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INFRASTRUCTURE Intelligence

Produced for the industry by the Association for Consultancy and Engineering



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Message from the editor



In our last issue I said that the industry needed to press the case with politicians for good and sustainable infrastructure. Well, with the calling of a general election on 12 December, the construction sector has a real opportunity to make that case and all the signs are that infrastructure spending is going to be centre stage during the campaign.

All the main parties are talking about infrastructure and increasing government spending on major schemes. This is long overdue and to be welcomed. Of course, it places great responsibility on the industry to deliver – especially on major projects – but with extra money planned for construction the entire sector should be set for a boost whoever forms the next government after 12 December.

It's also good to see climate change and the environment at the top of the political agenda during the political campaign. The infrastructure sector has an absolutely key role to play in tackling the climate emergency facing the UK and indeed the world, so this is another cause for optimism for our industry, given the opportunity it gives us to raise profile with politicians and opinion formers.

There's plenty of coverage on both the election and the environment in this issue as we report on a hectic end to what has been an uncertain year for the construction sector and the UK generally. Hopefully 2020 will be a better year and one that sees infrastructure take centre stage.

Until the next issue, our 40th incidentally, may I wish you best wishes for the festive season and a happy, peaceful and prosperous new year.

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Modular homebuilder gets £30m Homes England boost

Homes England is investing £30m in modular homebuilder ilke Homes to turbocharge production at their factory in Knaresborough, North Yorkshire.

The £30m is being allocated from the national housing agency's £4.5bn Home Building Fund and the investment will enable ilke to massively scale up its operation.

By next year, 2,000 modular homes will roll off the company's production line, rising to 5,000 homes a year within the next five years, potentially making ilke Homes a top 10 UK housebuilder.



An ilke Homes modular house being lifted into place.

The latest deal is part of a government drive to create a centre of excellence in the north for modern methods of construction to help speed up house building, aiming to create a construction industry which will deliver zero carbon homes and, claim ministers, an industry potentially worth £40bn a year and creating 80,000 new jobs.

Modern methods of construction combine off-site manufacturing and on-site techniques to provide alternatives to traditional house building, allowing homes to be built quickly, be more energy efficient and better designed. It can deliver high-quality housing at pace. By manufacturing off-site, the precision-engineered homes produced by ilke Homes are delivered twice as fast as traditional methods of construction while creating 90% less waste.

Dave Sheridan, executive chairman at ilke Homes, said: "This deal is testament to the dynamic approach Homes England is taking to address structural issues within our housing and construction industries. The funding will bring in further private capital, creating hundreds more skilled jobs allowing us to build more homes more quickly for first-time buyers. We want to continue driving efficiency, quality and sustainability within the housebuilding industry and see this as a fantastic signal to others wishing to do the same."

Nick Walkley, chief executive at Homes England, said: "Our role is to be bold and take steps to speed up the delivery of homes across the country and there is huge, untapped potential to unleash by creating more capacity in off-site manufacturing. Modern methods of construction offer enormous benefits to housebuilding and this deal will have a transformational effect on ilke Homes' production."

Edinburgh Airport plans £20m of transport improvements

More than £20m is being invested to improve transport access as part of ongoing development works at Edinburgh Airport.

Edinburgh is the sixth busiest airport in the UK, with over 14.3 million passengers a year, and the first phase of the project will deliver a new east terminus next summer, which will provide covered walkways for passengers, a new passenger bridge, a new waiting area for passengers with restricted mobility, a new base for the airport's licenced taxi operation and a self-service kiosk for booking private taxis.

The second phase of the project will deliver a new access road to further ease congestion on Eastfield Road near the airport and will see the entire drop-off

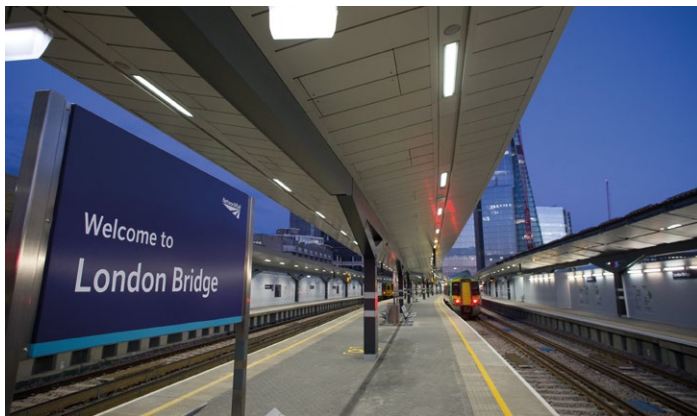


MPs call for new national rail body

The all-party parliamentary rail group (APPRG) has called for a new national railway body as it delivered its report for consideration alongside the conclusions of the ongoing Williams Review.

A parliamentary inquiry took place in June and July earlier this summer, with contributions from Arriva Trains UK, FirstGroup, Jonathan Tyler, the Office for Rail and Road, Network Rail, the Rail Delivery Group, the Rail Freight Group and the Urban Transport Group.

Much of the Williams Review input by various stakeholders and evidence received to the group's inquiry has focused on a new arm's length body or a "guiding mind." However, the APPRG's report *Rail Reform: A Guided Mind* goes a lot further, concluding:



The newly refurbished and expanded London Bridge station.

- A new national body is needed to create a professional 'controlling mind' to make key decisions, ensuring consistency of thinking and approach.
- A new centralised national 'controlling mind' having decisions and related powers moved closer to local markets appears viable. It does not appear possible to have both, however.
- De-centralisation rather than devolution is the logical path. The circle could be squared if all decisions and powers delegated to regions and cities relate to implementation.
- There needs to be clear alignment, and potential dis-alignment, of incentives between track and train.

Martin Vickers, chair of the APPRG, said: "While some may say we've been here before, it is important that any structural change not only focuses on aligning sometimes competing priorities, but also maintains the industry's primary role – serving its customers. The group supports better outcomes for passengers and freight. If the pitfalls we've identified are avoided, the case for a new arm's length body is strong. I commend our report to Keith Williams and his team, ahead of the government releasing its rail white paper."

The APPRG panellists were Martin Vickers (chair), Louise Ellman, Lord Berkeley (secretary) and Lord Scriven. The group was aided by transport specialists Burges Salmon LLP and T&I Communications Ltd.

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facility move to the new facility.

Gordon Dewar, chief executive of Edinburgh Airport, said: "As an airport, we provide quick and easy travel to destinations all over the world. That trip starts and ends here, so making it easier for people to get to and from the airport is important to us. As well as making it easier for licensed taxis to drop off and pick up passengers, this multi-million-pound project will also see the construction of a new access road, helping to ease the congestion we currently see on Eastfield Road at peak times.

"By investing in our infrastructure, we'll be able to deliver better access for public transport and increase those travel options for passengers, directly improving their journey."



Will this be the infra

As the two main political parties engage in a bidding war to see who can spend the most public money on much-needed construction schemes, we ask whether the 2019 political campaign is set to be the infrastructure election.

As the 2019 general election was called, construction industry lobby groups were quick off the blocks with calls for all the major parties to include infrastructure investment as a key part of their election manifestos. In truth, it looks as though such calls are unnecessary as both Labour and the Conservatives engaged in a public spending bidding war, promising massive programmes that will return public investment to levels last seen in the 1970s.

The proposals outlined by the chancellor Sajid Javid to spend an extra £20bn a year on capital projects such as roads, railways, schools and hospitals and shadow chancellor John McDonnell's pledge to increase infrastructure investment by £55bn for the next five years, are proof that infrastructure spending is seen by both major parties as key to winning the keys to Downing Street on 12 December.

The Institute for Fiscal Studies (IFS) has warned both parties that any future government might have trouble delivering projects on the scale planned, which the IFS say would return infrastructure investment to 5% of GDP under Labour's plans, a level last seen at the time of the IMF-imposed cuts crisis in 1976. The Tories' spending plans would mean investment levels of 3% of GDP, which have not been seen since the days of Margaret Thatcher.

Chancellor Sajid Javid criticised Labour's plans as "fantasy economics" while revealing his own plan which would tear up all the fiscal rules imposed by his predecessors in the Treasury. For his part, McDonnell said that Labour's plans were absolutely

necessary and that future generations would not forgive politicians unless they reversed the decline of previous decades.

But, can the two parties' ambitious plans be delivered? The IFS is certainly sceptical. They say that both Labour and Tory plans would represent a sharp change in policy and that "the key challenge for any government seeking to deliver investment on this scale,



Don't forget the north

Businesses, political leaders and the media have united to call on party leaders to set out plans to close the north-south divide.

As well as calls for major spending on infrastructure, the 2019 general election campaign has also seen the north of England come together to call on all the major party leaders to address the critical issues that matter to the 15

million people living there. Business leaders, politicians and even local news media have united to call for greater investment and devolution for the north and political parties are being urged to heed these calls or pay a heavy electoral price.

