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MAYORS**

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mayors make
positive noises about
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MILLENNIALS
A special four-
page feature on
the millennial
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INTERVIEW

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chief executive
Max Joy talks
about his first
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I INFRASTRUCTURE Intelligence

Produced for the industry by the Association for Consultancy and Engineering

BUILDING THE CONNECTED CITIES OF THE FUTURE

Smarter cities and the
millennial generation who
will make them happen





INFRASTRUCTURE Intelligence

Produced for the industry by the Association for Consultancy and Engineering
Infrastructure Intelligence
12 Caxton St, London SW1H 0QL
T: 020 7222 6557
www.infrastructure-intelligence.com

Editor: Andy Walker
07791 997602
awalker@infrastructure-intelligence.com

Associate editor: Jon Masters
07944 642455
jmasters@infrastructure-intelligence.com

Contributing editor: Natasha Levanti
07983 894811
nlevanti@infrastructure-intelligence.com

Commercial Director:
Brian Nolk 020 7227 1882
bnolk@acenet.co.uk

Design and production:
Andy Smith & Denise Bell
07968 588729
info@smithplusbell.com

Produced by Victoria Street Capital on behalf of the Association for Consultancy and Engineering, 12 Caxton St, London SW1H 0QL.

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MESSAGE FROM THE EDITOR

If you thought 2016 was a volatile year politically, with the Brexit vote and the resignation of a prime minister, then 2017 is shaping up to be similarly dramatic following the prime minister's surprise announcement that there will be a snap general election on 8 June.

Theresa May's shock move came despite the government previously denying it would call an early general election and her administration appearing to be concentrating its efforts on the looming Brexit negotiations. The prime minister is clearly concerned about ongoing uncertainty over the Brexit negotiations and she has calculated that a general election will give her the increased majority she needs to remove that.

In the short term, all this means for the infrastructure sector is more uncertainty as the political system grinds to a halt for the election. It is to be hoped that whatever the outcome of the 8 June poll we will see the new government renewing commitments to key infrastructure projects, moving them on apace and getting them delivered as soon as possible.

To that end, this issue of *Infrastructure Intelligence* highlights an important new white paper on cities and infrastructure that the new government would do well to take note of and act upon. We also examine the role of the millennial generation in a four-page feature which is essential reading for everyone with an interest in the industry's future.

That future ought to be a bright one given the support for infrastructure development being voiced by politicians of all shades during the general election campaign. After 8 June the industry will need to hold those politicians to account and ensure that their honeyed campaign phrases become a reality and that the UK gets the funding and political backing to deliver the quality infrastructure the country so urgently needs.



Andy Walker,
editor, Infrastructure Intelligence

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A manifesto for UK infrastructure



Just two years after the last general election, the UK is once again going to the polls. *Natasha Levanti* looks at the ACE election manifesto and its calls for infrastructure investment.

Since 2010 we have seen a greater level of appreciation for both the social and economic importance of infrastructure and also a corresponding increase in government spending. Yet, as the UK faces a general election on 8 June, the country stands at a crossroads. Either the UK invests in social and economic infrastructure networks that can compete with emerging economies, or it continues to underinvest and sees its international competitiveness fall.

Whilst much has been achieved there is still more to do. As a country we need to develop greater cross-party consensus on the development and implementation of large-scale infrastructure projects, stabilising a pipeline of much-needed infrastructure projects for years to come.

The Association for Consultancy and Engineering (ACE) as the voice of the consultancy and engineering industry working in the built environment has highlighted a number of priorities in its *Manifesto 2017 Engineering growth*. All of them should be considered by politicians and the industry as election day approaches.

Transport

While the current and previous government have recognised the scale of the transport challenge due to population growth and increased demand, more can and must be done. Airports are maxing out capacity and road network inefficiencies continue to cost as much as £12.2bn per year. While projects such as High Speed 2, 3 and Crossrail 2 will help, the National Infrastructure Delivery Plan (NIDP) 2016-2021 has identified over £88.4bn in transport investment needed for the UK.

Utilities

Within ten years, 10-12% of current power generating capacity will be lost, unless approximately £112bn in investment in made. The challenge is magnified by increased future demand. Other utilities are also strained. The water industry will invest £43bn over the next five years. And, according to the National Infrastructure Commission's 2016 report *Connected Futures*, UK broadband lags behind Peru, Albania and Panama in terms of network access.

Housing

ACE's 2013 report found that the UK had a 'housing gap' of around £185bn or almost 900,000 homes by 2021, representing a city twice the size of Birmingham. The report also highlighted the impact that current pricing, wages, and mortgages systems have on individuals. With a couple on an average wage needing to save for over 35 years to put enough aside for a 25% mortgage deposit, this inevitably has societal consequences. While recent measures like 'Help to Buy' have only been partially successful, it's clear that the most effective solution has to be to radically increase the number of homes being built, thus ensuring supply for current and future generations.

Finance

For the government to be able to access significant sums of private finance, it must ensure stability of the regulatory and funding conditions, as well as firmly commit to the much needed projects within the infrastructure pipeline. With £297bn in investments required for the

NIDP pipeline, the government needs to help build the investment capacity of alternative sources of financing, such as pension funds.

Procurement

As the UK approaches a period of increased infrastructure investment alongside the continued devolution of power and delivery responsibilities, if just 5% of the total UK annual public procurement spend is spent inefficiently this equates to £11.5bn in poor investment. Improving efficiencies in public procurement will require a shift in prioritisation from in/out specifications towards outcomes and outputs in the procurement process, as well as further refinement of client procurement methods.

Sustainability

As the UK continues to develop, there will be correlating pressures on our natural resources and ecosystems. With the UK having emitted 569m tonnes of carbon dioxide in 2013, rising traffic volumes impacting urban air quality, limited land available for food demand and urban sprawl, as well as the legally binding carbon budgets, the UK must reduce its emissions by approximately 80%.

Skills

The impacts of Brexit on EU nationals currently employed in the UK consulting and engineering industry are, as of yet, unknown, and this may compound the previously projected UK qualified engineer shortfall of 36,800 by 2050. Skills are a vital concern for the industry. Reaching out to diverse pools of future UK talent, ensuring STEM skills are taught early on, and provisions for inclusive skills development opportunities are vital. While there has been progress in the level of government support for specialised colleges and apprenticeships, UK skills development must be a part of the political agenda going forward.

New mayors pledge to benefit infrastructure



ANDY STREET



BEN HOUCHEN



ANDY BURNHAM



TIM BOWLES



JAMES PALMER



STEVE ROTHERHAM

The election of six new ‘metro’ mayors in England could provide stronger voices for the regions and a key part of the regional political landscape, writes *Andy Walker*.

May’s local elections saw the arrival of six new ‘metro’ mayors to lead combined authorities in England. Combined authorities are groups of councils working together to assume powers, devolved from central government, over matters such as transport, housing, planning, skills and economic development.

The areas which elected mayors were Cambridgeshire and Peterborough, Greater Manchester, Liverpool City Region, Tees Valley, West of England and the West Midlands. All have been granted a 30-year investment fund as part of devolution deals, but their duties vary from area to area. For example, Greater Manchester’s authority will have control over a £6bn health and social care budget, while Cambridgeshire and Peterborough and the Liverpool City Region will have powers over planning for health and social care.

Labour were successful in two of their three strongholds in the north but lost to the Conservative’s Andy Street in the West Midlands. There was a narrow win for the Tories over Labour in the West of England and as expected, the Conservatives comfortably won Cambridgeshire and Peterborough. There was a shock in Tees Valley with a narrow win for the Conservatives. The new northern mayors in particular could be influential in shaping the devolution agenda as it gathers pace in the months and years ahead.

In Greater Manchester, Andy Burnham has boldly pledged to end homelessness by 2020 and will focus on building new affordable homes, improving local transport and enhancing opportunities for young people in his area. The

infrastructure sector will welcome Burnham’s pledges which should lead to more work for the sector locally. Similarly, Liverpool’s Steve Rotherham is committed to improving housing, transport and opportunities for local young people and will be interesting to see how he works with his regional neighbour and close friend, Burnham, potentially delivering a North West Powerhouse in the future.

The Tees Valley saw a big upset with Conservative candidate Ben Houchen defying expectations to be elected as the new mayor, winning with a thin majority of 48,578 to Labour’s 46,400 in the second round of voting. Houchen made waves in the campaign after promising to use the mayor’s new £15m transport budget to bring Durham’s Tees Valley Airport back into public ownership. It will be interesting to see how he delivers those plans and also how the government and local businesses will respond.

Andy Street’s win for the Conservatives in the West Midlands was another surprise, if not on the same scale as the Tees Valley result. The ex-John Lewis CEO defeated Labour’s Sion Simon in the second round of voting with a majority of 3,766. This result will be particularly pleasing for the prime minister as it puts the party in a very influential position in the UK’s second city.

“If the pledges made during their election campaigns are honoured, the arrival of these new metro mayors will be welcomed by the infrastructure sector.”

All the new mayors could form a significant part of the regional political landscape, providing stronger voices for their city regions, across the national and possibly international stage. One sobering factor though will be the relatively low turnouts in all the elections, with less than 30% of eligible voters voting and just a pitiful 21% turning out in the Tees Valley.

On the positive side, all the winning mayors have made pledges that should benefit the construction and infrastructure sector. In addition to Burnham and Rotherham’s promises to improve housing and transport, Andy Street in the West Midlands has prioritised skills and apprenticeships for young people, cutting congestion, improving transport, protecting the green belt and regenerating high streets.

In the West of England, Tim Bowles has pledged to re-open rail stations and increase services, support road improvements on the Avon Ring Road and M4 Junction 18a and the A36/46 link road and also protect green fields by promoting urban regeneration. James Palmer in Cambridgeshire and Peterborough has promised to improve the planning system to get more homes built, support a new university for Peterborough and improve transport in the region.

If the pledges made during their election campaigns are honoured, the arrival of these new metro mayors will be welcomed by the infrastructure sector which will undoubtedly benefit from the increased work that will arise from the delivery of their plans.

Thanks to Paul Dimoldenberg and Quatro PR for their input into this article.

Creating cleaner, greener and smarter cities



A new initiative to bring together users of smart technologies and big data to create cleaner, greener cities has been launched by the Environmental Industries Commission. *Sam Ibbott* reports.

Cities around the globe exist in a state of perpetual flux, constantly evolving and growing exponentially. Over 50% of the world's population now lives in cities (75% within the EU), with the newer category of 'megacity' being created for the world's largest urban metropolises. Such is their magnetism and political and economic influence, some say that future geopolitics will be conducted between these megacities directly, with traditional nation states being relegated to support acts.

But despite this constant change, the basic needs of a city, and the underlying environmental challenges faced by city governments, remain constant: the need to tackle air pollution; manage energy demand; abate carbon emissions; collect and recycle waste; and provide clean, accessible water. Cities may well be magnets for the 'new', but these are old issues – and ones which become more acute as populations and densities grow.

As it has always done however, hope lies in technological innovation to provide us with new ways of dealing with old challenges – unlocking new approaches and new solutions, and ultimately improving our quality of life in ways not previously possible.

At the Environmental Industries Commission (EIC), we have been looking at this very issue. Can the latest smart technologies, the use of real-time remote sensing, the analysis of newly-available big data and the rollout of the 'Internet of Things', open up new, more effective and more (cost) efficient solutions to entrenched environmental challenges?

Our research suggests so, but the growth of the nascent market which supports this innovation is not growing without challenge. One of the more major barriers our work has highlighted is the lack of hard evidence that these smart solutions work at a city-wide scale. We hear lots of 'coulds' and 'shoulds', but fewer 'hads' and 'wills'. Just because an innovative technology works in laboratory conditions, does not mean automatically it will work across an entire city with a vastly increased number of variables. And this is a problem.

Cities, particularly in the UK, remain in

Smart technology will be tested in order to create hard evidence that it works for cities.



an age of austerity. Money is scarce, and it is a gamble to invest potentially significant sums in untested technologies which may or may not work. This leads to a chicken and egg situation: with city authorities hesitant to unlock investment without hard evidence, but with hard evidence not being created until a technology has been tested at that scale.

EIC established a taskforce consisting of city and central government representatives, technology manufacturers, consultants, universities and NGOs to look at how this problem could be solved in a pragmatic way. It was argued that a central industry repository to promote case studies, share best practice, and better match the cities facing these environmental challenges with cost-effective smart solutions would be beneficial – and so this is what we have done.

Later this month we will launch a new online platform, www.SustainableSmartCities.org. This free-to-access website will provide an industry-led resource to provide a central focal point for all stakeholders involved in the use of smart technologies and big data to create cleaner, greener, and more sustainable city environments.

