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Giving the public more of a say

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**Message from the editor**



Currently, there is much talk about improving and indeed transforming the construction industry. This issue of *Infrastructure Intelligence* reflects that trend and a number of articles look ahead into what the future might hold for the sector.

Transforming Construction Alliance programme director Keith Waller continues his radical take on how the industry needs to change (p14-15) while, after a year which saw more notable major project promises undelivered, we ask several industry leaders what needs to change to put UK construction project delivery back on a more reliable footing (p10-11).

We're delighted to be able to interview Sam Stacey from the Transforming Construction Challenge initiative who sets out his plans to implement change across the whole industry through the promotion of new ways of working (p22-23). Stacey is leading an initiative that should impact every firm in construction and it's worth reading what he has to say.

Elsewhere, we take a look at HS2 and ask whether the project can stay on track in the face of mounting costs and political criticism (p16-17) and we look at the effects of behaviour change on creating healthier cities (p24-25) and also how an understanding of why we do what we do what we do is essential in changing construction itself (p30-31).

Speaking of change and transformation, many thanks for the positive feedback we've received about the magazine's new look. We really appreciate readers' comments on that and all aspects of *Infrastructure Intelligence*. As ever, enjoy the read.

**Andy Walker,**  
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# Construction's major players warn PM on no-deal Brexit

In an open letter to Theresa May, five of the biggest construction trade organisations have issued a stark warning that a no-deal Brexit could lead to a 4% fall in construction output this year and a further 2% drop next year.

Industry bosses have come together to state how Brexit uncertainty is “already damaging and hampering” ability to do business and are urging the prime minister and politicians to “do their duty” and agree a deal before it’s too late.

The letter is signed by the Association for Consultancy and Engineering, the Civil Engineering Contractors Association, the Federation of Master Builders, the Construction Products Association and Build UK.

At this point the future is still very much uncertain with the UK set to leave the EU on 29 March, but whether the UK government is able to agree a trade deal with EU before that point, or whether the date for the UK’s exit will be delayed, is still unknown.

More worryingly, industry bosses say a no-deal result would have even graver consequences for the housebuilding and commercial sectors, which would both be expected to fall by at least 10% in 2019.

The report states: “With the impact of the previous financial crisis not forgotten in an industry that experienced countless

business failures, plant closings and nearly half a million job losses, the resilience of our industry has its limits. The UK economy mirrors the construction economy and the lack of knowledge and information around the UK’s exit from the EU has already reduced investment and output which will not be recovered.”



## Entries open for Year in Infrastructure Awards

Nominations for the 2019 Year in Infrastructure Awards organised by global software solutions provider Bentley Systems are now open.

The awards, which are judged by independent juries of industry experts, recognise infrastructure projects for digital innovations that improve project delivery and/or asset performance.

The awards are an integral part of Bentley’s annual Year in Infrastructure conference, which this year takes place from 21-24 October in Singapore with the theme, ‘Advancing BIM through Digital Twins’. Award winners are announced at a gala dinner during the conference.

Users of Bentley software are invited to enter their projects in the awards, no matter which phase the project is in –



preconstruction/conceptual, design, construction, or operations.

Finalists chosen for each awards category win a trip to Singapore to attend the Year in Infrastructure 2019 conference, as guests of Bentley Systems. All finalists will present their projects before the judges, industry thought leaders, and more than 100 members of the media.

The closing date for award nominations is 30 April 2019. For further information visit the website at <https://yii.bentley.com/en/awards>

# End franchising says rail review chair

The man responsible for leading a “root-and-branch” review of the UK rail network has said the industry is not delivering the benefits it should be to passengers and taxpayers.

After being appointed to lead the largest rail review since privatisation five months ago, former British Airways chief executive Keith Williams has called on the need for the sector “to adapt to a fast changing world”.

