the demand for onboard coverage as part of their drive to improve their customers' experience and, while mobile operators are responsible for investing in trackside infrastructure, they may not prioritise supplying coverage capacity which can be used by businesses supplying different services such as Wi-Fi.

There's little logic in rail operators opting for a single operator-owned infrastructure, as this will exclude a large number of their customers from being able to use the network. At the same time, neutral host systems, deployed by third parties, can prove expensive for operators and can lead to complications when expanding the network in the future. The optimum solution would be co-operation between a number of operators and stakeholders, who can share the costs of deployment and improving coverage and/or capacity.

There are, undeniably, challenges in deploying mobile coverage across Britain's rail network, but the benefits are wide-ranging. Mobile users benefit from the ability to work or play on the move, network operators can harness a lucrative revenue stream, and train operators will not only improve the experience of their customers, but can advertise their mobile connectivity as a means of differentiating their network from their competitors'.

With advantages such as these, there's little doubt that ensuring mobile coverage will put rail operators on the right track.

Phil Sorsky is head of service providers for Europe at CommScope



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That's entertainment

Roger Matthews looks at the new age of on-board infotainment

Remember the good old days of dial-up internet and surfing at speeds that would make a snail yawn? Thankfully that's in the past; but for too many rail users, on-board Wi-Fi, when available at all, has been a hit and miss affair. Something clearly had to happen.

> The new digital platforms through which rail users will access on-board infotainment offer another powerful potential route to engagement: they are an ideal way to learn about passenger preferences. And Toc's that run coach and bus services have a further engagement opportunity, by extending their bespoke infotainment delivery to the next stage of their customers' onward journey

Enter the government, with its pledge last February of £50 million to improve Wi-Fi on trains run by four rail companies, and a demand that it must be free on routes in England and Wales from 2017. This is good news for rail users and it brings fresh urgency to a major decision for Toc's, as well as a great opportunity. Better Wi-Fi should pave the way for high-quality infotainment on trains, but which technology should they adopt?

When it comes to infotainment Eurostar is one company already blazing a trail on its new state-of-the-art trains between London and Paris. It has engaged a world-leading provider of on-board wireless connectivity and adopted GoMedia's fully integrated digital rights management system. Now its passengers can enjoy films from major Hollywood studios, TV box sets, BBC news, cartoons, games and digital newspapers on their mobiles, tablets or laptops.

Eurostar delivers all this content from a server hosted on-board the train. The content is updated via existing station Wi-Fi, and GoMedia's online monitoring solution ensures consistent delivery.

There are significant cost savings compared to other models. Passengers find using their own mobile devices convenient, and it meant Eurostar avoided the unnecessary expense of installing airline-style personal entertainment devices at every seat. Encouraging passengers to use Wi-Fi also reduces cellular backhaul costs for Toc's.

Eurostar has effectively raised the bar of customer expectation for the industry. Of course, Toc's are experts at running trains, not necessarily at delivering world-class digital entertainment. So selecting the right infotainment provider – one with experts in the relevant technology, a wealth of experience in digital broadcast rights and a network of content partners – is a key decision.

And it's not simply a decision based on the desire to increase customer satisfaction with outstanding content. The more that passengers can be encouraged to stream

higher bandwidth content via on-board Wi-Fi, the more this frees up the mobile network for lower bandwidth use by other customers, aiding the government in its quest to improve mobile connectivity.

Possibilities endless

And there are a variety of potential new ancillary revenue sources to consider, such as passenger upgrades, refreshment orders and destination deals, as well as the obvious opportunities for pay-per-view content. With the right infotainment partner, the possibilities are endless.

There is a bigger picture, too. Toc's are always keen to build relationships with their customers that are deeper than simply selling them a ticket and delivering them to a destination. Innovative ways of connecting with rail users via their mobile devices can help them to build rapport and develop these relationships.

Take Virgin Trains. It is now using GoMedia's SMS texting app to address inefficient boarding at Euston Station, one of the busiest in the UK. Passengers watching customer information system screens tended to feel anxious about missing their train and rush towards their platform when boarding information appeared. Now they receive one text reassuring them that their train is ready for departure, and a second with the platform number, seat reservation and the updated boarding time. And Virgin can stagger the text delivery, allowing those with children, for example, to board earlier.

The new digital platforms through which rail users will access on-board infotainment offer another powerful potential route to engagement: they are an ideal way to learn about passenger preferences. And Toc's that run coach and bus services have a further engagement opportunity, by extending their bespoke infotainment delivery to the next stage of their customers' onward journey.

All this points to a much rosier and better-connected digital future for Toc's and passengers alike. But competition to provide industry-leading infotainment will be fierce, thanks to the rail franchise model.

In June last year the government launched a consultation document titled Improving Mobile Communications to UK Rail Passengers. This call for evidence on how to improve connectivity also made clear the direction of travel of the government's thinking, asking: 'What capabilities of mobile devices will passengers seek to use while travelling?' and, 'What does a good passenger experience look like?'

Train operators bidding for new franchises and direct award agreements must already show how they will meet the government's commitments to free Wi-Fi. The next logical step when it comes to future bid requirements may well be to show how they are using the opportunities Wi-Fi presents to improve customers' rail travel experience.

> The new digital platforms through which rail users will access on-board infotainment offer another powerful potential route to engagement: they are an ideal way to learn about passenger preferences

So, whether you view infotainment as a potential make-or-break franchise issue, a new route to customer engagement, or both, it's surely no time to make like a snail.

Roger Matthews is managing director of GoMedia

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Finding a balance

Lengthy commutes are having a negative impact on the wellbeing of commuters and ultimately reducing the satisfaction of life within the UK, says **Olivia Maloney**

According to recent research conducted by MOMA Foods, millions of UK workers are now travelling hours to get to and from work every day. This has a huge impact on the nation's work/life balance, as people are able to spend less time winding down and enjoying time with loved ones.

Not only do these daily commutes mean added hours of stress away from the comfort of our homes, but the sheer numbers of people making this journey every day means transport is crammed with warm, stressed bodies. According to the latest United Nations estimates, the UK now holds a population of more than 65 million people, where this has seen a striking rise of 13 million people since 2013. This is predicted to increase further, and will ultimately have an effect on the UK's daily commute.

Information derived from the TUC reveals the UK's daily commute has risen by 72 per cent over the last decade, in which commuters are now travelling more than two hours a day to get to work. According to this research, more than three million workers in the UK have lengthy commutes every day, with this rise most significant in the South-East (103 per cent), the South-West (102 per cent), the East Midlands (87 per cent) and Wales (76 per cent). With numbers on the rise, it's not only the commuting times and wellbeing of the passengers that is becoming a problem, but also their safety.

The introduction of Crossrail 2 sets out to tackle the challenge of commuting in and around London, where it will reduce overcrowding, provide greater connectivity, increase capacity and provide more frequent trains. One of the biggest issues faced is a lack of peak time services. Crossrail 2 will help to solve this issue in the capital, however there do not seem to be any plans to roll out new routes in other busy commuting cities such as Manchester.

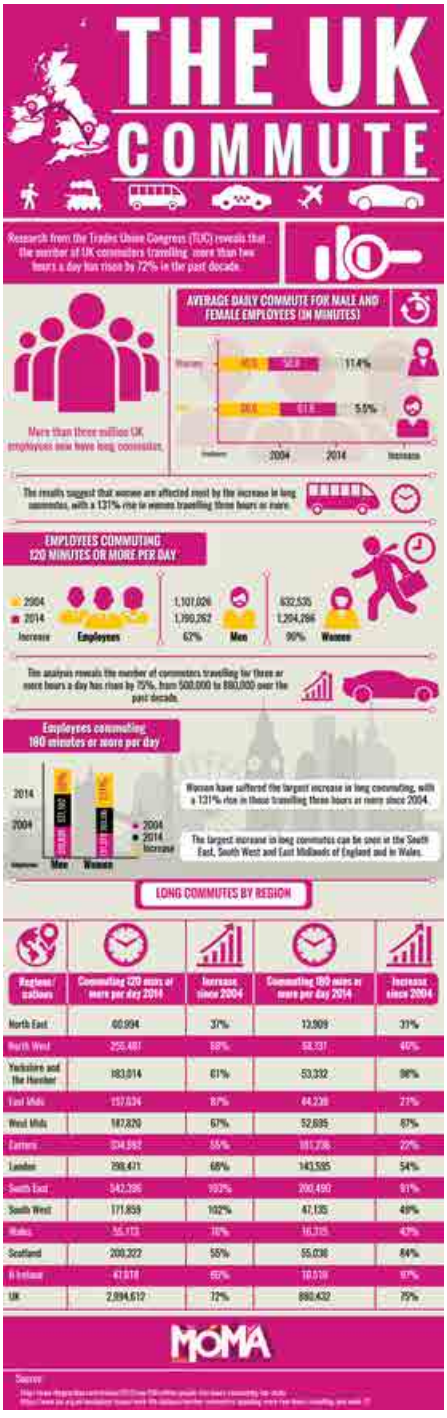
Reducing life satisfaction

The TUC research provided valid evidence that the number of commuters who travel three or more hours to work every day, has risen phenomenally from 500,000 to 880,000 over the last decade. A closer inspection of these results highlighted that the average commuting time rose by three minutes a day from 52 to 55 minutes during the decade from 2004 to 2014. These small rises are most frequently caused by the high numbers of passengers, making it hard for people to get on and off at their chosen stops. This change has resulted in commuters spending an average 11 hours and 42 minutes per year longer on their journey to work than ten years ago. For most commuters it means a very early start, with some getting up around 5:00am and returning home after 8:00pm. This leaves very little time for any home life, which could be a huge factor in the continuing rise in workplace stress.

According to the union, long commutes fall down to the fact that rent and housing price costs are phenomenally high in the UK. This, in combination with the UK recession in 2008 has led to an increased number of people who are willing to commute longer in order to keep or get a job. A further elaboration on this matter highlights that workers who are on a lower wage are those who face longer and costlier commutes. Above all, these lengthy commutes are having a negative impact on the wellbeing of commuters and are ultimately reducing the satisfaction of life within the UK.

With the UK's population estimated to increase by another two million people by 2031, the means of introducing new transport lines is absolutely crucial. These new systems set out to support society and the daily challenges the UK faces in extreme commuting. Such systems can help in reducing the ever-increasing time and money spent on the matter. Employers can play their part by introducing the likes of flexi-working and offering opportunities to work from home, which will help to reduce commute times and issues of overcrowding. As a result, business performance will surely improve, offering a better work-life balance and allowing for safer commuting overall.

Olivia Maloney is creative content consultant at FireCask



Infographic created by MOMA

Fit-for-purpose PPE

Safety equipment and workwear supplier Arco has voiced its concerns over the use of inadequate personal protective equipment (PPE) that could put those in the rail industry at risk.

The company, which has more than 130 years' combined experience in the field of work-based safety, has said that equipment that some of the products people assume to be safe may not actually be fit for purpose.

Arco warns that procedural weaknesses present within the approval and marking process mean that less reputable manufacturers or importers can gain CE certification for products and then make changes to the product, impacting on the product's safety.

Another major area of concern highlighted by the safety company was the unsafe nature of the latest variety of toecaps, which use non-metallic materials to protect workers' feet. Made from composite glass fibres and injection moulded thermoplastics, under compression testing it became apparent that some moulded toecaps performed significantly worse than their fibreglass composite counterparts.

Neil Hewitt, a director of quality and technical standards at Arco, said that it was imperative that anyone buying safety equipment could trust that they were safe.

'Substandard toe caps wouldn't offer sufficient levels of safety, resulting in injuries, broken bones or even amputation. The use of a thermoplastic toecap in safety footwear construction is not immediately evident and purchasers are relying on the CE mark being accurate.

'This issue has compelled Arco to assure our customers that we don't allow the use of thermoplastic toecaps in the construction of our own-brand products.'

Visit www.arco.co.uk

Compression testing

Building strong foundations

DB Cargo UK has signed a contract with Tarmac to up its rail freight capacity and to aid delivery of the UK's infrastructure ambitions.

Part of a plan to reduce transport CO2 levels by ten per cent per tonne by 2020, the contract sees the company formerly known as DB Schenker Rail UK continuing with its delivery of aggregates by rail from Mountsorrel Quarry in Leicestershire.

Now underway, the five-year contract was signed aboard DB Cargo UK's company train as it travelled from St. Pancras to Birmingham International, stopping at Mountsorrel Quarry on route.

In January 2016, DB Cargo UK began two other five-year contracts with Tarmac to transport materials for Tarmac's aggregates businesses in London and the west of England.

Mick Tinsley, head of building, infrastructure and construction at DB Cargo UK, said: 'With far greater collaboration than ever before, we're excited about the development of the services and the prospects for even more construction materials to be moved by rail in the future.'