Henri Murison, director of the Northern Powerhouse Partnership, said: "This election offers the three main parties a golden opportunity no government in living memory has achieved - to rebalance the UK economy, capturing a trillion-pound economic gain for the country over the coming decades. The 'Power up the North' campaign this summer saw 33 regional newspapers across the north join forces to call on the major political parties to commit to the Northern Powerhouse in full. The forthcoming election is the chance to truly demonstrate this

Infrastructure election?

particularly in a short timeframe, will be finding worthwhile and viable projects in which to invest”.

The IFS also warn that “shortages in the number of suitably skilled construction workers, a dearth of ‘shovel-ready’ projects and practical issues relating to delivery will be challenges the next government will need to think carefully about how to overcome”.

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However, the fact that construction spending is looking like it will be a key battleground during the election has to be good news for the industry, though with that increasing focus comes responsibility to deliver projects if the promised spending materialises.

These election pledges for more public spending on infrastructure have been coming. Hannah Vickers, chief executive of the Association for Consultancy and Engineering (ACE), commented: “Since 2015, we have seen a much-welcomed greater appreciation for the social and economic importance of infrastructure to the UK economy with a corresponding increase in government spending. We want all political parties to accept the need for a long-term plan for infrastructure investment and to work together to provide industry with the certainty it needs to invest in our future.”

The Civil Engineering Contractors Association (CECA) said that any incoming government must commit to an ambitious infrastructure agenda if the economy is to succeed. “Whichever party or parties form the next UK government the infrastructure sector has the potential to be a driver of growth in the economy,” said CECA director of external affairs Marie-Claude Hemmin. “That’s why we have called on all parties to commit to the existing pipeline of projects, as well as to guarantee the future of mega-projects such as HS2, airport expansion, and Crossrail 2.”

CECA’s own research shows that £1 of investment in infrastructure delivers £2.82 benefit to the wider economy, so it’s easy to see the attraction of more spending on construction for the political parties vying for power in the general election. The industry should be proud that it has won this argument for greater infrastructure investment, but the task now of course is to deliver real projects and programmes that can transform people’s lives.

There seems little doubt that unlike any other election in recent times, the 2019 campaign will see public spending take centre stage and that means that the construction industry will be under scrutiny like never before, especially after the polls close on 12 December and a new government has to deliver on its plans. This truly looks like it could be the infrastructure election.

h, party leaders told

commitment, as northern voters’ decisions will be what the result will likely rest on.”

Murison said that major infrastructure investment was needed in the north “not, as some would suggest, having to choose between HS2 and Northern Powerhouse Rail but seeing both delivered in full, all the way, north to south, east to west. Improving local bus services alongside trams, the lifeblood of communities, must also be a commitment, he said.

There have also been calls for greater devolution for the north and a recognition by politicians that the general election cannot be purely about Brexit. “It must also be about the transformational chance to rebalance the UK and create a country that works for everyone,” said Murison.



CEOs gather to d

Industry leaders from across Europe came together at this year's European CEO Conference to discuss the latest developments impacting on the infrastructure sector.

It's not often that CEOs and other construction industry leaders from across Europe have the chance to come together to discuss and debate the challenges faced in delivering the infrastructure that society needs. The European CEO Conference, organised by the UK Association for Consultancy and Engineering and the European consulting engineering federation, EFCA, offers one such opportunity and on 4-5 November in London, industry leaders gathered to discuss how best to deliver for society.

The conference has been running for almost a decade and over that time high-profile industry leaders from across Europe have shared their experiences and views on the challenges they face as a result of business, political and societal developments impacting on the world of infrastructure and those who plan, build, deliver and use it.

This year's event in London, along with its accompanying dinner, saw consultancy and engineering firms addressing some of the major challenges and opportunities that they face as businesses. Issues like the effect of political change on infrastructure - something that the industry rarely discusses - were given a thorough airing, with delegates really getting to grips with how the decisions of politicians, and indeed political movements, impact on the construction sector.

Climate change and the challenge of achieving net zero was a key theme of the conference, with speaker after speaker and contributors from the floor debating the role of the infrastructure sector in solving perhaps the biggest single issue facing global society. It's an issue that is impacting politics around the world and consequently the way in which construction projects are procured and delivered.

The conference also examined how construction and consultancy services would be delivered in the future in the face of digital disruption and societal change. Delegates heard that much of what is currently delivered by the hour is likely to be delivered as a service, with outcome-based billing likely to become more and more widespread. Firms will need to adapt now



One of the panel discussions at the 2019 European CEO Conference.

to deal with these challenges and the one thing that is certain is that increasing change, especially in the digital sphere, will shape the way that firms operate.

Results from ACE's annual benchmarking exercise were announced during a final conference session. This annual survey measures company KPIs across a number of areas including profitability and growth, controlling costs, productivity, staffing and winning work. The survey also lists the top threats to business highlighted by European CEOs. These were many and varied but the key threats were as follows.

- Competition for talent
- Economic issues
- Elections/politics/Brexit
- Pricing pressures and increased competitiveness
- Project funding
- Project delays
- Energy prices and foreign exchange risks
- Insurance costs

Closing the conference, ACE chief executive Hannah Vickers said she was pleased that the event had seen some open and frank discussion from clients on the future and this showed that the industry was capable of coming together to address the challenge of change. "I hope that the last two days have given you food for thought and that the discussions we've had will inform what we all do going forward and also shape future CEO conferences as we move into 2020 and the tenth anniversary of these events."



Delegates at this year's European CEO Conference.

Discuss key issues



rence.

Disruptors will mean real opportunities for infrastructure firms

European engineering consultancy leaders struck a positive note when discussing industry disruptors and the global challenges they face.

The European CEO Conference 2019 kicked off with a passionate plea from KPMG's global head of infrastructure, Richard Threlfall, for the construction industry to be much more optimistic about the future and the role it can play in transforming society for the better.

Referring to current economic and political challenges affecting the infrastructure sector, Threlfall said that these should be embraced by the industry as significant opportunities which would give organisations working in construction the chance to show the difference they can make to people's quality of life.



European CEOs discuss the key issues facing the construction and infrastructure sector.

"The rise of populism is having an effect on infrastructure because infrastructure itself is political," Threlfall said. "There is no doubt that Extinction Rebellion has influenced the movement towards net zero in the UK and as an industry we need to be engaged on these issues. You won't get funding for projects now unless you can show environmental and social responsibility," he said. This was a very significant development and places a greater responsibility on the industry than ever before to demonstrate social value.

Speakers at the opening session at the event were keen to stress the positives for the industry during a wide-ranging discussion on global infrastructure disruptors. Tractebel vice president and chair of the Belgian Federation of Industries, Bernard Gilliot, said that engineers needed to get better at explaining their role and the difference they made as this was key to raising their profile on the political stage.

Rebecca Larkin, senior economist at the Construction Products Association, struck a more pessimistic note as she reminded attendees that the construction sector's reputation for project delivery was too often not a good one and this needed to improve if the industry was to regain the trust of politicians and funders. Danish Association of Consulting Engineers chief executive Henrik Garver was more positive, highlighting the good work being done in his country and around Europe to engage with politicians about the positive influence that those working in the infrastructure sector are having.

Garver said that the key drivers for the industry across Europe were "sustainability, resilience and demographics". He highlighted technology, staff shortages and contracts, given the increasing complexity of projects as challenges but these could be overcome by working together in partnership on a continent-wide basis.

While current political volatility and instability, in the UK and internationally, are having an effect on the infrastructure sector, this presented a real opportunity for the industry to engage with politicians and opinion formers on how to create the right climate for infrastructure investment and how construction can help politicians realise their aims.

Shadow minister highlights importance of construction

Industry leaders were honoured and a shadow minister addressed guests at this year's European CEO dinner organised by ACE and EFCA.

On the eve of a UK general election campaign, the shadow minister for international business and trade Bill Esterson highlighted the importance of the construction and infrastructure sector in improving people's quality of life when he addressed attendees at the European CEO Dinner 2019 at the RSA in London on 4 November 2019.

Addressing the challenge of climate change, Esterson offered some political perspectives on the journey to net zero and also spoke about Labour's plans for a green industrial revolution which he said would create 250,000 quality jobs in the



Bill Esterson,
shadow minister for
international business
and trade.

construction sector along with a further 200,000 jobs elsewhere in the economy. Esterson said that his party's plans to cut carbon pollution by 10%, retrofit homes, invest in green tech and electric vehicles would transform the economy and the environment.

He also made a plea for the industry to engage with politicians on issues where they had real knowledge to share, saying that Labour was keen to hear from the industry on how best to tackle key issues like climate change, population growth, transport and housing. "We are keen to hear from those who work in this sector on how best we can address the challenges we all face as we move towards a zero carbon future," he said.

