



NORTHERN POWERHOUSE

The time is right to start a campaign for a Crossrail for the north
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INTERVIEW

Judith Blake, leader of Leeds City Council, talks about the transport plans for her city
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INDUSTRIAL STRATEGY

The government's new industrial strategy and what it means for construction
pages 6 & 7



I INFRASTRUCTURE Intelligence

Produced for the industry by the Association for Consultancy and Engineering

A DYNAMIC SME BUSINESS WITH LOTS GOING ON

Interview with
Clancy Consulting
chief executive
Alan Bramwell
pages 16-18





INFRASTRUCTURE Intelligence

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MESSAGE FROM THE EDITOR

This edition of *Infrastructure Intelligence* has a distinctly northern flavour about it, which is fitting given all the recent talk from government ministers about rebalancing the economy, investing in the regions and making sure that no one is left behind.

We report from Leeds on how the city is going about spending its £270m transport investment pot (pages 3-4) and speak to the city's council leader about the importance of winning public support for infrastructure projects (page 30). We also hear about why the time is right to start a high-profile campaign for a 'Crossrail for the north' (page 22).

The government's industrial strategy is put under the microscope as we hear from key industry figures about what they think of Theresa May's latest efforts at reducing the north-south divide (pages 6-7) and we also get the low-down on a series of initiatives that will help infrastructure to improve its green footprint (pages 10-11 and 15).

For our cover story we turn a much-needed spotlight on SME firms with an interesting interview with Clancy Consulting's chief executive Alan Bramwell (pages 16-18). He tells us about how the north west-based firm is punching above its weight in a competitive marketplace by doing things right, valuing staff and clients and working on interesting projects.

We also have a special feature on European transport infrastructure (pages 20-21) and in a fresh take on the skills shortage, we hear from Turner & Townsend's Patricia Moore on how the high-profile mega-projects the industry will soon deliver should be used as a PR opportunity to boost the image of construction as an innovative, exciting and socially responsible sector to work in (page 25).

We have all of the above and a whole lot more packed into 32 pages. I hope you enjoy the read and please do keep sending us your feedback, articles and comments.



Andy Walker,
editor, Infrastructure Intelligence

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Key leaders meet to get Leeds moving

Key industry and political leaders have met in Leeds to discuss the future of transport and infrastructure in the city and what needs to be done to improve it.

The future of Leeds's transport and infrastructure network is at a crossroads according to senior members of Leeds City Council and business and industry experts, who gathered in the city in February to discuss Leeds's planned £270m transport infrastructure spend.

A packed out seminar, *Transport and Infrastructure. What's Next for Leeds?*, hosted by Shulmans LLP and WSP | Parsons Brinckerhoff, saw more than 150 invited guests from key businesses in the area attend to listen to a range of speakers from the city council, Institute for Public Policy Research North, Legal and General Capital and Transport for the North.

With a proposal in place to spend more than £270m of investment on the city's infrastructure, the audience was keen to hear about the planned initiatives, including new rail halts, upgraded Trans-Pennine rail connections and improvements to Leeds train station, which could provide the greatest catalyst for economic growth.

Landmark plans to build a new station serving Leeds Bradford Airport have also been revealed as part of the £270m transport investment by Leeds City Council leaders. The proposed upgrades by the council also include new railway stations to be built at the city's White Rose Shopping Centre and Thorpe Park areas.

The transport improvements have been long awaited ever since Leeds's Next Generation Transport (NGT) trolleybus scheme – allocated £173.5m government funding to be spent by 2021 – was abandoned after being rejected by the Department for Transport in May.

Delegates at the event heard how



Leeds will spend its unprecedented levels of infrastructure investment and how this will support the city's ambition to become the best in the UK. Despite Leeds experiencing strong growth in its retail, property, manufacturing and digital sectors, the city still faces some significant challenges to ensure that the benefits of investment are felt across the city.

Councillor Judith Blake, leader of Leeds City Council said that although the Leeds and wider city region economy was continuing to grow and develop, "what is holding it back from really flourishing is

poor connectivity through slow and unreliable transport networks". She said that the proposed £270m Leeds transport package was just the first step in addressing the city's connectivity issues.

"It is important to note it is just the start with much more meaningful investment in infrastructure being needed to speed up the whole process of connecting people and businesses with jobs and opportunities," she said. "As a city, Leeds continues to be ambitious and we know that means having a modern

continued on page 4 >>>

"We are calling on everyone in the city and public and private sector organisations alike to work together to make the case to the government so we can get the substantial funding [we] would need and viable plans in place as soon as possible."

Councillor Judith Blake, Leader of Leeds City Council



Key leaders meet to get Leeds moving

>> continued from page 3

rapid mass transit system, so we are calling on everyone in the city and public and private sector organisations alike to work together to make the case to the government so we can get the substantial funding it would need and viable plans in place as soon as possible,” said Blake.

Adrian Kemp director at WSP | Parsons Brinckerhoff commented: “Leeds must be ambitious and forward-thinking in its approach to transform the city’s transport network in a way that aligns with the city’s plans for growth, both economic and in terms of population. Key to the success of any integrated transport system is an understanding of the socio-economic and demographic make-up of the areas to identify those that need better connections across the city and wider region.

“It’s about connecting people to jobs through better transport links across the city region and the wider north. By starting with people first, we can future-proof our transport system, and strengthen Leeds’s offer as part of the Northern Powerhouse,” said Kemp.

Shulmans partner Andrew Latchmore, who chaired the debate, added: “It is great



Business and industry experts met in February to discuss Leeds’s planned £270m transport infrastructure spend.

to hear that a significant upgrade is planned for our city’s transport network. Delivering this alongside a complete transformation of Leeds city station will create a world class integrated transport hub. Bringing together enhanced local and Trans-Pennine services with bus services,

and eventually HS2, will take Leeds up a gear, making the city a number one choice for UK or international businesses looking for a new home.”

● **Read our interview with Leeds City Council leader Judith Blake on page 30 of this issue.**

News round-up

NEW STATE-OF-THE-ART CAMPUS FACILITY FOR RCA

Mott MacDonald has been appointed lead consultant by the Royal College of Art (RCA) for a new education facility at the university’s Battersea South campus in London. The consultancy is working with Equals and Herzog & de Meuron to deliver the £108m state-of-the-art building, which will help transform the RCA into a science, technology, engineering, arts and mathematics focused graduate university.

MORE THAN 25% OF LONDON CONSTRUCTION WORKERS ARE FROM THE EU

London mayor Sadiq Khan has released a report highlighting that more than a quarter of London’s construction workers are from the EU. Of the 350,000 people who work in London’s construction sector, 95,000 are from European Union member states. At 27% of the workforce, the report underlines the negative impact that Brexit

could have on the construction industry if there is no agreement reached on ‘freedom of movement.

COUNCIL APPROVES UNIVERSITY OF GLASGOW MASTERPLAN

AECOM and 7N Architects have secured planning permission in principle consent from Glasgow City Council for their masterplan for the University of Glasgow. The masterplan provides a development and placemaking framework for a significant expansion of the University’s Gilmorehill Campus on the site of the former Glasgow Western Infirmary in the heart of the west end of the city.



ENGINEERING UK CHIEF EXECUTIVE TO LEAVE

EngineeringUK chief executive, Paul Jackson, has decided to move on from his role after eight years, and will leave EngineeringUK in July 2017. EngineeringUK is the not-for-profit organisation, which works in partnership with the engineering community to promote the vital role of engineers and engineering and to inspire the next generation.

ELECTRIC VEHICLES - POINTLESS WITHOUT GREEN ENERGY

Sales of electric vehicles are rising, but promoting their use is hopeless as a means of reducing carbon emissions if batteries are not powered by green, renewable energy; and further critical growth is unlikely anyway, without a rethink on provision of power for recharging. So says a new study by Atkins, published to highlight the lack of joined up policies in green transport and energy.

Time for change – a new delivery model for infrastructure



An influential group of leading figures representing industry client organisations and government is launching its latest work – Project 13. Jon Masters met with the Infrastructure Client Group’s Miles Ashley to find out what it’s all about.

For the past three years a group of industry leaders has been developing an initiative aimed at bringing significant change to the way infrastructure programmes are delivered. The Infrastructure Client Group (ICG) is now ready to launch a report introducing its ideas to the wider supply chain, as a precursor to a concerted drive for better project delivery.

Project 13 is the name given to this latest output from the ICG, simply because the previous one was its 12th, says ICG member, former programme manager for construction at London Underground, Miles Ashley. “Why change a recognised brand?” he says.

What the ICG does want to change is the inefficiency and shortage of innovation in how infrastructure programmes are delivered. It wants the industry to bring about a new delivery model; one that produces better value – more product per pound spent.

“Productivity in UK construction has been flat for the past 20 years. The industry is inefficient and wasteful, producing 400m tonnes of waste every year, three times the nation’s domestic waste,” Ashley says.

“At least 60m tonnes of material goes straight into skips due to over-ordering or incorrect storage. Up to 50% of the cost of a typical project is spent on management, technical coordination and other transaction costs. Half of the hours worked on construction sites are wasted.”

The ICG has been working on the problem. Infrastructure client organisations and companies have been exchanging information and sharing sensible ideas about what a new delivery model for infrastructure might look like.

The ICG is an influential group of industry leaders. Clients involved include Network Rail, Thames Tideway, Transport for London, the Environment Agency, Heathrow Airport, Anglian Water, HS2, National Grid, UK Power Networks and Highways England. The Treasury’s Infrastructure Projects Authority and the Cabinet Office are also represented.

Since its inception in 2010, the group has already published work on alliancing, skills, production management, carbon



reduction and risk management. Its work led to the Treasury’s Routemap, now used to test the maturity of projects as they develop through early stages.

Initially, the Institution of Civil Engineers (ICE) is publishing a short document launching Project 13. According to Ashley, the report presents an evidence-based economic case for change, identifying key factors in creating an enterprise culture and ‘building maturity’.

“If the ICE’s recent National Needs Assessment represented the ‘what’ of infrastructure, then Project 13 will begin to set out the ‘how,’” he says.

The associated academic research has identified five common fundamental features of project success: outcome-driven governance; clear integration; definitive alignment; effective organisation; and owner-operator leadership capability.

The proposals of Project 13 might sound familiar; like a near-repeat of the findings of previous reports into the industry’s

problems, such as *Rethinking Construction and Constructing the Team*. The difference this time, Ashley says, is that Project 13 does not present a conclusion.

Project 13 is intended to be a launch platform for five cross-industry working groups. These will now engage leaders of the infrastructure and construction industries in promoting real change, under the headings of the five common features of success.

“These groups will not only seek to understand and develop maturity in these areas, but in aggregate they will constitute a broad-based coalition with the Construction Leadership Council to drive change,” Ashley says.

“We are confident that the proposals the ICG is launching can deliver the change we need because they are already being used by Anglian Water, the Environment Agency, GSK (GlaxoSmithKline) and BMW.

“We know that when companies work with their suppliers in enterprise cultures, driven by a clear understanding of value, they consistently attain better outcomes.

“Infrastructure’s traditional approaches to assessing investments, procuring contracts, developing supply chains and managing work consistently bring us back to an inefficient transactional delivery system. We can change that, and we must.”



“Traditional approaches consistently bring us an inefficient transactional delivery system. We can change that, and we must.”

Miles Ashley is a member of the Infrastructure Client Group, formerly programme manager for construction at London Underground and now director of Wessex Advisory Ltd.

Infrastructure prominent



The government's new 'sector-specific' industrial strategy has been announced and upgrading infrastructure according to local need is high in its list of priorities, writes *Jon Masters*.

Upgrading infrastructure stands prominent among a list of priorities within the government's new industrial strategy, which was unveiled with a more hands-on approach to supporting individual sectors' specific needs.

A green paper, on the *Modern Industrial Strategy*, sets out a plan for strengthening living standards and economic growth by helping individual sectors that can come forward with proposals behind strong leadership. Early work has been done on a 'sector deal' for improving UK competitiveness and skills in the nuclear industry. In a wider context, improving the UK's performance on digital, energy, transport, water and flood defence infrastructure is listed as one of ten priorities of the strategy.

There are several other cross-cutting priorities listed with great interest and relevance for infrastructure, including developing skills and improving procurement.