Matthew Woodcock, head of group supply chain and logistics at Tarmac, said the new deal builds on the company's current capacity and will support 'more efficient, sustainable transport and a lower carbon built environment.'

Visit uk.dbcargo.com

Feeling the FORS

The Fleet Operator Recognition Scheme (FORS) has experienced an 'overwhelming growth' in accredited operators across the UK in 2015, reveals the scheme's 2015 Annual Report.

The document, which reports on the first year of the scheme under the management of the FORS Community Partnership, details the initiatives activities, development and growth.

FORS is an accreditation scheme that encompasses safety, fuel efficiency, vehicle emissions and improved operations.

The report's significant highlights include details on the establishment of a fully trained audit team, the launch of a programme of 44 UK-wide FORS Practitioner workshops and a 315 per cent increase in in Gold-accredited operators.

Also revealed include the issuing of more than 33,000 warning signage stickers and the completion of 20,000 eLearning modules.

Commenting on the report, John Hix, director at FORS Community Partnership, said: 'Our vision is to enable all fleet operators to attain and maintain the best possible level of productivity and efficiency with the least impact on society and the environment.'

The full report can be viewed on the FORS website.

Visit www.fors-online.org.uk

Good vibrations

Vibration energy harvesting company Perpetuum has received an order from Govia Thameslink Railway (GTR) to supply wireless sensor systems for four additional Class 170 units, joining its existing Class 171 fleet.

Perpetuum's sensor systems monitor wear of the bearings and wheels to help maintenance engineers determine when maintenance is needed. The energy harvesters enable the self-powered maintenance-free wireless sensors to be fitted in minutes without the need for complex retrofit wiring.

This latest agreement follows the installation of Perpetuum sensor systems on a number of Southern trains in 2014. Southern became part of the GTR franchise after it was subsumed by the Toc in July 2015.

Perpetuum's sensor systems collect vibration data while a train is in motion and this data is transmitted wirelessly to Perpetuum's database, where software algorithms look for the signatures of bearing and wheel wear. The result of this analysis can then be monitored remotely using web-based access.

Maintenance engineers can then use the data to view the condition of their assets. Isolated faults can then be rectified before they become a problem, thus improving reliability and safety and reducing operational and maintenance costs. This in turn improves asset utilisation for the operator and reduces service disruption for passengers.

Visit www.perpetuum.com

Carillion cleans up

Carillion has begun a major contract with train operator Northern for the upkeep of its 476 stations and to provide round-the-clock customer advice across all communication channels.

Carillion is now responsible for the maintenance and cleaning of the stations across the region and will give travellers 24/7, 365 support from its Customer Experience Centre (CEC) in Sheffield.

The support service company was awarded the contract on the day that Arriva took over the latest Northern franchise from Serco-Abellio on 1st April.

52 jobs have been created at the dedicated Arriva CEC, which will operate a combined facilities management helpdesk and customer relations team, providing a service across phone, mobile, email and social media channels.

Jamie McDonald, customer experience director at Carillion, said that bringing both services under one roof would directly benefit Northern and its passengers. 'Our model, integrating both the facilities management and customer relations into a single team, will ensure that every customer and every Arriva Rail North colleague will have a safe, efficient and enjoyable experience.'

Visit www.carillionplc.com/markets/rail

Cloud-based safety

A governance, risk and compliance software retailer has signed a deal with the RSSB to replace an industry-wide safety reporting system for the UK network.

Ideagen's safety management information system (SMIS+), Gael Enlighten, is a cloud-based software app that will replace the RSSB's current SMIS database, which acts as a central reporting facility for all rail safety incidents in the UK.

Gael Enlighten will increase reporting levels for risk and improve overall safety on the UK network. It replaces the RSSB's Close Call System (CCS) to record and manage low-severity events.

David Hornsby, the chief executive officer of Ideagen, said: 'This contract is a major one for Ideagen and is the result of a strong commercial and technical bid for the contract in late 2015.

'The current SMIS system is the rail industry's primary safety database and reporting system. It records around 75,000 events annually but the RSSB and its members have recognised the need to upgrade the system to integrate with modern technologies.'

George Bearfield, director of system safety at RSSB, said the new system will create a progressive safety management system that will exploit the best available techniques and technology.

Visit www.ideagen.com

Gael Enlighten replaces the RSSB's current SMIS database

It takes two

Laing O'Rourke, FCC Construction and Murphy, working together under the name LFM, has named a joint venture of WSP | Parsons Brinckerhoff and Ramboll as its design partner.

WSP | Parsons Brinckerhoff and Ramboll have worked together for ten years and will support LFM's future involvement in major rail infrastructure projects, providing engineering design services that include tunnelling, earthworks, structures, highways and viaducts.

WSP | Parsons Brinckerhoff will draw on its expertise in delivering high speed rail projects including rail system engineering for HS2, the Cologne-Rhine Main Line and Taiwan California high speed rail networks.

Ramboll's experience includes Norway's high speed line, the upgrade of Denmark's entire rail signalling system to ERTMS and the world's longest road-rail tunnel, Fehmarnbelt.

Nadia Savage, LFM JV board director said: 'WSP | Parsons Brinckerhoff and Ramboll JV are acknowledged experts in innovation and advanced engineering, and will be crucial to our plans to participate in the UK's latest high speed rail project.'

Visit www.wsp-pb.com / www.ramboll.co.uk

LFM is made up of Laing O'Rourke, FCC Construction and Murphy

International conferences

Annual Ticketing Innovations summit 2016

Taking place on 6th and 7th June in Barcelona, the two-day summit is a networking platform for ticketing professionals from all over the world to discuss current challenges, fresh perspectives and best practices in smart ticketing systems.

Case studies prepared by the event's expert speakers will deliver a wealth of new ideas and inspiration, looking at new technologies and innovations as well as business and marketing strategies.

Those in the industry are encouraged to come with colleagues to network with and learn from industry leaders and to discuss the development and the future of ticketing systems.

Visit www.luxatiainternational.com/Events/annual-ticketing-innovations-summit

East Africa Transport & Infrastructure Projects 2016

This year's event will showcase new business and investment opportunities for industry in the East Africa region and around the world working for development of rail, metro and road infrastructure.

The strategic conference is designed to attract all those involved in the development of transport infrastructure, from government authorities and ministries to heads of commuter services, airport rail links and high speed urban transport.

Also welcome are manufacturers; IT companies and solutions providers; component manufacturers, such as braking systems and couplers; and financial institutions that fund the rail industry.

Visit www.bricsaconsulting.com/conferences.html

Malaysia Rail 2016

After hosting three shows, Bricsa Consulting is back with the fourth annual Malaysia Rail 2016.

One of Asia's premier railway industry events, Malaysia Rail brings together more than 100 leaders and is supported by SPAD and attended by key industry professionals within Asia's rail industry.

The conference offers first-hand insights into the strategies of the APAC's top rail authorities and operators. In 2016, Malaysia Rail will have more content than ever before, covering the innovations in rail mainlines, high speed rail, metros and more.

Highlights of the conference include the Klang Valley Mass Rapid Transit (MRT) Project, the Southern Corridor High Speed Rail in Kuala Lumpur and the Guangzhou-Shenzhen-Hong Kong express rail link that will connect mainland China with Hong Kong.

Also covered are updates from State Railway of Thailand (SRT) and the Bangkok MRT Green Line Extension.

Visit www.bricsaconsulting.com/conferences.html

Recent New Members of the Rail Alliance as at end March 2016

Royal British Legion Industries
UK supplier of lineside signage to the rail industry, delivering sustainable social value while providing employment for wounded, injured or sick ex-military service staff
www.rbli.co.uk

Morgan Advanced Materials
Designer, developer and manufacturer of composite structures for lightweight assemblies, x-ray transparencies, stealth application and ballistic protection
www.morganadvancedmaterials.com

Track Access Services
Supplier of products to the rail and transport industries, including laser positional video scanning, CAD modelling and production services, rail driver training and mapping, rail survey services and 3D tack models
www.trackaccess.co.uk

PAULEY (Interactive)
Immersive 3D, virtual and augmented reality training
www.pauley.co.uk

A-Plant Rail
Supplier of a wide range of equipment for hire including track renewals, infrastructure maintenance and overhead line equipment projects
www.aplant.com

Deimos Space UK
Subsidiary of Spanish satellite technology company Elecnor Deimos, the UK division develops systems to provide passenger information based on real-time rail traffic information
www.deimos-space.com/en

HTA Group
Supplier of laser-cut components and fabricated assemblies
www.htagroup.co.uk

Jonathan Lee Group
Recruitment consultancy for permanent and contract work
www.jonlee.co.uk

EJOT UK
Manufacturer of industrial fasteners for fabrication assemblies
www.ejot.co.uk

ESG Rail
Leading consultancy in the development of the UK's rolling stock under the categories of strategic, technical and integration
www.esg-rail.com

Safeguarding rail's infrastructure

Fibox gives details on the products it manufactures that keep rail equipment safe, offering specific information on its ARCA range

In today's highly competitive market, the rail industry is facing significant economic, environmental and engineering challenges. This means that the industry has to move quickly and decisively to meet those challenges and turn good, innovative ideas into positive business benefits that will ultimately lead to a better railway and boost product development for a whole range of specialist UK manufacturers.

With its UK head office in Stockton-on-Tees – where the very first railway was opened in 1825 – it's fitting that thermoplastic enclosure manufacturer Fibox works in close collaboration with specialist rail suppliers like the iLECSYS Group. iLECSYS is a technology specialist that provides worldwide rail networks with specific aspects of rail equipment. It also offers consultancy and in-house engineering and caters for the bespoke modification of enclosures and the manufacture of mechanical components and assemblies that aren't otherwise commercially available.

Progressive approach

The emergence of Fibox over 50 years from a 'me too' enclosure supplier to a leading designer, developer and manufacturer of electrical enclosure products and systems is built on a solid tradition of innovation. The company's progressive approach is to work in collaboration with specialist distributors, searching out effective production solutions that support a wide range of customers in the pursuit of their differing objectives. Fibox designers and engineers are proud of their track record of meeting the technical challenges faced by all its customers.

Since those early days, Fibox has diversified and now supplies enclosures to many other industrial sectors, including for Highways England through specialist contractors. Fibox's rugged and high ingress protection enclosures house signalling equipment, control systems and devices, protecting units located in hostile, harsh and demanding environments. They're also widely used within the utilities industry, protecting those critical instruments and electrical systems that keep the public safe. Therefore, it's no real surprise that Fibox

is ready to pursue further avenues into the rail industry, supplying a wide range of enclosures and solutions.

As well as dealing directly with specialist distribution companies throughout the world, Fibox also supplies a large number of enclosures through main contractors, working with many of the country's leading electrical and mechanical installation companies.

Whole-life-cost

Commenting on Fibox's ARCA range of polycarbonate equipment housings designed for rail, Steve Gallon, the company's managing director in the UK, said: 'Asset management has become of paramount importance to the UK rail industry. No longer is a purchasing policy of buying cheap – and replacing often – a viable option. The whole-life cost of an asset must be at the forefront of decision making.

> 'The ARCA range is fire resistant and achieves a rating of 5VA in UL 94 testing. In short, ARCA equipment housings are a viable and cost-effective option for many applications within the rail industry...'

'The Fibox ARCA range of high rigidity and heat resistant glass reinforced polycarbonate housings offer a robust and weatherproof alternative to steel or GRP. Damage to equipment housing through impact or corrosion can impair the function or render inoperative installed equipment. ARCA is therefore tested to rigorous standards to ensure that the range meets the EN 62262 IK 10 classification, whilst maintaining an ingress protection value of IP 66.

'Installed outside, ultraviolet light and water absorption can quickly degrade many plastics and paint finishes. However, ratings of UL 746 C - F1 provide confidence that the ARCA range of equipment housings will perform well for years to come.

'The safety of personnel coming into contact with a housing into which electrical equipment is installed is vitally important,' said Gallon. 'Being injection moulded in polycarbonate, and having a better than 5kV/mm dielectric strength, gives ARCA a distinct electrical insulation advantage over metal cabinets, and also eliminates the cost and labour of earthing the housing.

'The ARCA range is fire resistant and achieves a rating of 5VA in UL 94 testing. In short, ARCA equipment housings are a viable and cost-effective option for many applications within the rail industry.

'The Fibox ARCA range is there for the long haul, ensuring that sensitive and important electrical equipment remains functional over time, thus making sure that the value of assets is maintained for everyone's sake.'

Tel: 01642 604 400
Visit www.fibox.co.uk

Beyond the solution

Rowe Hankins

Rail safety systems manufacturer **Rowe Hankins** is celebrating 30 years in business. Here, the company shows what it has achieved in that time

From its modest beginnings as a small distribution company, Rowe Hankins has gone through a remarkable transformation over the last three decades and during that time has gained a reputation worldwide for quality, reliability and innovation, and making railway operations safer and more efficient.