The dinner also saw two global recognition awards presented to industry leaders. The Contribution to the Consultancy Industry Award went to former FIDIC president and co-chairman of French consultancy firm Artelia, Alain Bentéjac. The Pioneer of the Construction Industry was awarded to Ray O'Rourke, the chairman and CEO of the multinational construction firm Laing O'Rourke.

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Class of Your Own announces partnership with Bentley

Class of Your Own and the Bentley Institute are to partner in secondary school learning programmes to advance skills for future infrastructure professionals.



Students from Drummond Community High School, who won the DEC Hyperloop Challenge, presenting their winning entry at the Year in Infrastructure conference in Singapore.

Class of Your Own, a UK-based STEM education provider of built environment-focused learning programmes for secondary school students, has announced a new global partnership with leading construction software provider Bentley Systems.

The new, future-focused global curriculum, Design Engineer Construct!® (DEC) for the World's Infrastructure, has developed over several years through Bentley Institute's support of Class of Your Own's DEC programmes and provides opportunities for students to gain hands-on knowledge and skills for careers in infrastructure professions.

DEC is currently accredited and used in schools throughout the United Kingdom. The new programme is already expanding into schools in Ireland, Lithuania, Thailand and the United Arab Emirates and offers technology education and project-based, real-world experiences through interaction with industry professionals.

The DEC curriculum for students ages 11 to 18 years is offered at intermediate levels to encourage and excite learners and is enhanced by Bentley's engineering design and 3D modeling technologies including ContextCapture, OpenBuildings, OpenRail, and OpenRoads ConceptStation. The more advanced future infrastructure qualification framework, for students aged 16 and older, including foundation level study at colleges and universities, focuses on rail, highway, port, and hyperloop projects.

Alison Watson, founder and chief executive of Class of Your

Own, said: "Our vision is to inspire and engage young people and their teachers to reach their full potential through world class education. So, we're very excited to partner with Bentley to offer the new curriculum, which applies industry knowledge and skills gained in the existing DEC programme to the most exciting infrastructure projects around the world.

"Our students are provided with face-to-face support from world-class sector professionals thanks to industry partners who truly understand what DEC can do. Expanding the programme outside the UK means we can offer genuine, meaningful opportunities for students and teachers around the world. We're helping the surveyors, technologists, engineers, architects and managers of future infrastructure."

Earlier in 2019, Bentley Institute and Class of Your Own hosted the first ever Future Infrastructure Challenge: DEC Hyperloop challenge in London. The event included students from four schools in the UK whose assignment was to conceptualise a design of a hyperloop transport system and stations for their own towns and then to adapt this to Singapore. Students from Drummond Community High School from Edinburgh, Scotland won the challenge and were awarded a complimentary trip from Bentley to attend its Year in Infrastructure Conference from 21-24 October in Singapore.

David Robertson, director of digital advancement research for Bentley Systems, said: "Our partnership with Class of Your Own demonstrates the two organisations' shared goal of providing students with valuable learning experiences that apply to real-world infrastructure professions and encourage students to pursue those professions. Bentley is very excited to participate in this important learning initiative to advance career opportunities for students around the world."

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Alison Watson, chief executive of Class of Your Own, announcing the partnership with Bentley Systems at the Year in Infrastructure conference in Singapore.

Using procurement to create a fairer economy

The government should use its massive procurement spend to influence a fairer economy and boost opportunities for SMEs, says a new report.

The government should use its significant procurement spend to bring about a fairer economy and give more opportunities to SME firms, especially when appointing external suppliers, says a new report by Demos.

With current spend on external suppliers at £284bn, procurement is the UK government's largest expenditure, equal to 13.4% of the UK's GDP. Influencing how this money is spent represents a significant opportunity for government to shape the nature of business and the wider economy, says the report, which looks at how central government could use public procurement more strategically to bring about a fairer economy and more efficient, effective government.

In their report, *Value Added: how better government procurement can build a fairer Britain*, Demos argue that the government could more effectively "procure for good" or "buy economic change" by more deeply embedding social value into the procurement process for the provision of goods, works and services. This can be used to encourage suppliers to undertake activities such as employing people on a real living wage, reducing carbon emissions, using more inclusive recruitment strategies, and offering training opportunities. There are encouraging early signs of these considerations being taken into account during procurement rounds, says the report.

The report also finds that social value procurement and current EU legislation, designed to promote competition and transparency, could help tackle aggressive tax avoidance as 25 of the government's 34 strategic suppliers (73.5%) are part of a corporate group including one or more



The publicly-procured Oculus Building at the University of Warwick.

subsidiaries in 14 tax havens (not including US mainland, EU or single market jurisdictions), according to public records.

Despite government efforts to improve matters, UK public sector markets are still relatively uncompetitive and increasingly reliant on larger suppliers and as a result, more should be done to increase competition and level the playing field for small and medium-sized enterprises (SMEs) and voluntary, community and social enterprise organisations (VCSEs) in public sector markets, says the report.

To deepen and embed social value in public procurement and improve transparency and a more level bidding playing field, the report makes ten recommendations.

1. Government should establish priority social value standards for departments in order to pursue select, strategic cross-government objectives, for example related to carbon emissions and fair tax practice.
2. Central government departments should include social value bare minimum standards that are pass or fail in the pre-qualification criteria.
3. The three central government departments with the highest procurement spend (Department of Health and Social Care, Ministry of Defence and Department for Transport) should create an SME advisory panel to help departments make it easier for SMEs to bid and win contracts with them.
4. Social value minimum standards for public procurement should include criteria relating to a bidder's exchequer contribution. For example, bidders could be expected to meet a certain Effective Tax Rate to pre-qualify for that procurement round.
5. The government should take advantage of existing provisions in EU competition law to ensure that companies do not gain an unfair advantage over their competitors by using international tax arrangements.
6. The government should take advantage of anti-corruption provisions to exclude from any public contract a supplier whose ultimate beneficial ownership is secret above the value of 5%,

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in order to ensure that no conflict of interest is entailed.

7. Central government should move to an Open Data Model for spending data. This should include Open Data standards covering every government contract and award notice and a clear, transparent register of public sector procurement authorities.
8. To incentivise buy-in from companies for the Open Data Model, the extra administrative burdens of transparency should be written into the costs of the contract by default.
9. The National Audit Office should conduct an annual report on central government procurement transparency, presented to parliament. This should include a 'league table' ranking of departments, with the bottom three departments having to make an oral statement to the House.
10. The requirements of the Freedom of Information Act (FOIA) should be extended to public sector contractors, through an amendment to the FOIA stipulating that all information held in connection with the performance or future performance of the contract should be considered under the domain of the FOIA.

Commenting on the report, ACE chief executive Hannah Vickers said: "It's good to see procurement being looked at in this way. ACE's Future of Consultancy report is advocating a 'five capital' model which sets out a more sustainable framework for



Hannah Vickers,
chief executive of
the Association for
Consultancy and
Engineering.

'value' which we are advocating clients use when they come to market so they determine what they value and develop their commercial models and pick suppliers on that.

"It's far more robust than current 'quality criteria' which only really demonstrates how well companies can answer questions. I would suggest that measures under financial capital around tax take and human capital around UK jobs would be the sorts of measures which would mitigate the risks the Demos report highlights.

"The system recently announced by the Construction Leadership Council and the Chartered Institute for Housing offers a vehicle to implement this approach on government projects and they are going to use our 'five capital' framework. ACE will also be doing what we can to influence clients directly."

Mark Robinson, chief executive of public sector procurement specialists the Scape Group, said: "Price and quality have long dominated the UK's procurement processes, but social value practices should also be embedded within decision-making, ensuring that projects leave a legacy within communities," he said.

"It is time to take a best practice approach and create a new UK procurement model that delivers maximum value for the economy as well as local communities. This presents a very real opportunity to allow procurement to act as an incredible force for change, making better and smarter public sector procurement a top priority for policy makers," said Robinson.

Download *Value Added* at <https://bit.ly/2Q71Ssv>



Why virtual site planning is crucial



Alistair Roxburgh is a solution architect with Atkins.

Construction companies operate in an increasingly uncertain and resource-constrained world. They often must respond at short notice to fast-moving military and humanitarian challenges with limited time for planning.

Whether it's the design of a temporary military base or refugee camp or quickly rebuilding a road after a natural disaster, virtual planning can help us identify the most suitable sites, designs and most cost-effective options quickly, from our own remote desktop.

So why use virtual planning? There are five key benefits to this approach.

Optioneering: To design infrastructure in remote, austere locations or in constrained brownfield spaces, you still need the right information to scope robust concept options early in the design lifecycle. Virtual site planning can help you explore and assess options, while overcoming construction roadblocks by simplifying logistics, maximising energy efficiency and reducing the site's carbon footprint. AI and machine learning can be used to improve the speed of this optioneering process, optimising and automating some of the workflow.