Williams believes franchising “cannot continue the way it is today” and that contracting out passenger services was leading to more problems for commuters. He wants passengers put at the heart of reform and believes franchising no longer delivers clear benefits for taxpayers and fare-payers.

With recommendations set to be published in the autumn, the rail review chair speaking to an industry audience in London, shared some thoughts after months of speaking to invested parties.

“I have heard a great deal about the franchising model... driving growth in passengers and benefits to services,” Williams said. “But with this growth, the needs of passengers have changed



whilst many of the basic elements of our rail system have not kept pace. Put bluntly, franchising cannot continue the way it is today. It is no longer delivering clear benefits for either taxpayers and farepayers. I believe that for the railway to be successful it needs to put passengers at its heart.”

Williams was appointed to lead the major review of rail industry in September after a summer of discontent. He is being supported by an expert challenge panel during the process.

Data shows that passenger journeys have more than doubled from 735 million in 1994-5 to £1.73bn in 2016-17 and the industry has not managed to keep pace with this significant growth.

# Armitt urges ministers to show greater infrastructure ambition

Responding to actions taken by the government to implement National Infrastructure Commission (NIC) recommendations, Sir John Armitt has warned ministers to “not take their eye off the ball” when it comes to improving UK infrastructure.

The chairman of the NIC was speaking ahead of the NIC’s *Annual Monitoring Report* published on 22 February, which offers an assessment of the government’s actions to act upon proposals put forward by the commission.

Armitt said that those in responsible for delivering change have a “real and exciting chance” to ensure the UK benefits from world-class infrastructure but believes ministers to date are favouring to enact the quickest-to-implement recommendations. He now wants to see progress on the more challenging targets.

The annual update makes particular reference to poor progress made towards improving mobile connections on the UK’s road and rail network - leaving passengers without the signal they should expect during their journeys.

Armitt says that greater ambition and better coordination between departments could deliver much-needed service improvements for passengers in these areas.

Commenting on the report, Armitt said: “There is a real and exciting chance available to ensure the UK benefits from world-class infrastructure, particularly through the forthcoming National Infrastructure Strategy – a first for this country. We cannot afford for ministers to take their eye off the ball. With this issue at the heart of the Industrial Strategy, I would urge the government to adopt the recommendations from our National Infrastructure Assessment and use this to offer industry the long-term, fully-costed infrastructure plan they need.”



Sir John Armitt, chair, National Infrastructure Commission.

# “We’ll deliver for passengers after a difficult year”

As Network Rail prepares to enter the next five-year funding cycle on 1 April, the organisation tells *Ryan Tute* that ensuring reliability of the railway will be at the heart of everything they do.

**I**t will be remembered as one of the toughest years for rail in recent memory with commuters up and down the country feeling the effect of mass disruptions caused by the introduction of a new timetable and poor train services, but Network Rail has vowed to turn it around.

The UK’s rail regulator, the Office of Rail and Road (ORR), took a bold step in 2018 and did something it has not done for the best part of a decade when it said punctuality and reliability on the UK railways were at their worst for five years.

New boss Andrew Raines has conceded that Network Rail has “let down” passengers but insists everyone connected is fully committed to ensuring higher levels of performance in the future. On a positive note, the ORR does believe the organisation is better placed to “deliver efficiently” in its next five-year funding period - CP6 - compared with the same point five years ago.

Back in February 2018, Network Rail outlined its vision for CP6 in which it said it aimed to slash train delays by 15% and provide 1,000 extra services by 2021. The rail operator says the plan “will drive economic growth, jobs and housing by delivering a better railway for the millions of people who rely on it”.

The scale of the task is undeniable. For the past 15 years, government-owned Network Rail has been responsible for 2,500 stations, 20,000 miles of track and 40,000 bridges and tunnels. It boasts an exemplary safety record, but critics are quick to highlight missed targets and budget overruns.

As the firm finalises its plans, those in charge of plotting the next five years of delivery see it as a chance to change and make marked improvements for the millions that commute on a daily basis.