In 1986, Rowe Hankins was formed by business partners Roger Rowe and Toni Hankins. The Manchester-based business began in modest premises in Bury, with just a handful of staff and a moderate turnover. Four years later, it moved to the Power House site in Bury where the company is still located today. Since that time the building has expanded three times to allow for larger manufacturing facilities and a service centre.

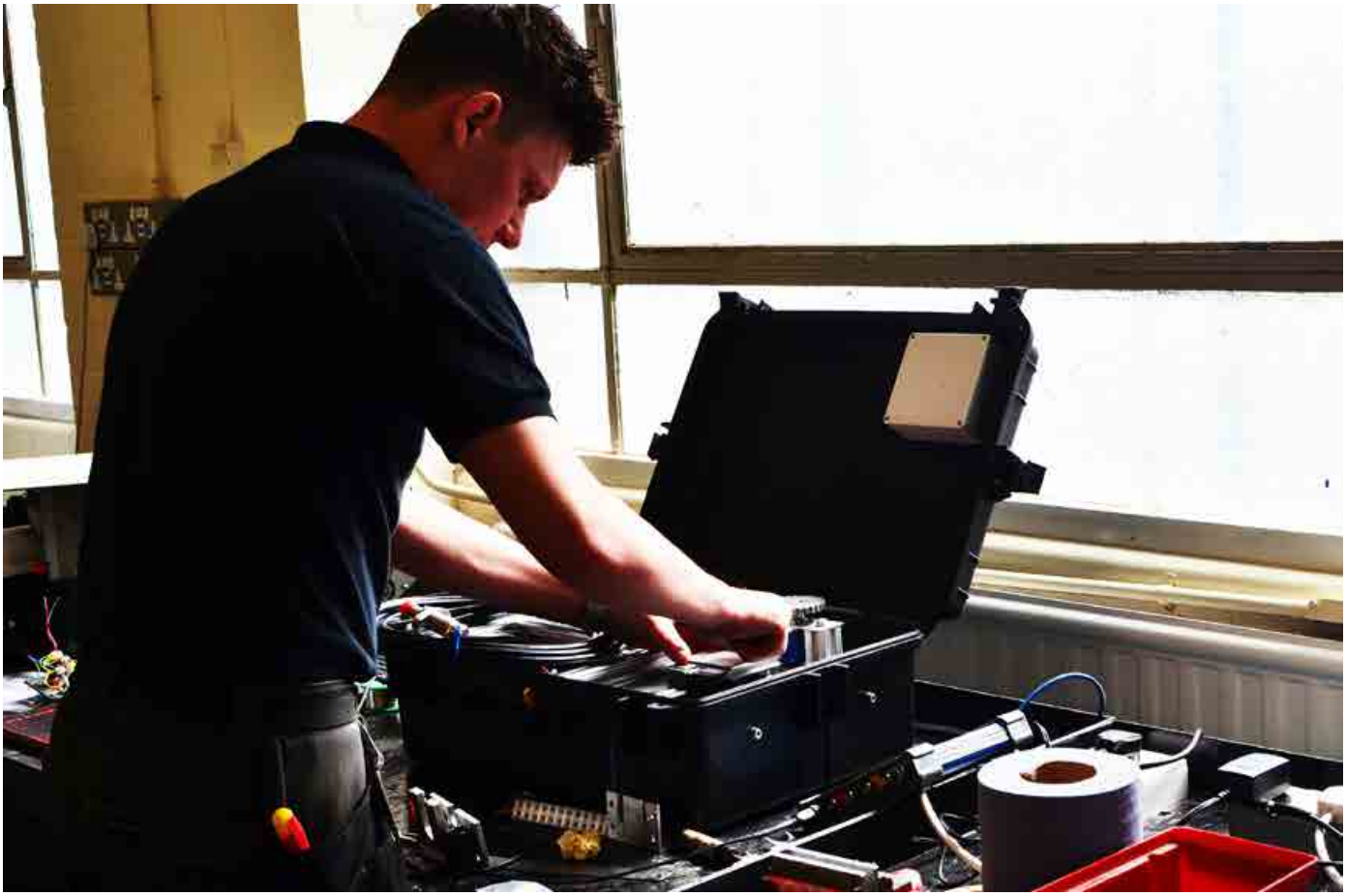
Today, Rowe Hankins is known globally as specialist designers and manufacturers of components used within safety-critical systems, and also for the worldwide distribution of electro-mechanical products for railways.

Despite its global reach, Rowe Hankins' headquarters are still based in Bury, north Manchester.

'Strengthening our engineering team'

Thanks to the continued growth and expansion of the business over the last 30 years, Rowe Hankins now employs more than 50 members of staff in various roles including production engineers, research and development, sales, admin, marketing, electromechanical service and repair, with sales outlets in the UK and also overseas in France, China and America.

'As the business has progressed from a distribution firm to a manufacturer, we've focused on strengthening our engineering



team,' explained Toni Hankins, now chairman of Rowe Hankins.

'Our engineers specialise in the maintenance, repair and overhaul of electromechanical equipment, providing savings of many thousands of pounds to major train companies, such as the London Underground, Siemens, Bombardier and Alstom.

'We employ skilled and uniquely experienced engineers that allow us to develop our own products, including speed sensors, current monitoring products, intelligent wheel flange lubrication and earth leakage detection units. Our aim is to go beyond the solution, striving to find better ways of increasing safety within the rail industry.'

Extending product life

Chief engineer David Rowe has been the driving force behind the company's Intelligent Wheel Flange Lubrication (iWFL) system. Engineered for both national rail networks and urban tram services, iWFL improves safety by greatly reducing both wheel and track wear.

'Research shows that an effective flange lubrication system significantly extends wheel life and reduces rail wear, when compared with a non-lubricated network,' explained Rowe. 'This results in extending service and maintenance intervals, reducing downtime and costs, and most importantly, has improved safety.'

The eco-friendly and cost-effective system is already in use on rail networks across Europe. In the UK it has been trialled with Metrolink, Manchester's tram network, and Rowe Hankins has also been approved as the preferred supplier to the Elizabeth Line, the high capacity railway for London and the South East.

'Our engineering team are proactively seeking new methods for making the products on the traction market safer and more efficient,' added Rowe. 'Last year our work was recognised with two industry award wins: Supplier of the Year at the Light Rail Awards and an Innovation Award from Modern Railways.'

Other key achievements for the company include being awarded the quality management standard ISO 9001, a certificate they still hold today, and accreditation from the International Railway Industry Standard (IRIS).

Fix before failure

Further examples of innovation include Rowe Hankins' Non-intrusive Current Monitor (NIC). Used in condition monitoring systems, the unit allows engineers to 'fix before failure' by ensuring the optimisation of maintenance activities and early detection of insulation degradation in signalling circuits. The product was designed for use in the 2012 London Olympics transport.

More recently, the UK British company launched its new Split-Core NIC, which was designed for non-track possession to assist Network Rail's preventative maintenance programme.

'The newly launched split-core NIC has many benefits, including its retrofit installation,' said Tariq Latif, engineering manager at Rowe Hankins. 'This allows the unit to be clamped around circuits without interfering the circuit or signalling systems, removing the need for costly downtime while a RCM is installed, which means that the rail network can continue to run safely.

'Our engineers were aware of existing problems caused by rail network AC electrical noise from overhead lines, which are picked up on DC trackside signalling circuits. The transducer was designed to remove these with low pass filtering techniques. This filtering is done at the source of the measuring circuit, completely removed from the output signals generated.'

Mike Hankins, son of Toni, who took up the role of managing director of Rowe

Hankins in 2013 following his father's retirement, said: 'Rowe Hankins is built on the hard work, passion and knowledge of our team. It's our customer first approach and our belief that anything is possible, that has kept us relevant in the rail industry for the last 30 years.

'Our designs are making vast improvements to the rail industry, not only making safety cheaper but more efficient, reliable and attainable. We have several new products that we're currently launching into the market and I'm genuinely excited about the future.'

Tel: 0161 7653005
Email: jemmah@rowehankins.com
Visit www.rowehankins.com
Twitter: @rowehankins1

A hot proposition

With a portfolio that fulfils many of rail's cooling needs, **Thornhill Heat Exchangers** (UHT) provides an overview of its services and products

Thornhill Heat Exchangers (UHT) has been at the forefront of heat transfer within the rail industry since 1996.With in-house design capabilities and UK manufacturing facilities, the company is able to provide a simple 'clean, test and repair' service right through to a complete design for all of the engine cooling applications.

Design capabilities
With the use of Autodesk 3D modelling and bespoke Mathcad-based thermal and mechanical design programmes, experienced in-house engineers have the ability to support ROSCO's, Toc's and related companies in the following areas:

- cooler re-engineering
- reverse engineering
- product data recording
- flow testing and life expectancy forecasting
- thermal design
- mechanical design.

Product capabilities
Since setting up 20 years ago, Thornhill Heat Exchangers (UHT) has built a reputation within many major rail operators within the UK to provide the following products and services:

Finless™ radiator technology
Thornhill Heat Exchangers (UHT)'s Finless™ radiator technology was designed to resolve airside fouling issues caused by leaves and other airborne debris associated with railway cooling. The product has been in service with a number of UK Toc's and have given them the benefits of lower cleaning costs and zero reduction of cooling performance due to fouling.

Oil coolers
Whether it is a transmission, engine or hydrostatic oil cooler, the company has the ability to convert brazed/soldered tube bundles to a removable tube bundle, which is more efficient, easier to clean and significantly more cost-effective to overhaul. A service exchange is also available on most oil coolers to minimise downtime.

Conventional radiators
Clean, test and repair, re-manufacture new and/or direct replacements are all services Thornhill Heat Exchangers (UHT) provides for rail conventional radiators. With its recent collaboration with Dutch heat exchanger manufacturer, NRF, the company can now enjoy the flexibility and quality of NRF's production combined with its own rail expertise and service capability.

Product development and modifications
Excellent working relationships with Toc's has allowed Thornhill Heat Exchangers (UHT) to develop products with modifications to resolve issues that they may have. Recent modifications that are currently either in the test phase or are in service are:

Finless™ coolant media underseat saloon heaters
These heaters are fitted with a long life DC brushless motor and integral fan. Due to no filters, motor brushes or fan detachments, it allows for a maintenance-free solution.

Radiator fan drive – hydrostatic system modification
This modification removes the existing fixed displacement pump and replaces it with a variable displacement pump, giving full fan speed at ALL engine speeds when calling for cooling.

Variable pitch fan
This modification is a direct replacement fan and can be operated pneumatically or hydraulically. A small timer unit allows the operator to set the time between the fan blades rotating, which allows the radiator at a pre-determined period to blow out any airborne contaminants that have fouled the radiator matrix while the vehicle/unit is in service.

'Light and heavy' fabrication
Fuel tank, CET (controlled-emission toilets), battery box and AUX/start fuses are all items that Thornhill Heat Exchangers (UHT) can repair and/or remanufacture.

The above overview of the products and services the company provides shows the diversity, experience and capacity that can offer support to maintenance needs and requirements.

Due to being located in Midlands, Thornhill Heat Exchangers (UHT) is well connected to many of the UK's rail sites and can pick up and deliver components or carry out removal, installation and testing work on-site to individual customer requirements.

For more information on the products and services that can be provided, contact Thornhill Heat Exchangers (UHT)'s rail department

Tel: 01827 722171
Email: lisa.finney@uhtltd.com
Visit www.universalheattransfer.com

Managing the risks from fire

Fire safety on rail vehicles used for railway applications presents a particular challenge for manufacturers and suppliers; **MTM Power** explains how to keep the network's infrastructure safe from harm

The extensive technology in modern trains and carriages means that these vehicles are faced with a variety of fire hazards, from technical defects to negligence and even arson. Due to the presence of many people in a confined space, often combined with a lack of options for evacuation, such as in tunnels and on stretches of track where help is a long way away, a fire on a railway vehicle can quickly lead to injuries or death, as well as extensive damage to property.

For that reason, all the materials, systems and components used in a modern rail vehicle must have proof of fire safety features so that the manufacturer can have the fire safety of the entire vehicle certified. The fire safety requirements were particularly complicated for trains used across international borders, with different national regulations needing to be taken into account for various European countries.

In August 2013, after two decades of development time, a new fire safety standard for railway transportation entered into force: the EU standard DIN EN 45545. Two major European research projects – Firestarr (1997-2001) and TransFeu (2009-2012) – were involved in its development.