Safety and Security: Safety and security features can be designed-in from the outset with best practice safety guidance being built into the workflow. The physical security of sites can be assessed using line-of-sight analysis and incorporating it into the developed designs. Blast and ballistic engineering analysis of standard and bespoke temporary infrastructure can reduce the risk to site users.

Collaboration: Thanks to digital tools, designers, decision makers and users can access a 2D and 3D model of a site, resulting in a collaborative approach to the assessment and review of design options. It also allows the user to conduct pre-deployment rehearsals, ensuring issues can be sorted out before construction.

Speed: When temporary infrastructure becomes part of a demanding operating environment – such as a major humanitarian incident – time is critical. Thanks to the collaborative approach and optioneering available through virtual planning, the timeline of a site's design and construction can be reduced.

“Virtual site planning can help you explore and assess options, while overcoming construction roadblocks by simplifying logistics, maximising energy efficiency and reducing the site's carbon footprint.”

Cost: We estimate that use of virtual planning software could reduce construction and maintenance costs by at least 5-10%. By planning things virtually, factors such as construction and maintenance costs, schedule, bills of material, and water and power consumption can be compared by decision-makers for different options.

By combining these master-planning tools with more traditional engineering skills and BIM tools as required, we can

radically change the way temporary infrastructure is planned, assessed, reviewed, designed, constructed and operated. Such an approach will unlock many benefits, especially in terms of cost and time savings.



Jonathan White
is KPMG's UK head of
infrastructure.

Keeping up with London's clean air policies

London faces some of the most severe levels of pollution in the world. The city has endured illegal levels of air pollution since 2010 and in terms of nitrogen dioxide emissions, levels in London are severe in contrast to other capitals such as New York or Madrid. In fact, they are nearly as high as those endured in Beijing and New Delhi.

Yet London remains streets ahead of other UK cities when it comes to putting measures in place to cut pollution levels. The capital's ultra-low emission zone, designed to cut fumes, was introduced in April 2019 and there is talk of rolling this out beyond London's central areas in 2021.

But pollution isn't just a pressing issue in the capital, it's a significant problem in large cities across the UK too. Pollution will always be particularly acute in large cities – volumes of diesel vehicles are more concentrated here and other types of transport also emit harmful emissions.

However, current UK policy hampers cities' ability to tackle the issue. Funding for infrastructure, for example, is often ad-hoc in its approach. The National Infrastructure Commission highlights this point, stating the need for a five-yearly budget – in line with the certainty provided to Network Rail and Highways England – to allow for more strategic planning.

Devolving powers could help to ensure progress is

“But pollution isn't just a pressing issue in the capital, it's a significant problem in large cities across the UK too.”

implemented evenly and at a sustainable rate across the UK. Fiscal devolution would raise the overall amount of funding available for cities, and now is the time for regional cities to act as one and push for more funding and greater control of spending, particularly when it comes to transport.

Greater Manchester's mayor, Andy Burnham, has been particularly vocal about moving away from London-centric decision-making on transport spending. With regional mayors banging a collective drum, calls for devolved regional powers are more likely to be heard to emulate the strides being made in the capital.



Henri Murison
is director of the
Northern Powerhouse
Partnership.

Election campaign must go beyond Brexit

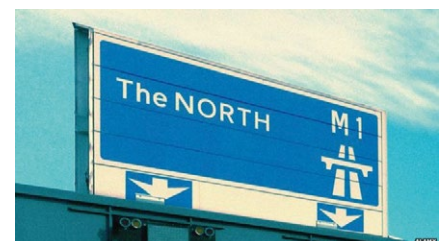
In the north we are challenging political party leaders to go beyond Brexit and focus on tackling the inequalities that exist between north and south - the barriers to a balanced country. Our train network has had no new line from west to east since the Victorian era and its lack of reliability and capacity causes misery for commuters and sluggish productivity for businesses.

We need major infrastructure investment; not, as some would suggest, having to choose between HS2 and Northern Powerhouse Rail but seeing both delivered in full, all the way, north to south, east to west. Improving local bus services alongside trams, the lifeblood of communities, must also be a commitment.

The key to unlocking the potential of the Northern Powerhouse is devolution – giving greater control to our regional leaders to tackle challenges and embrace opportunities in their area. We are therefore calling on candidates to grant 100% devolution to the north and

increased powers for those areas with existing deals.

The prize for whichever party that wins the election is huge. This election cannot be and must not be purely about Brexit. It must also be about the transformational chance to rebalance the UK and create a country that works for everyone.



Infrastructure can save the world from climate change

The infrastructure sector is absolutely fundamental to addressing climate change and saving the planet, says Forum for the Future chair Keith Clarke. *Andy Walker* reports from Singapore on an interesting and thought-provoking speech by the former Atkins boss.

“We can’t get the world to global warming of 1.5C on our own, but by doing nothing the infrastructure sector can ensure that no one else does either.” With this stark warning, Forum for the Future chair and ex-Atkins CEO Keith Clarke spelled out the crucial role of the construction and infrastructure industry in safeguarding the environment, not just for future generations, but for everyone here and now.

Clarke was giving a keynote address at the Bentley Year in Infrastructure conference in Singapore in October and it’s fair to say that his audience were hanging onto his every word during a fascinating, thought-provoking and at times provocative address. He told those present that circumstances would force construction businesses to change their business models whether they wanted to or not, mainly because of two things - technology and climate change.

Increasing population growth would bring with it some massive challenges, Clarke said. These included land use, urbanisation, housing, social cohesion and transport. With the equivalent of the populations of six new Europes to be created by 2030, there was a massive and growing market opportunity for infrastructure. But, Clarke said, it shouldn’t be the business opportunity that drove the industry to make changes. 700 million people remained poor in the world and that was not acceptable, he said.

Turning to the UN’s Sustainable Development Goals, Clarke

highlighted the industry’s role in achieving them. “Infrastructure impacts on every single one of these goals and that means that the infrastructure sector is absolutely fundamental to solving the inequality and poverty in the world. That’s a very important thing for the industry,” said Clarke.

As the chair of a leading international sustainability non-profit, Clarke is very familiar with the science of climate change, but he asked whether construction could say the same. “Does science come to your boardroom?” he asked his audience in Singapore. “Business as usual means 4C global warming and mass extinction. We kill the poor. This is science and this is now,” he said. This was a pin-dropping moment for his audience for sure.

Clarke talked about a recent conference he attended in Oxford where a representative from the Bahamas spoke and said: “Everyone keeps talking about the future effects of climate change, but my people are dying now because of climate change, not in the future, now.” Clarke said this was happening around the world and it was incumbent on the infrastructure sector to act - and not just through adaptation either. Radical change was needed. “If we keep adapting, then you get bigger answers to the same questions. Adaptation without mitigation is immoral and in the UK it’s probably illegal. It

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Forum for the Future chair Keith Clarke speaking at the 2019 Year in Infrastructure conference in Singapore.

accelerates inequality and that's a really bad thing," he said.

Mitigation is where the industry is headed and the infrastructure sector needed to move from being transitional to becoming transformational, said Clarke. "Change will have to happen at a rate of progress that we have never achieved except during wartime and existing business models would all be swept away, Clarke said. "Our industry is going to be transformational and you can make money out of this or you can go bankrupt! Engineering and construction need to act now to help curb global warming by designing and building for net-zero carbon. This is not CSR, this is science. We have to do it. Our clients will take us there," said Clarke.

The biggest threat to the environment, said Clarke, was the industry expecting someone else to solve the problem. "We should not expect someone else to solve this problem - we need to build solutions now and implement them to solve them," he said. "We are fundamental to solving



Keith Clarke, chair of Forum for the Future.

"We should not expect someone else to solve this problem - we need to build solutions now and implement them to solve them."

reports it, economic models, business models and technology. As an intellectual project it is fantastically interesting and it's a privilege to think about the rate that things are changing, he said, "but the thing is - it really does matter," said Clarke.

The infrastructure industry and the companies, organisations and people that work within it are crucial in not just saving but safeguarding the world for all generations. This is a massive responsibility for the sector and one it cannot duck.

Given the importance of the issue and the industry's role in addressing it, infrastructure should have a much higher profile on climate matters globally than it currently does. It's up to those that work in the sector to work more closely with politicians, opinion formers and NGOs to ensure that they recognise how infrastructure is absolutely fundamental to addressing this urgent issue for the planet.

this problem. We have the means and we know the end and this is a fantastic opportunity for our industry. We can actually do this!"

Clarke said that as an issue climate change involves science, politics, social behaviour, psychology, the way media

As climate disaster no time to lose

Declaring a Climate Emergency must be the precursor to massive changes in the way the world steers future development, argue BuroHappold's Mike Cook and Arup's Tim Chapman.