Launching the strategy at the end of January, prime minister Theresa May said: "The *Modern Industrial Strategy* will back Britain for the long term, creating the conditions where successful businesses can emerge and grow, and backing them to invest in the long-term future of our country. It will be underpinned by a new approach to government, not just stepping back but stepping up to a new, active role that backs business and ensures more people in all corners of the country share in the benefits of its success."



Commenting on the strategy, Nick Roberts, Atkins' UK & Europe CEO said: "The UK's immediate future is full of uncertainties and opportunities.

Having a clear, ambitious industrial strategy starts to put us in control of our destiny. It's in our DNA to be a trading nation and our efforts to re-

forge our place in the global marketplace post-Brexit will succeed or fail based on being bold, relevant, innovative and competitive.

"The UK is home to a cluster of world leading professional expertise in the financing, design, delivery and operation of high performing infrastructure. We need to nurture this cluster and quickly embrace and capitalise on advancements in technology to meet our own needs and grow a sector which can be a major contributor to our future export success."



Nelson Ogunshakin, chief executive of the Association for Consultancy and Engineering, said: "ACE welcomes the government's new

industrial strategy which places infrastructure and skills at the its heart. The UK professional consultancy and engineering sector has long been a champion of the benefits to the UK from investment in our digital, transport, water and energy infrastructure as a driver of growth. For too long the skills investment that we need to deliver these projects has, however, been neglected with a result that we now have far too few engineering professionals in the country. It is, therefore, welcome news that we will be seeing an increased emphases on STEM subjects at schools alongside new technical institutions.

"The stated aims of the industrial strategy to deliver jobs across the UK, to expand the reach of UK businesses and export markets, and to innovate new way of doing things, are all things that consulting engineering firms already excel at. With smarter policy making in areas such as public procurement and regulation, however, the sector can do much more to grow UK plc. ACE will collaborate with other industry bodies to champion working with BEIS on the development of the

strategy going forward to secure the UK's competitive position post Brexit."



Matthew Farrow, executive director of the Environmental Industries Commission, said: "The UK environmental sector is well-placed to make a

real contribution to the industrial strategy. Across areas such as air quality, land remediation, laboratory analysis and flood defence, we have innovative world class companies and a global reputation. The aims of the



in new industrial strategy

strategy – to create jobs across the UK, to reach new export markets and to innovate – are all things the environmental sector already does and could do more of with smart policy making in areas such as public procurement and regulation.”



Richard Threlfall, head of infrastructure, building and construction at KPMG UK, said: “I particularly welcome the recognition that infrastructure and R&D investment are vital catalysts for

economic success. The openness of the government’s invitation to support sectors which can unite under strong leadership is also to be applauded, but will present a challenge to the construction industry whose voice in government is fragmented.”

Threlfall’s comments about the challenge for the construction sector to speak with one voice are well made. The government is letting it be known that it is prepared to help industry sectors with trade deals but only for industries that organise themselves and make a strong case for government action. The PM has mentioned the automotive and aerospace industries as good examples of this and the construction sector would do well to heed her remarks.



One sector eyeing up government following the announcement of the strategy is nuclear. Tim Yeo, chair of New Nuclear Watch Europe, said: “Expansion of the nuclear supply chain should be an explicit priority. To ensure that this is achieved the government should engage now with both the nuclear developers and with British businesses to identify which areas of the supply chain for new nuclear plant can best be sourced within the UK.

“Secondly, the strategy should aim to develop and exploit the considerable British expertise in nuclear decommissioning and waste and must also include measures to ensure the provision of a workforce whose education and skill sets equip them for the opportunities which a revived new build programme, and the substantial decommissioning work already in the pipeline, both create.”

Given the fact that infrastructure will be a key driver of the economy moving forward, the industry should be pushing at an open door with government. “Substantial infrastructure investment is critical if the UK is to remain competitive in a post-Brexit future,” said Richard Threlfall. “The industry will be keen to know quickly the identity of the major new infrastructure proposed and will be disappointed if it transpires

Modern Industrial Strategy, the 10 priorities



1. Investing in science, research and innovation
2. Developing skills
3. Upgrading infrastructure
4. Supporting businesses to start and grow
5. Improving procurement
6. Encouraging trade and inward investment policy
7. Delivering affordable energy and clean growth
8. Cultivating world-leading sectors
9. Driving growth across the whole country
10. Creating the right institutions to bring together sectors and places

that these are ones which have previously been announced,” he said.

The government is also setting up an “industrial strategy challenge fund” to help distribute millions of pounds for research and development in areas such as smart energy, robotics and artificial intelligence, and 5G mobile network technology. The plan will also focus on the 50% of school-leavers who do not go to university. It will suggest maintenance loans for those wishing to pursue a technical education, the construction of institutes of technology in every region, and 15 core technical “routes” for students that train them in the skills most needed by employers in their regions.

Infrastructure leaders will be hoping that the new industrial strategy represents a genuine attempt by government to engage with business while intervening to help industry sectors that need assistance. The sector will also need to step up to the plate to speak with one voice to government on the issues that matter and to ensure a more unified approach to ministers than has previously been the case.



White paper ignores local infrastructure funding

On closer inspection of the government's white paper on fixing the housing market in England, you could be forgiven for being a little underwhelmed by the recommendations contained within it. England is, after all, facing a significant housing crisis that has the potential to not only stall the UK economy but to create a very real political crisis.

To put this crisis in context, it's worth highlighting that it now takes a first-time buyer couple 24 years to save up enough money for a deposit without assistance from their family. This fact has led to a collapse of home ownership for people 35 years or below to a record low of just 37%. Since 1998, the ratio of average house prices to average earnings has more than doubled because we are not building anywhere near enough new homes to meet demand.

To add insult to injury, the average London home now earns almost £10 an hour more than the average London worker living in it. How much more perverse a situation can you get than when property earns more than people!

The government proposes to meet this crisis by tackling the serious and growing gap between the number of planning permissions granted and the number of new homes completed. The white paper states that too few councils have plans to meet the unprecedented housing demand with 40% of local planning authorities lacking an adequate plan for building new homes to meet the projected growth in household numbers.

New centralised standards will be set for local councils to project their future housing needs, with the expectation that the plans will be reviewed every five years. Building more homes, close to city centres and transport hubs, is the only way to halt the decline in affordability, argues communities minister Sajid Javid.

All of this, however, fails to deal with a significant and underappreciated issue that is one of the primary causes for the housing crisis in this country – the funding of community infrastructure projects. An independent study on the mechanics of the Community Infrastructure Levy (CIL), *A new*



The government's housing white paper fails to deal with a crucial local development issue – the funding of community infrastructure projects – writes *Julian Francis*.

Approach to Developer Contributions, was released alongside the housing white paper and it presents some shocking figures.

The report suggests that CIL is not raising as much money as was envisaged by the government when it was first introduced. Nor is it raising as much as local authorities were anticipating. Figures cited by local authorities suggest that CIL is only yielding between 5-20% of the funding required for new local infrastructure, leaving the balance to be found by local authorities who are already addressing their own financial challenges. This is a financial black hole at the very heart of our planning system.

The report concludes that CIL has not provided the universal and 'fair for all' approach for delivering local infrastructure.

This is not news for ACE who have been arguing for years that the forgotten child of the infrastructure debate has been local community funding for both the social and economic infrastructure that people rely on for their day to day activities. For too long people have seen new development in their area exacerbate the problems they face from congestion to lack of school places or the inability to get a doctor's appointment rather

than bringing the promised increase in prosperity. This is down largely to the fruits of development not being fully shared with the people who face the brunt of the disruptions.

To combat this, ACE has called for specific local infrastructure instruments to allow local authorities to fund the infrastructure their communities need. This is the model that has operated in London for both the Olympics and Crossrail and we see no reason why this cannot be done across the country.

I was, therefore, very happy to read that that the report recommends the introduction of a strategic infrastructure tariff for combined authorities, Local infrastructure tariffs (LIT) for local authorities as well as reformed CIL, and Section 106 Agreements.

These reforms more than anything else will do more to fix the housing crisis in this country by significantly reducing one of the primary blocks on new development – community resistance. If adopted we may at last achieve the true promise of development to improve the lives of the whole community.

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



The white paper (inset) aims to 'fix our broken housing market'.



Why it's time to get REAL about smart cities

Talk to those we serve about smart cities – rather than those intimately involved in contemplating how digital technology can transform our urban lives – and the conversation typically prompts two questions. Question one: how will I benefit? Question two: what effort is required from me?

These common-sense questions are an opportunity to focus the minds of policy makers, infrastructure consultants, academics and think tank thinkers alike. For cities to be really smart, those involved need to make their plans relevant to the everyday lives of residents.

A city that can regulate street lighting to keep the community safer, streamline refuse collection, reduce wasted energy and transform public transport provision is a city that understands 'smart'.

In short, people are interested in outcomes. An Institute of Engineering and Technology survey found that when 'smart' is framed in terms of the technology – 'autonomous or electronic vehicles hired or ordered from smartphones', for example – there is little enthusiasm. Just 8% of respondents registered interest in this case. 'Smart' needs to be expressed in a different way, one that reflects the benefits.

That's why, Smart Energy GB has developed the REAL Ratio, a framework that allows policy makers to test ideas against the tangible needs of cities and their people.

Here's how it works.

REAL stands for Resilience, Efficient, Affordable and Liveable. Against these four



When planning smart cities, policy makers need a system to assess whether a new initiative works ahead of time, argues *Claire Maugham*.

criteria, a series of 12 questions are posed and rated.

For example, when judging whether a project will provide necessary resilience, it's important to ask if the project can enhance the city's ability to recover quickly from external shocks such as weather events or a terrorist attack. Whether the project will increase the reliability of services local residents depend upon. And whether the project makes the city safer. Similar outcomes-based questions are posed around the other three criteria.

By plotting the results in visual form planners can identify the unique features and qualities of a project. It's worth noting that the aim is not, necessarily, to score highly on all measures. There will, for example, be different drivers and priorities for different areas based on aims, demographics and challenges specific to the region.

Nonetheless, a model that puts the citizen first is asking the right questions.

In Great Britain the smart meter rollout will see 53 million smart meters installed in households across the country by 2020, bringing our energy system into the digital age, enabling cities and the entire country to better meet future energy demands. Smart meters are an essential step for consumers, to a world where they have better control of their energy. When an

initiative is designed with people's experiences and needs at its heart, engaging residents becomes much more achievable. This is why we have developed the REAL Ratio.

Around the world there are two approaches to smart infrastructure. One where policy makers decide what they will do 'to and at' their citizens. The other is where policy makers think about how they can work 'with' their citizens to develop solutions. There is little doubt which is the most effective in the long term. The REAL Ratio provides a check, to make sure that you are really working 'with' those you serve.

Claire Maugham is director of policy and communications at Smart Energy GB.



Download the REAL Ratio framework at <http://s.coop/25t4x>

Infrastructure projects could benefit from new Imperial lab



Improving construction materials to make infrastructure more sustainable and durable will be the focus of research at a new £5.4m lab, says *Colin Smith*.

Bridges, tunnels, and flood defences are some examples of the underpinning infrastructure that keep modern societies functioning. However, one of the major challenges for governments and industry is the drain placed on public and private finances by maintaining such infrastructure over the long-term. Each year, around 50% of the UK's construction budget is spent solely on upgrading existing infrastructure.

The Advanced Infrastructure Materials Laboratory (AIM) will be the centrepiece of a new Imperial Centre for Infrastructure Materials where researchers will develop a new generation of construction materials that are more durable and robust, able to withstand ever heavier loads, and more cost effective to manufacture and maintain.

The centre has been funded by the Engineering and Physical Sciences Research Council (EPSRC). The team will also receive a further £3.6m to create a network of collaborations with academic institutions across the country, taking the funding total to £9m for Imperial.

Professor Nick Buenfeld, project lead and head of the Department of Civil and Environmental Engineering at Imperial, said: "Construction materials underpin our whole society, but we are lagging behind in terms of developing them to meet the complex needs of our modern world. These days materials need to last, be cost effective to make, but also need to be environmentally friendly and enable us to conjure up ever more effective and aesthetically pleasing structures. That is why our new centre is so important, because it will help to fill the research gap and enable us to develop materials that meet our complex construction needs."

Making construction more sustainable

At the new centre, the team will explore ways to make construction materials more sustainable such as through developing new manufacturing methods. Currently, the construction sector uses concrete, steel and asphalt as the main



materials in infrastructure. These materials have a huge carbon footprint. For example, the manufacture of concrete accounts for the second largest industrial source of carbon dioxide, contributing to over 6% of carbon dioxide generated from human sources globally.