With the budget finalised, Network Rail have revealed that the majority of the £53bn of funding from government will be spent on operations, maintenance and renewals rather than enhancements. The key focus for the next five years is said to be maintaining the railway and ensuring services that passengers and freight users can rely on.

## A difficult year

Charles Robarts, Network Rail’s director for planning and regulation, concedes there is work to be done in rebuilding the trust of the UK public. “2018 was a difficult year for passengers and Network Rail takes its share of the blame for recent poor service reliability,” Robarts admitted. “Passengers deserve, and quite rightly expect, better. Improving punctuality and reliability is our number one priority, as well as continuing to improve on our strong safety record,” he said.

To turn things around, the UK railway owner is striving to work closer with train operator partners to ensure passengers come first. A change in the way in Network Rail sees itself will also be crucial during the next five years. Robarts said: “Part of the challenge is recognising that we are not an engineering organisation, or a projects organisation, or a maintenance organisation, or an operations organisation. Ultimately, we are a service organisation whose main role is to help move passengers and goods safely.”

The most recent standout change is Network Rail’s devolution plans to accelerate “radical change”. It has announced a major restructuring programme which will bring track and train closer together and include five regions, managing directors for each, and 13 routes under them.

But what will be the big differences to the last five years? CP5 was a period that saw a number of flagship projects completed

**“2018 was a difficult year for passengers and Network Rail takes its share of the blame for recent poor service reliability.”**



like the roll-out of the Thameslink Programme to the modernisation of stations including London Bridge, Birmingham New Street, Liverpool Lime Street and Reading.

Well, the UK is bound to see less big projects, enhancement work in CP6, with maintenance and renewals the priority for Network Rail. With defined routes, London North Western will receive up to £8.7bn and Wales, £1.9bn, the organisation hopes decision making will be faster with managing directors able to focus on local issues for those lines.

#### Bottom-up approach

This represents a notable switch from the “top down” approach to costing with the implementation of a “bottom up” method allowing for significant improvements in the business planning process for CP6.

“We have made consistent with devolution and has been informed by ongoing engagement with our customers,” Roberts said. “Adopting a bottom-up approach for CP6 has provided greater clarity on the estimated spend, increasing confidence in our forecasts (in particular workmix, national unit rates and achievable efficiency). For our supply chain, the bottom-up approach should mean greater visibility of our planned works, and improved confidence for all parties that we can achieve planned efficiencies together.”

But despite the change in emphasis for funding in CP6, Roberts is adamant that this doesn't mean enhancements to the railway will stop while we move towards 2024.

Roberts added: “Funding for enhancements will be allocated by DfT and Transport Scotland on a case-by-case basis, rather than in one five-year budget. This pipeline approach will be supported by business cases to confirm the strategic fit, value for money, affordability and deliverability of proposals. This process will allow decisions to be made at the right time for a project and will prevent commitments being made too early,” he said.

*“Adopting a bottom-up approach for CP6 has provided greater clarity on the estimated spend, increasing confidence in our forecasts.”*

*“Network Rail seeks to embrace new technology wherever it offers the potential to improve services for passengers.”*

#### Digital Railway

This year it was also announced that Network Rail would be saying goodbye to the man at the helm of its Digital Railway, David Waboso. It's just been revealed that Waboso's successor will be from within with Stuart Calvert taking up the reins from April. But with 63% of the network's signalling needing replaced over the next 15 years, Network Rail's continued digital transformation will be crucial in ensuring faults on the line are kept to a minimum.

Calvert, the current director for programme technical services and supply chain, says the wave of signalling renewals that are due in the next 15 years provides an opportunity to harness the benefits of introducing digital forms of train control.

“Network Rail seeks to embrace new technology wherever it offers the potential to improve services for passengers,” he said. “The Digital Railway Strategy was launched last year and commits Network Rail to making all major renewals digital/digital ready from CP6 onwards. Network Rail and the wider rail industry is currently working with DfT to develop a long-term deployment plan to align digital signalling renewals with the fitment of in-cab signalling on new rolling stock,” Calvert says.