Around 17 years is the length of time on current extrapolations before the earth passes 450 parts per million concentration of CO₂ in the atmosphere and matches the levels of some 35 million years ago.

Because of the greenhouse effect and the higher temperatures that were then created, water levels were tens of metres higher than now. The evidence is clear - that climate change will lead to large parts of the globe becoming uninhabitable as changing rainfall patterns and higher temperatures lead to food shortages, the sea level rise will submerge all our coastal cities and the remnant land will suffer an increased rate of natural disasters.

Seventeen years is also the length of time it takes for a large capital project to come to fruition; a project on the scale necessary to change society. Very many of these megaprojects will be needed for us to change our ways of living so we emit far less greenhouse gas pollution and have a chance of averting catastrophe.

Why does this matter? We continue to burn fossil fuels in ever greater amounts, chucking more and more pollution into the atmosphere. We are still building coal-fired and gas-fired power stations all over the world. More than half of the world's fossil fuel emissions have been released since 1988, the year leading scientists made it widely known that these emissions are heating the planet. We are still driving economies based on an assumption that the earth's finite resources are unlimited and the earth's delicately balanced ecosystem is indestructible.

The pressure to develop is occurring at an increasing rate as more of humanity is taken out of subsistence survival into a less precarious state and able to live more productive lives - as they have every right to do. Meanwhile the over-consuming nations over-consume more and more. So, this hugely welcome success story for humanity comes with a sting in the tail which is based on us mortgaging our future survival as a species.



Mike Cook
is a partner at
BuroHappold.



Tim Chapman
is director of
infrastructure at Arup.

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er looms, there is



From Bangladesh in Asia to York in the UK, climate change is causing flooding and other environmental disasters on a worldwide scale.



Yet we do understand what is happening and we do have the skills to reverse it. Engineers and other built environment professionals are at the heart of the solution. What needs to happen is a rapid acceleration to implement much of what is known about sustainable and regenerative development in parallel with a recognition at every level that our development targets must embrace social and planetary health. This demands a paradigm shift.

Wouldn't it be wonderful if a concerned citizenry were agitating and lobbying our governments for change to protect our future and avert catastrophe? We are starting to see this happen with Extinction Rebellion on the streets and with professions, cities and national governments declaring Climate Emergency, agreeing to act and instigating serious controls on development - 85% of UK adults are said to be concerned about global warming.

With the Declaration of Climate and Biodiversity Emergency across the construction industry (www.constructiondeclares.com), firms are pledging to set new priorities and accelerate the introduction of better ways of working. Importantly we are agreeing to work together more closely and share information and best practice, agreeing to drive rapidly towards zero carbon construction, supporting the UK government's declared, and legally binding, aims.

In addition to collaborative action, we have an urgent need to respond within our own businesses. Consumers, employees, investors and clients are already changing their demands. Overconsumption and failing to respect our planet are becoming unacceptable. Consumption Shaming is upon us. Flights, food, fashion, workplace ethics are all increasingly defining what people demand, what they do and where they work. We must satisfy our employees, our investors and our clients, or we will have no business.

The crises of climate breakdown and biodiversity loss are the most serious issues of our time. Buildings and infrastructure, in construction and in use, play a major part, accounting for around 80% of energy-related carbon dioxide. This activity has a major impact on our natural habitats.

As engineers, our primary purpose has always been, and remains, to enhance society and wellbeing. While we have seen major improvements to practice over the last 20 years, for everyone working in the construction and infrastructure industries, meeting the needs of our society without breaching the earth's ecological boundaries will demand a paradigm shift.

We seem to have been sleep-walking into catastrophe. Declaring Climate Emergency must be the precursor to massive changes in the way we steer future development. We need to prioritise actions that secure better outcomes for society and the planet. We need to start now, because we have left it so very late.



A workforce fit for the future?

Mott MacDonald's Smart Infrastructure Index® enables organisations to assess their digital progress and work out where they need to improve. *Ann Woulfe* reports on creating a workforce fit for the future.

Digital transformation requires a workforce with the necessary skills and capabilities to take advantage of the changes which have disrupted other sectors. However, responses to our Smart Infrastructure Index® showed that 70% of people still feel they don't understand their organisation's digital skills gap.

There are many facets to creating a future-ready workforce. Skills need to be continuously developed, knowledge has to be captured and transferred from those retiring or leaving the organisation, and new talent with new expertise has to be attracted to the industry.

Digital skills are in high demand, and the need to attract and retain top data architects, software engineers and process analysts will increasingly see our industry competing with the financial sector, new start-ups and tech giants for the best talent. Our data shows that digital capability is a challenge across the industry, yet digital transformation is key to changing our image from traditional hardhats to something that appeals to the coming generations of digital natives.

People, not technology, drive digital transformation

This year's assessment of progress shows that most organisations are still at a relatively early stage in their digital transformation, particularly when it comes to skills and capability. People are at the centre of this change, which is fundamentally about developing new ways of working and new business models. Despite this, responses to the Smart Infrastructure Index®

"Changing an existing culture is a slow process and there will naturally be resistance, driven in part by a fear of change."



Ann Woulfe
is regional digital lead, Europe at Mott MacDonald.



show that an overwhelming majority of individuals (93%) think their companies do not systematically assess the digital competency of staff across the business.

There are some initial steps you can take to combat this, such as developing a digital competency framework for your organisation that is relevant to all roles and responsibilities, then defining clear career paths for a digital workforce and recognising that these will evolve much faster than traditional roles. Organisations should also assess their baseline competence and prioritise immediate training needs.

Changing an existing culture is a slow process and there will naturally be resistance, driven in part by a fear of change. We need to educate our teams, helping them understand how digital transformation will make their lives easier, while managing concerns about the disruptive effects of widespread automation. In all of this the role of senior leadership is crucial in identifying the correct course of action, steering progress, and supporting their teams with the challenges of transition.

Promote a learning mindset

Over half (53%) feel they cannot analyse the impact of organisational changes on



overall performance – yet the ability to measure and learn is central to a digital business. Learning agility is critical to closing the skills gap and demands a new mindset to really drive a cycle of continuous improvement. Another approach that might accelerate the process is reverse mentoring. Often championed in the context of equality, diversity and inclusion, it can also be a way of encouraging the exchange of digital skills and industry experience within your organization.

Information management is everyone's responsibility

Last year the assessment called out the need to make information security everyone's responsibility, not just the domain of corporate IT. This extends to all aspects of information management – it's crucial we transfer our strong 'don't walk by' health and safety culture to the approach taken when considering data quality.

We recommend establishing strong information governance with clear responsibilities and owners across the business, then creating visibility of everyone's performance, championing good practice to drive meaningful change across the business.

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Benchmark your organisation's digital maturity



Richard Shennan, group digital business development director at Mott MacDonald, comments:

"If you can measure it you can manage it," says Richard Shennan, group digital business development director at Mott MacDonald. "It's a saying commonly used in our industry, and it's clear that having a standard methodology for measuring digital maturity will help infrastructure owners and operators accelerate digital transformation."

"The Mott MacDonald Smart Infrastructure Index® provides that standard. It enables organisations to plan change based on a clear understanding of their current position and provides a methodology for implementation and measurement. It also provides a valuable benchmark with respect to peers."

To access the SI Index® and benchmark your organisation's digital maturity in just 15 minutes visit <https://bit.ly/33ozqGs>

Exploit rail data better and take a systems approach

Digital has the potential to improve reliability and maintenance in the rail sector, but the industry needs to use data smarter to make improvements.

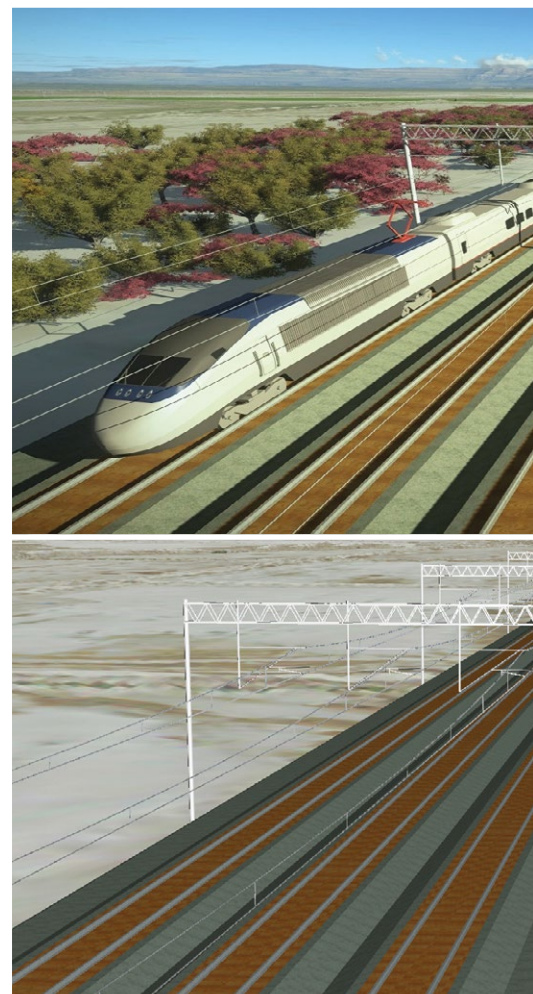
Andy Walker reports.