Researchers will also explore ways of integrating new types of construction materials with traditional materials. This could enable engineers to develop cheaper and more adaptable ways of maintaining existing infrastructure.

Lab improvements

Imperial's Centre will be based in the Department of Civil and Environmental Engineering and will consist of a suite of

new labs and equipment that will extend the capabilities of the researchers. It will enable them to produce and process a wider range of materials, and image, analyse and test them in more detail. The researchers will also train the next generation of engineers, via an MSc course in infrastructure materials, which will start in October 2019.

The Imperial laboratories are funded by the EPSRC and sit under the 'umbrella' of the UK Collaboratorium for Research in Infrastructure and Cities. It forms part of a new National Centre for Infrastructure Materials, which includes the Universities of Leeds and Manchester, with overall funding from EPSRC for the combined institutions totalling £16.6m.

Academic collaboration

As part of the new national centre, the University of Leeds will establish an infrastructure materials exposure facility, which will be used to analyse how new materials stand-up to long-term weathering conditions associated with ageing infrastructure. The other member of the national centre, the University of Manchester, is establishing a fire and impact laboratory, where new materials will be subjected to extreme conditions to determine their robustness.



"Construction materials underpin our whole society, but we are lagging behind in terms of developing them to meet the complex needs of our modern world."

Professor Nick Buenfeld, head of the department of civil and environmental engineering at Imperial College London

Colin Smith is communications manager for the Faculty of Engineering at Imperial College London.

Driving the resource efficiency agenda



The infrastructure sector must be at the forefront of making the transition to a circular economy. *Tim Smith* explains why it makes good business sense.

There's no denying that construction remains one of the worst offenders when it comes to resource use. According to data from the Office for National Statistics, our sector consumes around 200 million tonnes of aggregates and other mineral products every year. We are also the UK's largest producer of waste. Statistics from the Department for Environment, Food and Rural Affairs (DEFRA) show that on average construction, demolition and excavation generate over half of the UK's annual total waste. Some progress has been made to improve materials recovery within our industry – the UK is currently meeting EU targets to recover at least 70% of non-hazardous construction and demolition waste – but there is still work to be done.

The infrastructure sector is especially resource-intensive, with road construction works, for example, requiring thousands of tonnes of finite raw materials and crude-oil derivatives such as bitumen. With a record £500bn of projects planned under the government's infrastructure pipeline between now and 2020, this demand for resources looks only set to increase.

Adopting a more sustainable approach will be critical to fulfilling these material needs, while helping to minimise the environmental impact of projects. Crucially, we need to make the transition to a circular economy, where materials are kept in use for as long as possible and then recovered and regenerated at the end of their service life to be used again.

Towards a smarter, sustainable model of materials use

The EU has long been championing a more circular approach to materials and in 2015 set out clear recommendations for supporting the recovery and re-use of materials by both consumers and industry in its 'Circular Economy Package'. The UK government has echoed this sentiment more recently, advocating the benefits of a more resource-efficient economy in its industrial strategy green paper issued at the start of this year. The paper notes that increasing the efficiency



FM Conway's state-of-the-art Erith asphalt recycling plant.

of material use across the whole supply chain can deliver huge cost savings as well as improve the productivity of UK businesses.

The highways sector is a case in point. Demand for sand, gravel and crushed rock supplies, which make up around 95% of the road surface, continues to outstrip permissions granted for new reserves in the UK. Meanwhile, technological advances in oil refinery production techniques are cutting the supply of another key component of our roads, bitumen, as refineries are able to increasingly focus their efforts on extracting higher-value fuels. Both aggregates and bitumen are imported by the highways sector to make up this shortfall in supply, making it vulnerable to the vagaries of currency fluctuation and potentially adding both time and costs to highway construction and maintenance schemes.

There is, therefore, a clear need to find an alternative resource stream for the sector. Asphalt recovery and recycling can go a long way to filling this gap. Asphalt recycling is not a new concept to the highways sector but to date we haven't fully exploited its potential benefits.

Shifting recycling up a gear

It is not unusual for asphalt with 50% recycled content to be incorporated into the lower layers of our roads. However, many highways operators remain

cautious about using material with a recycled content of more than 10% for the upper layer, or surface course, of our highways, especially on strategic routes.

We need to make recycling standard practice across both the strategic and local road networks as well as across all layers of our highways. Conservative estimates suggest that two billion tonnes of asphalt could be recovered from the UK's roads and reused on our highways. Tapping into this underutilised resource will not only help us to reduce the environmental costs of building and maintaining our roads, but also unlock significant financial savings.

Leading the charge

With significant development projects planned for the UK over the next few years, now more than ever the construction industry needs to ramp up efforts to adopt a more sustainable approach to resources. There are clear benefits to the highways sector and the infrastructure industry as a whole leading the way in this regard. As well as fulfilling a company's duty to act responsibly and ethically, making the move to a circular economy also makes business sense; bringing reliability to materials supply chains while driving financial efficiencies for projects.

Tim Smith is head of technical services at FM Conway.



Ben Ruse, managing director (London & South East) of Social Communications

Learning infrastructure delivery lessons from the rail industry

“Quite how much railway stations have improved over the last decade or so is astonishing.”

Why do we have such difficulty delivering infrastructure? Historically, the UK gained a reputation for short-term planning, delayed implementation, poor design and outdated construction techniques that invariably meant projects suffered from late delivery and an inability to stick to budget.

Somewhat ironically, what often lay at the heart of this reputation was an honest desire to get it right. Nothing delays the start of big projects than a desire to over-justify their existence. What seem like endless business case analyses, economic justification reports, cost:benefit ratio planning and the like apparently have to be produced, poured over, reproduced, studied, adjusted and then withdrawn before there's even the slightest sense of agreement.

Trying to get politicians to look forward beyond the fixed term of parliament is almost impossible. Heaven forbid that we could have a view that stretched decades into the future.

Mercifully (though still far too slowly), we seem at last to be moving in the right direction. Billions and billions of pounds are now invested in projects like HS1, Crossrail, HS2, the London 2012 Olympics legacy, a nationwide strategic road network improvement programme, etc are all being progressed and delivered on time and on budget.

One of the symptoms of this progress can be seen in the railway sector. Quite how much stations have improved over the last decade or so is astonishing. I worked on the HS1 project for some ten years so I acknowledge my bias, but the

project to renovate St Pancras International (the central London terminus for HS1) was as visionary as it was controversial. At the core of this new vision were two things:

That St Pancras International could become a destination in its own right. That is, that with the right retail mix, the right events programme, the right communications strategy, the right brand, the right management and with the right people working there St Pancras could attract people to its facilities who have no intention of getting on a train.

That St Pancras could be the centrepiece and catalyst that promoted a new cultural quarter of London.

Both these things have come to be a reality with results that even our most optimistic planning could not have predicted. Today something like one third of those people shopping, eating, meeting and enjoying themselves at St Pancras are not catching a train. St Pancras lies at the heart of King's Cross Central, perhaps (and certainly arguably) the most vibrant, creative, attractive and productive part of north London.

I am particularly pleased to see this model of rail-led regeneration and revitalisation being replicated at King's Cross, the magnificent Birmingham New Street and equally importantly at smaller stations on London's overground, Crossrail and elsewhere up and down the national network. Rail? That stuffy old one-track-thinking industry? At the vanguard of this revolution? Heaven forbid!



David Spencer, managing director for consulting, Amey

Better journeys, next exit

According to the Department for Transport, motorways account for less than 1% of the country's road network, and yet they carry nearly 21% of all traffic. Not only are most people's journey's made by road, it's also the main method of transporting freight, with almost three times more goods moved by road than rail, despite an 80% rise in rail freight since 1995.

This massive demand for increasing capacity and reliable journey times means we need to develop smarter, more intelligent engineering solutions to help make the network fit for 21st century demands.

I travel a lot, and I spend a great deal of time on motorways, particularly the M6 between Lancashire and Birmingham – so I know that traffic doesn't always flow as well as it could do! But behind the cones, the work to make at least part of this stretch of road 'smart', is well underway and this will

have a positive impact on the motorist experience.

Unrelenting demand for mobility

The seemingly unrelenting demand on our motorway network has meant that we need to be smarter about how we design, build and manage motorways. The M25 motorway is perhaps a classic example of how organisations, like Amey, are working and designing more intelligently to make our journeys better.

“Technology is now helping us make further and greater improvements.”



Mark Keenan, chief executive officer, Real Wireless

Ten priorities for a digital minister

“We are interested in the recommendation that the government appoints a digital champion, or cabinet minister, to take responsibility for our digital future.”

Just before Christmas, the National Infrastructure Commission published *Connected Future*, a report looking at what the UK needs to do to become a ‘world leader in 5G deployment’.

Media reporting of the report focused on the revelations that the UK’s 4G coverage is worse than that of Albania and Peru and hailed 5G as the opportunity to put things right.

At Real Wireless, we’ve watched the coverage of this issue in the media with some interest. While we don’t share the nation’s obsession with next generation labels, we are interested in the recommendation that the government appoints a digital champion, or cabinet minister, to take responsibility for our digital future.

There are certain things that a digital minister should know. Here’s ten key priorities for starters:

- Exploit the capabilities of 4G and focus on truly universal wireless coverage at last (e.g. bring connectivity to not-spots and rail), predictable and consistent speeds more important than peak speeds, with more targeted government funding or carrots/sticks for MNOs.
- Create the regulatory environment for key verticals to have access to optimised wireless networks, not one size fits all – for example incentivise MNOs to invest in network slicing.
- Lower barriers to entry for new MVNO operators, for example with flexible spectrum pricing and allocation, and a more shared/unlicensed spectrum.
- Post-Brexit, create a net neutrality programme which allows investors in

“What the UK needs to do to become a ‘world leader in 5G deployment.’”

networks to monetise their infrastructure effectively, such as high QoS services, while retaining open access to core services.

- Create meaningful structures for dialog between spectrum owners and vertical industry players (eg transport) to break down the mistrust, and ensure advanced 4G and 5G serves more than one vertical.
- Provide support and funding for integrated smart city initiatives – reduce rates and incentivise investment by making access to publically owned assets easier.
- Invest in radio skills and in testbeds for all kinds of wireless, not just 5G.
- Ensure that 5G consultation is held with all sectors, and prioritise resources according to areas of social and economic impact – forget about 5G ‘leadership’.
- Ensure that all new or upgraded buildings and infrastructure such as road and rail networks are obliged to consider how wireless communications will be deployed in the environment they are creating.
- Encourage and incentivise private investors to make greater use of shared infrastructure, such as structures, transmission and power to deliver wireless services.

The innovative orbital M25 motorway, took a decade to build in the mid-70s and 80s, but by the early 1990s was already a victim of its own success. There were significant capacity issues and I was then working to maximise lane space and help keep more traffic flowing within the existing land-take. While the work I and many others were doing over 20 years ago might have seemed pioneering at that time, thankfully technology is now helping us make further and greater improvements.

We’ve made central reservations half the size as their traditional counterparts and the use of BIM technology is helping us to solve the challenges for designer, constructor and maintainer, associated with the congestion of many interweaving components. Whilst we fit together the intricate jigsaw puzzle of drainage, lighting columns, power cables, safety barriers and the like, we also keep open six lanes of live traffic to help people make the journeys they need.

Hardshoulders require similar treatment, not only to be available in emergency situations, but to become running lanes and increase capacity at peak times. With the use of technology they can both detect and manage our increasing traffic volumes, in order to optimise the traffic flow.

Smarter Motorways require even smarter maintenance

But of course building truly ‘smart’ motorways isn’t about comparisons

“Really smart engineering will also be required for the maintenance of this smarter infrastructure.”

with what we did 20 years ago, or indeed what we can achieve today – it needs to be about how we can learn from this and prepare ourselves for what needs to be done next.

Thankfully technology improvements will increase our range of options as the un-remitting demand for mobility also continues. We will therefore be able to design for the needs of autonomous vehicles, for which the smart motorways of tomorrow will surely have to facilitate, much closer vehicle spacing, remote speed controllers, automated re-routing, collision prevention, and even the recharging of vehicles ‘on the go’.

So, we’re already starting to look at the next generation of smart motorways and how they might be operated, but we know that really smart engineering will also be required for the maintenance of this smarter infrastructure, on which we all increasingly rely on.