The site will be used as the foundation from which to promote the accelerated growth of this industry through a series of targeted activities, including:

- The provision of a platform for sharing international case studies and best practice to underpin investment decision making.
- Connecting people and encouraging collaboration by acting as a neutral broker between parties, through networking events, roundtables and seminars; and operating as the nexus between technology, cities, policy makers and academia.
- Providing thought leadership, market intelligence and investment insight through in-depth policy reports, briefings and blogposts by leading industry stakeholders.
- Proactively lobbying governments and policy makers at both city and national levels for a regulatory framework to support and encourage innovation.

A launch event for this new initiative is being held in central London on 25 May 2017, bringing together the wide range of stakeholders necessary to make this market work. To attend or to get involved in the taskforce which will continue to guide this work please contact me at sam.ibbott@eic-uk.co.uk

Sam Ibbott is head of smart cities at the Environmental Industries Commission, a UK-based trade association for the environmental technologies and services sector.

Improving business resilience through reverse mentoring



In an age of big data and disruptive technology, millennials can actively contribute to business resilience. *Anil Iyer* reports how ACE's Progress Network is proposing a pilot reverse mentoring scheme for the industry.

BIM, big data, social media, disruptive technology, the internet of things – these are all buzzwords that are commonly used by professionals working in the natural and built environment. However, how many seasoned professionals truly understand their meaning and significance and are they sufficiently hands-on to be able to implement them in a manner that can make a positive impact on their businesses?

Reverse mentoring could provide a solution. This is a 21st century concept that pairs up seasoned executives (mentees) with millennials (mentors), and by doing so, closes the knowledge gap for both groups – the senior executives pick up on social media and technology trends, and the early career professionals gain valuable insight into business strategy.

The benefits to the organisation are apparent. Diverse employee generations are brought together and both emerging and established leaders are empowered, helping enhance business reputation and minimise retention issues. Additionally, the greater uptake of new technological advancements may save time, cost and improve the company's innovation as well as long-term economic resilience.

Whilst reverse mentoring schemes have been established and rewards recognised in technology giants such as GE and Microsoft for over a decade, it is only now that companies working in the built and natural environment are embracing the concept. Progress Network, the Association for Consultancy and Engineering's (ACE) group for emerging professionals, is developing a pilot scheme to test the industry's appetite for reverse mentoring to make this the norm.

Leading this initiative is Rebecca Wooding, national vice-chair of Progress Network and a hydropower engineer with Mott MacDonald. Wooding said: "The pilot is modelled on a reverse mentoring scheme that Mott MacDonald has recently introduced. Our scheme focuses on diversity and inclusion and covers cultural differences and unconscious bias.



Reverse mentoring can help seasoned professionals learn from younger colleagues.

Capitalising on the lessons learnt from implementing this scheme, we feel this is a great tool to address the growing technology understanding and uptake gap between millennials and senior staff across the industry," she said.

The Progress Network pilot will involve pairs (mentee and mentor) from around six ACE companies of varying sizes. A workshop involving all participants will initially be held at which the ground rules would be established (including addressing sensitive issues), objectives and KPI's set and frequency of mentoring sessions agreed. The pilot scheme is envisaged to last around 12 months. Progress would be monitored and lessons learned recorded, with a feedback session set up with all participants before the results of the pilot are shared.

Should the reverse mentoring pilot scheme prove successful, there is potential

for the model to be rolled out across the industry. Wooding hopes that Progress Network can then help promote awareness of the scheme through social media and networking events. The scheme could be expanded to include other reverse mentoring subjects such as diversity and inclusion and the challenge that many companies have of retaining middle managers after they have secured their chartered status.

The scheme could also eventually include mentors and mentees from different companies, something which could particularly benefit micro-organisations with less than ten staff which may not have an appropriate mentor in-house.

If successful, the Progress Network initiative will meet a number of objectives in ACE's new corporate plan for 2017 to 2019. Not only does it support commercial best practice, business continuity and risk resilience, it improves the industry business environment and helps promote the industry to the next generation.

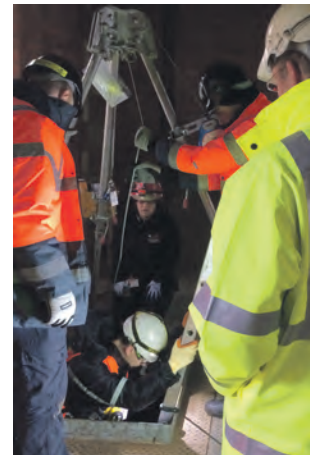
If your company is interested in hearing more about the Progress Network pilot scheme, please email aiyer@acenet.co.uk

"This is a great tool to address the growing technology understanding and uptake gap."

Rebecca Wooding



Anil Iyer is the chief operating officer of the Association for Consultancy and Engineering.



Complex planning and coordination keeps iconic asset running

Inspecting and maintaining the Elan Valley Aqueduct is a complex job requiring a great deal of coordination and resource planning that sees Amey working with Severn Trent Water to keep millions of people connected to an essential resource.

People in Birmingham have relied on the Elan Valley Aqueduct to deliver safe, clean water to their homes since 1904. Today, more than 1.2 million people in the city still rely on the aqueduct to carry water almost 80 miles, from Elan Valley Reservoirs in Wales to their taps.

The aqueduct crosses Wales and the Midlands, running eastwards from the Elan Valley reservoirs in mid-Wales to Birmingham's Frankley Reservoir. It delivers enormous quantities of water by gravity across the mid-Wales countryside, through north Herefordshire, south Shropshire and into the West Midlands through eleven major river valleys. The aqueduct is 73 miles (117 km) long, down which the water travels at less than two miles per hour, taking one-and-a-half days to get to Birmingham.

Getting access to inspect and maintain this one-of-a-kind infrastructure is a considerable logistical challenge, but an essential part of keeping services running smoothly.

Amey has been working with Severn Trent Water to overcome these challenges. As Matthew Watt, Amey's senior project manager, explains. "To carry out our inspections, the aqueduct is drained of its supply and this, understandably, has a massive knock on effect on the rest of the

network," he says. "We work closely with the client for months in advance to meticulously plan every detail. But it can often come down to a go or no-go decision on the day of the shutdown and we have to do what we can to make the most of the short window of opportunity," says Watt.

The work is complex and requires a great deal of coordination and resource planning to get the job done in the time available. "We've recently completed our fourth successful shutdown on the aqueduct," says Watt. "It took 129 people shifts to work inside 21 tunnel sections using 28 different access locations, which often means working in rural locations, during adverse weather and regularly with no mobile phone signal. Over three days, we mobilised a huge amount of resources to make sure that we had all the people,

materials and technology we needed – and a backup of everything, just in case," Watt explains.

Technology and planning out the 'what ifs' is key to Amey's successful work on projects like the Elan Valley Aqueduct and this intelligent approach is paying off. "The key to getting this done right, safely and on time, is our smart approach of strategic and scenario planning, coupled with a specialised briefing to each and every member of the team," explains Watt. "Complex planning operations are what we do best, utilising the best mix of technical, logistical and operational expertise from across our business.

"We use our in-house developed software apps, hosted on ruggedised tablets to capture data electronically and support on the spot decisions. During this shutdown we also collected concrete core samples which we'll be analysing at our in-house laboratory to help make long-term maintenance and improvement recommendations," says Watt.

This intelligent, end-to-end approach to asset management is a core component of Amey's offering in the utilities market. "We're in a unique position where we can offer the frontline operational expertise, combined with more than 40 years' experience in the water sector," says Ian Dodgson, Amey's director of asset engineering. "And this is all underpinned by our industry leading consultancy, asset management and analysis capabilities. It's what makes us different to many of our competitors and means we can deliver a truly end-to-end service to our clients," Dodgson says.

Dodgson continues: "The Elan Valley Aqueduct is more than an iconic asset; it holds a significant part of the total water supply on Severn Trent Water's strategic grid. Projects like this take months of detailed planning and coordination to make sure that we help our clients meet their targets, and to ensure that millions of people are kept connected to this essential resource."



"The key to getting this done is our approach of strategic and scenario planning."

Matthew Watt

Britain's railways poised to modernise



Greater capacity and the better performance needed from Britain's railways are going to come from technology in future. *Jon Masters* met up with the managing director for Digital Railway, David Waboso, to get an update on plans for modernisation.

David Waboso is at the helm of a programme of major significance for the future of Britain's rail industry. At present, he's entering final stages of producing his plan, so cannot divulge publicly what's going to be in it and over what period it will be delivered in, but that's exactly what's going to take shape over the coming year.

Waboso is Network Rail's managing director for Digital Railway – a programme of technological modernisation of how Britain's trains and rail infrastructure are operated together. So far the initiative has amounted to a small number of discrete but significant projects, such as installation of the moving-block signalling system ETCS (European Train Control System) and Automatic Train Operation (ATO) on the central section of Thameslink in London – due to be operational in 2018.

ETCS is also being built into the western end of Crossrail where a high density of services will be needed to cater for demand at Heathrow. And at Romford and in Cardiff new systems of Traffic Management (TM) train control and signalling software mean more trains can be managed at peak times and timetables recovered more rapidly when things go awry.

Digital Railway is poised to take a step up. Hitherto, its projects have been delivered as part of wider upgrades, but now the programme is starting to assume more of an identity of its own.

At NR's Euston House in London, on a floor dedicated to Digital Railway, strategic outline business cases have been drawn up for how the technology can be best deployed to solve problems of insufficient capacity and poor performance on key routes.

The appearance is of a line being drawn under what's been done so far, as Digital Railway looks at how it can apply proven technology on a more nation-wide basis. Waboso's team is leading work on five business cases while also supporting three more (see box).

Digital Railway projects have been carried out as part of wider upgrades so far.



Thameslink will be operational with ETCS and ATO from 2018.



Over coming months it will be presenting the results to the Department for Transport and discussing how much of it can be funded, how it can be delivered and how it can be integrated with the Control Period 6 investment programme for 2019-2024.

"The settlement for CP6 is not determined yet, but Digital Railway will need to integrate as far as possible with the routes' strategic business plans. It may be that an appropriate change control process is built into CP6 to allow elements of Digital Railway to be worked into the programme later in a way that makes sense. The concept of CP6 needs to

recognise that a Digital Railway will occur in coming years," Waboso says.

Network Rail has strong industry support for its Digital Railway modernisation, Waboso says, including from the rail unions and from government. In his last Autumn Statement in November last year, chancellor Philip Hammond promised £450m for Digital Railway. This will only go as far as allowing Digital Railway to deliver more of the initial enabling projects needed.

A full roll-out will be a different matter. Just installing ETCS will cost an order of magnitude more and it's yet to be decided who will pay for it. "Part of what we'll be doing next is looking at the possibilities for private finance and for more innovative ways of delivering the programme," Waboso says.

"Importantly, this is a cross-industry programme, so it will not be just government and Network Rail that works all this out. We've received strong support from the unions because a lot of this is about safer operations. The RDG (Rail Delivery Group), which effectively represents the train operating companies, has also been supportive.

"One of the things we'll be looking at is where on the network new rolling stock is



David Waboso

"The main thing for now is to work with DfT to decide what schemes we can take forward, how much it's going to cost and how we structure it."

Digital Railway – eight strategic outline business cases

Wessex Route*: addressing a capacity and performance challenge from London Waterloo to Southampton (South West Main Line)

Anglia Route*: addressing capacity and performance from London Liverpool Street to Norwich (Great Eastern Main Line)

South East Route*: addressing performance on

the route including the Brighton Main Line

London North East Route*: leveraging opportunity to renew life expired assets to meet capacity and performance needs from London King's Cross to Leeds and Newcastle-upon-Tyne (East Coast Main Line)

Western Route*: identifying the best way to replace

existing train safety control (currently Automatic Train Protection) while taking into account wider strategic needs of the route (Great Western Main Line)

Anglia Route (Essex Thameside franchise): identify options to meet demand requirements on the route via digital technologies. Also consider commercial/delivery models to deploy

TfL Overground Network: investigating options to

increase train frequencies on the East London Line, in conjunction with the Digital Railway programme

London North East and London North West (Trans Pennine): led by DfT, the Trans Pennine upgrade programme is focusing on improved journey times on the route. This potentially requires digital interventions.

* Network Rail's Digital Railway team is leading on these five business cases.



due to be introduced over the next few years. We want to make sure trains come enabled with the technology. Virtually all rolling stock in Britain is owned by ROSCOs (rolling stock operating companies) so it could be that we explore private finance that way, but the main thing for now is to look at what schemes we want to do.”

Adding to the complexity, if NR wants to introduce Digital Railway efficiently, it has to install the technology on trains coincidental with the same being done track-side. So it has to coordinate its resignalling programmes in-phase with refranchising, matched to where the network has capacity or performance problems: “Generally where trains and platforms have been lengthened and capacity problems are still coming at us; this is where Digital Railway technology will make the biggest impact,” Waboso says.