Digital technology and the application of data is crucial to improving the operation and maintenance of rail networks. Rail experts from construction software provider Bentley Systems spoke to me about the key challenges to be addressed, with the chief amongst them being using data in a smarter way than it does currently.

In recent years, the rail sector has dramatically increased its use of data and taken advantage of technological advances to make improvements to the network. Challenges still remain though and taking a digital approach is only part of the solution.

"The main thing is capturing the network that we have and understanding it – in the UK we know the assets that are out there but actually there's a lot of missing information and we need to understand the quality of that," says Ian Rosam, director product management, design engineering at Bentley Systems.

"The challenge that faces us is cost overruns and we are seeing it across the network, with electrification being curtailed and cut back," Rosam says. "It comes back to the quality of the understanding of the network that we have got. This is where



Imagery from Bentley's Open Rail Designer software.

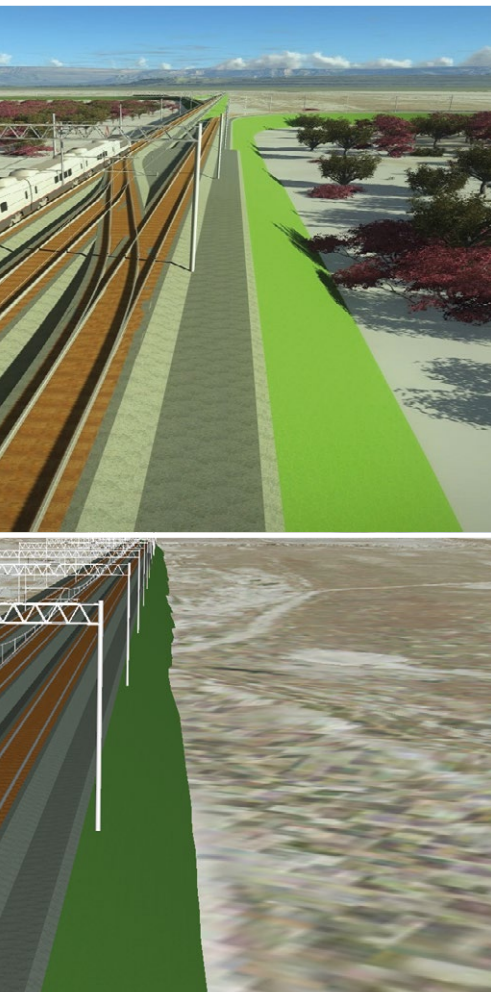
technology like reality models can assist because you're more informed up front in terms of those design decisions," he says.

Gaining that better understanding of the network is crucial in saving costs and doing construction better, says Rosam. "A good example might be the location of an electrification mast - where do you position that and can your position it there? And also, traditional survey techniques - you have to get track access, you have to get possession, which is a real challenge and then you've got to get access to that location where you need to do the inspection," he explains. "Trying to reduce the number of possessions that you need to make informed decisions is a challenge for the designer because you are limited in those possessions," Rosam says.

"From the construction side of things, the same situation occurs. If you don't have the good quality information as to where that structure can go and you need to make changes on site, typically you're going to end up with 'we can't do this work now, we have to move onto another location and go back to the designer for it to be redesigned'. So, the number of

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Bentley Systems' director of product management, design engineering, Ian Rosam (left) and rail asset performance manager, Andrew Smith.

possessions becomes a real challenge for the UK market because access onto the track is limited."

Rosam said that Bentley's Open Rail Designer, out for two years now, has been making a difference. The product introduces a new, comprehensive modelling environment for streamlined project delivery of rail network assets. This environment unifies design and construction from concept through commissioning and completion. The application delivers high performance, immersive, 3D modelling that enables instantaneous and interactive parametric modelling of rail corridors.

"We are also partnering with Siemens on Open Rail Overhead Line Designer. That's a combination of the Open Rail design technology with the Siemens equipment, libraries and components for electrification that come together into essentially what is a digital twin of the network," he says.

Making the most of the rail network's known digital information is vital, says Andrew Smith, Bentley Systems rail asset performance

manager. "We need to take full advantage of the data that we already have in the rail network," he says. "We are not data poor - we have a vast amount of data about what's going on in our network in terms of usage, maintenance, inspections, measurements and designs

"Having the right kit is not enough, when you use it you've got to change the processes and the way by which you work."

in many places. What we are not doing is taking full advantage of that in order to be able to make optimal decisions," says Smith.

There is a need to operate differently, he said, and see the rail network much more as a system rather than an asset. "We are tending to operate microscopically and putting blinkers on in many cases - and I'm talking globally here," Smith says. "Having the right kit is not enough, when you use it you've got to change the processes and the way by which you work. We provide people with a toolkit that enables them to work differently to be able to increase efficiencies and reliability. If you don't actually use the tool, then you are not going to realise the efficiencies that come out of the far end.

"What you're responsible for is a large, safety critical national system. It's not a series of assets, it is a system. You have to treat it as a system, manage and maintain it as a system and make decisions at that level in order to build and optimise what you are doing more microscopically underneath," says Smith.

A sustainable social housing solution for councils to follow

After 40 years of decline and demonisation, a well-deserved renaissance and a mass council house building programme could be the perfect solution to the nation's housing crisis. *Rob O'Connor* reports.

After 40 years of decline and demonisation, council housing finally made headlines for all the right reasons earlier this autumn, when a Norwich council estate made history by being named as the UK's best new building – the first social housing project to win the prestigious RIBA Stirling Prize in the award's 23-year history.

The Royal Institute of British Architects (RIBA) gave its top award to Goldsmith Street in Norwich, designed by Mikhail Riches with Cathy Hawley, and the award, coincidentally, came exactly 100 years since the 1919 Addison Act initially paved the way for the country's programme of mass council housing.

The winning project has been described as beacon of hope and a pioneering example for other local authorities to follow, with the Local Government Association (LGA) also calling for councils to be allowed to keep 100% of their right-to-buy receipts as the next step to deliver the renaissance in council housebuilding the nation needs.

The Goldsmith Street project for Norwich City Council is made up of almost 100 highly energy-efficient homes. And, in contrast to the higher-rise flats dominating the surrounding area, Goldsmith Street is arranged in seven terrace blocks, modelled on the Victorian streets of the nearby Golden Triangle district.

Rows of two-storey houses are bookended by three-storey flats, each with their own front door, generous lobby space for prams and bikes, and a private balcony. The back gardens of the central terraces share a secure 'ginnel' (alleyway)



Goldsmith Street is an example for other local authorities to follow.

Photo: Tim Crocker.

for children to play together, and parking has been pushed to the outer edges of the development, ensuring that people own the streets, not their cars.

Julia Barfield, chair of the 2019 RIBA Stirling Prize judging panel, said: "Goldsmith Street is a modest masterpiece. It is high-quality architecture in its purest most environmentally and socially conscious form. This is proper social housing, over ten years in the making, delivered by an ambitious and thoughtful

"Goldsmith Street demonstrates that social housing can and should be great quality and highly sustainable."

John Alker, director of policy and places, UK Green Building Council

council. These desirable, spacious, low-energy properties should be the norm for all council housing."

John Alker, director of policy and places at the UK Green Building Council said: "Goldsmith Street demonstrates that social housing can and should be great quality and highly sustainable. Norwich City Council has shown incredible vision and leadership with Goldsmith Street and has set a very strong example for others to follow."

Having a social housing project win the award can clearly be seen as a welcome sea change from the decline and negativity shown towards council housing over the last 40 years, when an incoming Conservative government first established the right-to-buy scheme – unfortunately with councils being prevented from investing the funds from selling discounted homes into building replacement homes.

The LGA say the ongoing decline continued thanks to policies of successive governments over the following 40 years, such as rules and restrictions hampering the ability of councils borrowing to build – compounding the already devastating financial impacts of right-to-buy.

So much so that the LGA now says there are now over 200 councils who do not own any housing stock at all, with many authorities having transferred their whole housing stock to housing associations over the years, many of which now openly describe themselves as property developers rather than social landlords.

LGA figures show that the number of homes built for social rent each year has fallen from over 40,000 in 1997 to 6,000 in 2017. This loss of social housing has led to more and more individuals and families finding themselves pushed into an often more expensive and less secure private rented sector. As a result, the housing benefit bill paid to private landlords has more than doubled since the early 2000s.