The EN 45545 is responsible for harmonising country-specific fire safety regulations in Europe, a combination that results in an even closer security concept for stations, rolling stock and infrastructure. For new projects the validity of different national regulations such as DIN 5510-2 (Germany), NFF 16-101 (France), UNI CEI 11170 (Italy) and BS6853 (UK) ended in March 2016 after the expiration of the transition period.

Pan-European evaluation

As an established manufacturer of power supplies for use in railway vehicles, MTM Power was faced with the task of equipping all of its product lines for railway technology with the most comprehensive fire safety certifications available, in order to offer its customers optimal support during certification of the fire safety of their entire systems or vehicles. MTM Power realised that a certification at European levels makes more sense for comprehensive fire safety certification of all rail products.

That is why MTM Power used EN 45545-2 as the basis for creating fire safety designs for electronic power supplies.

A recent update of the standard was issued in February 2016 and became effective immediately. MTM Power offers fire safety certificates of all rail products, according to the current EN 45545-2: 2016-02 standard, to its customers.

The challenge for MTM Power was to develop a universally applicable document as a fire safety certificate for all projects. It took this approach in order to provide its customers with the necessary information for creating their own fire safety certificate when using MTM Power components in a complete system or vehicle.

Unclassified components

Clause 4.2h in EN 45545-2:2016-02 regarding the use of electrical components specifies that components installed in suitable control cabinets aren't subject to evaluation and, as a result, do not require fire safety certification. Fire safety requirements are defined for the control cabinets or installation containers and have to be respected for the following reasons:

- either the technical cabinet is made from E10 fire barrier and the enclosed volume is equal or less than 2 m^3
- the cabinet is made of a E15 and I15 fire-barrier
- the cabinet is protected by an automatic fire detection and fire extinguishing system.

Owing to MTM Power rail components being almost exclusively for installation in a control cabinet, it would usually be sufficient just to call these components built-in units for use in suitable control cabinets.

Listed and non-listed components

However, the trend for rail vehicle design is shifting towards the use of any available installation space to install technology, such as in the roof or underneath the floor. Electrical components are also being installed more frequently in vehicles that don't meet the requirements of a control cabinet with fire safety features. As a result, the fire safety features of the components themselves have to be evaluated.

MTM Power's DC-DC converters have been designed as compact built-in power supplies. Both the installation location and the mounting conditions have to ensure the protection against hazards, such as unauthorised access, unintended touching, environmental effects and fire hazards. Electrotechnical equipment in accordance with standard DIN EN 45545-2:2016-02 is named in clause 4.4; table 2; section E. Such electrotechnical equipment is defined as a 'listed product' and request records of the standard can be accessed directly.

Other electronical parts or components (not named in table 2) are defined as 'non-listed products'.

The request records for non-listed products are stated in clause 4.3 and picture one of the standard DIN EN 45545-2:2016-02. These request records depends on the size, weight and location of each installed electronical part or component.

MTM Power product have been investigated, classified and tested in accordance with DIN EN 45545-2:2016-02. Therefore, the classification for fire safety regulations of the product is based on the hazard level HL 1 to HL 3 in relation to the table 1 of DIN EN 45545-2:2016-02. MTM Power DC/DC converters have been designed as compact built-in power supplies with DC-wide input ranges for universal applications, meaning the classification for fire and safety regulations of the products are based on:

Listed products:
The DC-DC- converter can be assigned as listed products according to table 2.

Non-listed products:
The DC-DC converter can be assigned as non-listed products according to clause 4.3 to grouping rules:

- due to the size and weight of the converters and using as indoor and outdoor application they have to fulfil the rules from one to three of clause 4.3
- list of weights for metallic and non-metallic parts of a typical representative of product family P(C)MGS14
- testing of all plastic materials with combustible weight of > 0 g (test condition: specimen are realisable)
- remaining components are evaluated again starting with rule one
- evidence by a certificate from the manufacturer or by testing.

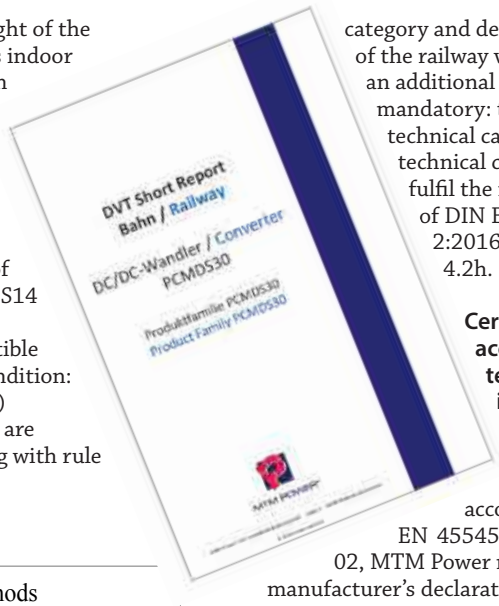


Table 2

Component	Name	Request	Test Methods
EL 9	PCB (for electronical components mounted on PCB; clause 4.7 applied)	R24 or R25	T01 oxygen index or T16 HWI test
EL 10	small electrotechnical components	R26	T17 vertical small burner test

Evaluation of MTM products

MTM Power's DC/DC converters are classified as listed components according to EL9 and EL10 and fulfil the above mentioned classification of DIN EN 45545-2:2016-02, hazard level HL1, HL2 or HL3.

Furthermore, the converters are classified as non-listed components according to the grouping rules and they fulfil the above mentioned classification of DIN EN 45545-2:2016-02, hazard level HL1, HL2 or HL3. If there is the requirement of hazard level HL3, caused by operation category and design category of the railway vehicles, an additional measure is mandatory: the use of a technical cabinet. The technical cabinet must fulfil the requirements of DIN EN 45545-2:2016-02, clause 4.2h.

Certified by accredited testing institutions

With its fire safety certification according to EN 45545-2:2016-02, MTM Power makes a manufacturer's declaration to the user with a detailed list of all the materials and compounds used in each product. A test report from a certified testing institution is included for all materials that can be tested. MTM Power has created a fire safety certificate management system to maintain these test reports and ensure that they are renewed every five years to meet requirements and remain up to date.

MTM Power's certificates evaluate the test results with regard to suitability for hazard levels HL01 to HL03 when used as individual components. Only the user can ensure compliance with the configuration rules defined in EN 45 545-2 for the use of multiple components in the same installation space. MTM Power's fire safety certificates also provide all the necessary data for compliance to these rules.

Tel: +49 (0) 69 / 1 54 26-0
Email: info@mtm-power.com
Visit www.mtm-power.com

Earning its trackside credentials

With the ability to detect and monitor more than 15 separate physical and environmental factors, **Mabey Hire** gives details on what its monitoring system, EnviroGuard, can do

As Murphy Group's senior health and safety advisor for the Farnworth Tunnel, Stephen Morgan said: 'The introduction of the Mabey Hire pH monitoring and noise monitoring system into our environmental control strategy has had a positive impact, ensuring environmental compliance within this unique and challenging project.'

Unlike grab sampling by monitoring personnel, EnviroGuard's automatic pH sensor monitored continuously to ensure that pH levels in any water runoff remained within acceptable levels and alerted Murphy personnel to rapidly changing conditions.

Two weeks of data

Murphy Group has also chosen EnviroGuard at another location to collect two weeks of background noise data that will provide a datum point in advance of night-time trackside drainage works that are close to residential properties. Murphy will then use the system to monitor noise during the works and compare levels to the benchmark levels established earlier.

Squarely aimed at the rail, construction and civil engineering industries, EnviroGuard offers Mabey customers a full spectrum of sensors and detectors in a single tailored package that has been engineered for long-term deployment, making it particularly suited to remote and unattended trackside monitoring.

The successful conclusion of rail works like these often requires close monitoring of a number of factors, especially when much of the work takes place during possessions after midnight or is close to residential properties. Rail contractors such as Murphy can use data gathered by EnviroGuard to put accurate and proportionate controls in place to minimise environmental disruption and nuisance, as part of a forward planning and early stage background monitoring exercise.

Specially designed temperature sensors

With summer approaching, the perennial problem of monitoring and reporting Critical Rail Temperature (CRT), especially with regard to the increased use of continuously welded rail, EnviroGuard is attracting interest for its monitoring and alerting functions. Specially designed temperature sensors enable EnviroGuard to continuously measure and record CRT and send out alerts at set levels.

The whole EnviroGuard system is managed from Mabey's LIVEsite, a sophisticated web-based suite of tools and reporting functions that allows users to monitor instrument readings in real time, export historical data and overlay readings

to compare recent with historical data or correlate readings across different sensors. LIVEsite has been designed to create reports that are fully compatible with the vast majority of systems currently used by construction and engineering companies, local authority environmental officers and government departments.

Dave Holland, technical director at Mabey Hire LIVE Instrumentation, explained the advantages of the EnviroGuard system. 'One of EnviroGuard's key strengths is its integration with Mabey LIVEsite. Each EnviroGuard installation is in constant communication with LIVEsite, streaming data from its instruments into a sophisticated software platform that allows customers to analyse data both historically and in real time.

'Customers can predefine value thresholds for any of the sensors to alert nominated users by email to excessive or insufficient readings, making EnviroGuard a valuable tool in ensuring safety and pre-empting crises. EnviroGuard can also alert users to potentially unsafe working conditions at remote sites, allowing teams to allocate resources to work-safe sites and eliminate wasted journeys.'

Monitoring more than 15 factors

EnviroGuard has been developed by Mabey Hire LIVE Instrumentation, Mabey

Hire's dedicated instrumentation and metrics division, to be able to detect and monitor more than 15 separate physical and environmental factors, from airborne particulate levels and wind speed to vibration, water pressure, and the presence and concentration of volatile organic compounds (VOCs).

The basic EnviroGuard configuration comprises three standard sensors that measure the levels of noise, dust, airborne particulates, wind speed and direction that are housed in a lockable, rugged composite enclosure with a minimum IP65 rating. Enclosure options include different ingress protection (IP) ratings, composite, stainless steel or metallic construction with or without additional security options. ATEX-compliant enclosures are also used for deployment in explosive atmospheres. Mabey Hire offers a comprehensive range of instruments as part of the EnviroGuard solution, enabling it to tailor environmental monitoring solution precisely to customers' needs. The range currently comprises instruments that will detect and measure the following environmental factors:

- dust and airborne particulates (light scatter, cyclonic or non-cyclonic, PM10 or PM2.5)
- noise levels (class 1)
- wind speed and direction
- barometric pressure
- rainfall (tipping bucket)
- temperature (internal, external, structural, concrete curing)
- pH level
- flow rate
- water pressure
- water level
- vibration
- volatile Organic Compounds (VOCs)
- gases
- thermal effect.

Suitable for a range of environments

EnviroGuard also has a range of power supply options to increase its range of deployment options. The system uses standard 110v AC power and is fitted with a 30 minute uninterruptible power supply (UPS) back up on board, in case of mains power interruptions. Where mains power is unavailable, unreliable or unsuitable, EnviroGuard can be configured with a range of low voltage DC power solutions that enable the system to operate continuously and entirely off-grid, including UPS and battery power, solar power, wind turbine and water turbine generators. These off-grid power options permits the deployment of EnviroGuard to track side construction and repair projects that are often characterised by remote and inaccessible work sites.

This combination of a wide range of sensor packages, enclosures and power supply options makes Mabey Hire's EnviroGuard a versatile and capable solution for environmental monitoring in almost any rail, road or construction situation. The EnviroGuard system has successfully completed trials in a variety of fields, including real-time monitoring of noise and particulate levels on demolition sites; section 61 compliance on construction sites; air quality levels at the roadside; gas emissions from contaminated sites; and water levels in boreholes. The modularity of the system – from instruments to housing and power – means that it can be configured to fulfil almost any conceivable remote monitoring role.

Mabey LIVEsite completes the EnviroGuard system with its rich reporting and analysis functions and the ability to export and exchange monitoring data with other systems and processes. LIVEsite also allows users to integrate data from other Mabey instrumentation solutions, enabling them to maintain constant, real-time monitoring of multiple critical factors across several locations.

Tel: 0845 7413040
Visit www.mabeyhire.co.uk

A proven coping strategy

FP McCann is providing a total solution to precast concrete platform construction on the Bicester to Oxford collaboration; the company gives a description of what it entails

FP McCann has played a major part in the building and refurbishment of three stations on phase 1 of the east-west rail project, which involves the upgrading and doubling of track between Oxford and Bicester. Passengers are now able to take a fast train directly to London Marylebone station, providing the first new rail link between London and a major city for more than 100 years.

In 2014, McCann's specialist precast concrete facility in Littleport in Cambridgeshire supplied a bespoke retaining wall system – a key structure in the building of a one kilometre length of railway track linking the town of Bicester in Oxfordshire with the Chiltern Main Line. The major rail construction joint-venture between Carillion and the Buckingham Group is delivering the design and build programme of works on the project and, following the successful installation of the walling system, FP McCann was awarded the precast concrete platform supply package. The work is part of the station new build at Oxford Parkway and the upgrading of Bicester and Islip stations to incorporate the new dual track.