Moving from strategy to delivery

Say what you like about the UK economy, but the one thing we're not short of is strategy. The government has finally unveiled its initial thinking on an industrial strategy for the future, the Northern Powerhouse has a strategy and a strategy for the Midlands Engine will follow in the coming months.

Let's not be cynical about this, planning is good. You don't go asking for money without detailed evidence that you've got an investable proposition. So is the sense that there's some co-ordination behind this. The Northern Powerhouse and the Midlands Engine may have different identities and separate strategies, but they need to join up their investments. Boundaries are one thing we need to start looking beyond if we're going to make our way in the world in the years to come.

The reoccurring theme in all of these strategies is a pressing need to upgrade our infrastructure. I'm preaching to the converted here, because *Infrastructure Intelligence* readers already know that money spent on road, rail, air and technology connectivity is the gift that keeps on giving. It provides employment and revenue during construction, it connects people to opportunities and delivers a better-functioning, more sustainable economy in the long-term.

Broadly, these strategies tick some sensible boxes – investment in R&D, developing skills relevant to the future, upgrading all forms of infrastructure, supporting business growth across the country, encouraging international trade and inward investment.

But in a world likely to soon be dominated by digital technologies and empowered attitudes, government also has to buy in to a mind-set as well as physical assets, because one follows the other. At BWB, everything we do for clients is about the art of the possible and that if conventional solutions aren't appropriate we'll find an unconventional option.

If you apply that innovative mind-set to some of the challenges that the UK economy faces you begin to realise that we can think big. We know that one of the key challenges we face is just keeping the economy moving when many of its transport networks operate beyond theoretical capacity and regularly suck up eye-watering maintenance bills. And a post-Brexit economy can't compete with the world if it's held back by clapped-out infrastructure.

So let's consider initiatives like the Great Britain Freight Route (GBFR), a 450-mile rail



The Great Britain Freight Route could transform the movement of freight – nationally and internationally.



Talking about industrial strategies is all well and good, but creating a match-fit economy means that more than ever we need to focus on infrastructure delivery and think big, says *Steve Wooler*.

route prioritised for freight and connecting key UK industrial centres to Europe. Just as HS2 is a massive opportunity to unleash regional economic potential by radically improving connectivity and reducing journey times between key cities, so GBFR could transform the movement of freight – nationally and internationally.

The case for a dedicated GBFR network is compelling. It would largely employ rail routes that are under-utilised or have lain dormant since Beeching sounded their final whistle. Its model is based on transporting loaded road trailers rather than rail containers, so they can roll-on/roll-off with HGV tractor units at either end of the journey. And because the trains would be compatible with the European loading gauge, it would unlock significant long-distance transport efficiencies.

It would also do something else very important – reduce the punishing impact of long-distance HGV freight on the UK's battered motorway network, and significantly decrease the carbon footprint of business (CO₂ emissions on a like-for-like basis from rail freight are 76% lower than road freight). A preliminary budget

cost for the project has been estimated at circa £6bn. This would be far outweighed, however, by the direct and indirect benefits of construction spending, the long-term economic opportunity it unlocks and the significant financial and environmental advantages that accrue from decreased HGV traffic and consequential reduction in highway maintenance.

The Great Britain Freight Route is one of a number of strategic investments that could do so much to unlock regional economic potential. It's consistent with the stated ambitions of both the Northern Powerhouse and the Midlands Engine – and the prime minister herself.

It often seems that the single biggest challenge we face in the UK is pushing the start button. Well, the industry is ready and waiting. We have the projects, we've developed the business case, and we have the skills and ambition to make them happen.

Let's quickly move from strategy to delivery.

Steve Wooler is the chief executive of BWB Consulting.

Organisations in the infrastructure sector continue to show growing interest in sustainability and climate resilience when planning major developments and 2017 could see a rise in the number of innovative approaches being applied. Natural capital and circular economy principles that were once seen as ‘nice-to-haves’ are now starting to become more mainstream, with infrastructure owners recognising the business benefits that introducing these approaches can bring.

This increasing awareness is partly a result of the Paris Agreement that was signed in December 2015, which created a common climate goal for the world through which to focus new technologies and ambition. It has also led to growing acknowledgement of the need to build resilience to the impacts of climate change.

Savvy infrastructure providers are already taking steps through measures such as carbon pricing to address the challenge. Many operators, for example, now include carbon weighting in bids and are seeing it drive significant cost efficiencies. Most operators have incorporated carbon in their optioneering assessments for major investment decisions, either by providing a carbon budget as well as a cost budget, or by integrating a carbon price in the asset profile.

With a strong UK pipeline of infrastructure projects, many schemes will be under increasing pressure from the local availability of construction materials. By taking a circular economy approach, assets and materials are kept at their highest value for as long as possible, helping to deliver real cost efficiencies. This year the first circular economy industry standard, BS 8001, will be published, providing a framework for implementing circular economy principles within organisations.

Widespread adoption of circular economy principles in infrastructure will require innovative business system models and the new standard should guide organisations through the process. As the circular economy continues to build momentum, the UK has the opportunity to become a leader in its application.

Natural capital is another approach that is gathering pace. Last year, the Natural Capital Protocol was launched with uptake from some of the world’s leading organisations. This year will see the publication of more specific guides to help businesses in different sectors incorporate natural capital into business planning and its application in infrastructure continues to grow. Next on the agenda, however, must be social capital. Social capital, which covers the benefits that sustainable measures can bring to the wider community, is proving

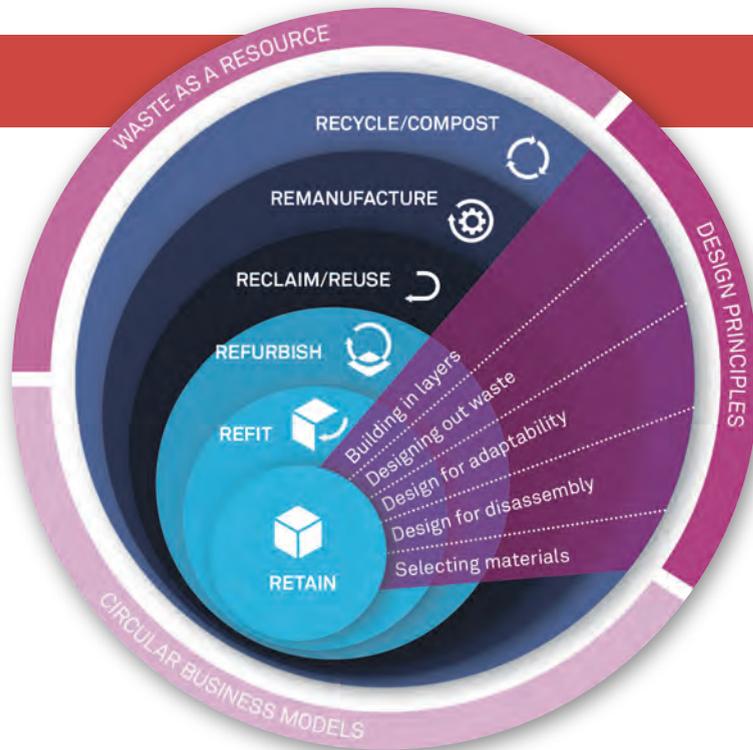


ILLUSTRATION: DAVID CHESHIRE

From ‘nice to haves’ to the mainstream



As environmental concerns become more mainstream and the circular economy continues to build momentum, the UK has the opportunity to become a leader in its application, says *Robert Spencer*.

more complex and difficult to quantify.

There is evidence that demonstrates the considerable health benefits that natural capital and circular economy measures can bring, with air quality chief among these concerns at present. Social capital uptake will no doubt increase in 2017 and the infrastructure sector must take steps to account for its benefits as new schemes

develop. How to buy social value will continue to be a question that will perplex infrastructure commissioners in the months ahead.

To push forward the application of approaches such as natural and social capital and the circular economy, infrastructure owners will need to work together to convert ideas into actions. Sharing best practice is key to aid widespread implementation across the sector.

Robert Spencer is sustainability director at AECOM.



“It is increasingly apparent that traditional financial accounting practices are failing to recognise all relevant business impacts and risks. The Natural Capital Protocol is a real world first in bringing structure and a standardised common framework for natural capital assessment.”

Liz Barber, Yorkshire Water

The Natural Capital Protocol is a framework designed to help generate trusted, credible, and actionable information for business managers to inform decisions. The protocol aims to support better decisions by including how we interact with nature, or more specifically natural capital. Download the Natural Capital Protocol at <http://naturalcapitalcoalition.org>



Clancy Consulting has been providing engineering services for a wide range of clients for over 45 years. *Andy Walker* visited the firm's Altrincham offices and spoke to chief executive Alan Bramwell about how the firm is doing and how he views the state of the industry.

A dynamic and successful business with lots going on

Alan Bramwell (pictured, right) strikes you as the sort of person you'd like to work for. He's confident without being showy and he knows his stuff. He's been with Clancy Consulting since 1982 so he knows the firm inside out and he's seen many changes during his time there. Like many of the staff at Clancy, he's stayed the course and in a part of the country where loyalty is valued more than most, Clancy Consulting has got it in spades.

That loyalty works two ways, to clients as well as staff. It's a selling point that Bramwell is keen to mention when bidding for work. "What we try to highlight as much as we can is the owner-managed element of the firm and the direct influence and longstanding care for that client's programme we bring," Bramwell tells me. "We use that heavily when we are pitching for work. The people that our clients are going to be working with are people who have an absolute genuine stake and a hard core interest in that business. It's why we structure our business in the way that we do, so that our share ownership goes right through the firm. They are not just winning the work, they will be involved in that project and are hands-on," says Bramwell.

Spread over nine locations across the country, Clancy Consulting is a firm that's on the up, with turnover now at £12m. Like many SME firms, the Altrincham head-officed consultancy is heavily involved in property and building work and Bramwell is keen that the industry looks beyond heavy infrastructure when promoting the



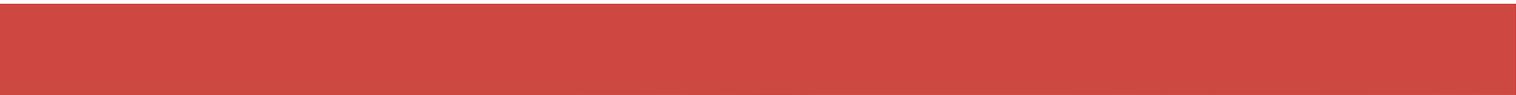
benefits of what it does. "Most SME consultancies like ourselves have probably been doing 60-65% housing work for the last three or four years," says Bramwell. "Residential is still important to firms like ours but other sectors are starting to pick up, including industrial, health and education. Representing the people that are doing buildings is important as that's often the public's main contact with our industry," he says.

Bramwell welcomes the government's recent focus on making sure that local SME firms get a slice of the infrastructure investment pie, but he thinks that that the

playing field is not a level one. "The government outwardly talk about their agenda to encourage SMEs but they are continually shooting themselves in the foot," he says. "The requirements to bid or to get on frameworks are often unrealistic. The latest one we saw was 'cyber-essentials', a commitment on data security for bidders that cost £1,200 just to put in an application. Smaller SMEs are not going to pay that on the off chance of getting the work," says Bramwell.

"Complying with minimum requirements alone can sometimes take ten to 12 weeks, which is no good for





The multi-award-winning Aloft Hotel in Liverpool.

smaller firms. Government and public sector clients need to look at these things if they genuinely want to encourage SME firms to bid for work. We need local firms to be bidding for work because that means local jobs and money going into the local economy,” Bramwell argues.

With new government investment to the regions set to come on stream soon, Clancy Consulting should benefit, but Bramwell has a warning. “New investment is important but the government’s focus on the regions needs to truly benefit the regions. Will HS2 bring more to the north or make it easier to get to London? Political

“We need local firms to be bidding for work because that means local jobs and money going into the local economy.”

Alan Bramwell

decisions make a difference and the politicians need to get it right,” he says.

The social infrastructure that the government says it wants to develop more of is an important area for Clancy Consulting and the housing sector in particular is very active. “We’re not doing as much social housing as we did in the past but we are doing a lot of variable work,” says Bramwell. “Assisted living has been a massive area for us with a lot of clever models coming out for that sector and also student accommodation. We are doing

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more multi-storey residential work than we have done for a long time, thanks to the investment-led private rented sector and Manchester and Liverpool is particularly busy. At the last count we had 15 to 20 30-storey-plus schemes on the go which are sizeable chunks of infrastructure," he says.