In places on NR's network where there are chronic performance problems – such as sections of the Southern network – installation of TM may be the low hanging fruit that the business cases will support. Where capacity is at issue, on the Wessex Route into London Waterloo, for example, then ETCS and ATO may be the answer.

The types of equipment in question are essentially ETCS and ATO, the software and

control systems of TM, plus Connected Driver Advisory Systems (CDAS), which will allow updated journey plans to be communicated to drivers when disruption occurs. Advisory systems are already being rolled out, but they're fixed and do not update when things go wrong. The 'connected' variety is crucial for replanning journeys and recovering timetables, but it needs TM in signal boxes first.

“These changes are actually quite fundamental, so a lot has to be considered. Signal boxes are to be moved to traffic control centres and there will be big changes to the way signallers, drivers and others work. It will become a different railway with a shift in operational culture, so we're doing a lot to engage with the workforce, wider industry and unions,” says Waboso.

He also has an issue of capability to consider. Waboso has built a team about 100 strong, including a number of trusted lieutenants he brought across from London Underground Limited. Before joining NR in June last year, Waboso was responsible for a similar shift to a semi-automated railway during seven years in charge of LUL's capital programme.

“We've now got a really good tooled up UK workforce for Digital Railway; people

that can do all this,” Waboso says. “The important thing now is to keep them. We've got to look at where they're deploying to next and there's the whole export agenda to consider. We have valuable skills here we can offer overseas in a consulting capacity.”

If Digital Railway is going to be the future for adding capacity and reliability, it's going to need effective project delivery. Appointment of programme and technical delivery partners will be announced soon, Waboso says, for adding more capability to the client team.

The first phase of an early contractor involvement (ECI) initiative has concluded with nine of its suppliers (Alstom, Amey, Atkins, Bombardier, Hitachi, Indra, Resonate, Siemens and Thales) giving Digital Railway a list of recommendations for how it can work better with its supply chain. Now Digital Railway is doing the same – through an ECi2 project – with companies it doesn't usually work with.

“We want to be an intelligent customer, with a small number of highly skilled people,” he says. “A big part of the future has to be innovative delivery, but the main thing for now is to work with DfT to decide what schemes we can take forward, how much it's going to cost and how we structure it.”



Richard Green, director and business unit lead for the north of England, AECOM

Housing vital for Northern Powerhouse delivery

Most of the discussions around the Northern Powerhouse centre largely on how to spur growth, but housing and ‘soft’ infrastructure is vital to the success of the Northern Powerhouse too.

There has been much debate and discussion at various industry events about the delivery of key transport infrastructure, which is undoubtedly one of the fundamental elements at the heart of Northern Powerhouse delivery. However, transport infrastructure must not be planned in isolation, with housing just as important to the successful growth of the economy in the north.

Housing and its associated social infrastructure such as schools and healthcare must also be part of decision making and planning for the Northern Powerhouse. It is not enough to only focus on transport connectivity as aspirers and skilled professionals must want to live and work in an area. Plans for improving existing housing stock, strengthening communities and building new homes will need to be considered now if long-term balanced UK economic growth is to be achieved.

Areas that are likely to experience an influx of major industrial and infrastructure investment such as Cumbria will need to attract and retain the best talent to the region. Key to achieving this will be to build sustainable, well-connected communities where people want to live and work.

With major new transport schemes already being mapped out, the pressure is on local and regional authorities to

develop long-term strategic growth plans that open the potential for housing along route corridors. The argument for aligning housing with transport infrastructure couldn’t be clearer.

Developments along these routes will not only attract more passengers onto transport infrastructure but also bring additional social and economic benefits to the region.

Housing is key to economic growth and must become a vital element of Northern Powerhouse delivery. It must not be overlooked in decision making around the allocation of funds associated with the Northern Powerhouse. A rebalance of the economy can only be achieved if city and regional authorities in the north successfully create well-connected communities close to transport links.

“Areas that are likely to experience an influx of major industrial and infrastructure investment such as Cumbria will need to attract and retain the best talent to the region.”



Tim Nosworthy, partner, Mayer Brown

UK pension funds eye up infrastructure investment

In recent years, there have been many examples of overseas pension funds (notably Canadian plans but also others from countries such as the US, Australia and The Netherlands) participating in “direct” investments in UK infrastructure (as opposed to “indirect” investment through third party funds). Could UK pension funds be set to follow suit?

Typically, these foreign funds investing in UK infrastructure are very large, having made significant investment over a number of years in developing their in-house investment capabilities. To date, only a few UK pension funds have adopted this approach, and it is likely that only a small number of UK pension funds would be of sufficient size for this to be a realistic approach.

More likely is that further “club” arrangements will evolve, of the type that already exist involving some local government pension schemes, to make

or facilitate infrastructure investment. Indeed, at the end of 2016 it was reported that five of the UK’s biggest local government pension schemes pooled £1.3bn into the GLIL fund, rivalling the Pensions Infrastructure Platform (PIP) set up in 2011 by the government.

The need is there. The UK has suffered from a shortage of available capital for the provision of new infrastructure since long before the credit crisis. In recent times, and in part as a result of changes implemented in response to the crisis,

“The UK has suffered from a shortage of available capital for the provision of new infrastructure since long before the credit crisis.”



Patrick Bossert, head of infrastructure asset intelligence at EY

Squeezing capacity out of Britain's roads and railways

“If we allow our streets to clog up with more traffic and push people on to already overcrowded trains, the economy and prosperity of a city may start to be impacted.”

this shortfall has become more acute as regulatory changes such as increased capital requirements for longer term loans have made access to traditional sources of long-term project finance less available and in some cases, noticeably more expensive.

In the face of this shortfall, funding from sources other than banks, such as pension funds, mutual funds and insurance companies, has long been touted as a potential source to fill the gap. An OECD report which estimated the total amount of global infrastructure funding required from 2010 to 2030 at \$50trn, also reported the total sums held by sources of non-bank funds to be in excess of \$65trn. In the UK, the government's National Infrastructure Plan, updated at the end of 2016, includes projects requiring £500bn of investment, the majority of which is expected to come from the private sector.

In the face of dwindling returns in other more traditional areas of

Would you drive the wrong way down a one way street? Nor would I, but the time is rapidly approaching when fixed constraints on Britain's infrastructure – like fixed speed limits and one-way traffic flows – could become serious obstacles to getting the most out of the infrastructure we already have.

In Britain we spend an average of £50bn every year on central-government-funded infrastructure projects, according to some recent estimates, yet the reality is that by the time they're built, demand is likely to have caught up and we may have to build more. It's time to take a closer look at what we already have in place. If we can make better use of existing infrastructure, we're also likely to get a better return on every pound invested in new capability.

So what has changed to make us think we can do something different? The answer is, unsurprisingly, rooted in information. Organisations now have the ability to collect data 'over the air' from mobile-data-enabled sensors, access low-cost data storage, and have the computing power to make insights actionable in near-real-time. Big data has become a buzz word in some circles, however, useful data, collected to meet a specific need, carefully blended and analysed correctly is another matter altogether.

Information allows us to understand business and social challenges better. If we allow our streets to clog up with more traffic and push people on to already overcrowded trains, much as Paris found to its peril 30 years ago, the economy and prosperity of a city may start to be impacted.

Knowing what road and rail assets a city has, data on how they are used, who and what uses them and what the changing

investment, many UK pension funds are seeking more diverse, and potentially remunerative, investment opportunities. Although infrastructure projects can provide this diversification and return (often with attractive RPI linked returns), appraising and structuring infrastructure investments requires highly specialised skill sets which rarely reside with trustees and asset managers in traditional (and in particular smaller) pension funds.

There are also legal obstacles. A pension fund wishing to become involved in

“An OECD report estimated the total amount of global infrastructure funding required from 2010 to 2030 at \$50trn.”

demand patterns look like enables a new type of integrated decision-making. Network Rail's Digital Railway project used railway capability and performance information to model options for addressing constraints and demonstrated the potential to add up to 40% more peak-time trains (and seats) into city termini without building new tracks.

The model called for replacing signals with digital technology to run trains closer together as well as a 'central digital brain' to adjust speeds to optimise the flow of traffic through junctions and other pinch-points.

Road networks have a similar dynamic, with tidal flows of traffic and a need for better speed and traffic flow optimisation at pinch points. Roads are rarely jammed in both directions at the same time so their raw capacity is equally underused in some cases.

We also need to look at modelling constraints on an integrated road and rail model, or a transport and city model. This could potentially reveal the best places to build road and rail interconnections that maximise road use and benefit from a high-frequency suburban rail system.

In conclusion, there's a lot of spare capacity in today's infrastructure. If we learn how to exploit it, we could solve some of the big economic and social challenges sooner, and make future investments far more effective. An infrastructure capability model, consistent across multiple disciplines, is the key to unlocking such value. It doesn't yet exist, but we are likely to become the first country to develop a new infrastructure capability modelling standard.

funding infrastructure transactions should be aware that while in the UK lending activity on a wholesale basis is generally not regulated, there are some activities for which they may need to be authorised under the Financial Services and Markets Act 2000.

In addition, pension fund trustees are usually subject to statutory investment restrictions in relation to funds held in occupational pension schemes and furthermore many potential participants must also comply with internal rules on investment thresholds or rules requiring participation to be structured by way of a subscription for securities rather than by way of a loan.

However, these legal obstacles are not insurmountable. With the government firmly focused on infrastructure and the clear appetite of pension funds to explore new investment frontiers, 2017 could be the year this area finally takes off.



With an increasing number of nearing or recently qualified professionals upping sticks and leaving the world of engineering consultancy, *Rebecca Wooding* asks whether there is an industry-wide millennial exodus.

I recently attended my sixth leaving party of another millennial friend who is about to walk away from their career, friends, family and home to start an “adventure in the big unknown”. All of these friends are engineers, all highly educated and many of them graduates from top engineering and consultancy companies. Yet, they all have an overwhelming desire to get out and ‘experience’. This pattern is repeating in many millennials across the industry. But why is this happening and what does an exodus of nearing or recently qualified professionals mean to companies and the wider industry?

Millennials currently make-up around 50% of the workforce and typically span between those born in 1980-2000. Even within this range their exposure to the internet is greatly varied. Some will remember the old dial-up tone whilst others have only ever used fibre optic connections. Regardless, there is a consensus in the industry that millennials are ambitious, over-confident and impatient which ultimately results in them leaving their careers. My suggestion as to why is linked to the internet and accessibility of global mobility.

It is a human tendency to keep up with the Joneses. But what happens when the Joneses are no longer just the people who live next door, but your entire extended network? We are comparing ourselves against the best bits of everyone we know and trying to shape all of that into our lives, but that it just simply not possible. Or perhaps you can have the career, the house, the freedom, the wedding, the cat, the full season skiing, the scuba diving lessons, the volunteer farm work, all whilst looking impeccably flawless. We constantly consider ourselves uniquely disadvantaged to our peers and this makes us dissatisfied and constantly striving.

Never before has a generation had such exposure to other cultures and possibilities. Post A-Level gap years are now commonly accepted and often expected. Whilst these young adults are off finding themselves, they are also discovering cultures, new perspectives and ultimately more

Millennials – the unforeseen business risk?

opportunity. This experience may not only whet the appetite for more travel, it also shows us that we don’t have to accept the status quo, as was earlier more common, so we can appear more ambitious.

Available data shows we are starting families much later in life. Perhaps previous generations also felt an urge to ‘get it all out of their system’ prior to settling down, but with earlier first child ages, they simply wouldn’t have had the capital to go off into the distance. Additionally, the renting culture allows for a flexibility that owning a house perhaps might not. As such, millennials are in a unique position to take the opportunity to leave, which was not on offer to previous generations.

I’ve heard many senior management refer to millennials as not respecting authority and hierarchy in the same way as ‘the good old days’. I agree, perhaps millennials are more prone to respecting a person if first given reason to, rather than simply respecting the title. I’m sure there are many reasons for this, but one potential explanation to this perceived over-confidence is the ability to Google.

Traditionally, your knowledge grew because you had experience or read or consulted a specialist. Now we have the world’s knowledge immediately at our fingertips. This presents a false confidence as millennials feel they can

progress with the safety net of the internet to support them, developing a certain career-progress impatience. However, there is a huge difference in capability and understanding, between first-hand knowledge and a Wikipedia check and this needs to be understood.

Therefore, increasing exposure to more possibilities, more knowledge and postponement of achieving big life goals is resulting in those reaching nearly middle management to leave the industry. This presents a substantial and potentially growing risk to the industry, particularly in a time when the skills gap is growing. Could the late 20s exodus soon be as common as the late teen’s gap year? Can anything or should anything be done in the industry to prevent this?