FP McCann combined traditional build methods with modular precast concrete products

FP McCann was involved in work to rebuild the station at Oxford Parkway and the upgrading of Bicester and Islip stations

McCann edge beams

The rebuild and refurbishment of the three stations combined both traditional build methods with modular off-site manufactured precast concrete products, designed to increase productivity and speed up platform construction.

The platforms at Islip and Oxford Parkway have been constructed using McCann edge beams and hollowcore planks seated on a precast crosswall structure, with each individual crosswall unit 450mm wide. At Bicester Village (previously Bicester Town) station the existing supporting structure was used in combination with McCann edge beams, hollowcore planks and, where a section of platform required piling beneath, 52 solid precast slabs from McCann's Grantham works were used to provide extra strength. All three platforms were finished using McCann's standard Network Rail copers and tactiles, supplied from Littleport.

In total, the £650,000 supply contract involved 144 cross wall units, 185 edge beams, 3415m^2 of hollowcore planks, 1,290 copers and 3,336 buff tactile slabs.

Commenting on the contract, Paul Smith, project engineer for McCann specialist precast said: 'The range of products supplied to this project is an excellent demonstration of FP McCann's ability to offer the total package with regards to modular platform construction. Not only can we manufacture large structural supporting units but also aesthetic products such as copers, tactile slabs and acid-etched edge beams.'

Traditional construction

Speaking on behalf of the Carillion/Buckingham joint venture, both the site agent at Islip station, Jen Watt, and the

sub-agent at Oxford Parkway, Svet Stoyanov, concurred that 'each station presented its own challenges but by using a combination of traditional construction and modular precast concrete we were able to open the platforms to passengers on schedule.'

Phase 2, the western section of the east-west connection, which will link Oxford with Bedford and Milton Keynes with Princes Risborough, is now being developed and FP McCann is confident its precast concrete products will be used further on the remaining rail delivery programme.

Contact Stuart Carson for all specialist precast concrete enquiries
Tel: 01455 290780 / 07850 234136
Email: scarson@fpmccann.co.uk
Visit www.fpmccann.co.uk

Tracking fuelling changes

Cameron Forecourt, the UK commercial fuelling company, has recently implemented a new fuelling system for Colas Railfreight, at its new facility in Westbury, Wiltshire

Cameron Forecourt is an expert in fuelling management and has years of experience in designing, implementing and commissioning systems that significantly improve fuelling operations at its customers' sites.

Colas Rail is the railway division of the Colas Group and one of the world's leading providers of rail infrastructure services. In the UK, Colas Rail combines the engineering skills of its specialist businesses to provide total solutions in all aspects of railway infrastructure, from high speed rail systems to light and urban rail.

Colas Railfreight, the company's freight division, turned to Cameron Forecourt for its expertise in fuelling management systems. The Barnsley-based company has extensive experience of supplying cost saving fuel management systems and associated equipment to a wide range of clients in various industries.

Jigsaw Eclipse

As the system would be installed at a busy rail freight facility, it needed to be robust enough to cope with significant numbers of users and trains, but also provide detailed management information on usages and drawings. The system designed and implemented by Cameron Forecourt utilised the Jigsaw Eclipse fuel management system, which allows for the full monitoring of site fuel drawings and detailed associated reporting mechanisms, all of which appealed to Colas.

The new system not only monitors Colas Railfreight's fuel usage at the site (with full detailed reporting available), it also gives the added benefit of giving the client total control of all fuel management, with each driver and train fully monitored within the system's parameters.

Reliable updates

Another benefit of the system for Colas Railfreight is that, due to it being linked directly, there is no need for daily polling, as all information is updated as it happens. Stock figures are always current with immediate low stock or overfill alarms, as are immediate notifications of pumps being disabled or of attempted use of blocked or stolen access cards/keys.

'Here we deal with a reasonable amount of rolling stock traffic per day and it was vital that we were able to accurately monitor fuel usage across the depot,' said Huw Phillips, traction and rolling stock engineer at Colas Railfreight. 'We're pleased with the system that Cameron Forecourt provided, it meets all of our needs and was professionally implemented and commissioned and is now saving us both time and money.'

The Colas Railfreight system was yet another example of Cameron Forecourt providing a fuelling system that makes a significant difference in being able to reap the benefits of carefully maintained and monitored fuel consumption.

The company

Cameron Forecourt offers a national maintenance and installation service using directly employed engineering staff and has been providing a turnkey one-stop shop service to the commercial fuel industry for more than 30 years. Tanks, gauging and leak detection systems, pumps, web-based fuel management systems, pipework and electrical systems are just some of the products and services available.

Tel: 01226 742441
Email: info@cameron-forecourt.co.uk
Visit www.cameron-forecourt.co.uk

On the charge

Designing and manufacturing batteries that produce more power than the competition, **Haze** details the work it's putting in to develop its business

Easystart is the UK and Ireland's sole importer and distributer for the Haze battery brand. Haze is a worldwide recognised battery producer based in China with a turnover of more than £70 million a year and was established more than 20 years ago by two English brothers with backgrounds in battery production. The company is built on a foundation of western business technologies and eastern production techniques.

Haze has appointed distributors around the globe in countries such as America, Australia, Malaysia and across Europe. Easystart is the appointed distributer for UK and Ireland and works in a number of different industries, one of which is the rail industry.

Focusing on everyone's needs

Haze's products cover a full range of two, four, six and 12 Volt VRLA batteries in absorbed glass mat (AGM) and gelled electrolyte.

The company's philosophy is to focus on the actual and implied needs of the customer, supplier, the employees and the environment and its ever-expanding product range provides solutions to the ever-changing requirements of the rail industry. Its design service can provide cost-effective tooling for customers individual requirements, resulting in the market advantage its customers need to develop their own business.

Haze's manufacturing facility thrives in an atmosphere of continuous improvement and reinvention, challenging its employees to find more efficient procedures and working practices. Resulting benefits from this approach include a highly stable workforce, cost minimisation, better quality products and increased job satisfaction – all of which ultimately improve the service that Haze provides to its customers.

To optimise the performance and cost-effectiveness of its products, the company continuously evaluates its designs and specifications through analysis and testing.

Industry flexibility

Haze manufactures a range of front access batteries that are used in many standby applications. It offers a more extensive range than many suppliers (from 12v 30Ah up to 12v 180Ah) that gives the rail industry increased flexibility when designing products to suit. Unique to many other batteries, this particular range has terminals located at the front of the battery rather than on the top; a design that allows the batteries to be easily maintained and replaced. As a result, the front access range allows teams to work quicker, with greater efficiency and more safely when installing, maintaining or replacing the batteries.

Easystart holds a wide and varied stock in the UK across its three branches: the head office in Corby, Manchester and Belfast. This level of stock allows Easystart to meet the needs of its customers with a high level of flexibility. Now in its 20th year of trading, Easystart's employees have a wealth of experience in the battery industry, with well over 100 years' combined knowledge.

Worldwide testing

Haze has been working for a number of years with battery experts globally to improve the performance of its products. It believes that the key to a reputable brand is not only recognition, but also the knowledge that the brand will provide quality and reliable products.

After five years of research and development, in 2014 Haze began production of its EX range of AGM batteries; a unique range that allows it to manufacture batteries with a greater amp rating in the same sized box commonly used for that part number. For example, the widely-used 12v 18Ah size battery has developed from being an 18Ah battery to now producing 26.4Ah. This technology has been implemented across the Haze range of AGM batteries, giving the company some of the most powerful batteries on the market.

Haze also has a comprehensive range of gel batteries. The 100 per cent gel technology, which only very few manufactures produce, allows the battery to cycle a greater number of times compared to AGM. Gel batteries also work more efficiently at a greater variation of temperatures, as well as taking more abuse in charge and discharge modes. For an application with irregular charging methods such as solar or off-grid technology, gel batteries are an ideal alternative.

Tel: 01536 203030
Email: sales@easystartbatteries.co.uk
Visit www.easystartbatteries.co.uk

Possession-time-friendly concrete

UltraCrete has a big range of maintenance and repair products that can reduce possession times and keeps the network flowing

UltraCrete, part of the Instarmac Group, is home to a portfolio of contractor-friendly repair and maintenance products for the rail, road and transport industries. Its product portfolio is ideal for a range of applications including the installation of signals, signposts and street furniture as well as for the maintenance of kerbs, sleepers, and repairs to car parks, concourses and crossings. UltraCrete's bedding, repair and refurbishment materials are independently tested and proven and offer fast setting and time-saving advantages.

UltraCrete's list of repair products is extensive, with a number of them approved for use on London's Underground and Overground. Ultracrete products have been used in the highways industry for more than 35 years, with many achieving the Highway Authorities Product Approval Scheme (HAPAS) seal of approval, an independent third-party system of approval supported by the Highways Technical Advisory Committee.

Nationally recognised for first time permanent reinstatements, the scheme provides the supply chain with the confidence and peace of mind that they are using products from a trusted, reliable and expert source.

Easy to mix and apply

For the fast, efficient installation of heavy duty posts and for repairs to concrete sleepers, UltraCrete produces its HAPAS-approved QC10 F flowable, fast-set concrete. It's fibre modified for added strength and achieves 20N/mm² after 90 minutes. It's also easy to mix and literally pours from the bucket, facilitating speedy application.

UltraCrete worked at Edinburgh Waverley station to bed platform kerbs, tactile paving and linear drainage

UltraCrete's M45 rapid strength bedding mortar is the ideal choice for bedding platform coping and kerbs and can be open to traffic in just 45 minutes, keeping downtime to an absolute minimum.
For the reinstatement of linear drainage, and ironwork in areas exposed to extreme trafficking, UltraCrete offers its HAPAS-approved Envirobed HA104® bedding mortar. An environmentally friendly alternative to resin-based materials, it can be used in wet weather and in temperatures as low as 1°C, meaning it can be applied even in poor weather conditions. It achieves 51N/mm² compressive strength after three hours and can be open to traffic in 60 minutes.

To eliminate vandalism to concrete repairs, UltraCrete's QC6 rapid set surfacing concrete is ideal for the surface reinstatement of 'picture frames' or fillets and around access covers and for general repairs. The product sets in just 15 minutes, making it much more difficult to deface, which improves public image and limits asset liability.

Pothole repair

For planned and reactive pothole repairs to station car parks, UltraCrete offers its HAPAS-approved Permanent Pothole Repair cold lay asphalt concrete, which can be poured from the tub and compacted to provide a lasting repair. It's also instantly 'trafficable', reducing the level of disruption to commuters. It comes in a handy 25kg tub that proves useful for sites with limited access.

UltraCrete's repair solutions are being used on stations all over The British Isles, such as its QC10 F fast-set flowable concrete that was used to carry out track repairs to a section of the LUAS tram line in Dublin. RSC, UltraCrete's rapid hardening cement, was used in Edinburgh's Waverley station to bed platform kerbs, tactile paving and linear drainage, while M45 rapid strength mortar is the product of choice for Network Rail on sleeper repairs in Milton Keynes.

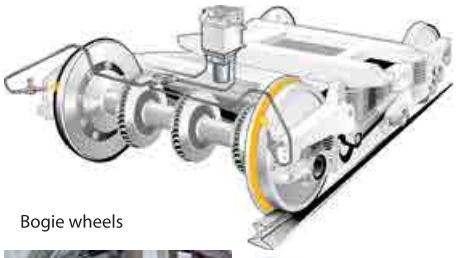
Want to find out more? Contact UltraCrete for further information on rail maintenance solutions
Tel: 01827 871871
Email: enquiries@instarmac.co.uk
Visit www.ultracrete.co.uk

Keeping businesses running smoothly

Klüber Lubrication shows how its customers can get on the right track by using its customised products to increase reliability

Lubricants play a critical role in the maintenance of railway components, ensuring that trains and rails work reliably. Equipment like doors, traction motors, brakes and the entire railway infrastructure must be maintained to optimum condition whatever the weather. This is why Klüber Lubrication has dedicated itself for more than 85 years to developing high-performance specialist lubricants for railway applications that help reduce operating costs and increase reliability and efficiency.

Rail industry customers can choose from a selection of more than 2,500 oils, greases, pastes, waxes, bonded coatings, tribo-system materials and corrosion inhibitors for all kinds of components and requirements, which cover a vast array of applications from door mechanisms to current collectors that carry electrical power from overhead lines or third rails to vehicles.