Other sectors like education are also productive for the firm and Bramwell cites increasing work in the health and leisure centre sector driven by the need for better health and wellbeing. "Wellbeing is interesting because it's likely that wellbeing ratings for commercial buildings will become a serious factor in the future," says Bramwell. "A wellbeing accreditation in your building will be a significant factor in rental values and workplace satisfaction and we are likely to see investors investing in schemes that have a wellbeing tag because they will be easier to sell or let. It's something that's worth keeping an eye on and we have a director keenly involved in that area," Bramwell tells me.

Turning to the issue of recruitment, I ask Bramwell how a firm like Clancy Consulting goes about attracting the people it needs. He tells me that just as clients benefit from the firm's hands-on approach, so do staff. "An example is one of the recent directors we have just taken on, who left a much larger firm because he didn't see a career path ahead," Bramwell explains. "So, he joined us to run an office with autonomy, but with an umbrella of other



offices around him, and he also has a career path through into ownership if he wants it. People can join us, run an office in a senior position in a local area and then develop the firm in that area," says Bramwell.

"We need to bring people in from outside with the experiences of being at an AECOM or a WSP for example, because they have a different take on things and new and different managerial experiences we can draw on," Bramwell says. "Bringing

"Bringing people in alongside others who have been here for longer creates a diverse mix of people. It's all about getting the right balance at the end of the day."

Alan Bramwell

those people in alongside others who have been here for longer creates a diverse mix of people. It's all about getting the right balance at the end of the day," he tells me.

The firm takes a flexible but nimble approach to resourcing work and their office structure enables them to pool their resources, such that around a third of Clancy's work is moved around the business and resourced in that way. This in turn leads to a very healthy and collaborative team spirit within the firm which is something that Clancy Consulting is justifiably proud of.

"We have a really good company culture," says Bramwell. "A family culture is what we provide as a company and there's a lot of social activity in the individual offices. We also try to help out staff who have gone through difficult periods and we did that during the recession in particular. We have examples of people who have been offered other positions elsewhere on more money who have turned around and said 'what Clancy's did for me was priceless and I'm not moving'. That loyalty is very valuable to us," Bramwell tells me.

Clancy Consulting is typical of many SME firms in the construction sector that get on with the job, often without fanfare, but who are very highly regarded by their clients. Those clients include many that have worked with the firm repeatedly. Recent projects include the multi-award-winning Aloft Hotel in Liverpool, where Clancy provided the civil, structural and M&E work of a sensitively restored building in the city centre. Their work on HB Villages' assisted living roll out programme has also received plaudits and as a consequence of the experience they have developed working on a technology-led housing project, they are now working with other contractors on other schemes.

The British Motor Museum Collections Centre, where Clancy provided civil, structural and mechanical and electrical services, is another award-winning project and the firm is also involved in a range of leisure and retail projects across the country. Clancy is also working at Lynemouth in Northumberland on the first power station to be given the go ahead from the government to cease coal burning and convert to full biomass supply.

"We're proud of the projects we work on," says Bramwell. "We want to grow and develop the business sustainably and our fundamental reason for wanting to do that is so that we create career development opportunities for people. We're enthusiastic about the future and we want to be dynamic because people want to join a business that has things going on," he says.

A Cities and Infrastructure white paper, to be launched in April at an event in parliament, is set to kick start an ongoing process of engagement with key industry, business and political figures on the importance of economic and social infrastructure to the UK.

Infrastructure Intelligence is collaborating with WSP | Parsons Brinckerhoff on a new initiative aimed at identifying infrastructure priorities to allow cities to be competitive in the new global landscape, following the EU referendum.

A series of three industry roundtable events, bringing together key figures from the industry, were held in London, Manchester and Birmingham and the issues raised and conclusions reached will form the basis of a Cities and Infrastructure white paper to be launched in parliament on 27 April 2017.

Attendees at the roundtables were clear that infrastructure was a big agent for revitalising the economy, but that it needed to be defined in a much broader way – hard and soft (education, housing, digital etc). It was crucial to amalgamate the economic aspects of infrastructure with the physical and virtual aspects as these were seen as just as important for growth as is putting in a new high speed rail link. It was also thought that this would make it easier to make the link between infrastructure investment and economic growth.

However, those attending the roundtables felt that there needs to be more work on communicating the positive aspects with the public. Often the media is full of negative stories about infrastructure but people don't hear the personal stories of job creation and life enhancement. It was very important to understand what the general public thinks as they should be an informed electorate capable of understanding infrastructure priorities given the right information.

Public support for infrastructure was seen as absolutely critical as it is the key to unlocking and putting pressure on government for a range of different projects and schemes that the industry would be looking to deliver.

Roundtable attendees also expressed concern about the ongoing political and economic uncertainty in the UK. If the country is perceived as an unattractive area with a lot of uncertainty, it will not attract investment. This may have been exacerbated by Brexit and Trump and knowing what the future holds was seen as crucial as a confidence booster for investors.

How the industry promotes infrastructure was also seen as important. What sort of language is needed (that is

Walking the talk on infrastructure



currently not being used) that will allow ordinary people to understand the benefits of infrastructure? Does the industry need to highlight the employment opportunities, increased social well-being, better air quality, centres of excellence, more than it does?

“We should be articulating that infrastructure can enable economic, social and environmental benefit, not just growth,” said one attendee at the Manchester roundtable. “But we also need to make the distinction between economic benefit and economic growth. Using the term ‘growth’ can be a bit of a double-edged sword – a general, nebulous term.”

While generally welcoming the moves towards greater devolution, roundtable attendees had a warning. While devolution means that decisions made locally can better reflect the requirements of the area in question, devolved governments don't necessarily deliver as they are dependent on central government funds to be able to realise projects. More devolution may exacerbate the north-south divide, said to be a concern for the prime minister.

The need to explore alternative funding models was highlighted. Some local authorities are using pension funds to invest in real estate and infrastructure, but it's not just the pension funds but also the Treasury too. More needs to be done to encourage local government to invest in more projects in this way. Shifting the focus from London was seen as crucial.

Overall, there was a strong view expressed by all those that attended the roundtables in London, Manchester and Birmingham, that the industry needed to be much more effective in its public advocacy work. “We don't do enough on what the construction industry delivers in terms of its social impact in terms of the projects themselves, the jobs created long-term and the redistribution of wealth – we need to make people much more aware of this,” said one attendee in Birmingham.

Increasing that awareness – amongst the public, politicians and opinion formers – will begin in earnest when the Cities and Infrastructure white paper is launched at parliament in April.

Policy around facilitating transport infrastructure in Europe has improved significantly over the last two decades, shifting the focus from nationally isolated projects to viewing transport as a cohesive network across



the continent and beyond. *Natasha Levanti* reports.

With the significant economic benefits derived both directly and indirectly from successful transport infrastructure, partially driven by increased economic, social and territorial cohesion, the EU has undertaken significant amounts of research and policy facilitation. These efforts allow us to gain a much deeper understanding of efficiencies for transport infrastructure and the successful implementation of projects.

Following the recent publication of several policy and research reports covering the state of European transport infrastructure, both country-specific and EU-wide, it is clear that co-modality, inter-connectivity and operability, as well as sustainable urban mobility, are going to be key drivers for the future of European transport infrastructure.

TEN-T to connect

The Trans-European Transport Networks (TEN-T) are a planned set of road, rail, air and water transport networks in the European Union. Over the years, TEN-T policy has evolved as infrastructure has become a matter of top political importance for national governments.

The purpose driving all facets of TEN-T is to connect Europe, its neighbours and the wider world through ensuring that isolated national priority projects still fit into an overall interconnected multi-modal transport network.

Between 2007-2013 there were at least 68 TEN-T projects within the United Kingdom alone, changing the thinking about transport network use from a single mode isolated approach to one that encompasses the user from journey start to destination, with various transport modes in between, allowing for efficient hassle-free transport of both people and freight.

Towards sustainable urban mobility



Many transport infrastructure initiatives throughout Europe balance both social and environmental impacts.

Inter-connectivity and operability are both particularly intriguing approaches to UK transport, particularly in the light of the conundrums within rail franchising and disputed responsibilities of devolved powers towards initial building as well as maintenance. With individuals statistically living further away from their places of work, it is essential that issues related to transport efficiency and ease of use are addressed. Many in Europe are looking to inter-connectivity and operability for solutions.

Connect to compete

While interconnectivity and interoperability within Europe has been paramount, significant effort has also been made to ensure that these networks connect with the world, facilitating efficiencies in trade for both goods and services.

For this to be successful, it is essential for all nations involved to uphold compatible standards. Though done initially to ensure

connectivity and operational efficiencies, this extends the knock-on effect of European transport policy, directly impacting worldwide transport.

Given the strategic role that the British Standards Institute has played, the UK has been instrumental in the development of standards that are now used to connect the world.

However, this perspective of transport policy has not only spurred cross-border collaborations, but also collaborations across sectors. Seen across Europe and in the UK, for these large scale compatible networks to be put in place, transport policy and investments are increasingly paired with land use policy and anticipatory optimisation, to best ensure the success of projects.

No longer can the ease of user journeys across various transport modes be fully separated from operational processes, safety needs, funding sources, long-term financial planning, community impact, or



local planning permissions. As seen in a variety of EU reports, when considering transport projects all factors must be taken into account as a comprehensive approach to success across the project lifespan.

Compete to grow

Unlike other forms of public procurement, a large part of the challenge for transport infrastructure is the irrevocable investment commitments needed prior to project commencement, as well as the series of oft-contested governmental decisions relied upon at local, regional, national levels.

Fundamental to the planning and implementation of new projects is the pricing and funding schemes through which projects are most likely to succeed over their lifespans. The case studies experiencing the highest success took account of the social marginal cost from the start of the planning process, while funding was considered over the lifespan of the

project, with pricing being factored into the funding process.

Across Europe's transport infrastructure data collected over the past 20 years, a fundamental recommendation for the pricing and financing appraisals for new projects is to account for variants or imperfections within the current and predicted economic landscape, within the evaluations of financing and pricing options. If imperfections in the economic landscape exist, the value of initial transport impacts will not be the same as the value of the final economic impacts. While not accounted for within conventional ex-ante and ex-post appraisal methods for transport projects, this was found to have serious repercussions upon both the short term and long term perception of project success for investors.

The cohesion of transport networks and streamlined identification of investment needs have enabled better ROI as well as

sustained added value for national and cross border networks, particularly in regards to user feedback.

Ultimately this reinforces interoperability and interconnectivity as key trends for success, as this is largely dependent on being attractive to investors.

Grow for the future

As sectors converge, for the enhanced delivery and success rates of large scale transport projects, there is a need to consider the increased integration with innovative content or funding and technology enabled automation processes.

Though Europe has historically been a world leader in manufacturing and services related to transport, the constantly evolving potential of innovations and digital efforts fundamentally changes the globally competitive landscape.

It is increasingly important that transport infrastructure is optimised to be competitive not just for today, but for the future. Optimisation is important to not just enable companies based in Europe to export their expertise to the rest of the world, but to have the most efficient and modern transportation network available so as to maintain international competitiveness.

In order to ensure that national and cross-border networks are ready for the future it is vital to develop a strong framework, both within governmental project pipelines as well as individual project development, that will utilise cross-sector synergies to support innovations and incorporate the newest 'smart' technologies. Often geared towards efficiency within a rapidly growing population, much of these elements also have to do with balancing the social and environmental impacts of transport infrastructure.

This is the foundation of sustainable urban mobility, the new and fast developing focus of many transport infrastructure initiatives throughout Europe.

In order to combat the rapidly growing global population, in addition to the well-known environmental, social, economic, and structural impacts of transport infrastructure, sustainable urban mobility is the preferred goal of the majority of projects planned to take place in Europe prior to 2050.

Along with multi-modality, interconnectivity and interoperability, sustainable urban mobility will undoubtedly be a key objective in the United Kingdom for years to come.

It's time to campaign for a Crossrail for the north



Given the pressing need to improve east-west transport links in the north of England, it's time for a relentless campaign for a 'Crossrail for the north', argues *Paul Dimoldenberg*.