But, in a welcome chink of light last year, the government finally accepted the LGA's call to scrap the housing borrowing cap, giving councils new powers to borrow and invest in new and existing housing.

However, the LGA has also called for councils to be able to use 100% of their right-to-buy receipts if they are to truly resume their historic role as major housebuilders, reverse decades of decline in social housing, and deliver the renaissance in council housebuilding the nation needs.

An LGA spokesperson said: "Reversing the decline in council housing over the



"This is proper social housing," said the Stirling Prize judges.

Photo: Tim Crocker.



RIBA Stirling Prize-winning Goldsmith Street in Norwich.

past few decades is urgently needed to help families struggling to meet housing costs, provide homes to rent and reduce homelessness while also providing economic growth and lowering the housing benefit bill.

"The last time this country built homes at the scale that we need now was in the 1970s when councils built more than 40% of them. With millions of people on social housing waiting lists, councils want to get on with the job of building the new homes that people in their areas desperately need.

"By scrapping the housing borrowing cap, the government showed it had heard our argument that councils must be part of the solution to our chronic housing shortage. Allowing councils to keep 100% of their right-to-buy receipts is the next step to deliver the renaissance in council housebuilding we need as a nation."

"LGA figures show that the number of homes built for social rent each year has fallen from over 40,000 in 1997 to 6,000 in 2017."

Benchmarking study shows firms hit by uncertainty

ACE's latest benchmarking report highlights a number of key concerns for the industry.

The 14th annual ACE Benchmarking Report shows company profits increasing at a slower rate than revenue, a majority of firms recording falling profit levels and business costs on the increase against a background of rising concerns over domestic political uncertainty and the Brexit stalemate.

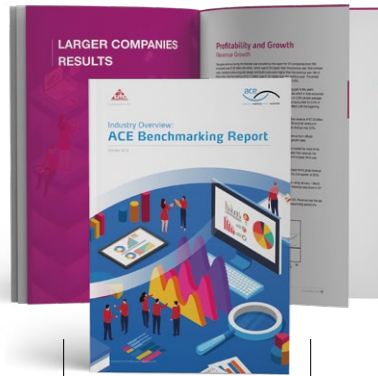
The increase in costs and the lack of increased revenue has seen

firms cut back their spending on IT despite the fact that the digital revolution continues apace. 64% of UK firms stated that overheads were rising at a faster pace than revenue and this is clearly placing a squeeze on UK companies' balance sheets.

On the plus side, despite the uncertainty in the market, companies are registering an increase in their order book pipeline for next year of 8% on average. UK firms are much better placed than European ones.

The scramble for talent continues, with the report showing an improvement in the total UK turnover rates for fee earners from 17.7% to 14.9%. This is mirrored in the European staff turnover figures, with fee earners leaving for all reasons averaging 16.3% compared to 17.8% last year. Although the numbers have declined since last year, they remain high. Recruitment costs continue to be a significant cost for the industry and it's clear that attracting and retaining talent remains a key challenge.

This year's benchmarking report shows single-digit growth in revenue (net of subcontracted costs) both within the UK and European markets - levels more muted than in recent years. There has also been a fall in profitability for UK firms and a standstill for European firms.



Infrastructure for everyone says ACE manifesto

ACE's general election manifesto, *Infrastructure for Everyone*, outlines a programme that can be adopted from day one of a new government.

All political parties should accept the need for a long-term plan for infrastructure investment that will help to build UK prosperity, says the Association for Consultancy and Engineering in its 2019 election manifesto, *Infrastructure for Everyone*.

In the manifesto's foreword, ACE chief executive Hannah Vickers said that the UK was at a crossroads and if it took the wrong decisions on infrastructure then it could see its standing in the global economy falter.

"Since 2015, we have seen a much-welcomed greater appreciation for the social and economic importance of infrastructure to the UK economy with a corresponding increase in government spending," said Vickers. "As we face the upcoming general election, the UK, however, stands at the crossroads - either it can decide to invest in social



and economic infrastructure networks that can compete with emerging economies, or it can continue to underinvest and see its international competitiveness fall," she said.

The manifesto said that as a country the UK needs to develop greater cross-party consensus on the development and implementation of large-scale infrastructure projects and that more needed to be done to link societal needs with government delivery within national and regional frameworks. The huge potential of the UK's cities also needed to be unlocked to grow their economies, meet their residents' needs, and create social value, say ACE.

The brief but comprehensive document covers all the key areas of infrastructure and outlines proposals for transport, utilities, housing, finance, procurement, sustainability and skills. "Our manifesto highlights the issues that face the UK economy and proposes solutions that can help a future government achieve the economic growth that the UK so desperately needs," said Vickers.

"Building on the research that ACE has done over the last few years and the extensive experience of our members, it outlines a programme that can be adopted from day one of a new government," she said.

Future of Consultancy campaign report launch

ACE launches robust plan to deliver transformational impact across 30% of the UK's economy through a smarter, long-term approach to the built environment.

ACE's Future of Consultancy campaign is recommending six potential business models for consultancy businesses in future and an ambitious exports strategy highlighting ten key global construction and engineering markets for UK consultants to target as a priority.

The robust domestic and exports strategies, developed by and on behalf of ACE's membership of more than 400 businesses, are intended to significantly enhance the built environment and protect the professional standing of UK consultancy into the next century.

The Future of Consultancy campaign has identified three key drivers of change, which will impact on how tomorrow's built environment will be shaped:

Data: Effectively harnessed, the plethora of customer and performance data could deliver annual benefits of £15bn across the UK's infrastructure sector.



Demand: Society's expectations of the built environment are changing, reinforced by government commitments to net zero by 2050 and an increasing influence of ethical investors.

Devolution: The devolution of both spending and decision-making powers will bring closer alignment between the customers and users of the built environment. Consultants must adapt to meet the needs of these new clients.

ACE says consultancies should embrace these drivers and adopt one of six future business models to form a pathway from volume to value. Each business model is underpinned by a commercial and supply chain structure based on 'five capitals' - natural, social, financial, manufactured and human - to help the industry define its value more effectively.

The report also sets out a 'golden thread' for the Future of Consultancy - a whole life-cycle approach which redefines value, with operation, policy, and delivery working hand-in-glove to create a truly virtuous circle.

ACE also says that there will be strong export opportunities for the consultancy sector to help nations adapt to shifts in climate, technology and social change across the following ten key markets:

- United States
- India
- Indonesia
- Germany
- Australia
- Canada
- Mexico
- Saudi Arabia
- Malaysia
- Ethiopia

The first outputs for the Future of Consultancy were shared at an industry event in London, following the conclusion of an intensive 12-month research period. ACE chief executive Hannah Vickers commented: "We're committing the sector to a major step-change in productivity performance by fully embracing the fourth industrial revolution. This means better defining the value that consultancies bring beyond just built assets and construction.

"It also means embracing change, especially technology, to ensure consultancy as a profession can also support the supply of infrastructure services and the transition to a cyber-physical system. With emerging fast-paced technologies alongside a growing population and 2050 net zero targets for carbon emissions, now is the time for consultancy businesses to diversify, establish a new role and demonstrate their true value at the heart of British society."



ACE chief executive Hannah Vickers speaking at the Future of Consultancy campaign report launch.

Tackling the rising cost of PI insurance

With professional indemnity insurance premiums rising for consulting engineering firms, there is an urgent need to address the short-term market and create a sustainable solution for the long term, says *Hannah Vickers*.

It comes as no surprise that the latest ACE Benchmarking Report shows average expenditure for UK companies on legal and professional costs increasing at a faster rate than revenue. Chief amongst these costs is professional indemnity insurance (PII).

So, what's causing the continuing rise in PII. The deterioration of contract conditions is certainly one factor as is insurers leaving the market. We also have the aftermath of Grenfell, which is making providers ever more nervous and risk averse.

Short-term actions

Firms can take action now by speaking to brokers early and preparing all relevant information in particular activities which might be perceived as high risk, such as cladding. To choose the right policy it is essential to understand particular financial to which a firm might be exposed and these will differ based on ownership structure and limits of any personal liabilities. Of course, there are several routes to managing this, but firms should put a plan in place by working closely with their broker.

Medium-term solutions

At ACE we are researching options for government intervention, seeking to put in place a sustainable solution. This could take the form of a government-backed scheme insuring specific



Hannah Vickers is chief executive of the Association for Consultancy and Engineering.

clauses or underwriting the level of risk akin to floods RE arrangements. We might even see the rise of alternative arrangements such as firms creating a mutual where they collectively pay in and cover any claims across a number of firms.