We will discuss this in a future *Infrastructure Intelligence* article.

Rebecca Wooding is the national vice-chair of the Progress Network for young engineers and a hydropower engineer with Mott MacDonald.





Millennials want to work in a business that makes a positive contribution to society. What better job than transforming Britain's outdated Victorian rail infrastructure, says *Clair Mowbray*.

By 2020, millennials are set to make up 50% of the global workforce which raises a pertinent question – are we doing enough to prepare young people in the UK for the economic challenges they will face and equip them with the skills they need to have a successful career?

Millennials, born between 1980 and 2000, are entering employment in vast numbers and they will shape the world of work for years to come. The importance of the group certainly hasn't been lost on UK government who recently published a 50-page *Guide to Millennials* for MPs. With more than £500bn worth of UK infrastructure projects currently in the pipeline, we need to engage with millennials on their own terms to encourage more young talent to actively pursue a career in infrastructure as their first choice rather than something they fall back on.

Attracting these workers will be critical to the future success of UK infrastructure projects, especially in the rail sector where one in five rail engineers are currently over 55. We have an annual shortfall of engineers and technicians and this has increased by 25% to 69,000. While the government has recognised this growing skills gap and the need to encourage young people to join the industry, plenty more still needs to be done.

The millennials' career aspirations, work attitudes, and knowledge of new technologies are defining culture in the 21st century workplace. In order to engage them, we must excite them by responding to their aspirations and offer appealing career pathways. As the *Deloitte 2016 Millennial Survey* outlined, this generation wants help developing leadership skills and to work in a business that makes a positive contribution to society. In this context and

High Speed Rail – the career of the future

with major projects such as HS2 underway, working on a once-in-a-generation infrastructure scheme to replace Britain's outdated Victorian rail infrastructure is surely an offer that millennials will find hard to refuse.

One of the defining features of the millennial generation is their affinity with the digital world. This is the first generation to enter the workplace with a better grasp of the latest key business tools than more senior workers. All of this will be vital to the development of future industries and particularly rail and infrastructure.

The National College for High Speed Rail is preparing to educate 1,300 learners annually across its Doncaster and Birmingham campuses. We're getting ready to provide the kind of training and support that the millennial generation really needs and are confident that our innovative approach to teaching will not only help close the skills-gap but also inspire millennials to become industry leaders of the future.

A recent report has shown that 80% of millennials hope to leave their current job as they see career progression as more important than loyalty. Our challenge as an educational institute is to show this generation that the rail industry is a fast-moving sector with plenty of opportunity and jobs.

With HS2, on the horizon, our college

will be supporting the demand this project will create. But the transferable skills and expertise will be applicable to all future rail and infrastructure projects. With a campus in Birmingham we will be at the heart of the Midlands. Our Doncaster campus is in the heart of a town that has a strong rail heritage that continues today with more than 200 rail-related businesses accessible across South Yorkshire.

Our courses will encourage diversity in the industry by encouraging more women and other underrepresented groups to enter the sector. The stereotypical image of hard hats, overalls and unsociable hours has a huge influence on career choices and decision-making. In 2013/14 just 18.2% of applicants to engineering degree courses were female. This is representative of a significant lack of diversity in the engineering sector.

With more than half of businesses expecting difficulty in recruiting STEM-skilled staff in the next three years, we cannot take a laissez faire approach and expect millennials to step up to the plate. It's now our job to empower this next working generation with the capabilities, education and opportunities to thrive in their careers and add value to the businesses that employ them.

Clair Mowbray is chief executive of the National College for High Speed Rail. For further information visit www.nchr.ac.uk



Volunteering is a key part of the life experience of millennials and it enables young professionals to make an impact in the infrastructure sector in the early days of their careers, say *Anastasios Stamatis* and *Petros Kkolas*.



The era of active citizenship



Helping others in need, devoting your free time, improving a community and providing relief during a crisis has been an often overlooked but integral part of the human race. Our history is filled with volunteers who followed their instinct of compassion and helped shape our world to what it is today.

According to the 2016 *Millennial Impact Report*, volunteering is one of the key ways millennials use to act as catalysts for societal change. And with good reason; being passionate about the resolution of an issue you care about can give you cause, meaning, and a rewarding sense of fulfilment.

Who would not be impressed, for example, by Let's Do It! World, a network of over 16 million volunteers from 116 countries who undertake national environmental clean-ups. All the clean-ups within a country take place on the same day and the ever-growing success of the campaign has led to the first planet-wide clean-up day being scheduled for 2018. Or consider the brave volunteers from all over Europe and the world, joining forces in Greece to help Syrian refugees who put themselves and their families in danger, to escape the horrors of war in hope of a better life?

Through Bridges to Prosperity, engineering professionals and students have volunteered in the construction of over 200 bridges in 20 countries.

And landing a bit closer to our own industry, what about Bridges to Prosperity, set to diminish rural isolation by building footbridges to provide isolated communities with access to essential health care, education and economic opportunities? Engineering professionals and students have been involved as volunteers in the construction of over 200 bridges in 20 countries, improving the lives of nearly a million people.

This potential of making the world a better place through purpose and passion for change has also been acknowledged by the European Union. Last December, the European Solidarity Corps was established, supporting young people in projects that benefit communities all over Europe.

So what is it that drives millennials to devote their time to a cause they care about? According to the *Impact Report*, the answer is the cause itself. With the credit crunch being a major part in the first steps of our adult life, we saw organisations and leaders rise and fall in an instant. We experienced the truth

behind the words of Heraclitus, the Greek Philosopher that “everything flows”. In an ever-changing world, values and ideals are the anchors on which we set our dreams.

According to the 2015 *Impact Report*, 77% of millennials would be more likely to volunteer if they could use their specific skills or expertise to benefit a cause. As an industry, we need to understand this potential. In our industry's professional bodies we highly value the input from members with infrastructure-specific knowledge and skills who can help improve our industry and the society.

Volunteering with a professional body is an opportunity to test and sharpen our organisational skills, our communication methods and our affiliation with modern technology. Organising events to spread the knowledge around key infrastructure topics brings together a set of like-minded individuals. People of all ages, established thought leaders, or leaders in the making. Like pieces of a puzzle, when they are together they can uncover the big picture and help the industry go forward, breaking stereotypes.

We have to keep working towards a more open, more inclusive industry and for millennials this comes through peer to peer engagement, as nothing is more powerful than personal contact. Putting names to faces of our industry's leaders and understanding their drivers and views can help us understand our own future too.

Above all, this participation gives us purpose. By understanding the industry, we are in a position to raise awareness, to connect and to act. And we are able to speak our mind, to influence change, to make an actual impact in the infrastructure sector on the early days of our career.

We are not just industry newcomers within our professional bodies; we are proud volunteers trying every day to uncover the map of infrastructure, connect with our peers, and make a positive change in people's lives.

Anastasios Stamatis is a graduate engineer at BWB Consulting and chair of Progress Network Midlands. Petros Kkolas is a graduate engineer at Waterman Aspen and vice-chair of Progress Network Midlands.



The onus is on employers in the infrastructure sector to attract, retain and develop millennials through alternative work models and career mobility to keep them energised and engaged, says *Dugald McIntosh*.



Attracting, retaining and developing millennial workers

Whether we look at transportation, construction or engineering, each sector is going through a digital revolution, with technologies such as automation, robotics and artificial intelligence transforming how projects are assigned and carried out. As a result, organisations are increasingly relying on skilled workers who have the capacity to learn new processes and technologies to ensure that critical projects can be completed on time and within budget.

Yet, this is not a straightforward procedure – a recent study found that 40% of employers are having difficulty filling jobs. Businesses admitted they were experiencing the most marked tech talent shortage in a decade, with employers singling out engineers as one of the most difficult roles to fill.

Employers within the infrastructure industry should therefore be looking at new ways to source this talent, starting with millennial workers. This generation, which will make up 35% of the global workforce by 2020, are a great asset for employers to tap into.

At the same time, the growing gig economy has given this generation an appetite for new challenges and portfolio-style jobs, with recent research revealing that nearly two-thirds of millennials believe less than two years is the 'right' amount of time to stay in a single role before being promoted or moving on to another. The onus is therefore on employers to attract, retain and develop these individuals through alternative work models and career mobility to keep them energised and engaged. So, what can employers do to achieve this?

Be open to alternative work models

Millennials want more choice over where, when and how they work. Gig working and digital platforms are making it easier for professionals to pick and choose short-term contractor roles that suit their lifestyle. This is particularly beneficial for those individuals working in construction and transport, who don't want to be tied to a single employer. And from an employer perspective, embracing this type of workforce enables them to tap into global top talent more easily and plug any resourcing gaps they may be facing.

Recognise that there is no silver bullet for training

Millennial workers' more flexible way of thinking should be embraced across all aspects of the business. Looking at training, organisations should respect their employees' diverse needs and ways of learning. A multi-channel approach is therefore a vital part of motivating staff, as it provides the ability to learn and develop skills in new ways.

Virtual and augmented reality training programmes are two examples that showcase the future of training and are better suited to more technically-minded individuals, but traditional, more hands-on tactics, such as face-to-face training or a classroom-based approach, are more appropriate for others. This type of training enables employers to use regular catch-ups as a chance to review development and coach employees on the job – which is better suited to those who are practically-minded.

Provide continuous opportunities to up-skill

For many, career security is critical. Because

of this, some millennials are increasingly seeing in-demand skills as an enabler to climb the corporate ladder and secure long-term employment. They understand the key to remaining employable over longer working lives is through upskilling and continuous development and are focused on learning technical and interpersonal skills. Employers should provide supportive development and training initiatives that enable crucial upskilling opportunities. By also sharing examples of employees who have progressed through on-the-job learning, it shows people what's possible.

Focus on variety and mobility

To keep employees energised and engaged, employers should aim to create a working environment that encourages staff to be involved in multiple projects. With different assignments requiring different skill-sets, this technique is designed to widen understanding and professional experience, keeping employees motivated.

Working with the millennial generation can be invaluable to employers within the infrastructure industry, as it gives them direct access to an enthusiastic workforce who are adaptable and keen to learn new skills. Ultimately, this attitude can help organisations to keep up with the pace of the digital revolution. To stay ahead of this curve, organisations need to both future-proof their workforce and give their employees career security. If these requirements are addressed, businesses will improve engagement, retention, speed to competency and ultimately, their bottom line.

Dugald McIntosh is head of professional resourcing and workforce solutions provider, Experis Engineering.

Ministry of infrastructure improve delivery



A new report has called on the government to take key steps to improve the delivery of UK infrastructure. *Andy Walker* reports.



Infrastructure leaders have called on the next government to form a new ministry for infrastructure as part of a ten-point plan to improve the delivery of UK infrastructure and boost economic productivity and growth.

The recommendations have been outlined in a new report, *Cities and Infrastructure: Ensuring infrastructure continues to drive the UK economy*, produced by global infrastructure consultancy WSP in collaboration with the Association for Consultancy and Engineering and Infrastructure Intelligence.

Key new actions include the creation of a dedicated infrastructure minister, further devolution of fiscal powers to regional powerhouses, and the development of more economic corridors that better connect cities.

The ten opportunities outlined for government were developed following an industry survey and a series of round tables held last year by WSP and

Infrastructure Intelligence of 152 infrastructure industry executives.

The ten measures outlined in the report are:

1. The establishment of a minister for infrastructure to provide a clear, strong focus in government and who could head a fully-fledged national infrastructure department.
2. The empowerment of metropolitan leaders to become local clients with powers and financial resources to produce comprehensive local development plans.
3. The devolution of fiscal power to London, Birmingham, Manchester, and the other big UK cities.
4. Facilitating the connectivity within and between cities to develop better connected economic corridors and nodes that will act as growth promoters.
5. Migrating to a more stable long-term pipeline of infrastructure projects to

give the private sector greater investment confidence. Five-year investment-cycles have proved unable to facilitate long-term infrastructure provision.

6. The social value of infrastructure (jobs, schools, hospitals, etc.) should be made more obvious to the public.
7. New structures and governance models must be implemented that will facilitate regional integration and strategic planning.
8. New place-based identities that will promote cities and regions and help attract investors. (Cardiff Capital Region comprises three enterprise zones in which the Welsh Government is prioritising investment in business infrastructure).
9. Making infrastructure more resilient to climate change.
10. A greater focus on brownfield sites to allow more efficient land utilisation.

The industry survey found that:

Politics and industry need to work together



Construction professionals and politicians need to work more closely to ensure that the UK plans and delivers the infrastructure it needs, says *Stephen Hammond MP*.

This government understands that infrastructure can drive economic growth. It is clear that more productive economies and those with higher economic growth potential generally have better infrastructure.