The recent IPPR North report, *Paying for our Progress*, sets out the case for rebalancing transport investment in the UK in favour of the north. The report shows how, through Transport for the North, we could fund a new high-speed rail service between northern cities, including by new northern infrastructure bonds. The benefits of investment are already paying dividends – under their new franchises, Trans-Pennine and Northern Rail are investing significant sums in rolling stock and station facilities which will drive improvements to our experience of travel in the north.

Key figures such as John Cridland, chair of Transport for the North, have been calling for vastly improved east-west transport connections. In September 2016, Cridland told the *New Statesman*, there are major new investments across the north, from Sheffield and Manchester to the ports of Liverpool, Teesport and the Humber, which could, if connected, offer a “multiplier effect”, allowing businesses to share resources and expertise. “East-west links could liberate travel patterns for citizens to get to higher-quality jobs and for entrepreneurs to seize economic opportunities, because they're filling a real gap. It's the east-west links in the north of England that are poor”, he argued.

More recently, shadow chancellor John McDonnell has echoed Cridland's call.

“Labour is absolutely committed to delivering HS3, a Crossrail for the north, connecting the great cities of the north of England,” he said. “It's at least a £10bn commitment from Labour to invest in the north. It means the journey from Manchester to Leeds will take just 25 minutes, instead of close to an hour. Or you could get from Liverpool to Manchester in 25 minutes. Crossrail for the north will become the foundations for a transformed northern economy.”

These are all fine words which few in the north would disagree with. But turning fine words into real deeds will take more than media interviews and political soundbites. What is really needed is a relentless, focussed and effective campaign to force ‘Crossrail for the north’ on to the national political agenda and to keep it there until government agrees to the necessary funding and powers to make it happen.

So, how can this happen? The campaign needs to be led by a private/public sector partnership with cross-party support and reaching out beyond the narrow confines of Westminster and Whitehall. The ‘Crossrail for the north’ campaign should be the ‘beating heart’ of the UK's post-Brexit future, bringing new opportunities, new promise and new hope for many northern communities. It will need to be one clear message echoed by a thousand voices.

Timing is often critical in these policy and political matters. With the Northern Powerhouse as a key part of the UK government's economic growth arsenal and firmly embedded in the Treasury and the developing industrial strategy, the mood music is right. Transport for the North should become a statutory body this year providing a regional enabling body to bring forward the funding and technical case for its delivery.

But still the case needs to be made. What might a ‘Crossrail for the north’ campaign look like?

- A powerful ‘case-making’ document setting out the economic benefits that ‘Crossrail for the north’ would bring, including local versions setting out how individual towns and cities would benefit
- A strong and convincing analysis of how ‘Crossrail for the north’ can be financed
- A coalition of private and public sector business leaders, politicians, academics, cultural leaders and media personalities endorsing the campaign
- A group of respected spokespeople from the north acting as the ‘public face’ of the campaign
- A series of local campaigns involving a wide coalition of business, political, community and public sector interests calling for their town or city to be linked by ‘Crossrail for the north’
- A ‘Crossrail for the north petition’ supported by the regional media
- A social media campaign involving Facebook, Twitter, Instagram and other digital outlets
- A letter-writing campaign to Cabinet Ministers and the national and regional press
- A series of polls to track public sentiment and demonstrate growing support

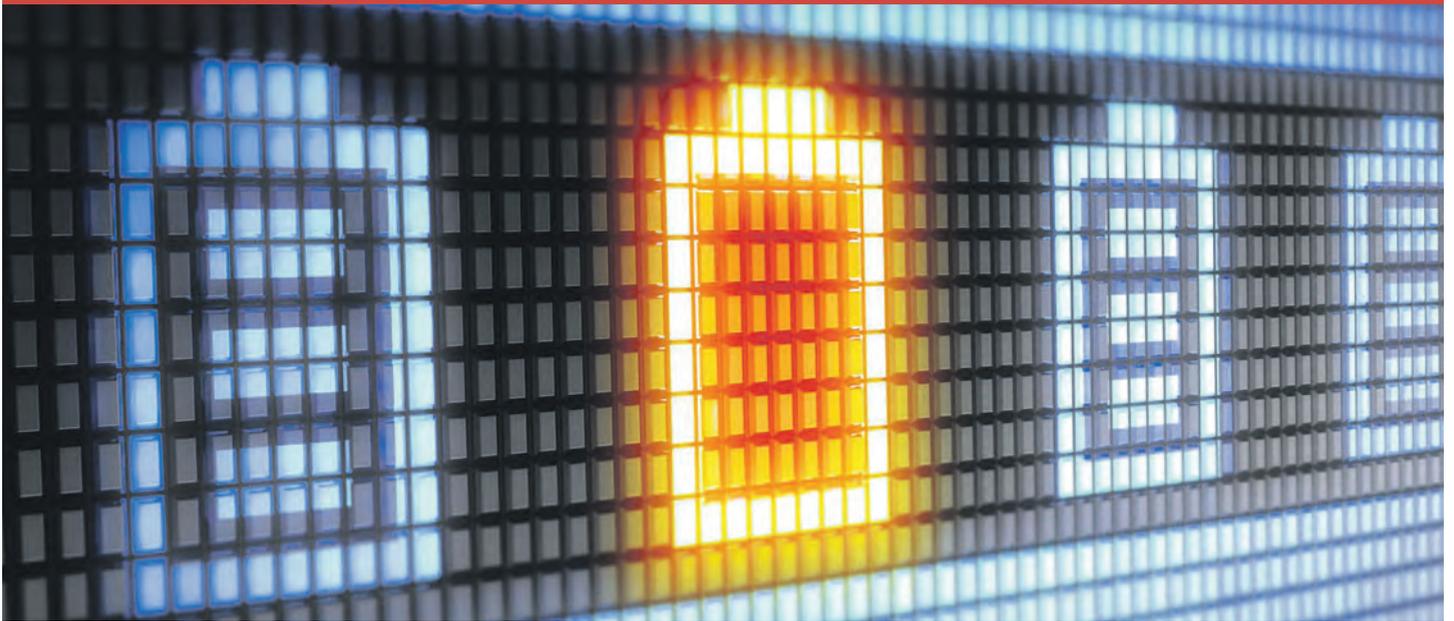
It's time to get serious about ‘Crossrail for the north’. We cannot afford to let this necessary infrastructure be delayed any longer. We need start the campaign now.

Who wants to help us get the campaign started?

Paul Dimoldenberg is chairman of Quatro, a communications and public affairs consultancy for the planning, property and energy sectors.



Turning fine words into deeds is what is needed.



Energy storage can save £8bn in the UK



Energy storage and decentralised energy presents a massive opportunity for the infrastructure sector and the nation, says *Frank Gordon*.

The National Infrastructure Commission has identified energy storage as an area offering £8bn in savings to UK Plc. Energy storage consists of a range of technologies used to intelligently store and discharge energy to the UK grid, homes and factories, such as batteries, liquid and compressed air, and pumped hydro storage. This balances and smooths out energy flow when demand and supply don't match, such as during winter evenings, as well as provides a range of technical services to the network allowing for operating in peak condition.

Furthermore, when you combine storage with a distributed energy system, which means generating energy is closer to where it's used, you increase energy security, improve efficiencies by removing losses from transporting it to where it's used and lower the carbon footprint of the energy network. One example is a 'microgrid' where energy generation, for example solar panels, is combined with smart infrastructure such as smart meters and intelligent software, to charge a battery and then use this to power up electric

vehicles all on a separate grid system.

The huge savings being talked about refer to needing less back-up energy generation (the likes of gas plants) and fewer overhead wires sending power around the country.

The cost of energy storage is falling considerably year on year for many forms. Lithium-ion, which is the leading chemistry



A microgrid is a localised grouping of electricity sources and loads that normally operates connected to and synchronous with the traditional centralised grid (macrogrid), but can disconnect and function autonomously as physical and/or economic conditions dictate.

for most batteries and exactly the same as found in smart phones and laptops, has come down in cost by more than 10% per year in the past five years. New battery chemistries and other forms of energy storage are emerging on a regular basis, for example lithium titanate and copper/zinc batteries.

Applications include in people's homes and offices – often linked to on-site solar panels – to factories and offices, up to large 'grid-scale' sized, standalone projects. Of course, large scale deployment will not happen overnight; what we need is for the regulations to match the opportunity. To their credit, BEIS and Ofgem have launched a call for evidence on what needs to change and there has been public support from ministers.

What the industry needs now is a roadmap to deliver the regulatory regime required and for the necessary changes to take place with a sense of urgency. The urgency will unlock a valuable and important market for all energy users and deliver savings for bill payers. Just as importantly, it provides job and investment opportunities and future export potential if we can develop the market faster than other countries and then sell our expertise.

This may seem far-fetched, but the UK has very strong positions in energy storage installation, design, services and some manufacturing. So as well as an infrastructure priority, energy storage and decentralised energy must also be seen as an industrial strategy opportunity.

Frank Gordon is a senior policy analyst at the Renewable Energy Association.



The Renewable Energy Association represents renewable energy producers and promotes the use of all forms of renewable energy in the UK.



Looking ahead will save project costs

Early mechanical and electrical systems supplier involvement on projects can deliver cost savings and avoid common missed opportunities, says *Simon Burras*.

“If only they’d spoken to us earlier,” is a thought I’ve had many times after completing the first pass of M&E tender documents for the latest infrastructure project. And I suspect this is a common wish among M&E suppliers.

Although used to being the ‘tail-end Charlies’, giving M&E suppliers the opportunity to become involved earlier will benefit many aspects of a project as a whole, especially where the M&E provider’s role extends to system integration. This is because, when designing large infrastructure projects, it is customary for the owner organisation to engage a design company to ensure the project’s viability from an engineering and budgetary perspective.

Once the project is approved, the role of the designer evolves to focus on generating performance specifications and tender documents. From experience, it is during this process that a series of disconnects with M&E systems can be introduced, which can subsequently lead to three key missed opportunities and longer term cost of ownership issues.

Missed opportunity #1: Disparate systems rather than an integrated approach

M&E equipment is generally specified as a number of separate packages and these in turn will most likely be tendered separately.

Historically, this wasn’t a problem as most of the M&E packages were relatively simple, stand alone systems. Today, the situation is vastly different, with the majority of M&E equipment having its own computer control. In a complex infrastructure setting, this requires an integrated system approach rather than the supply of a number of disparate computer systems that the operator of the final systems may struggle to reconcile and use.

Missed opportunity #2: Relying on generalists without specific systems experience

A second disconnect occurs where the performance specification becomes too prescriptive in some areas, but ambiguous in others. The root of this problem lies with the engineers who write the specifications, because as generalists, they will inevitably have a more limited understanding of the current technology available than specialists.

This is not a criticism of the engineers, but a statement of fact as to the way that design companies are often organised. For example, an electrical engineer is frequently assigned the role of specifying the SCADA (Supervisory Control and Data Acquisition) computer system and whilst he or she will have some experience of the

Applied Industrial Systems supply the SCADA system that monitors and controls two tunnels at the Dartford tunnel.

technology, they probably won’t have the in-depth computer system and software experience that could benefit the design.

Missed opportunity #3: Failure to innovate

The first two missed opportunities inevitably result in M&E specifications being recycled across different projects, with the consequence that new technologies are neglected for the ‘same old’ approach. This is in part understandable as design budgets like all other areas of construction are under pressure, but the context here is that we have seen specifications based on documents over 20 years old and that simply can’t be right.

A good example to illustrate the benefits of early M&E involvement can be found in the Dartford Crossing, for which Applied Industrial Systems supply the SCADA system that monitors and controls two tunnels and the Queen Elizabeth Bridge. Working in partnership with the project consultants, Jacobs, led to the design and build of a single, integrated Life Safety Control System (LSCC). The UK’s first SIL2 and BS EN 61508 approved SCADA system, this would operate in stand alone mode for safety functions, but was integrated with the site wide SCADA for maintenance and diagnostics.

The collaborative approach taken between M&E and the main project contractors offered multiple benefits. These included improved functional integration between the Fixed Fire Fighting System (FFFS), the ventilation systems and active exit signage, the opportunity to innovate with a dedicated fixed camera CCTV being installed for automatic incident detection, greater system acceptance because operators were involved early on in the process and perhaps most significantly for the contractors, minimised operational and lifetime ownership costs through reduced maintenance complexity.

Early main contractor involvement in large infrastructure projects has been around for a number of years and has undoubtedly delivered benefits in terms of costs and timescales. We would now like to see it becoming the norm for early M&E supplier involvement too. There is significant innovation available from Tier 2 and Tier 3 suppliers if they are given the opportunity to participate early.