We will look at risk transfer and the quality of contract conditions. Very few clients knowingly want to transfer levels of risk to the suppliers at unsuitable or uninsurable levels, despite this becoming increasingly common. In response, ACE is actively engaging clients, supported by intelligence from our members.

Industry can reduce the perceived level of risk by increasing the transparency and robustness of our competence, qualification and assurance systems. This is currently overseen by the professional bodies as an almost pseudo-regulator and assurer of our competence. This framework has been challenged recently and improvements recommended by Dame Judith Hackitt in her Building Safety Review on high risk buildings. We should implement the changes here without delay and take the learning she highlights into other parts of the sector. This would provide confidence to the insurance industry that we have robust and transparent competence and quality systems in place.

Long-term sustainable regulation

In the long term though, there is clearly a need for the evolution of the current system to one which sustainably regulates and insures the industry. Our Future of Consultancy initiative highlighted the need for industry business models and contractual arrangements to change to meet new challenges. It may be that we might need different PII arrangements for alliances akin to integrated project insurance, so encouraging a more collegiate and collaborative approach to problem solving and lowering project finance costs through the 'wrapping' effect of an integrated project policy.

There's no quick fix for such a significant challenge, but ACE will now be bringing organisations together to tackle this challenge head-on.



Environment takes centre stage in general election

The forthcoming general election will see environmental issues high up the political agenda and that can only be a good thing, says *Matthew Farrow*.

A recent opinion poll found that 65% of Britons believe climate change is the biggest issue facing the world and for 54% it would affect how they voted in December's general election.

Now, the poll was commissioned by green NGO Client Earth and does sound like the sort of answers people feel they should give when questioned by a pollster, but there is no doubt that the combined efforts of the IPCC, Greta Thunberg, Extinction Rebellion, the Daily Mail and David Attenborough have put green issues on the election agenda in a way that is unusual.

Unusual rather than unprecedented. In the European elections in 1989, the Green Party gained 15% of the vote (at the time of writing they are at 4%). But what is worth remembering is that environmental issues normally gain prominence during times of prosperity (1989 was in the latter stages of the 1980s boom, while the huge support for climate action that led to the Climate Change Act was in 2006/7 at the end of Blair-era prosperity). Yet this time, green issues have come up the agenda against a background of a political crisis and a slowing economy.

The government is going into the election on the basis of a reasonably strong record on the environment, but one overshadowed by a huge cloud. The cloud of course is Brexit, or more specifically the persistent perception that despite all the talk of 'non-regression clauses'



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

and 'dynamic alignment' of regulations, the real Tory agenda post-Brexit will be a slash-and-burn approach to environmental regulations.

Against that, the legally binding net zero target, the environment bill and the planned banning of single use plastics along with the natural capital focus add up to a stronger record than most recent governments.

The opposition parties meanwhile have largely focused on climate change and as is the way with oppositions are engaged in a bidding war with the government over who can do broadly the same thing but faster and better. So, the current government has put a 2050 net zero target in law, while the Labour conference voted for a 2030 target (though it remains to be seen whether that would actually make the manifesto).

Sajid Javid has promised £20bn on low carbon infrastructure, while John McDonnell has raised the stakes to £250bn over ten years to tackle climate change, while the Green Party would spend £100bn every year to decarbonise.

What's interesting is how the two main parties couch their green offerings in language which reflects their historical ethos and heritage. So, the Conservatives talk a lot about protecting our natural capital and passing on the environment to the next generation in better shape – classic conservatism. Labour meanwhile has adopted the Green New Deal rhetoric of Democrat senator Ocasio-Cortez and talks of a green industrial revolution – the focus is urban and job-centred.

Will any of this actually make much difference to voting patterns on 12 December? It's hard to say, but as an environmentalist I'm pleased that green issues in this election are more than the usual footnote.



Citizens must be involved in creating smarter digital cities

Digital professionals and the infrastructure sector must engage with those who will benefit the most from their work, writes *Andy Walker*.

The construction and infrastructure sector is often criticised for not clearly and in an accessible way illustrating the tangible benefits of its work to citizens. In my experience this is a charge that could easily be laid at the door of construction's growing number



Ayesha Khanna, chief executive of ADDO AI.

of digital advocates, who come together at conferences and workshops and are so excited by the tech that they forget about its impact on those whose lives it affects the most.

So, it was a breath of fresh air to hear Ayesha Khanna, co-founder and chief executive ADDO AI, an artificial intelligence advisory firm and incubator, speaking at the Bentley Year in Infrastructure 2019 conference in Singapore, say passionately: "It's never the right way to start with the technology – you should always start with the problem." Khanna repeatedly urged her audience to focus on citizens and the benefits of digital technology on real people's lives and making them better for longer.

Khanna has been a strategic advisor on artificial intelligence, smart cities and fintech to a number of clients such as SMRT, Singapore's largest public transport company, SOMPO, Japan's largest insurance firm and Smart Dubai, the government agency tasked to transform Dubai into a leading smart city. So, she knows her stuff and it was refreshing to hear her talk about smart cities in terms of how they can improve the lives of citizens, rather than the complexity of the technology being used to make them smart.

After all, said Khanna, "a smart city is not some big system in place, but a platform for data and artificial intelligence," which can then be used to make people's lives better. She cited the example of an AI-powered transportation app in Singapore that was joining up journeys to create a seamless experience for users to get them from A to B, quicker and more efficiently. "Human-centred cities and their transport infrastructure are personalised to resident needs, not dictated by technical engineering," Khanna said, continuing her theme that technology should always be subservient to citizens.

She went on to explain how artificial intelligence is changing not only transport integration, it is integrating all aspects of people's lives. It was vital to explain the holistic approach to digital applications, said Khanna, who pointed out that the boundaries between all industries are blurring because of AI. This brings with it big responsibilities for those who use data in the infrastructure sector. Effective governance was key, Khanna said. "If you are going to use data and AI then you have to govern it to protect citizens," she said.

This was good to hear at a time when citizen scepticism about data use was rising and especially important when you consider that, according to the latest estimates, smart city solutions could improve quality-of-life indicators in cities by 10-30%. Increasing collection and application of data can't be done over the heads of citizens, there must be genuine consultation, involvement and engagement with people by the industry, with best practice leaning towards co-creation of smart city solutions.



Ayesha Khanna, CEO of ADDO AI, speaking at the Bentley Year in Infrastructure 2019 conference in Singapore.

Retrofitting with digital infrastructure

While new technologies show great potential, smartening existing infrastructure and empowering citizens with insights is key to creating smart cities, says *Parag Rastogi*.

The term 'smart cities' is a much (ab)used phrase. The variety of views about what a smart city is has resulted in broad definitions with no focus on specific technologies or sectors. I want to focus on a critical but often-neglected aspect of smart cities – retrofitting existing buildings with digital infrastructure to enable this crucial element of any smart city.

The scientific literature and our own experience suggested that, in order to be scalable and adopted widely, the digital infrastructure system has to be low impact, retrofittable, modular, economic, and intuitive. Recent advances in sensors, batteries, internet of things (IoT), and cloud-based solutions have made such a system possible.

Through installing novel IoT sensors in buildings, it is now possible to implement integrated hardware and software solutions that can create a richly detailed, continuously updated picture of buildings and their relation to the wider city environment. Crucially, in our own tests, we have combined the objective measurements with feedback from users to understand how people interact with sensing and smart infrastructure.

The upshot is that the new sensing capabilities provide a sort of 'robotic arm' to those who operate, maintain and repair buildings, giving them new tools to diagnose problems and assess the impact of interventions. However, it is not always the case that the citizens of the newly smartened building necessarily understand or appreciate the availability of this information.



Parag Rastogi

is health, wellbeing, and climate products manager at building modelling and simulation company, arbnco.

The availability of information increased awareness and, in some cases, interaction with indoor conditions and infrastructure, though from a low level of baseline engagement. Simply put, if neither operators nor users find a system to be useful, nobody is going to put up with it or buy it.

To maximise the usefulness of data collected by such a system, it is crucial that the service or technology be joined up with existing systems and new smart infrastructure. Several promising new initiatives such as Brick and Project Haystack and integrative platforms like Niagara or Schneider Exchange exist for this, though there is some way to go in operationalising seamless connections between existing and new systems.

In buildings, for example, there is substantial potential in connecting conventional automation and data-exchange protocols such as BACnet (to control heating, ventilation and air-conditioning) and DALI (control lights) through clever cloud-based software to allow them to participate in smart cities and energy grids.

New sensing and communication technologies allow us to have ubiquitous, continuous sensing of environmental and infrastructure conditions for the first time ever. Yet it is in the translation of this data into information and actionable insights that will make or break any smart city initiatives.

It seems reasonable to conclude, therefore, with a qualified call to action, while new technologies show great potential, smartening existing infrastructure and empowering citizens with insights needs to be part of the solution for the initiatives to be sustainable.



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