The speed of technological change means that some of the infrastructure you might build in cities is no longer the conventional infrastructure that you see but I think that people are going to have to be receptive to other methods of transport. In certain urban centres it may be that fast walkways and driverless pods will play a

More needed to delivery and boost growth



- 80% thought that the public does not understand the role of infrastructure in enabling growth.
- 72% thought that cities should have greater fiscal/revenue control and decision-taking powers on investment priorities.
- 94% thought that the government should not put off investment decisions until there was greater certainty on Britain's relationship with the rest of Europe.
- 79% said the quality of our cities and the public realm will be of increasing importance in increasing our national competitiveness should we leave the EU.

Commenting on the report, Ian Liddell, managing director for planning & advisory, WSP, said: "Infrastructure is an enabler of growth, drives the economy and ultimately our national prosperity. There is cross-party

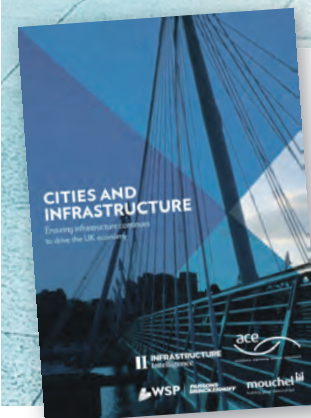


Ian Liddell

understanding of infrastructure's importance, so we would like to see politicians on the campaign trail demonstrating their commitment by explaining at a national and local level how they are going to deliver the measures we need to become a more competitive and productive country. "We hope that this paper contributes to the debate on how government and the private sector can collaborate to improve the delivery of UK infrastructure and ensure that cities continue to provide the social and political environment that drives the nation's prosperity."

Nelson Ogunshakin, chief executive of the Association for Consultancy and Engineering, said: "We are living in rapidly changing times characterised chiefly by technological progress and rapid urban population

growth. These two challenges alone are exerting huge stresses on our towns and cities. We can at least relieve these pressures by ensuring we have the right infrastructure in place delivered at the right time and at the right cost to society. But to achieve this will require from both industry and the government an on-going rapport that is well-informed, joined-up and all inclusive."



Cities and Infrastructure: Ensuring infrastructure continues to drive the UK economy

Download the report at <https://goo.gl/x2nzwD>

part in the future. It may also be that we have a much different view in terms of how electricity is provided so that you see much greater capture of solar power which is then fed into the grid because of the increase in battery technology.

And what do we mean by infrastructure? It is road and rail but also housing, broadband expansion and how we deliver energy. So we need to keep open minds to infrastructure in the wider sense of the word.

The good news is that the National Infrastructure Commission aims to give

you cross-silo thinking, which is important. Where we fail institutionally at present is that we do not have a minister for infrastructure, let alone a department for it, and that is really a problem because at a political level it needs a champion. Some argue that should be the chancellor and at one level it should be but at another level you need a minister to drive infrastructure in this country.

It is not at all clear yet that the Infrastructure and Projects Authority (IPA) is doing what it should be doing in making the government a more intelligent client

that allows us to design, specify, procure and then manage. We have made a start but it has not gone far or fast enough and therefore perhaps not having the political drive behind the IPA is an issue that we need to consider.

In terms of Brexit and the changing global economic climate, there are issues that we will have to confront. One is whether we will still have the access to labour? Is the government still going to have the vision to keep infrastructure at the forefront of driving economic growth

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in the future? Industry then needs to think about why it is that other countries attract overseas investment, including pension funds, yet in the UK we still do not have any real systematic way of getting private sector money into some of the bigger government schemes. Some of the net investment we get back from Europe funds infrastructure in this country and that is clearly not going to be there in future so in a post-Brexit world how we fill that gap is key.

A key challenge we face is that

government does not have the expertise to design, specify, procure and manage projects. Some of that can be bought in but archetypally, if you look at the transport industry, who in government can say whether a project is the right one or is at the right cost? The solution is for the IPA to attract a cadre of people in from industry, probably on five to seven year contracts, who have completed projects and who can ask the right questions and give the right advice. This needs to happen so that government can become the intelligent client.

A number of things come from that. First, we will have projects that are more likely to be delivered on time and on cost. Second, industry knows that it does not need to overbid for government ineffectiveness, and third, you can probably start to develop a slightly longer pipeline and offer some security for business.

Stephen Hammond is MP for Wimbledon and a former parliamentary under-secretary of state for transport. He is also chairman of the all-party parliamentary group on infrastructure.

Creating positive pressure to make things happen

The regional political challenges in delivering the infrastructure the UK needs are many, but *Lord Heseltine*, one man who has been there and done that, thinks they can be overcome.

To deliver effectively on the ground, cities must first get themselves into a structure that is accountable and effective, because in order to develop the potential of the city region you need leadership and an administrative machine. You need this to do the job and create the confidence to encourage the devolution in the first place.

The structure we are pursuing at the moment is a sub-regional structure. The combined authority is the larger of the effective vehicles that we are creating, but of course as we have seen with the Northern Powerhouse, you can have an accumulation of combined authorities in order to produce a regional relevance.

It is all about being part of a democratic process but huge forces are at work resisting it and they are not going to give in easily. It is therefore a question of creating pressures that prevail. But talking is easy. I have spent 40 years of my life trying to achieve it with very limited results compared to what we need, what we should have and what every other country has got. I started off in the 1960s when we had 1,400 local authorities. We are now down to 400. We need 60.

In the past six years we have made more progress than in the rest of my life and it is an ongoing process. You see that in conversations that have been successfully concluded – the Northern Powerhouse, the Midlands Engine and in one or two other areas. Other ongoing discussions have a high prospect of being concluded and the process is underway, but there are challenges.

Devolution is not an absolutist concept, it is a partnership, so a balance must be struck with national needs as far as infrastructure investment is concerned. There is a role for central government in providing the main arterial connections but that is not to say that they cannot do it in conjunction with a well-informed local power base.

In terms of funding development, the financial institutions want risk-free money and the Treasury wants to pass on the risk. Putting risk into the negotiations is always the stumbling block. We need to develop prototypes that the Treasury has approved in advance.

Surely there has to be a way of getting the private sector to commit to projects? I have a solution. For example, if you are

going to build a public sector project for £100, then you go to the institutions and you say this is a £100 project. If it was done in the public sector it would carry all the cost overruns. So we will agree it is a £100 project and cost overruns will remain in the public sector. But the private sector is only prepared to put in £40 of the £100 because the rest is negative value. So we agree to that. The consequence is that the public sector is left with £60 investment and the overrun but it has got £40 from the private sector. I do not see why deals like that cannot be done because the public and private sectors know exactly what they are getting – a £100 deal for £40. The answer lies in the Treasury – it must come up with the schemes.

There is every sign that the government is pursuing a devolution agenda. I would wait to see how comprehensive it is but there are no grounds at all for thinking that the big urban conurbations will not pursue a devolution agenda. I have no doubt that if the government could get Newcastle and Leeds over the line with their deals then they would leap at it.

Where the infrastructure sector can play a role is that you should be making a big scene. “Why is my city being deprived of a devolution deal and all that entails because of the ‘amour propre’ of the little guys who run our councils?” That will get you a big story in the local press. It might make you enemies but it needs to be done.

Lord Heseltine is a former secretary of state for defence, environment and trade and industry and most recently he was a special advisor to the Cameron and May governments on regeneration and devolution issues.



“In order to develop the potential of the city region you need leadership and an administrative machine.”

Lord Heseltine

Replenishing the water talent pool



Creating a more flexible workforce will help the water sector meet the tides of change and fill gaps in their talent pool, says *Manjinder Mann*.



The water market in England and Wales is now changing faster than at any point since the regional water authorities were privatised around 30 years ago. Deregulation has now ended the monopoly of regional water provision for businesses creating the world's largest competitive water market.

At the same time the utilities are also investing more to improve Britain's ageing water infrastructure. Severn Trent has embarked on the largest engineering challenge in its 32-year history by investing £300m to improve the 100-year-old Elan Valley aqueduct which brings fresh water from Wales to Birmingham. Anglian Water will invest a further £425m this year as part of its £5bn programme to maintain and improve water and sewerage services up to 2020 while Yorkshire Water is investing £3.8bn in services to 2020.

These investments and many more besides will help to maintain water supplies and reduce water leakage. While a great deal of progress has been made to reduce leakage by a third from their highpoint in 1994/95, the rate of improvement has slowed as the latest figures from the Consumer Council for Water show leakage only reduced by 1.4% to 3,087 megalitres a day in 2015/16.

While the tides of change are flowing through the water sector, the utilities will not be able to make a success of it unless they adapt their organisations to meet the challenge of change.

One of the key problems the water industry faces in meeting these challenges is an ageing workforce. The Energy and

Utility Skills Group have previously noted that due to retiring workers and significant capital expenditure programmes, in particular in new technologies, the gas, power, waste management and water industries, need to recruit tens of thousands of additional staff. The skills gap Britain faces is only going to widen across all sectors when we leave the European Union.

To meet these challenges water providers need to put a plan in place to reach their improvement targets and fill the gaps they have in their talent pool. Key to this is creating a more flexible workforce.

While more than 40% of NES Global's permanent recruitment business occurs in the infrastructure and construction sector we are already noticing more and more firms turning to contractors to help them manage periods of change and uncertainty.

Hiring contractors provides a number of advantages when compared to taking on permanent staff during such times. Using contractors means you're much more likely to find 'plug and play' candidates that will add value to the business instantly – rather than taking the time to train up permanent staff. Contractors also remove significant costs to businesses by removing the need to pay for staff National Insurance contributions, pensions, holiday pay, as well as healthcare and other staff benefits. Contractors also reduce the cost of recruitment fees compared to permanent hires.

Building a team of trusted contractors can help utilities to react quickly to tackle new projects and to launch new teams to

embrace the new opportunities created by water market deregulation.

Whether hiring contractors or permanent staff, there are other things that can be done to increase workforce flexibility. The kind of terms and conditions that can be inserted in the contracts of permanent and temporary staff include:

- **Mobility and movement:** To allow staff to move to another location or to other reasonable day to day work if required.
- **A project completion bonus:** This can incentivise a workforce and for employers also reduce costs if any workers leave before the project has been completed.
- **Annualised hours:** if your business has major peaks and troughs throughout the year, you might look at averaging out hours across the year for some or all employees whereby staff would work reduced hours during quiet times, and increased hours during peaks but the employee would be paid in equal instalments throughout the year.

It is important for water utilities to remember that they must remain attractive in the battle for talent, however as they build their workforce for the future, flexibility should be at the heart of everything they do.

As the saying goes: "It's not the strongest or the most intelligent who thrive, but those who can best manage change."

Manjinder Mann is operations director at NES Global Talent.

Trusting people to make a difference in the world

Engineering, environment and design consultancy Sweco UK has enjoyed a successful 12 months since its rebrand from Grontmij in April last year. *Andy Walker* visited Leeds recently and spoke to Max Joy, Sweco's UK managing director.

You can't help warming to Max Joy. Easy to talk to, personable and honest, the former army man is thriving since he took over at the helm of the UK division of Sweco a year ago. So, how has he found his new role and is it what he thought it would be?

"I haven't had a lot of time to sit down and reflect but three words describe how I feel about the last year," says Joy. The first is uplifting. I came from a job that I was in for almost 30 years and loved every minute of it and the decision to change jobs – not professions as I'm a mechanical engineer – was a big decision for me and my family. I wanted to go into a job which felt as if it is making a difference and I can honestly say for the last year I have loved it; the Sweco brand, the company, the culture is fantastic. So, uplifting.

"The second word is exciting, because the people, opportunities and the type of work we do is really exciting and the third is challenging, because for six months it felt as if every day was a school day and I was learning something new," he says.

Making a difference is clearly something that's important to Joy. Coming from an army background, why did he choose this role and what skills and experiences has he brought from the military? "As an engineer we have a broad range of experience," says Joy. "And when I looked at what Sweco does – we plan and design cities and communities of the future, connect people and carry out sustainable engineering, it's fantastic. It really makes a difference. I just thought, what a great company to work for. It's about the people you work with and the work that you do," he says.

Joy says that the people aspects of his role at Sweco are similar to those he developed in the army. "Consultancy is all about relationships, building them and keeping people engaged. Motivating people and bringing them with me is a key skill so there are parallels there with my previous

role. And I have been very impressed with the people here. They are all highly motivated," he says.

Joy also says that instilling an attitude in people of "being better than our competitors and better than everyone else," is a key part of success in the consultancy business, but not in an arrogant way, more from being proud of the work that people do. I ask him about his management style. "My approach is pretty relaxed," he says. "My default is to trust people and to allow people to make decisions and I think the people around me thrive on that, relish the opportunity to make decisions and not to be told what to do," he says. Joy is certainly relaxed and you feel at ease in his presence. I can't help feeling that this is someone you'd want to work for and with – an essential attribute for any leader.