Simon Burras is the managing director of Applied Industrial Systems, an M&E system integrator specialising in the control and monitoring of tunnels and bridges in highway and rail infrastructure projects.



Transforming construction's image problem



The high-profile mega-projects the industry will soon be delivering should be used as a publicity opportunity to boost the image of construction as an innovative, exciting and socially responsible sector, says *Patricia Moore*.

Britain's infrastructure sector began 2017 with a spring in its step. With the three mega-projects – Hinkley Point C, HS2 and Heathrow's third runway – all confirmed and the government championing infrastructure as an engine of job creation and economic growth, boom times seemingly lie ahead.

Yet despite the £2.3bn injection into infrastructure announced in the chancellor's Autumn Statement, there will be no blank cheque. January's much-heralded industrial strategy made clear that infrastructure will face tough competition from the technology and manufacturing sectors, both in terms of official support and in the battle for talent.

Capacity is now the greatest challenge confronting our industry. Skills shortages in construction have been driving up labour costs for years, but now the spike in work, coupled with the tech sector's proven ability to attract the brightest young minds, has raised the stakes dramatically.

With global demand for construction forecast to rise by 3.2% a year for the next decade, the skills gap is no longer a mere inflationary annoyance – it could severely limit the industry's ability to deliver what is asked of it.

Meeting the recruitment challenge will require a seismic shift in strategy and buy-

in from the industry, government and the education system. There are three broad areas we need to focus on:

Expanding the talent pool

The government has a key enabling role to play; by expanding the teaching of science, technology, engineering and maths to create a pipeline of potential recruits. However, so too do schools and parents, teachers and educational establishments need to wake up to the benefits that degree apprenticeships can offer.

The industry must embrace the provision of highly-skilled apprenticeships like never before. The timing is propitious, as the apprenticeship levy, which goes live in April, will be a game-changer because of the funds it will unlock and the wider acceptance it will bring for apprenticeships. The question is, do the educational establishments have the required infrastructure in place to deal with a major swell in demand?

With increasing numbers of talented young people questioning the value of the conventional university route – in which acquiring a degree can saddle them with tens of thousands of pounds of debt – there is a strong case to be made for professional apprenticeships that allow them instead to graduate with several years of career experience and salary rather than debt.

Boosting diversity

Just 14% of people working in the UK construction industry are women. While better than some countries, Britain still lags far behind others. In Norway the figure is 35%. An industry that holds little appeal for half of the population will always struggle to recruit adequately. However, some forward-thinking players are taking active steps to attract more female talent.

Tideway, the company delivering London's £4.2bn 'super sewer' tunnel, has stated its aim to achieve a 50–50 balance between men and women in its workforce, using a range of measures including bringing skilled women back from career breaks to rejoin the industry.

Changing perceptions

The competition with the tech sector throws into relief just what an image problem construction has. Far too many potential recruits dismiss it because they assume it is dirty, dangerous and low-tech.

A recent survey by the Construction Industry Training Board found that more than a third of career advisers thought a career in construction was unattractive. Clearly, we must ramp up outreach efforts at schools and universities, and showcase the futuristic designs, robotics and technology that make ours such an exciting industry.

The fragmented nature of the profession doesn't help, so we need our industry bodies to speak with one voice and make more of the contribution that construction makes to society as a whole.

Fortunately, construction has a trump card – the obvious socio-economic benefits it delivers. It should therefore boost its appeal by emphasising the wider value of what we do; construction directly contributes to and improves the lives of millions by providing and creating sustainable and diverse communities while making a net contribution to GDP.

This means building critical social infrastructure such as medical and educational facilities and regenerating the spaces we live and work in, ensuring we have power networks that keep the lights on, driving growth in urban areas through critical transport links and finally, enabling communications through new technology such as 5G.

The high-profile mega-projects the industry will be delivering are both a challenge and a publicity opportunity. We should use the platform they give us to show what an innovative, exciting and socially responsible industry ours is – and seize this opportunity to refresh our image and recruit the next generation of infrastructure talent.

Patricia Moore is managing director of UK Infrastructure at Turner & Townsend.

Delivering engineering services in a changing digital world



ACE has taken a key first step in practically articulating some of the emerging industry thinking and trends about how services are delivered on a project in an increasingly digital and collaborative environment. *Richard Shennan explains.*

When the Association for Consultancy and Engineering (ACE) embarked on an update of its highly popular Schedules of Services for Civil and Structural (C&S) and for Mechanical, Electrical and Public Health services (MEP), it soon became clear that the new edition would need to address a number of industry changes, with a key primary focus on improving overall efficiency. It also takes account of the need to embrace the growing focus on the performance of buildings in use, as evidenced by the introduction of Government Soft Landings, based on the principles established in the earlier BSRIA publication.

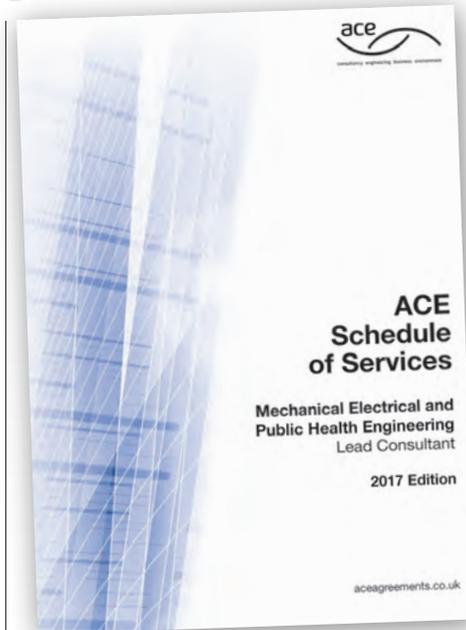
The result is a contractual document that is clear and up-to-date regarding what and how services and deliverables are commissioned, whilst remaining flexible enough to accommodate a range of procurement and information exchange methodologies. Both C&S and MEP schedules identify core and optional deliverables at each stage of design development.

It's all about information

A major challenge was related to BIM. The option of identifying BIM or non-BIM pathways through the schedules was considered, from various perspectives. Our approach was to focus on the purpose and value of the information to be delivered at the various stages, which from most clients' perspective is the information that they need to make well-informed decisions as they progress through the stages of their project. Whether this information is derived from, or delivered in, a model-based format or through the more established medium of drawings and specifications is something that can be agreed between the parties, but it does not change the fundamental requirement to fulfil the required purpose.

Options for procurement

The preferred procurement method will always vary, depending on a range of factors that are specific to client and



A "contractual document that is clear and up-to-date... whilst remaining flexible".

project profile, such as size, complexity, risk allocation, project financing structure and the particular experience of the client. A common driver is the pressing need to reduce waste and duplication of effort, seeking a seamless interface between the work of the consulting engineer and various contractors, fabricators and specialist suppliers that are an essential part of the design effort.

The new edition aligns with the RIBA *Plan of Work 2013* in making reference to common procurement methods and identifying the work stages at which tender would typically take place for each but stimulates an early conversation about the content and purpose of the information provided by the consulting engineer at each stage to suit the agreed method.

In the MEP context in particular, there was a need for clarity on the level of definition in the information delivered to the client through the work stages. For this the schedule takes advantage of the availability of industry-standard definitions of content. The preferred definition in UK is the two-strand *Level of Detail (graphical)*

and *Level of Information (non-graphical)* developed by NBS aligned to the current PAS 1192 series, but the American Institute of Architects LODs could also be used. Once again the emphasis of the schedule is that the purpose of the information is paramount and it can be delivered in different ways to suit the parties.

Allocation of design responsibility

Putting together a building of almost any level of complexity requires the skilled inputs of a wide range of participants, ranging from consulting engineers through to contractors, fabricators and manufacturers, much of which might be classified as 'design'. As all parties increasingly work around common information sets, there is a great opportunity to increase overall efficiency and deliver better value to the client if each party can be clearly responsible for the things that they are best suited to do, collaborating together for the common project objective.

Careful thought is required at the outset to see that design responsibilities are properly allocated for each stage of the process so that the services captured in the agreed schedule fit together without gaps or overlaps with those services provided by others, to meet the overall best interests of the client. Consultation with BSRIA on the ongoing development of BG6 has been of particular value in the context of MEP services.

Collaboration and Leadership

In producing the new edition, ACE has consulted widely and has actively engaged with other organisations that are moving their own ideas and publications forward, with the aim of helping the industry to work towards an integrated set of publications that together help all parties to collaborate and deliver project objectives as efficiently as possible in an age where waste is not affordable.

Richard Shennan is global BIM leader at Mott MacDonald and a member of ACE's schedule of services working group.



Presenting the UK as Brexit-ready

This year will see the UK really begin to feel the impacts of the decision taken in June 2016 to leave the European Union. It is the year in which Article 50 will be triggered, negotiations will begin, and Britain and the other 27 EU nations will start outlining their positions on the various issues that will need to be clarified.

In response to this, ACE has chosen *Connecting Markets: UK and the World* as the overall theme for its 2017 conference, taking place on Wednesday 7 June in central London. The key to making the UK a success in its post-Brexit guise will be to ensure that the country presents itself as a forward-thinking, well-connected, highly-skilled nation. Our competitors will be doing just this and we cannot allow ourselves to fall behind.

It is with this in mind that the morning session of the conference will focus on the measures being put in place by the government and industry to ensure the UK is Brexit ready. Infrastructure will play a key role in the future of the UK's economic prosperity, now more than ever, and it is crucial that we start the conversations now to highlight any problems or challenges that must be overcome. Future generations are depending on this.

We will be joined by representatives from government, opposition, and industry who will give us an overview of how key messages from the infrastructure delivery sector are being interpreted and incorporated into thinking. At the same time, this will be a golden opportunity to quiz those in positions of power on the measures being taken and to highlight the challenges we face in delivering the networks we need.

There will also be three panel sessions, providing commentary and analysis, as

ACE will once again be hosting its prestigious national conference this summer with key speakers from industry and politics. Here, *Peter Campbell* gives us a preview of what is in store.

well as further chances to give voice to those issues we are seeing across the nations and sectors. The first will look at what the government is doing more specifically, while the second will seek to identify what infrastructure we require, while the third will then ascertain what exactly the industry itself needs to do.

Speakers will join us from the industry itself, from key firms across the consultancy, engineering, and contracting sectors, while other speakers will come from academia, technical, and client backgrounds. This will ensure that the very best commentary will be made available to those delegates attending on the day.

The importance of all of this cannot be underestimated. In order for Brexit to be made a success, all three of these factors must align: government must put in place the right policies; world-class infrastructure must be delivered; and the

industry has to make it sure it has the personnel and skills necessary to follow through. Otherwise, the UK's reputation could take a knock that allows our economic competitors to steal a march on us and put our prosperity at risk.

This is your chance to ensure this is not the case, however. The ACE 2017 National Conference represents the best opportunity we will have in the early stages of the negotiations to put across your views, the views of your company, and the views of the whole consultancy and engineering sector to key decision-makers.

It would be incredibly naïve to ignore the notion that these conversations are not taking place in other European capitals, with political leaders across the continent keen to secure the best for their own industries and sectors. We must take every chance we can to put our case to government as to why our industry needs to be considered and why infrastructure must continue to be delivered.

Only then will the UK continue to present itself as an attractive place to invest, to base a business, to attend a university and build a life. This all begins in 2017 with the triggering of Article 50 at the end of March, and we must all ensure we are talking and listening.

Booking is now open to attend the ACE National Conference. Visit www.ace-conference.co.uk to reserve your place.

Peter Campbell is a senior policy manager at the Association for Consultancy and Engineering.



As in previous ACE conferences, delegates will be joined by guest speakers from key firms, academia and politics.

Getting to grips with the digital economy



In a changing commercial landscape, leveraging big data as well as the digital economy will be the future difference between business success and business failure, writes *Nelson Ogunshakin*.

Undeniably, technology has revolutionised the way our industry approaches business. It has also changed the way pathways to success are formed.

While many people describe these technological evolutions as ‘disruptors’ to the business status quo, I feel that the reality is that these evolutions and refinements are the new, everchanging status quo. Big data and the digital economy present new opportunities for leaders to develop paths to commercial success, with greater efficiency and they will continue to revolutionise our industry.