Bogie wheels


Door operator


Automatic coupling


Traction motor


Braking system


Gearbox


Railway switches


Overhead lines

Klüberrail ALO 32-250

A new lubricant for overhead power lines that's highly adhesive to prevent dripping. It's highly resistant to water, ensuring reliable lubrication between the current collector and the line leading to lower wear and, as a result, longer re-lubrication intervals. It also helps reduce overhead line noise and vibration and is biodegradable and therefore, eco-friendly.

Klübersynth GE 4 75 W 90

The fully synthetic gear oil has high scuffing load capacity and micropitting resistance that provides protection against corrosion and wear of both teeth and rolling bearings. The base oil's pronounced shear stability prevents the lubricant film from collapsing even under high loads and offers good low-temperature behaviour and a high resistance to ageing and oxidation, leading to considerably less frequent oil changes. Klübersynth GE 4 75 W 90 is approved by several gear manufacturers, such as IG Watteeuw, Voith Turbo, Siemens-FLENDER and the German rail operator, Deutsche Bahn.

Klüberrail LEA 62-2000

This lubricant ensures good wear protection for wheels and rails and reduces stick-slip effects on curves to reduce noise. The fluid grease provides excellent adhesion, making sure it stays on the wheel, even at high speeds. Furthermore, it offers very good water resistance and is rapidly biodegradable, according to OECD 301 F.

Klüberrail AL 32-3000

Synthetic biodegradable speciality lubricant for setting railway points with small forces, even at temperatures as low as -30°C. It also combines very good resistance to water with good corrosion protection and a high resistance to UV radiation, which helps extend re-lubrication intervals considerably.

On track for reliable railway operations

Lubricants that seem inexpensive may bring savings initially, but consider the cost should the lubricant fail to cope with the extremes of vibrations, shock loads, or even the weather: delays, cancellations and timetable disruption, all down to poor lubrication. Klüber Lubrication offers a comprehensive range of powerful speciality lubricants that, through collaboration with manufacturers and operators, contributes to the smooth functioning of components and machines.

Recommended for use by rail and tram OEM's, such as Stadler, CAF, Alstom, Siemens, Hitachi, Bombardier, CSR Zhuzhou Electric Locomotive Co., Wikov MGI and approved for use by rail operators including Deutsche Bahn, SNCB-Infrabel, STIB, (Brussels Metro), ADIF, SBB, OBB, SNCF and Renfe, Klüber Lubrication works with clients to find the right lubricant solution to deliver higher efficiency and to achieve longer maintenance intervals. By taking this approach the company can lower the cost of energy consumption and thus reduce overall operating costs. So, whether it's advice on speciality lubricants, support on lubrication application, training, or used lubricant analysis, Klüber Lubrication keeps businesses running smoothly.

Tel: 01422 205115
Email: sales@uk.klueber.com
Visit www.klueber.com

Stone vs trackway

Lion Trackhire gets straight to the point on the pros and cons of today's trackside access solutions and unearths the facts

Temporary access is essential for rail maintenance. Lion Trackhire's Kevin Woolner has worked for three major rail contractors over the last 25 years and in that time has used every solution available. He explains which method ticked the most boxes for environmental responsibility, cost-effectiveness and site safety. Here is the run-down of his top five:

One LION wagon and trailer load

5. Plastic track mats. Good anti-slip surfaces that can be useful on overhead line works, especially because of their isolation properties. Environmentally though, it's a fact that plastic is becoming a global problem. Once broken it has to be recycled – which is expensive – and surprisingly plastic isn't fully recyclable and, alarmingly, in some oceans granular pieces of plastic outweigh zooplankton by a factor of six to one. Plastic track mats are unsuitable for the majority of rail industry projects, however, as it's too light to be used.

4. Timber bog mats. Incredibly strong, these mats can withstand the heaviest of steel tracked machines and work particularly well where the ground is incredibly wet. However, timber is slippery when it's wet, which can lead to rubber-wheeled vehicles sliding. Also, bog mats are rigid and not connectable, meaning that when they're laid across rougher terrain they can be uneven and result in pedestrian trips or damage to the underside of vehicles.

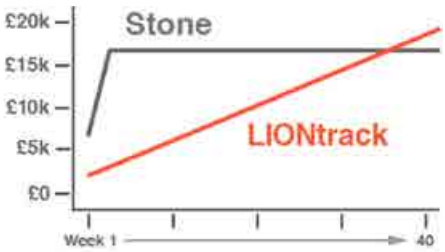
3. Steel plates. Again, a very strong solution for steel-tracked machines, but like timber its surface can be slippery and prone to movement when used by heavy traffic, especially on cambers and inclines.

For the final two solutions – stone and aluminium trackway – Woolner has ranked them based on average costs for an engineered 100m stone roadway and hire rates from trackway supplier, LION Trackhire.

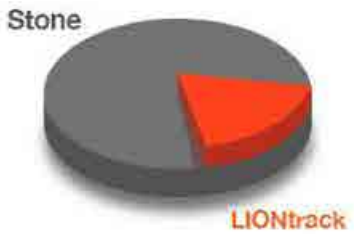
2. Stone. Aggregate roadways have to be 'engineered' to last the project length, not just tipping stone onto virgin ground and hoping for the best. Woolner has taken into account good ground preparation, geotextile membrane and hydraulic compaction.

Stone is incredibly versatile and hard-wearing if installed correctly. It can carry the heaviest of vehicles and is a good, long-term and cost-effective solution for timescales over 36 weeks. Good news for companies with a major project or a requirement for a permanent lightweight road. However, for timescales running an average of 15 weeks, with the road having to be recovered, the cost and environmental impact isn't attractive.


LIONtrack takes one day to install



LIONtrack is cheaper for up to 36 weeks



LIONtrack is 25 per cent the cost of STONE

To mobilise a works site, installing stone would typically require around 12 tipper loads and take around eight working days to complete. It will require an excavator, dumper, roller, textiles, stone and labour and snagging maintenance to keep the roadway performing.

For demobilisation, five to ten working days are necessary including waste transfer, tipping fees and waste disposal approval. If the land is intended to be used again for farming it wouldn't be arable for another two years.

1. Aluminium trackway. LIONtrackire thinks that aluminium trackway, which can be recycled indefinitely, is the strongest and safest option available. It can assist lorries to climb 1/3 inclines and has supported 50-tonne cranes across saturated marshland. In comparison to the stone scenario above, it takes just one day to install and even less time to recover. It requires only one lorry, creates zero waste and leaves the ground arable after around six to eight weeks. The project cost is 25 per cent of stone and remains cost-effective for up to 36 weeks. In Woolner's view the results are clear. For the majority of access, trackway is out in front as the most environmentally friendly, the cheapest, the quickest and also the safest access solution.

To find more, email Kevin Woolner, project engineer at Lion Trackhire
Email: kevinw@liontrackhire.com
Visit www.liontrackhire.com

The tools of the trade

Orbital Fasteners' latest catalogue includes a product range that gives its customers the choice from more than 300 manufacturers and 26,000 products

UK distributor of fixings, fasteners, tools and power tools, Orbital Fasteners has more than 35 years' experience in products, application know-how and customer service. Offering next-day delivery of a vast product range available off the shelf, the company has excellent customer service, is ISO9001 accredited and is trusted by many companies in the rail industry.

Orbital Fasteners employs around 50 people and is based in Rickmansworth, Hertfordshire, giving it easy access to central London and the M25, M1, M4 and M40 motorways.

Delivery is free via Orbital Fasteners' FORS (Fleet Operator Recognition Scheme)-accredited van fleet in a delivery area that includes central London and much of the Home Counties for orders over £20.00 plus VAT. The company offers national next-day delivery free of charge for orders in excess of £50 plus VAT.

Orbital Fasteners' trade counter

£10 million of stock

Orbital Fasteners' product range continues to grow. The company has 50,000 sq. ft of storage holding stock with a value of up to £1.8 million in its Watford warehouses. This is backed up by a further £10 million of stock from its primary supply partner, which can be delivered to Orbital Fasteners by 6.00am. An arrangement that means Orbital Fasteners can offer a next-day delivery service for more than 30,000 products.

Every day, Orbital Fasteners typically sends more than ten same-day deliveries by courier for customers working on London Underground projects throughout the night.

Rail industry customer profiles

Orbital Fasteners' customers within the rail industry range from factory-based companies that manufacture devices used in signalling, to site-based main contractors and subcontractors. Orbital Fasteners even supplies products to miniature railway societies.

More than 30,000 products are available for next-day delivery

Rail project profiles

Over the years Orbital Fasteners has become a preferred supplier of many goods for major rail projects, such as the Channel Tunnel, Docklands Light Railway and the East London Line Project, as well as numerous London Underground projects and the East Coast and Great Western Main Line electrification schemes.

Credit account facilities

Account facilities are immediately available to companies with a minimum of three years' trading, subject to an Experian credit appraisal. A credit application form takes a few minutes to complete and can be found on the right-hand side of Orbital Fasteners' website home page. The company also accepts credit and payment cards.

Unique selling point

Orbital Fasteners issues its own priced catalogue that is packed with products and a wealth of technical information. The publication is available in unlimited quantities, which helps to simplify purchasing between site-based personnel and purchasing departments.

Sales office

Orbital Fasteners' sales office is staffed by a team of 12 people, some of whom have backgrounds in industry. As a result, the company has a detailed understanding of the products that it sells and can offer technical advice – and even alternative solutions – to each company's particular requirements. Quotations can be issued almost immediately, whether in store, over the phone or by email. Currently, Orbital Fasteners' processes

around 800 orders every day, delivering goods with 100 per cent dedication to its ethos of unmatchable service.

Website

Around 25 per cent of Orbital Fasteners' sales orders now come through its website. The purchasing facility is available to all customers with or without an account once a secure link is established with their credit account. Please contact Orbital Fasteners' sales office to activate a link.

Charity support

On the last Wednesday in each month, Orbital Fasteners' donates two per cent of its day's turnover to Cancer Research UK, which typically exceeds £1,000, a contribution well supported by the company's customers. Orbital Fasteners wishes all Rail Professional readers a prosperous 2016 and looks forward to being of service in the near future.

Contact the sales office at Orbital Fasteners
Tel: 01923 777777
Email: info@orbitalfasteners.co.uk
Visit www.orbitalfasteners.co.uk

A big reach in testing environments

Rail-Ability Ltd introduces its latest intermodal road-rail truck equipped with a Rail Reach III access platform and a manipulator crane, making it ideal for use in areas with restricted access

The Rail-Ability Rail Reach III access platform uses a hybridised MAN 4x4 rigid body truck. It was designed to provide unparalleled levels of off-road performance for access to rail sites with minimal line closure and associated possession costs. It is, however, also offered without the custom designed hydrostatic drive rail gear for use as an on-road/off-road mobile elevating work platform (MEWP) and crane combination, which is ideal for use where site access is restricted by poor ground conditions.

The individually demountable front module features a 6.5 tonne per metre crane equipped with an optional fly jib and winch. The winch has the ability to be used as a manipulator using a lightweight custom-designed grab that provides 11.5 metres of outreach. To the rear of the crane module the independently demountable Rail Reach III MEWP module incorporates a telescopic boom MEWP with a working height of 13.5 metres and 500kg capacity on a 2.2x1.2 metre platform.

A distinct feature of this vehicle is that the MEWP and crane can be operated simultaneously whilst free to travel on rail with additional enhanced duties when the optional outriggers are deployed.

Improved manoeuvrability

The Rail Reach III MEWP module is also equipped with a one metre articulating fly boom to enable enhanced platform manoeuvrability through overhead electrification wires or overhanging structures.

The MEWP and crane are matched for vertical height and outreach, enabling straightforward interaction between up to five workmen on the platform. Suspended catenary components, via the winch or grab, provide near-unmatched performance for erecting and disassembling overhead structures.

Twist lock intermodal system for demountable bodies

The 6.5 tonne per metre crane is equipped with an optional fly jib

By combining a highly efficient compact crane module with a large-capacity MEWP, which features overlapping working envelopes, it removes the requirement for multiple vehicles or the temptation to use the work platform as an impromptu materials lift.

Gale-force operation

Unlike many MEWPs, the Rail Reach III has been designed to accommodate high lateral manual forces associated with the rail industry and it has also been rated for operation in Beaufort gale force eight winds.

Attaching both units to a single host vehicle with intuitive combined controls brings additional safety benefits because both the MEWP and crane positions are known by the integrated safety controllers. This enables stability requirements to be achieved when the crane and MEWP are in use on rail and also limits the possibility of the two booms conflicting while interacting with each other.

As a package, the vehicle also features connections to enable towing of trailers of up to 18 tonnes on road and rail. When the optional rail axles are not fitted (when being used in the utilities and forestry industries, for example), the machine is operated with outriggers deployed. Due to the machine's tyres being pneumatic, the vehicle is able to retain conformity as a road-going 18 tonne ISO container twist lock-fitted lorry and, as such, is allowed access to all UK roads, including motorways where it is limited to 56mph as standard.