Max Joy,
Sweco's UK
managing
director.



Looking back on his first year in office, Joy says that his main remit was to gain an understanding of where the business was, its outputs and key work, and also to get a handle on the company's relationships with its clients. "I think I have broadly achieved that," he says. "From a Sweco Group perspective I wanted to understand where the business was under Grontmij, understand where Sweco is, understand how you bridge that gap and integrate the company into Sweco, its culture, processes, and people and start creating firm foundations to grow the business," says Joy.

Joy says that integrating Grontmij into Sweco was relatively easy because people wanted it. "People were open to change and with Sweco there was a real opportunity – to be modern and fresh and to shout more about what we do," says Joy. He also says that Sweco's Swedish culture of teamwork helped the process too. "Swedes are far more 'teamy' than the Brits," he says. "They also talk about simplicity with not too much process. Simple documents, direction and



decentralisation is very much the approach. They are saying things that we want to hear,” says Joy.

Notwithstanding that, Joy says that integrating Grontmij with Sweco “hasn’t been painless”. “We are not there yet,” he admits. “The Swedes are very keen on empowering people from the lowest level and we weren’t like that; we were quite hierarchical,” he says. “The Swedes like small teams and work through teams of teams and we have had to restructure our business and move people around. Some people are now leading smaller teams and this empowers as many people as possible. It’s not about leading as many people as you can. Smaller teams mean leaders have more time to manage and talk to people,” says Joy.

Sweco has just over 750 staff in the UK with over 200 based at the Leeds head office. Turnover last year was £57m and the budget for the coming year is £62m. I ask Joy about Sweco’s plans for the UK market and the key growth areas they are targeting. “We are really strong in buildings and transportation

Photos: Fosters+Partners / Forth Crossing Bridge Constructors / Euan Brownlie

Three examples of Sweco’s work. Above: The iconic Bloomberg building in London.

Below: The Queensferry Crossing and the British Antarctic Survey.



and are pleased with the growth and turnover there and will build on that,” he says. “The areas where we are less strong – water, energy, environment and asset management – are areas we are really going to focus on in the next couple of years. We have recently broken out energy and environment to form their own business units to give them added focus,” he tells me.

As a firm based in the north, Joy said that he thought Sweco was well placed to capitalise on the increase in investment coming to the region. “Our brand in Edinburgh and London is good but our brand in Leeds, where we have our head office is less well known,” he says. “We intend to build our brand and up our game in Yorkshire and Leeds. We are well positioned and the Northern Powerhouse and Transport for the North is a real opportunity. We can play a key role in making things happen,” says Joy.

Sweco has big ambitions for its operations in the UK. “In the Nordic countries Sweco are the market leaders, as well known as IKEA,” says Joy. “In terms of turnover we are probably 14 or 15 in the UK. Sweco want us to be a market leader in the UK and that’s a 10-15 year vision. Our challenge is to build our brand, keep winning work and convince potential clients to not go to the usual suspects but to come to us. People are beginning to look at Sweco. Our name is coming up more and more, we are being talked about and we are winning some good work,” Joy says.

That work includes buildings in London like the iconic Bloomberg building, “a fantastic building that we are very proud of” says Joy, the land-based work on the Queensferry Crossing, a raft of Highways England work and Sweco’s work for the British Antarctic Survey, “sustainable, good for the environment and making a real difference,” says Joy.

Sweco is also very active in the water sector and energy sectors where it works with the majority of water companies in the UK and the company is also involved in over 50% of onshore UK windfarm work.

Joy says he is excited by the prospects for the future and in showing the Sweco difference to clients. So what is that difference? “Two things,” he says. “First, the culture. The vast majority of people want to come and work for a company where they feel valued, that they are going to be developed and feel part of a team. That’s what we are trying to do here. The second is the engineering challenge. Join us, work with us and make a difference in the world. Why would you not join Sweco and want to do that?”

Joy says it’s people that make a difference and when you hear him talk about those he works with at every level of the business, you know he means it.



Since being established in 2007, UK Flood Barriers has grown to become one of the UK's leading specialist flood contractors, project managing multiple high profile contracts across domestic property schemes for both public and private sector organisations at any one time.

Based in Worcestershire, UK Flood Barriers chief executive, civil engineer Frank Kelly, had witnessed first-hand the misery that flooding causes which led him to set up the company with the express aim of sourcing and installing the best flood protection products on the market.

The company's USP says Kelly lies in being able to provide innovative and cost-effective flood barriers in a market where few have specialised in that field.

"Truthfully, in the flood defence market there's not many specialist contractors," Kelly tells me. "We carry a design and build team so we are traditional contractors but we got out of it in 2007 to specialise in flooding. It's on cost where we add value. Most manually operated defences have to be put up 'just in case' so the lifetime cost is literally unquantifiable. Our system has zero operational cost and minimal maintenance because it's stored underground constantly. There's no UV deterioration and it's vandal proof so it's a passive, lifetime cost zero product and price comparable to any system out there," says Kelly.

The company's success in securing work in the US came as a result of an internet search. "After Hurricane Sandy hit in 2012, we were approached by

Making waves in flood defence here and across the pond

UK Flood Barriers is blazing a trail in flood resilience at home and in the United States of America, where the company recently installed the first self-activating flood barrier in New York. *Andy Walker* spoke to the firm's chief executive, Frank Kelly.

Ennead Architects, who work directly for New York University, who had been looking for innovative flood defences on the internet," says Kelly. "They wanted to know what was on the market outside the US and they reckoned we stood out. As young as our company was, we'd had our systems tested by Bristol University and we were right at the forefront of passive flood defence," says Kelly.

"We had proven products that had been used and at the time we had also just completed the biggest passive system in the world in the UK for the Environment Agency at Cockermouth. Ennead invited us over and we started working with them pretty much from the

get-go. They wanted a passive system with no power, no human intervention and literally zero operational cost," he says.

UK Flood Barriers started working with Ennead and redesigned the foundations of a number of the large projects they were working on and things have moved on since then. "We now have the US Army Corps of Engineers working with us and we are doing design work for the Holland Tunnel in New York and lots of other different projects, which is quite nice for a little company from Droitwich," says Kelly.

In March this year, Kelly's company installed the first self-activating flood barrier in New York to protect the brand new New York University Kimmel science block and medical centre on the banks of Manhattan's Hudson river. The company was originally engaged in 2016 by US contractor, Turner Construction to install the self-activating barrier at the university site. As part of a campus transformation project, the NYU science building is a new facility encompassing more than 365,000



Kelly's company built the biggest passive system in the world at Cockermouth in Cumbria.



square feet and 10 floors of laboratory space dedicated to medical research.

“I’m really proud to be partnering with US manufacturers and suppliers to introduce this world-beating British technology to the US flood mitigation sector,” says Kelly. “The 30m-wide self-activating flood barrier installed at the science building will be ready to deploy at all times, providing 2.5m high flood protection to the main entrance of the new building. “The barrier is self-contained underground when not in use, bringing the benefits of minimal maintenance, being vandal proof, having no restrictions to vehicle or pedestrian access and having no costly storage and delivery charges in times of flood,” Kelly explains.

The project has been several years in planning and getting UK Flood Barriers involved in the early design stage allowed the building’s foundations to be designed to include the installation of the self-activating flood barrier. A second 68m-wide barrier is also being installed at NYU Langone Kimmel Pavilion, a new state of the art hospital/ medical facility due to open in 2018.

As well as being passionate about his company and the work it does, Kelly is also an advocate for the wider flood defence sector and in helping people protect themselves against flooding. He was a prime mover in setting up the Flood Advisory Service, a not for profit organisation offering free, independent advice on flood mitigation solutions to high-risk communities.

“In 2010 I saw that the biggest issue for property level protection in the UK was the

total lack of awareness by the general public of what is available,” said Kelly. “I tried to persuade the Environment Agency that setting up an advisory service was a good way of getting homeowners to protect themselves because if you give people the right information they will take action. Things continued on but nobody would back it so in 2015 I stepped in and agreed that UK Flood Barriers would be the primary sponsor of the Flood Advisory Service because I wasn’t waiting any longer for it to happen,” he says.

Kelly is clearly proud of the work of the service. “In one year the Flood Advisory Service came into contact with and helped over 30,000 people at a cost of less than £3 a person,”



Installing a flood barrier this year to protect the brand new New York University Kimmel science block and medical centre on the banks of Manhattan’s Hudson river.

“In one year the Flood Advisory Service came into contact with and helped over 30,000 people at a cost of less than £3 a person... It is there to help homeowners ... and push standards.”

Frank Kelly



he says. “The Flood Advisory Service is there to help homeowners and make them aware of any British Standard kite marked product. It is there to push standards because one of the key issues in this sector is a total lack of regulation and standards,” Kelly says.

Kelly and UK Flood Barriers are also key players in the UK Flood Partnership, an organisation set up to support the growth of a high quality, UK wide flood defence industry. Providing a unique forum for engagement, the partnership was the first ever attempt to bring together like minded organisations to help tackle flooding.

“Historically our sector has been extremely fragmented and what you had was small manufacturers who had no understanding of construction that were very protective of their products,” says Kelly. “What I wanted to do was bring the sector together and last year we started getting really good traction with Arup, Royal Haskoning, Atkins and loads of the other big players that wanted to learn how small companies were getting involved in big projects around the world. The EA and Defra came on board the steering group and things have progressed from there,” Kelly says.

Looking to the future, UK Flood Barriers’ acquisition of Sunderland-based Arktek’s Flood Division is a real statement of intent. The Arktek Flood Defences team will operate under the newly formed UK Flood Barriers Northern brand securing and delivering projects in the north east and north west of England and also Scotland. “Our partnership with Arktek is a critical component of our long term vision,” says Kelly. “As a company with a great pedigree and a growing reputation in the flood sector, they were a natural choice to take on responsibility for UK Flood Barriers Northern working out of their existing Sunderland offices,” he says.

Looking back across the pond, the company’s success in America has led to the setting up of a US arm of the business, US Flood Barriers, with offices in New York. “The company will work in the US, partnering with US manufacturers and suppliers, to bring our world-beating technology to the forefront of US flood mitigation, so we are now proud to be able to state ‘made in America’,” says Kelly.

The future certainly looks bright for the company with prospects for new business increasing rapidly. “I see flood protection as easily the fastest growing sector for the next generation worldwide,” says Kelly. It’s certainly the case that in Frank Kelly, UK Flood Barriers and the flood defence sector has a real enthusiast for the work that it does and the people and businesses they help.

Change is coming; let's meet it head-on

Knowledge management, digital trends, innovation and collaboration were some of the key industry issues discussed at a recent executive roundtable organised by *Infrastructure Intelligence* and supported by BST Global. *Andy Walker* reports.

Any discussion on knowledge management, creativity and innovation in the infrastructure sector will inevitably highlight people issues and that was certainly the case amongst the industry leaders that attended a recent roundtable at The Shard in London.

A key question posed at the event was how should the professional sector leverage intellectual creativity for competitive advantage and use digital capabilities to deliver growth and improved operational efficiency?

A changing business environment was creating challenges and also opportunities, according to Adrian Griffiths of architects Chapman Taylor. "Historically professionals wanted to protect their knowledge because it gave them a competitive advantage," said Griffiths. "I think life is very, very different these days and obviously with the internet and the web it's very easy to get access to knowledge. Life is becoming more and more competitive, with clients expecting more for less, but if we as an industry don't worry about sharing, use it to our benefit and change the way we look at things, then I think that will help us to be more competitive. We have a chance of being more competitive if we are all a lot more collaborative and share information," he said.

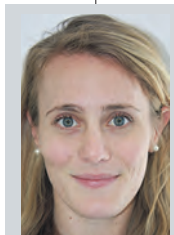


Adrian Griffiths: "More competitive if we collaborate and share information."

However, sharing information and collaboration was often easier said than done, said Alex Janzen of Atkins. "I've been at a few meetings recently where a lot of people have agreed round the table that they should share information and work more collaboratively, and that's great, but as soon as they walk out of the

room they are back into competition! So I'm interested to know how people would transition the strategy of collaboration into the operational delivery of collaboration," said Janzen.

Many of those round the table thought it was a trust issue and more than one participant made the point that people who trusted each other were very willing



Rebecca Wooding: "Open source data is not really done in our industry."

to share information. Firms needed to build a level of trust to be in a position to share in the first place and foster a different way of working.

Data being more readily available was also a key driver for collaboration, said Mott MacDonald's Rebecca Wooding. "Open source data is something that other industries take as normal practice but it's

not really done in the infrastructure industry," she said. "There's an awful lot of very useful data that can be captured and utilised and it might inspire innovation and faster progression that we haven't really considered before. But does open data and greater access to information mean that our business model is

changing?" Wooding asked.