This is why, at the end of 2016, I identified big data and digital economy as one of five key challenges and market drivers for our industry. While political uncertainty, which I focused on in my *Infrastructure Intelligence* column in January, needs adaptive leadership as the situation continues to fluctuate, data and digital economy has already significantly altered our industry’s business landscape. It requires leaders to gain new skills to seize future opportunities for success.

In an age of information, access to data is critical to provide businesses with insights to enable appropriate decisions to be taken by leaders. The potential is for far greater commercial growth than for business decisions made without such data insights.

To achieve this business success, however, we need to use the right technology and develop appropriate skills to seize the growth potential through leveraging big data. No longer is allocating resources into IT a luxury cost. Upgrading IT is now a vital strategic business investment that has the commercial potential to yield higher returns than most other business initiatives.

To realise this commercial potential, business leaders must embrace big data and technology fully, taking IT from the status of ‘disrupting’ the workplace to fundamentally changing all aspects of the business, both internally and externally.



Data and digital economy has already significantly altered the industry’s business landscape.

Big data and technology has enabled internal and external stakeholders to want to ‘belong’ or feel a part of the tribe that is your business. While many think embracing digital processes would create extra noise, if done appropriately it allows for a form of engagement that revolutionises business conversions, efficiency that maximises output, as well as retention of both clients as well as staff, increasing the overall business value.

The trick to all of this is ensuring that you have the correct technology and skills for digital transformations to yield business opportunities, while

“Upgrading IT is now a vital strategic business investment that has the commercial potential to yield higher returns than most other business initiatives.”

appropriately addressing any potential security risks.

The solution is to find strategic partners amongst the variety of providers out there. Developing a closer relationship with such a partner better enables deeper insights that can reveal opportunities you as a business would not have known of otherwise. Given the continual evolution of the digital landscape, having a strategic partner enables your business to best seize the opportunities that come along.

Inevitably, while undergoing digital upgrades will fundamentally change your business landscape, the commercial opportunities those upgrades yield will be the future difference between business success and business decline.

As leaders, we need to think and plan for the future and that includes appropriately leveraging big data as well as the digital economy.

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

Five priorities for a post-Brexit economy

In terms of Brexit specifically, while the planned Great Repeal Bill was a welcome start, I see five priorities for urgent action.

First, we need a much clearer commitment from the prime minister to world class environmental standards. The current mantra, that “we will be the first generation to leave the environment in a better place than we found it” to my mind doesn’t cut the proverbial mustard. Taken literally, it means what? That the Government would be happy if NOX levels in our cities were slightly lower in 20 years’ time than today? If recycling rates in 2030 were 45%? If CO2 emissions were down another 10% on today’s numbers?

Divorced from the steady strengthening of green standards and policies that EU membership provided, we need a much more specific set of ambitions with some credible thinking as to how they will be met. My hope is that the long-awaited 25 Year Environment Plan will provide this, or at least be a solid first draft. My understanding is that it has been signed off by Defra ministers and is awaiting clearance at Number Ten. We need it published by the time Article 50 has been triggered to provide reassurance both to the public and to the investors who drive the green economy forward.

Second, we need to give careful thought as to how to avoid the risk of so-called ‘zombie legislation’, where simply ensuring that specific legislation is carried over into UK law is not sufficient to enable the actual implementation of the policy.

Third, we need to develop and build a consensus around UK-specific targets in a range of environmental areas. At EIC we have recently called for a debate on targets for England for recycling for 2025. Our thinking is that we are struggling to meet the existing 2020 EU-set recycling target and what is more important for the industry is what the ambition is for the following decade. EU targets such as those in the circular economy (CE) proposals have to compromise between what would be appropriate for member states such as Germany and Austria, whose recycling rates are already over 60%, and those such as Cyprus which have not yet hit 20%. So while we might decide simply to copy the CE targets, it’s worth doing in England what Wales and Scotland have done and considering what would be a genuinely



With the pace of events around Brexit about to quicken significantly, it’s a good time to consider where environmental issues stand within the Brexit big picture and the government’s plans for a post-Brexit economy, says *Matthew Farrow*.



ambitious but also credible target that would be relevant to the public and help business and local authorities plan.

Fourth, while the vast majority of EU environmental law should be kept as it is, there are some examples where the original regulations were poorly drafted or not especially effective in a UK context. An example might be the separate collection provisions of the waste framework directive, or the Energy Savings Opportunity Scheme where the current EU regulations generate process with limited outcomes and need strengthening. Let’s use Brexit as an opportunity to revitalise such areas of policy.

Lastly, many of the EIC members I talk to in the environmental sector are very concerned about the risk of skills shortages following Brexit as immigration controls are tightened. The UK environmental goods and services sector is very much an international one and there are many

“Ministers need to be aware of the full range of skill areas where radical restrictions on EU migration could have implications.”

citizens of other EU countries working within it, ranging from air quality modelling specialists in large consultancies, laboratory technicians at environmental laboratories and energy management equipment installers working for property developers. Of course, many non-environment sectors have concerns as well, and ministers need to be aware of the full range of skill areas where radical restrictions on EU migration could have implications.

As well as managing the implications of Brexit, we also need to look at how we best make use of any opportunities that might come our way. One such is the government’s revived enthusiasm for an industrial strategy. The environmental sector is bigger than pharmaceuticals or aerospace, has great export potential and creates jobs across the UK. It is also vital to delivering the government’s other objectives. We won’t be able to build the planned million new homes and avoid destroying the green belt unless we scale up our land radiation sector and focus on brownfield sites.

So, the environmental sector certainly deserves a place in any industrial strategy worth the name.

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

Public support crucial to get the infrastructure cities need

Public support for local infrastructure is vital if cities are to get the development they need. *Andy Walker* went to Leeds and spoke to the leader of Leeds City Council and chair of the ten city-strong Core Cities group, Judith Blake, about the benefits of getting the public onside with the city's transport plans.



Leeds City Council leader Judith Blake is clear about the importance of winning over the public's support when planning infrastructure, following a major consultation exercise in the city on Leeds's transport plans. "The need to go out, consult with people, work with people and develop schemes with people, not just going with the finished article and presenting it to them when they either like it or they don't, is absolutely critical," she says.

"Too many schemes have failed because they fail to properly consult, so for us this is really important. It's also a real way of getting to understand the transport needs of people out in our communities, what they will use and what they won't use and how that can inform better decision making," Blake says.

"When I first became a councillor I struggled to get highways officers to come out into our communities to talk to people, but once they started it, they loved it," she tells me. "They got the feedback and they got the recognition for the great work that they do, but also they ended up with better schemes as a result. By getting that level of engagement you create great schemes that people actually want and recognise the benefit of," says Blake.

Blake says that the benefits can be seen in Leeds where a major consultation exercise on the city's transport plans saw

8,000 people respond with their ideas and hundreds more attend meetings and consultation events. "More than 8,000 people responding is a major, major achievement. We consulted right across the city and went to all the different interest groups and to older people and younger people and brought together all the different views," she says.

People responded to the approach says Blake and came forward with their own ideas about what needed to happen. "People came forward with ideas that they had been thinking about for a while and as a result we now have some much more straightforward local schemes developed with the common sense of local people, rather than more involved projects that actually aren't always needed," she says.

With her Core Cities hat on, I asked Blake about the importance of transport and infrastructure to the economic development of those cities. "Every single core city would say that transport and infrastructure is absolutely key to helping to unlock economic potential, particularly by linking out into their city regions and working with businesses across those areas," she tells me.

"Actually though, it's also the devolution question that's the key issue," she says. "We need to get the money out of Whitehall, down to the local level so we can devise the schemes we need. It's a mixed picture around the core cities and I'm afraid that politics has interfered in things like administrative boundaries, which shouldn't be an issue because it should be about the economy and people and driving forward the opportunities in each particular area," Blake says.



"We need to get the money out of Whitehall, down to the local level so we can devise the schemes we need."



"Cities are unique and special and the people who represent those areas and work in those areas know best how to move forward, not Whitehall. Whatever the structures, we need those resources and powers coming down to a local level to make things happen," she says.

Given that the government seems to be steadfastly sticking to the idea that you have to have city mayors to get a meaningful devolution deal, I ask Blake how is that going to happen, especially in Leeds where the city region does not yet have a city mayoral deal. Blake says that she remains confident of success despite the challenges.

"We've already got a significant growth deal in Leeds city region and we got that over the line before George Osborne came in and said you had to have elected mayors," Blake says. "So, we are demonstrating that we can deliver without the change in governance. If the change in governance is still an essential requirement, then we will work to get what we need to do to get things over the line and we are actively talking to the various secretaries of state to unlock the log jam and help us move forward," says Blake.

Time will tell on this and the people and businesses of Leeds will be hoping that their city gets the resources it needs to prosper.

Keeping the lights on

Making sure that services run smoothly is a key part of our task but, more and more, Amey's clients and customers are challenging us to deliver smarter, more intelligent solutions that not only meet the demands of today, but help futureproof too.

Often, it's the combination of digital tools, analytical knowhow and expertise in frontline service delivery that makes 'the lights' go on. This isn't just a metaphor for Amey's unique blend of consulting and delivery services. In the utilities sector, the team are literally helping to provide safe, reliable and efficient energy to millions of customers.

Industry-leading capability

With well over 20 years of experience working in the power market Amey's services span the whole-lifecycle of a project, from feasibility design and construction to the refurbishment and reconfiguration of existing assets. Working directly with licensed distribution and transmission network operators, the team specialises in long-term framework agreements that create real value for clients and customers.

Creating greener, more sustainable power

Among Amey's industry-leading capabilities, is an expertise in electrical transmission and distribution services for substations, HV cabling and overhead line design from 11kV to 400kV. Substation solutions they have designed has enabled more than 800MW of renewable energy to be exported onto the grid.

Working with SP Energy Networks – who supply power to 3.5 million homes and businesses in Scotland, England and Wales – Amey's consulting business developed an end-to-end programme to build a new



Looking after assets and services that more than 64 million people in the UK rely on every day is a big responsibility, but increasingly clients want smarter solutions too, says *Charles Oldham*.

substation that would connect two major wind farm developments in South Ayrshire to the grid.

The project included the complete construction of the new substation and major site preparation civil works. The design works allowed for the removal of substantial peat strata and the provision of a new formation level. It also included the diversion and protection of the existing water course, access road improvements and the construction of the substation's HV compound and control building.

Big data equals big benefits

National Grid owns and maintains about 15,000 circuit kilometres of overhead electricity transmission lines across England and Wales. A large portion of those overhead lines were installed in the early 1960s and are fast approaching the end of their designed asset life. However, to replace them all will be a huge task and potentially cost UK consumers billions. With this in mind, Ofgem (the regulating body for electricity and gas) requires National Grid to maximise the utilisation of these ageing assets, while managing the risk of loss of energy supply, and at the same time sharing the benefit with UK consumers.

To achieve these goals, National Grid has adopted modern asset management practices, which focus on portfolio management, risk management and asset lifecycle management. One of the key elements which enables these asset management activities is detailed, granular

asset condition information. However, this condition information needs to be processed and utilised carefully within the wider business context, through the lens of data science and mathematical modelling. This is the only way to turn this data into a clear and reliable vision of future network condition, which is the key to long term investment strategies.

Amey's consulting business is working with National Grid to deliver just that. As part of this work, we have built a data-driven model of the condition assessment process that is used by National Grid to forecast the future network risks involved in overhead line conductors. The model has been used to drive improvements to National Grid's asset management practices and achieve savings for the UK consumers.

By bringing intelligent, data-led solutions, we're helping decision-makers to optimise their asset management strategy based on a balance of risk, cost, and process complications. Part of our vision is that soon, all asset management decisions will be based on science rather than budget.

A unique offering, unlimited applications

Our consulting business is one of the things that sets Amey apart from others in our industry. The team works collaboratively across the business to deliver a whole lifecycle approach to asset management – something that we originally piloted in our rail business.

With customer expectations at an all-time high, and budgets under more pressure than ever, we're predicting that the need for data-based, life-cycle asset management consultancy mixed with operational delivery will grow rapidly in the coming years. We're already geared up to provide both the analysis and frontline delivery so our focus is on expanding our already diverse team to meet this demand.

In the next year, we'll be bringing in even more skills and expertise to help maximise our impact on the country's most valuable assets and making sure that we're keeping the lights on long into the future.

Charles Oldham is strategic consulting and technology director at Amey.



Amey's customers are challenging them to be smarter.

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