The telescopic boom MEWP has a 13.5 metre working height and 500kg capacity

Tel: 01785 214747
Email: mail@railability.co.uk
Visit www.railability.co.uk

Focusing on geophysics

RSK shows the advantages that GPR-based surveys have over intrusive alternatives, offering cost and time savings

December 2015 was the wettest month on record in the UK. That will come as no surprise to the flood-affected regions in the east of England and Scotland, where numerous landslips on the network occurred and many tracks were submerged following unprecedented levels of rainfall. It has highlighted the importance to maintain and monitor the condition of the trackbed and subgrade; RSK supplies many of the specialist services required for infrastructure development and maintenance.

RSK is a fully integrated environmental, health, safety and engineering services company employing more than 1,200 technical staff in 38 offices across the UK and worldwide. The company has a turnover in excess of £90 million a year, with sales in the rail industry approaching ten per cent of total UK business. It has 40 years' experience in rail, covering high speed, interurban and commuter services, and more than 100 staff members with personal track safety (PTS) competency certificates.

Victorian legacy

The company offers a broad range of environmental and engineering services for a large range of projects and clients in England, notably AMCO, Amey, Atkins, Babcock, Balfour Beatty, BAM, Buckingham, Carillion, Costain, HS2 Ltd, Kier, Laing O'Rourke, Network Rail, Osborne, Schofield Lothian and Vinci. In Scotland, RSK is building a strong relationship with Carillion on electrification projects, and in Wales the company is a core supplier to the ABC Electrification consortium working on the Great Western Electrification (GWE).

Now, more than ever, the rail network urgently needs investigations to be carried out into the properties of the subgrade and the supporting ground. Much of the Victorian-era infrastructure was constructed before engineering best practice came into being. As a result, many embankments are constructed of variable, uncompacted fill material, with additional shoulders of differing material often tacked on to accommodate additional tracks.

In addition, embankment slopes are rarely well protected from water ingress, containing permeable ballast and often poorly maintained drainage. Combined with the prevailing wetter weather and increased loading, the settlement of embankments is an increasing occurrence.

Figure 1: RSK offer comprehensive rail investigation services

While much data can be gathered using 'traditional' site investigation methods, such as excavation and drilling on problematic hotspots of the network, geophysical techniques are being increasingly used as a rapid reconnaissance tool to assess subsurface properties rapidly over large areas without ground disturbance for the benefit of the whole network.

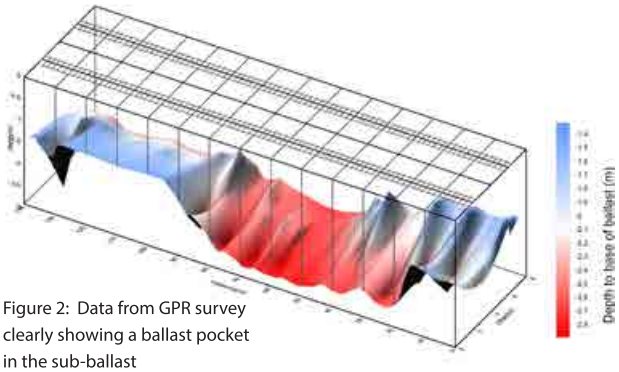


Figure 2: Data from GPR survey clearly showing a ballast pocket in the sub-ballast

GPR

Ballast – and sub-ballast – thickness is one such indicator that can be used to determine embankment vulnerability, using ground-penetrating radar (GPR) to establish the depth of the ballast layer. GPR works by sending a pulse of energy into a material and recording the strength and the time required for the return of any reflected signal. The GPR data can also be used to show areas of fines contamination, waterlogging, and buried structures.

GPR surveys are a cornerstone of RSK's geophysics team services. One such project involved a targeted GPR survey of the Portsmouth Direct Line in an area of embankment showing signs of deterioration. As shown in Figure 2, the GPR data was able to clearly show a ballast pocket (areas of thick ballast due to differential settlement), which was confirmed by CPT drilling.

'Clients find the ability to detect ballast pockets particularly useful, as these are invisible at the surface and can indicate underlying formation problems such as low bearing capacity ground,' said RSK managing director, George Tuckwell.

In this instance the GPR survey covered a 300m detailed area in a single shift, highlighting the effectiveness of the technique as a primary tool in trackbed evaluation.

GPR is very versatile and can also be used to find voids, whether natural, man-made or from animals. Badger burrows are especially problematic as live setts can cause significant delays to projects. As well as determining the extent of burrows, the detection of buried services is an important application of GPR because it helps prevent utility strikes during works such as piling for overhead line (OHL) masts. Electrification across the network also poses many challenges as tunnels need to be deepened for overhead cables. GPR can even be used on tunnel walls to scan for problematic hidden voids. →

Figure 3-4: GPR surveying to detect buried utilities on the Great Western (above) and badger burrows (here) on the East West Rail Link

three 'low density' anomalies along the track. These were found to be where coal seams are sub-cropped below the track. The gravity data confirmed that the seams were not likely to have been worked and that no other shallow void areas were present, thus helping the remedial strategy.

Competent experts

Geological faulting is another issue that can cause the failure of embankments. A seismic and resistivity survey was recently carried out at a station in West Yorkshire where part of a retaining wall had failed. The geophysical data (acquired in one day) clearly showed the location and geometry of the fault, without the need for costly multiple boreholes.

In summary, there is no magic bullet for the investigation of the rail network. Geophysics tells you how a particular physical property varies over a larger area, whereas a borehole gives detail at one location. Cost dictates a mix of both.

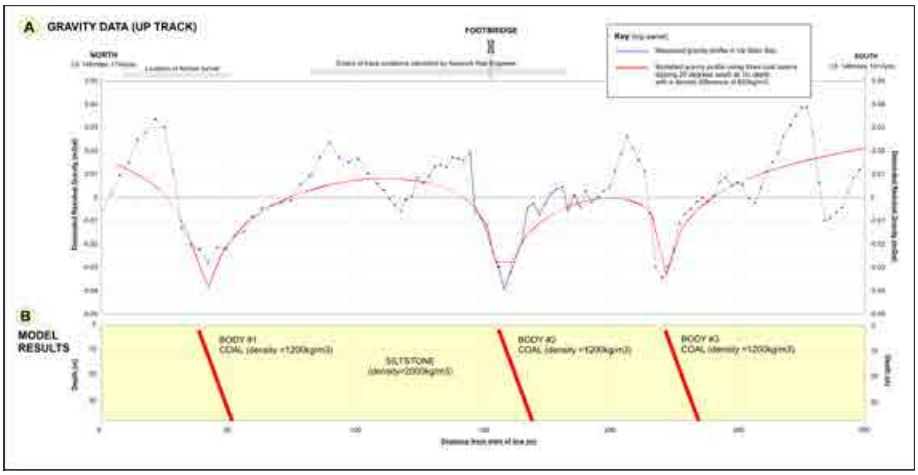
When used properly by competent experts, geophysics adds enormous value to traditional intrusive ground investigation. The use of geophysics can provide condition and construction information quickly and without disturbance or damage to the track and structures, and at a relatively low cost. Information about the problematic zones of the track should be considered as part of the ongoing management of the UK's aging network.

2016 looks like it will provide many further new opportunities across the spectrum of classic and high speed rail projects and, with the advent of new, improved survey technologies, the future is bright for non-destructive ground investigation.

Authored by Matt Stringfellow, principal geophysical engineer at RSK Environment

Tel: 01928 726006
Email mstringfellow@rsk.co.uk
Visit www.environmental-geophysics.co.uk

Figure 5: Results of the microgravity data and modelling to show location of underlying coal seams



Code of practice

Rail engineers can be sceptical about the use of geophysics. They may have been disappointed in the past with bad experiences related to inconclusive surveys, the cause of which is generally down to poor practice and bad planning. The newly revised BS5930 Code of practice for site investigations (which dictates how site investigations are undertaken in the UK) includes updated sections on geophysics to better reflect its importance to the investigation process, not least of which includes the requirement for geophysical survey designs and interpretative reports to be signed off by a chartered and competent professional.

GPR is well known, however other geophysical methods such as resistivity imaging, seismic refraction, surface wave ground stiffness, and microgravity can also provide valuable information on the electrical, density, and elastic properties of the ground under or adjacent to the trackbed.

Voiding and mine workings below the trackbed occur at many locations across the UK. Many historic workings are poorly recorded and as a result may pose a risk to the track's stability. One such site is located on the Midland Main Line that runs over Derbyshire's coalfields. As shown in Figure 5, gravity data collected overnight displayed

There are times when geophysics isn't practical, such as where steep vegetated banks preclude GPR access or where other works in the area and passing trains may interfere with gravity and seismic data acquisition. Therefore these should all be considered early in the design stage.

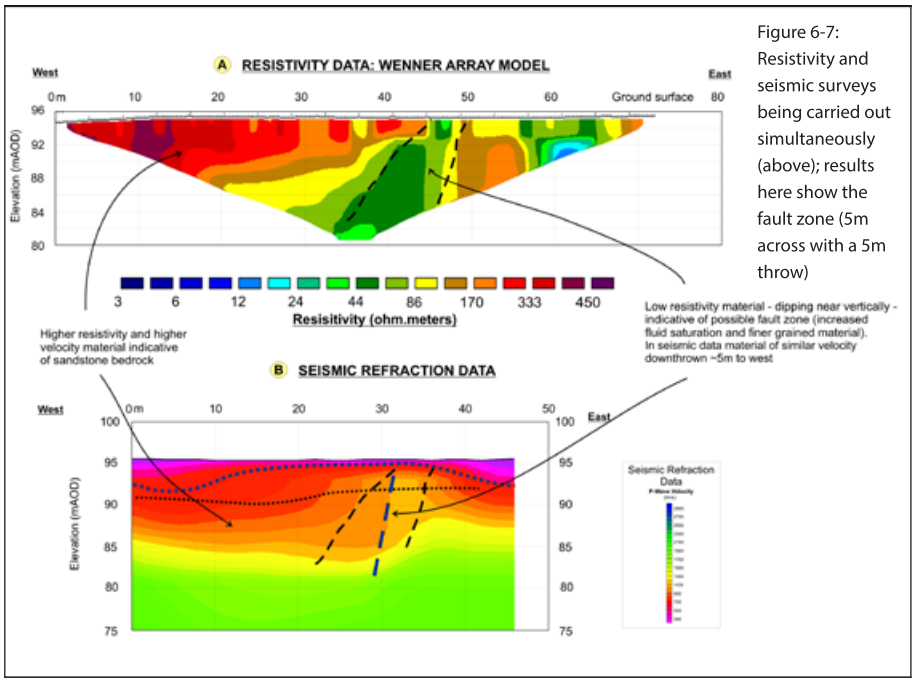


Figure 6-7: Resistivity and seismic surveys being carried out simultaneously (above); results here show the fault zone (5m across with a 5m throw)

An open-and-shut case

Kee Systems introduces its self-closing safety gates that bolster rail safety for those working on the network

Kee Systems, a leading supplier of safety fittings, has introduced a range of spring loaded self-closing safety gates, Kee Gate, as part of its product portfolio that provides rail professionals and maintenance teams with safety solutions.

Ideal for use in rail environments, Kee Gates are particularly suited to providing safe access and egress on one or both sides of a railway track, on parapets, bridges and around electrical and signal boxes. Kee Gate ensures maintenance and inspection staff can fulfil their jobs, follow best practice and comply with current safety standards without putting their safety at risk.

Cutting risk

Kee Gates are spring loaded so can automatically close behind the user, providing an added level of security and overcoming the potential for human error. This type of system is the preferred solution to chains, bars or sliding tubes, as these traditional forms of protection can lead to a hazardous void, when used incorrectly. Kee Systems self-closing safety gates are available in galvanised steel and if required can be powder coated in safety yellow. The safety gate is available with standard 'U' bolts for fixing to uprights of 33.7, 42.4 and 48.3 mm diameter, enabling the gate to be fixed quickly to existing supporting structures, posts or stringers.

A galvanised self-closing safety gate

An additional fixing pack is provided that allows the gate to be fixed to square, flat or angle uprights. Easy to install on all types of handrails or to retro-fit existing structures, such as work and access platforms, Kee Gate is one metre wide but has been designed to be trimmed on-site, saving companies the time and money it takes to fabricate their own gates.

A full range of tests

Kee Gate is compliant with the requirements of EN ISO 14122 Part 3 and Part 4, EN 13374 Class A, and is CE marked to EN 1090. The system has undergone extensive testing to ensure total reliability, including salt spray testing to ASTM B117-11, with neutral pH solutions sprayed for 200 hours to assess the coating's corrosion resistance; life cycle testing to BS 6375-2:2009 Clause 6.5, involving the opening and closing of gates through 90 degrees 50,000 times; and abuse testing, when nine 25kg weights are suspended from the gate. These tests ensure durability, superior corrosion resistance and defence against signs of wear.