Gianluca Barletta of WSP agreed. "The point about open data is very important," he said. "Depending on the project, sharing of data will be the right thing to do and that will open doors to innovation. We don't see that as a threat but as an opportunity to integrate and that is where you start to create the value-add. It's not

the raw data, it's what you do with it that will eventually create a differentiation and your USP." Barletta said.

There was a strong feeling that clients wanted to work differently and that they no longer wanted a 'master and servant' relationship. Innovation was a state of mind, a culture where the big challenge was to establish a cultural transformation. There was also a strong push from the millennial generation to embrace new ways of working otherwise people

might go elsewhere and do something else.

"The individuals that work for us in the future are not going to be choosing to work for one organisation at one time, they will want to work for all of us," said Amey's Dave Spencer. "How we deal with a skills base that is ever more mobile will be crucial," he said.



Gianluca Barletta: "Sharing data will be the right thing to do."

Roundtable participants

- **Dave Spencer** - managing director, consultancy, Amey
- **Alex Janzen** - executive Officer to the CEO, Atkins
- **David Coyne** - executive director, Benoy
- **Stephen Trinder** - partner, Calford Seaden
- **Adrian Griffiths** - director, Chapman Taylor
- **Dan Rennison** - head of design management, Costain
- **Richard Davies** - director, Hoare Lee
- **Rebecca Wooding** - engineer, Mott MacDonald
- **Rod Burton** - partner, Pick Everard
- **Gianluca Barletta** - head of smart consulting, WSP
- **Eduardo Niebles** - managing director, international business, BST Global
- **Andy Walker** - editor, *Infrastructure Intelligence*
- **Diane Williams** - business development manager, ACE
- **Brian Nolk** - acting commercial director, Victoria Street Capital
- **Nelson Ogunshakin** - chief executive, ACE, chairing the meeting



The Shard was the venue for the latest ACE roundtable.

image issue with construction that we need to get over," he said. "Parents in particular still don't know what we do and have a negative image of engineering. We also need to show what opportunities there are in the business so people can see clearly how they can progress. We need to show to younger people coming in what's on offer," Burton said.

Retaining the best talent in an ever-changing business landscape was obviously key to success but firms needed to accept that demographic and cultural changes in the workforce would lead to issues that would have to be overcome. Millennials in particular were impatient and demanding and the rise and rise of virtual networking was creating a much more collaborative and technological environment in which they could prosper.

Companies also needed to keep pace with technology if they wanted to keep their best people. "People are using A-grade technology at home on a daily basis and you can't give them C-grade technology at work," said Eduardo Niebles.

BST Global's Eduardo Niebles agreed. "We have had to change how we operated as a software company, changing the entire business model and look at how we operate from a millennial perspective," he said. "Once we changed our approach, innovation increased. Looking at engineers and architects globally, the companies that are doing really well are completely redefining how they work. Younger workers are communicating with their peers in other companies but they are not 'giving away the farm' as we say in the States. Talk to other companies and find out what they do. We need to break down the silos," said Niebles.

A more democratic approach to innovation was also needed where everyone has the right, whether they use it or not, to develop their talents and pursue new ideas. Architects Benoy have an initiative called 'firestarters' which was doing just that. "There's 600 of us in the company and everybody is given the opportunity to be a firestarter where they can work on productive and non-productive themes and allocate their time against it," said David Coyne of Benoy. "We opened it up to all 600 staff and there's 240 people who are firestarters in our business. They are allowed to have a meeting whenever they want on whatever they want as long as it benefits Benoy. People of different ages are communicating together.



Dave Spencer: "How we deal with a skills base that is ever mobile will be crucial."

It's changed our brand and what we are as a company," said Coyne. Atkins also do something similar with their 'lockdown' programme. "One week a month we take away 15 people and do what we call lockdown, where we look at a particular problem with a completely fresh set of eyes," said Alex Janzen. "There's normally only

one or two people of those 15 who are experts in that area and we work out different ways of solving the problem. It removes all of the hierarchy in the business and it's a completely open free thinking creative environment. It has created some of the best ideas in the company. We asked for 20 or 30 volunteers for the first lockdown, for the second we had over 200 volunteers and for the third over 500." Janzen said.



David Coyne: "Everybody is given the opportunity to be a firestarter."

Mott MacDonald's Dragons Den initiative sees mainly millennials proposing business ideas to senior management and then getting funding to work on that project internally. All participants in the roundtable thought it was crucial to run such schemes to show that firms really value their people and their input. In terms of attracting younger people into the business, Rod Burton of Pick Everard thought that the image of the sector was still an issue. "There is still a big



Eduardo Niebles: "Once we changed our approach, innovation increased."

A fascinating discussion concluded with the strong view that increasing collaboration and innovation needed to be built on a solid foundation and use all available networks. There was a real feeling that the industry was one that was ripe for disruption and that new competitors will arise, increasing competition and the need for more creativity.

Innovation needed to be a serious, tangible and quantifiable part of business plans and not kept as a blue sky strategy that's nice to talk about. Above all, companies needed to reshape their business models because change was coming and the challenge was to meet it head on.



About the sponsor

BST Global provides integrated business management software solutions for the world's leading architects, engineers, and environmental consultants. More than 100,000 professionals across six continents and 65 countries rely on BST solutions each day to manage their projects, resources, finances, and client relationships. The company's latest offering, BST10, is the world's first multi-lingual business management system to be built exclusively for the architecture and engineering industry and made available both in the Cloud and On-Premises. For more information, visit bstglobal.com.

FIDIC 2017 – an opportunity to look to international markets

Hundreds of infrastructure professionals will gather in Jakarta in September to discuss the key business issues facing the sector.



This year's FIDIC International Infrastructure Conference takes place in Jakarta, Indonesia, from 1-3 October 2017 and given the ongoing Brexit negotiations, the event should provide an excellent opportunity for UK-based consultancy companies looking beyond Europe to win work in international markets.

FIDIC's annual conference will see hundreds of infrastructure professionals and key decision makers gathering to discuss a range of key issues around the central theme of Resilient Infrastructure. Delegates will discuss what constitutes resilience, reliability, functionality, adaptability, sustainability, political and societal expectations.

Current threats and challenges will be examined including political turmoil,

climate events, natural disasters, population growth, urbanisation and inadequate investment. The conference will also look at identifying infrastructure's needs and benefits, the increasing global demand for quality infrastructure and the social and economic benefits it can deliver when planned effectively.

The role of data and digital technology in planning and design will also be put under the microscope, with speakers asking whether the industry possesses the necessary data to identify and redefine the events for which infrastructure must be resilient and also whether new weather forecasting and modelling software helps to redefine design events. A range of international speakers in Jakarta will also look at how to plan infrastructure with built-in

resilience and also the lessons to be learned from disaster and infrastructure failures.

Nelson Ogunshakin, chief executive of the Association for Consultancy and Engineering, said: "The FIDIC annual conference is a key event in the international calendar for consultancy and engineering firms. As well as high-level discussions on some of the key issues facing the industry, the event provides excellent opportunities for consultancy firms to network with contractors, funders, professional advisers and government decision makers from around the globe. With many UK firms now looking to target international markets in the wake of the Brexit decision, FIDIC 2017 is an opportunity that firms should grasp with both hands."

Covering all key infrastructure sectors, the FIDIC 2017 annual conference promises to be a valuable and inspiring event for the global consultancy and engineering community.

Early bird discounted conference tickets are available online at www.fidic2017.org until 30 June 2017 as is the full agenda for the event.

New groups to steer ACE through Brexit waters



New sector groups will give consultancy and engineering firms an opportunity to influence ACE's policy and public affairs work, says *Julian Francis*.

With an ambitious agenda for infrastructure and Brexit ahead, the government needs all the help it can get, something ACE can provide.

ACE's revitalised Sector Interest Groups (SIGs) will provide the membership with an unmatched ability to feed into ACE's policy and public affairs work. This comes at a time when it could not be more important for engineering and consultancy firms to be at the front of the queue to advise government.

The SIGs will each focus on three key

areas, such as skills, value for money in the rail sector, and the future needs of the road network. These play very neatly into the key priorities of the UK government, with its ambitious agenda for infrastructure delivery, developing industrial strategy, and desire to maintain the UK's position as an attractive destination for global investment.

New chairs and vice-chairs have been appointed, each with the knowledge and experience of the various sectors they are leading on, providing a reliable and reassuring voice that ACE can deploy to

make the case for infrastructure. Who better than own members to convince the public, government, and other stakeholders of the importance of the work they do?

ACE currently has SIGs looking at the rail, road, sustainability, and water sectors, while we are also in the process of establishing groups for major projects, property, and ports and airports. These are all vital areas for the UK which, in light of Brexit, must present to the world an image of reliability, connectivity, and capacity. Our new SIGs will make sure no one can be in any doubt our infrastructure networks are fit for a 21st century purpose.

If you are interested in getting involved in ACE's SIGs, please contact pea@acenet.co.uk stating which sector you work in and what you think you can bring to the groups.

Julian Francis is director of policy and external affairs at the Association for Consultancy and Engineering.

Consultancy and Engineering Awards shortlist announced

The shortlist for the 2017 Awards has been announced by the Association for Consultancy and Engineering and as ever the competition is tough.

From the business categories chosen for overall business performance, to the champion categories, the Consultancy and Engineering Awards are an annual showcase for the best that the engineering and consultancy sector has to offer.

With a high standard of entries across all nine categories, compiling this year's shortlist was a difficult task for the judges. The winners will be announced at the Consultancy and Engineering Awards Gala Dinner in central London on 7 June 2017 and the event will be hosted by award-winning television news journalist Clive Myrie.

Commenting on the shortlist, Nelson Ogunshakin, chief executive of ACE, said: "The strength of this year's entries is a clear indicator that the future is bright for our industry. Congratulations to all those shortlisted for their remarkable achievements from companies across the built and natural environment sector.

"At a time when we face a number of political uncertainties ahead, it is vital for our industry to continue to be a backbone for the UK economy, not only providing the best properties, housing, schools, retail and major infrastructure investments necessary for modern life, but also acting as a shining beacon of exceptional talent and innovation."

To book places and tables at the awards gala dinner on 7 June 2017 visit <http://www.ace-engineering-awards.co.uk/attend/book-a-table/>

ACE National Conference postponed

Due to the government's announcement to hold a snap general election on 8 June, the ACE National Conference 2017, scheduled for 7 June, has been postponed.

Pre-election constraints on policy discussions meant that key public sector speakers would be unable to participate at the conference so a postponement was the only option.

An announcement regarding the revised date will be made as soon as possible.



Consultancy & Engineering AWARDS 2017

The shortlist for the Consultancy and Engineering Awards 2017 is as follows:

Best UK Business Performance – SME

Lewis Hubbard Engineering
IMC Worldwide
CGL
Clancy Consulting
Geo-Environmental Services

Best UK Business Performance – Large Firm

AECOM
Curtins
Mott MacDonald
BWB
Peter Brett Associates
Atkins

Young Professional of the Year

Lisa Rammig (Eckersley O'Callaghan)
Paul Diebel (Mott MacDonald)
Tahira Newaz (MWH)
Ben Freedman (MLM)
Simon Evans (Atkins)
Mannan Akshat (Atkins)

Apprentice of the Year

William Mathew (CH2M)
Nathan McClean (Tony Gee & Partners)
Caitlin Stuart (Troup Bywaters + Anders)
Jordan Laraway (Arup)
George Hart (Arcadis)
Kyle Baptie (Arup)
Bruce Gibson (CH2M)
Millie Coombes (Atkins)
Stuart Hirst (TSP)

Inclusion and Diversity Champion of the Year

Max Fordham
Arup
Mott MacDonald
WSP | Parsons Brinckerhoff
BWB
CGL

Training Initiative of the Year

WSP | Parsons Brinckerhoff
BWB
Troup Bywaters + Anders
Cundall
Hurley Palmer Flatt
MWH

Collaboration Champion of the Year

Mercury Group UK
IMC Worldwide
WYG
Hoare Lea
Amey
Waterman
Chapman BDSP

Technology Champion of the Year

Davies Maguire
Hoare Lea
Structuremode
Mercury Group UK
Ramboll
BWB

Sustainability Champion of the Year

Mott MacDonald
AECOM

Buy-outs, mergers and takeovers set to continue



Merger and acquisition is now widely accepted as an integral part of corporate growth strategy in the consultancy and engineering sector and further consolidation of the industry can be expected in the near future, writes *Nelson Ogunshakin*.

Over the past ten years, the consultancy and engineering industry has seen several waves of merger and acquisition activity. It has been viewed by firms as a viable path to business growth and success, no matter what the size of the company.

With continued market shifts, as well as changes in the composition of our industry over recent months, it is perhaps unsurprising that towards the end of last year I identified market consolidations as one of the five key topics to keep an eye on in 2017.

Business leaders and chief executives are charged with ensuring the progress and profitability of their companies. That is our role, to adapt to the current business environment and lead our teams to success.

While organic growth is depended upon for day-to-day success, the average business can begin to plateau in its annual rate of growth due to lack of resources. For the UK industry, this does not usually mean decline, but rather untapped potential. And it is in such circumstances, or when significantly increased yields are desired by shareholders, that mergers or acquisitions can provide sound growth solutions.

Big data and digital economy, which I discussed in these pages in March, means that for a business, distance is no longer a limiting or defining factor. Once a business is listed, it is a globally accessible company. If it can be bought in the UK it can also be bought from elsewhere, creating global growth opportunities for the business.

Mergers and acquisitions are also a crucial way for investors or shareholders to spread out risk, build and diversify



“Our industry is still growing and companies will continue to make the strategic decision, with the potential for higher yields, that they are better together.”

portfolios, and gain skills. With the fluctuations in our industry landscape, it has become clear that particularly in cases of listed businesses, it is less about who owns what or the size of an organisation.

It is all about what you do with the organisation. It is about your leadership, culture, business drivers and how that forms the organisation that adds value to

your shareholders, delivers client satisfaction and is a place where skilled staff want to work.

There will be more market shifts going forward and there will undoubtedly be more instances of mergers or acquisitions. Our industry is still growing and companies will continue to make the strategic decision, with the potential for higher yields, that they are better together.

We at ACE will continue to provide platforms, such as the European CEO Conference or webinars, for discussing optimal merger and acquisition practices, assessments to undertake, risks to account for, achieving business synergies and other topics that will continue to arise from new market shifts.

Merger and acquisition is now widely accepted, by both SME and large companies, as an integral part of corporate growth strategy in the professional consultancy and engineering sector. With constant pressure on CEOs and business leaders to de-risk and seek diversified business portfolios, both in terms of sector and geographic reach, I expect to see further consolidation of the industry in the near future.

Dr Nelson Ogunshakin OBE is the chief executive of the Association for Consultancy and Engineering.

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Stronger leadership needed in air quality debate

The air quality debate is complex and contains many different actors, technical and scientific complexity and uncertainty. Considerations include how different airborne pollutants interact and the impact of various pollutants on different elements of human health across entire populations. We also have a media which sees air pollution as a long-running public interest story with an added tang of corporate corruption, courtesy of Volkswagen, and a public who want the problem solved urgently but by someone else. On top of all that most of us are both victims and perpetrators – our children’s schools are often on polluted roads, but we are driving them there.

Yet the hardest problems need the most political leadership. Otherwise such issues go round in circles as ministers come and go, pressure groups and vested interests nudge policy slightly one way and then the other and newspapers say “something must be done”. But the air quality debate has been sorely lacking in government leadership and the draft air quality plan finally published in early May does nothing to buck the trend.

My personal preference, unsurprisingly given EIC’s role, would be for our political leaders to persuade the public that some sacrifices and behaviour changes are worth making to deliver clean air. But even if the government went the other way and argued that the impact of air pollution was less of an issue than other pressing public health issues and that the social and economic impact of, say, banning all diesels from city centres (as called for by some campaigners), would have serious impacts on employment and business success, at least it would be doing what we elect governments to do – clarifying trade-offs and building support for tough choices.

In truth, the government is still muddling along on air quality. For years, the political view was that since air quality was gradually improving (as coal power plants closed, industrial emissions filter technology improved, regulations toughened), it was not a major public concern. Even if we were struggling to meet EU timescales it was reasonable to balance further progress with the interests of vehicle manufacturers who were big



A lot of environmental problems are challenging but air quality is more challenging than most and strong leadership is needed if the UK is to have cleaner, greener air in our towns and cities, says *Matthew Farrow*.



The draft air quality plan does not seem to address the hard decisions that have to be made.



employers and firms owning old vehicles who could not easily replace them.

Ministers and their advisers though did not see that the ground was shifting, in three ways.

First, the scientific evidence of health impacts of air pollution has grown. Second, the dominant position of climate change as an issue ebbed after 2010, meaning more air time for other environmental issues to come to the fore. Third, the Volkswagen scandal led to huge media coverage of the topic.

Despite the new context, ministers were reluctant to act decisively for fear of alienating motorist groups and business lobbies. Multiple supreme court judgements against the government created the impression that ministers had to be dragged kicking and screaming towards anything resembling a tough Air Quality Plan and the recent farce over whether publication could

be delayed until after the election (Defra wanted to delay on the basis that because they hadn’t got round to publishing it, ‘purdah’ now meant they couldn’t – the high court told ministers to publish and be damned) was the icing on the cake.

There are some good elements to the plan. More Clean Air Zones, additional funds for bus retrofitting and recognition of alternative fuels and innovation more widely. But despite Defra analysis showing that only a significant and rapid drop in use of existing diesel vehicles in urban areas will make meaningful cuts to NOx levels, the plan does nothing to build support for the hard decisions that follow from this – charging polluting vehicles, a scrappage scheme, aligning vehicle tax with NOx/PM emissions plus support for retrofitting, low emission fuels and ultra-low emission vehicles.

EIC’s air quality working group is scrutinising the plan (which is out for consultation) and we will be having discussion with officials and ministers post-election. But if ever “strong and stable leadership in the national interest” was needed it’s on this issue.

Matthew Farrow is director of the Environmental Industries Commission, the leading trade body for environmental firms.

“Our political leaders [need] to persuade the public that some sacrifices and behaviour changes are worth making to deliver clean air.”

Start thinking now about the city of the future



EY's recent report on the future of cities highlighted the importance of smart infrastructure and the need to start thinking about solutions now. *Natasha Levanti* spoke to EY's Amanda Clack and considers some key questions that need addressing.

With the exponential growth of urban living around the world as well as in the UK, the infrastructure that supports thriving cities is becoming more complex than ever before. Not only do climate change impacts need to be accounted for, but changing forms of governance, technological leaps and increased lifespans are all playing significant roles in what will be the backbone of cities in the future.

The EY report, *Future Cities: Is the path to future growth through smart infrastructure?* considers all these factors and more as fundamental to the role infrastructure will play in urban life in the future.

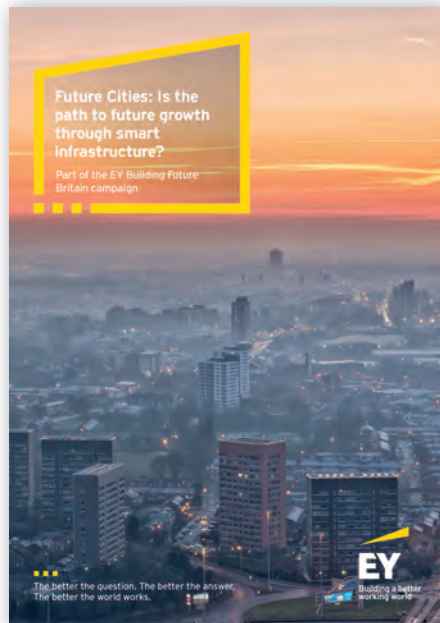
How do people and businesses that move in and out of cities interact with these cities?

The increasing number of people that choose to live and work in cities, together with ever-improving transportation links, are seeing people as well as businesses moving between cities. They need individual cities to satisfy basic needs but also multiple cities to collectively satisfy higher personal and business needs. Clack recommends reflecting on how people and businesses interact with a city, making the relationship one of urban user engagement and not just a checklist of available services. An example would be a city catering to older and younger users, which stresses the need for urban walkability as well as age-friendly access.

How will cities maintain their own culture while still being able to meet modern demands?

Clack says that while megatrends are appearing in all cities, it should be acknowledged that there are various types of cities, all of which serve different demographics and economic purposes. The urban infrastructure must match these unique needs appropriately, while reflecting much of the heritage and culture local residents hold dear.

Key to this, says Clack, is interconnectivity within and across cities



in a region and how cities share data and information with each other. An example of this is Italy's recent embrace of technology for its cultural library, ensuring that technology and interconnectivity are leveraged to preserve culture. The Scottish Cities Alliance is another really great example where the seven major cities in Scotland have come together to form an eighth overarching one. Other examples include the Midlands Engine and the Northern Powerhouse.

How can businesses seize the competitive opportunities that innovations bring?

“City leaders have to leave personal egos and agendas behind to develop a long term strategy for the city.”

Amanda Clack



For innovation to truly flourish, businesses must change the sentiment towards research and development to one that acknowledges the role of innovation in future-proofing a business's competitive edge. Businesses must aim to compete on a global stage and innovation and support by industry, education and the government, is a key way to achieve this.

Why do people want to come to live or work in a city?

Answering this fundamental question, says Clack, helps to provide a guide as to why some cities will succeed and some will fail. People and businesses have to ultimately want to be in that city, whether for the sustainability and regenerative efforts in place, for the competitive connectivity, or because that city has successfully achieved a balance in preserving culture as well as providing for the needs of modern life.

While ultimately only certain aspects of the future are predictable, Clack makes it clear that cities will find individual formulas for success as cities of the future, with resilience, the right benefits and outcomes of measures and through citizen engagement.

What should city leaders be focusing on to help create a city of the future?

City leaders are key, says Clack. They have to leave personal egos and agendas behind to develop a strategy for the city that is long term (30 years +) and then consult with citizens and businesses to help design a city's future vision.

Strong governance and leadership are crucial in articulating that vision to the outside world so that cities are in a strong position to attract the finance they need. This is a great time to be a city leader, says Clack, and there is a real potential to help create the city of tomorrow, a place where people will want to live, work and enjoy their recreation time.

Amanda Clack is the head of infrastructure advisory at EY and the current president of the Royal Institution of Chartered Surveyors.



Getting it right and making a difference for Crossrail

Amey's work on the Crossrail project covers a number of diverse areas and projects where their multi-disciplinary team is playing a key role in creating better journeys across London and the south east.

Millions of people pass through Paddington station every year as they travel from A to B. Balancing the need to keep the route open with the demand for service and network improvements – like the Crossrail project – is a delicate operation.

To minimise disruption, the bulk of major rail projects are carried out during holidays like Easter and Christmas. So while many of us are dialling down, Amey's rail team are gearing up to deliver complex improvement works within narrow timescales.

Nathan Sealy, Amey's regional engineering director for the south explains. "With projects like Crossrail, it's all about the timing and we've seen what happens to journeys when things overrun," says Sealy. "So when we're planning works on a crucial transport route like Paddington, we make meticulous plans to make sure that we get it right.

"Our people play a huge part in this. When you only have a block of ten days, like at Christmas 2016, to complete the work safely, making sure that you have the right people and skills to hand is absolutely critical. Our design engineers, installers, project engineers and support staff all work in unison, bringing together the full breadth of our expertise," he says.

Amey has been working on Crossrail for many years and have built up significant experience and expertise on the project. "We've been working on the Crossrail project since 2011," Sealy says. "Amey engineers designed the alterations to the signalling layout for the works on the north east section from Stratford out to Shenfield and developed the outline designs for track and overhead line works on the western reaches around Maidenhead.

"We have also been designing, building, and commissioning all the required signalling alterations at Acton, West Ealing, Southall and Heathrow Airport Junction including new signals, track circuits, points operating equipment and a bespoke Shunter's control system for

freight at Acton Yard. All of which is helping to deliver solutions that work, making train services run more smoothly," he explains.

Amey is now turning its attention to another key aspect of the Crossrail project, upgrading the design of the power supply system. "The latest element of our long-running involvement on the Crossrail programme is an £11m upgrade to the power supplies," says Sealy. Not only are we growing our relationship as a trusted supplier to Network Rail by proving that we can deliver on our promises, but most importantly, we're playing a key part in helping create better journeys across London and the south east," he says.

The power upgrade includes a cutting edge electrical power design across 12 miles of track between Paddington and Hayes. "We are the first people in the UK, and probably the world, to implement this kind of power system on the rail network," Sealy says. "Not only will this system increase capacity whilst maximising reliability on the railway, it's also safer to work with. And with our continuous focus on safety, this is a real advantage," he says.

The upgrade is also crucial to the future operation of Elizabeth Line services as well as the modernisation of the Great Western Main Line. "This system is adding real resilience to the network," says Sealy. "In the event of a power failure, the signalling systems can be automatically re-fed from alternative supplies. This for us is the measure of great design work, where our solutions are improving the service provided to customers," he says.

"We are helping to deliver solutions that work, making train services run more smoothly."

Nathan Sealy





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