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Making the connection

Henry Williams talks about its Distribution Interface Transformer Assembly, which enables the latest power distribution cables to be connected with original cabling

Henry Williams has gained product approval for a device that enables the latest Class II systems being introduced along mainlines to connect safely with original cabling still found on branch lines, freight yards and other track.

Network Rail is installing the new Class II aluminium and copper cables across the railway network. Prior to their installation, power distribution safety was being compromised by poor earth continuity, potentially placing workers at risk of injury or death.

Class I power distribution

Henry Williams' Distribution Interface Transformer Assembly (DITA) is the first approved interface system that allows existing Class I power distribution cables to still be powered from the latest Class II systems.

The development comes as Henry Williams continues to work in association with Alstrom Transport to provide Network Rail with solutions to its distribution issues. Henry Williams has already supplied hundreds of its Class II-rated SafeBox switchgear. The equipment provides

safe electrical isolation and supplies to original location cases on improvement schemes including the East and West Coast mainlines, Great Northern Great Eastern, 650V cable renewals in Scotland and also Thameslink projects.

Speaking about DITA's development, Dave Hughes, Henry Williams' project engineer, said: 'The DITA is a safe and cost-effective solution for situations where upgraded Class II systems need to continue to power older Class I systems, thus removing the requirement to upgrade the complete system to Class II.

'It effectively buys the industry time as it concentrates on upgrading mainlines but also keeps the rest of the network connected.'

Steve Cotton, director of sales at Henry Williams, said: 'Being the first to gain approval for DITA puts the company in a great position to play an important role in the continuing upgrade of the railway infrastructure. It also represents Henry Williams' commitment to work with Network Rail to make the railway a safe and better system.'

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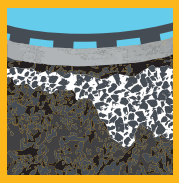
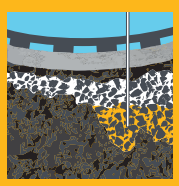
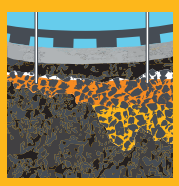


Slab drop due to weak ground



We inject directly through the slab



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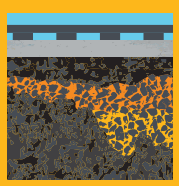

Slab lifted by expansive forces

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The perfect cover

Aura Graphics gives the lowdown on how its repair and refurbishment solutions can solve rail's everyday problems

Well established in the UK rail market, Aura Graphics provides livery and refurbishment services for rolling stock. Its portfolio principally offers high performance graphic solutions for exterior and interior branding and decoration. Over the years the company has packaged this offer with complementary services, including surface repairs and paint refurbishment to deliver comprehensive in-depot project solutions.

Working with a large proportion of the UK's train operators and engineering companies, Aura Graphics has been responsible for many successful livery and refurbishment projects. The company has managed major franchise rebrands, and is a leader in implementing printed advertising wraps on train, tram and underground networks.

Always looking to enhance its products and services, the company works hard to understand its clients' pain points and, through its own innovations and that of its key partners, solves these problems with engineered solutions that add value for all rolling stock stakeholders.

Hard-wearing AuraFlexTM graphics used to recover table tops

Watertight solutions

One of Aura Graphics recent research and development projects has been looking at the issue of water ingress through cab and carriage joints and roof seams, particularly on older rolling stock where vehicle movements and corrosion have left these areas vulnerable. Water penetration through these weak points can lead to significant interior damage to surfaces and electrical components.

Aura Graphics, alongside Blocksil, its European partner specialising in innovative surface protection products, has been developing a product to help solve this common problem for ageing rolling stock. The UK's exclusive distributor and approved installer of the Blocksil Rail Line, Aura Graphics has been successfully testing and implementing this sealing solution with several of its TOC and ROSCO clients.


Roof seam repair preparation


Application of liquid polymer waterproofing system

Blocksil Rail Line, which is used in mainland Europe and now in the UK, is a cost-effective solution for water ingress repairs on cab seams, body joints, bellows, window frames, roofs and electrical boxes.

Liquid polymer waterproofing

Aura Graphics provides this unique full repair as a managed solution that addresses the underlying corrosion in affected areas, using its repair teams to seal the areas with a special liquid polymer waterproofing system.

The system is adaptable to a range of situations and is an environmentally friendly product with short curing times and can be used safely at depots, allowing rolling stock to quickly return to service after being repaired. Importantly, it is also fire compliant for all vehicle categories.

By using this cost-effective new process, which can be implemented alongside other maintenance works, costly damage resulting from water penetration can be avoided and the life of the vehicle body extended.

Interior refurbishment

For the inside of the train, the Suffolk-based company also manages several large interior refurbishment programmes as the industry sees a number of franchise handovers.

Involving a mix of paint, graphics and label requirements, Aura Graphics is seeing a rise in its rail interiors work and an increasing interest in its proprietary printed laminate product, AuraFlex™.

This graphics product is a subsurface


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Aura Graphics team at work installing full wrap sponsorship branding on Heathrow Express fleet

printed laminate with excellent abrasion-resistant characteristics. It can be printed with full colour photographic imagery or more generic patterned designs. From a creative point of view, it has endless possibilities.

From a practical perspective it's used not just to decorate, but also to protect surfaces from wear and tear by providing a hard-wearing finish that also has graffiti-resistant properties. The graphic laminate has been used for tabletops, vestibule walls and other interior panels where scratching and knocks from luggage can cause damage.


Grand Central first class carriages after full interior refurbishment, managed by Aura Graphics

Competitively priced, quick to install and durable, AuraFlex is an attractive option for interior refurbishment and enhancement.

Tim Locke, general manager of rail refurbishment at Aura Graphics, said: 'We're keen to show how simple well-engineered products and services can produce multiple benefits for operators, not only improving rolling-stock aesthetics but also providing cost-effective answers to a host of operational and maintenance challenges faced every day.'

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David Waboso joins Network Rail

Waboso, capital programmes director at London Underground, will join the company as managing director, digital railway. He replaces Jerry England, who will retire later this year.

Waboso will lead NR's Digital Railway Directorate, which includes the Digital Railway Programme – a cross-industry programme funded and facilitated by NR to boost the capacity of Britain's rail network using digital signalling and train control technologies.

As a member of NR's executive committee, Waboso will report to chief executive Mark Carne, who said: 'The single biggest challenge for UK rail is how to provide the capacity we need for the future. Attracting someone of David's talent highlights the progress we have made and our determination to use technology to unlock capacity on Britain's congested network.'

An internationally renowned engineer and project manager with decades of experience in leading major infrastructure projects both in the UK and abroad, Waboso is currently responsible for leading LU's £1.5 billion annual Tube Upgrade Programme.

Waboso was recently appointed president of the Association for Project Management. He was awarded a CBE in 2014 for services to transport in London and the infrastructure leader prize in the UK Black British Business Awards.

It is hoped that he will start at Network Rail next month.

TfL names new managing director of London Underground

Mark Wild will join Transport for London this month, having been special advisor to the minister and secretary of the state government of Victoria, Australia. Until recently, Wild was chief executive of Public Transport Victoria, the integrated transport authority based in Melbourne serving a population of around six million people.

London's transport commissioner, Mike Brown MVO, said: 'We look forward to welcoming Mark, who will help us continue the vital modernisation of London's transport network.'

Brown also thanked Nick Brown, departing interim managing director, saying 'He has made a remarkable contribution at a crucial time.'

James Martin joins Virgin Trains as executive chef

Virgin Trains is set to partner with British chef and TV presenter, **James Martin**.

From May, a new range of specially created seasonal menus will be served to First Class customers, before changes are rolled out to standard class customers in the autumn.

The new menus will showcase fresh, local flavours and champion producers on the Toc's route. Breakfast, casual dining and, on selected services, evening meals are all set to be reinvigorated by Martin's ideas.

Martin said: 'Virgin Trains came to me with a genuine vision and passion for improving the experience they deliver to their customers and – as a frequent Virgin Trains traveller – I shared their belief that the food on offer could have a real impact on customers' experience as a whole.'

New head of drivers for South West Trains

The Toc has appointed **Tara Deller-Hoy** to the position, which involves looking after almost 2000 drivers across 13 depots.

Deller-Hoy has joined from London Overground (LOROL) where she was also head of drivers, covering 500 drivers over five depots. She has had a long career in driver management, starting out as a train driver with Heathrow Express in 1997. She was also involved with the design of the new fleet of trains on Crossrail in 2015.

Said Deller-Hoy: 'With the new fleet of Class 707 trains coming in during 2017 it's important that our team of drivers are ready and prepared.'

New group head of environment for FirstGroup

Jim Harbidge has been appointed to the role. As lead environmental practitioner for the Group, Harbridge, who has worked for Virgin and Carillion, will provide guidance to management teams and specialists in FirstGroup's UK and North American businesses on the company's environmental plans and performance.

Kate Broome, group director of corporate responsibility, said: 'Jim's expertise and strong direction will help us develop our reputation further and meet our ambition of providing truly low carbon solutions for an increasingly congested world.'

Harbridge said: 'Sustainable transport is at the heart of the challenge of limiting the impact of climate change while also underpinning competitive economies and strong communities.'

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Making the right connection

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The company's development and significant growth has been achieved through its partnerships with market leading manufacturers, knowledge of product approvals, technical support, 24/7 emergency call out service, product training and a total commitment to stock.

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- LV Joints & Accessories
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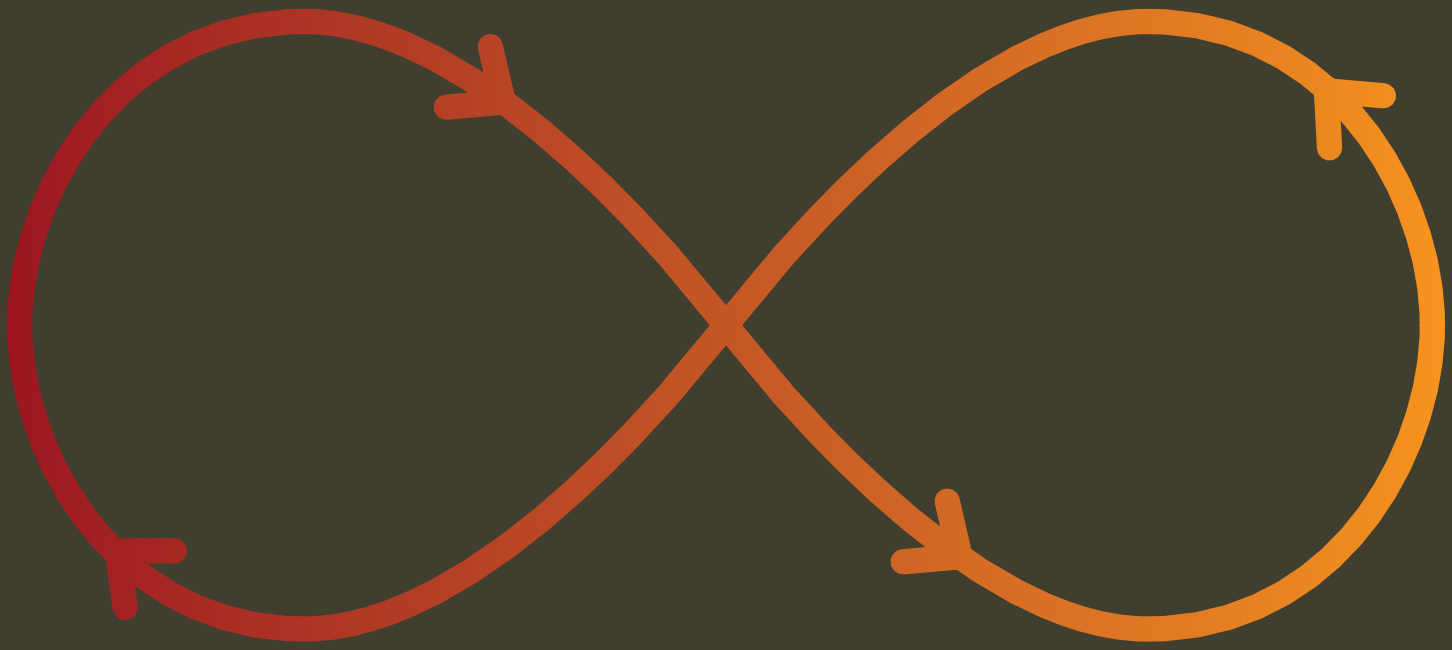

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