There is little doubt that the next few years will be pivotal for the organisation and ultimately CP6 is about “getting back to basics” and providing a service that passengers and freight users can rely on – something Network Rail may have lost sight of in CP5.

# UK environmental policy after Brexit

After Brexit, could the UK could become an environmental ‘pariah state’ on the edge of Europe? With the UK no longer having to align its environmental policy with EU law, *Tim Hill* looks at what is likely to happen.

**A** key concern of business is how environmental policy will work post-Brexit, with fears that diverging UK policy could lead to surplus regulation and a reduction in environmental standards.

Through the draft Environment (Principles and Governance) Bill, published in December 2019, the government has committed to maintain environmental principles after the UK leaves the EU. The draft bill was published a week before the 26 December 2018 deadline enshrined in the EU (Withdrawal) Act 2018 and responds to concerns that post-Brexit, the UK will no longer be legally required to align its environmental policy with EU law. It is also intended to allay fears of a perceived ‘governance gap’ in environmental decision making as a result of the UK no longer being subject to the oversight and scrutiny of EU institutions.

The draft bill proposes nine environmental principles for the UK - precaution, preventative action, rectification at source, polluter pays, sustainable development, policy integration, access to information, public participation in decision making and access to justice. These draft principles are drawn from several EU and international sources.

The aim is to embed previously disjointed environmental principles into UK legislation and ensure that they are central to government policy and decision-making. These environmental principles will form the framework for a new governmental policy statement and influence environmental decision making across governmental departments.

Another key focus of the draft bill is improvement of the natural environment through the publishing of government Environmental Improvement Plans (EIP) and a new legal body, the Office for Environmental Protection (OEP).



**Tim Hill** is a partner in the Eversheds' global corporate compliance group.

Alongside the EIP, which will be reviewed every five years, the OEP will report directly to parliament to ensure impartiality and independence, replacing the scrutiny function currently provided at EU-level. The OEP will assess the government's progress in implementing any objectives in an EIP and will have a broader role in monitoring and reporting on how environmental law is being implemented.

The OEP will also be able to investigate complaints from any person into the actions or decisions of public authorities where it suspects that, following an investigation, the authority has failed to take proper account of environmental law in decision-making. Following an investigation, where a breach of environmental law is found, the OEP may bring enforcement action (cumulating in judicial review proceedings) against a public authority.

However, at present, there is a risk that the definition of a “public authority” in the draft bill is too broad and could potentially include ‘hybrid bodies’ (for example - statutory undertakers) who are already heavily regulated by the Environment Agency. There is a danger of duplication of roles between the OEP and the EA which could cause uncertainty and ultimately lead to ineffective environmental regulation.

Despite this, overall the draft bill signals the government's clear commitment to keeping core environmental principles at the heart of government policy and decision-making in the UK after Brexit. This should help to provide some comfort to anyone concerned that post-Brexit the UK could become an environmental ‘pariah state’ on the edge of Europe.





# Adding value in a more integrated industry

In her second update on the *Future of Consultancy* campaign, ACE chief executive *Hannah Vickers* looks at three key areas where firms can add value for their clients.

In the last edition of *Infrastructure Intelligence*, I provided further details of the *Future of Consultancy* campaign and the four workstreams we have initiated. The aim of this is to develop a single industry view and help those working within the sector to better understand and navigate to the opportunities appropriate to their business.

There are many possibilities open to us in supporting our clients and we have divided these into three areas based on the asset lifecycle:

- **Strategic planning and placemaking**

A better understanding of user requirements helps clients to 'optioneer' the best solutions, making trade-offs in what they value to get to the best 'quality' design. An increase in data and digitally-enabled modelling gives consultancy the tools to apply its expertise in a more strategic way, requiring a maturity shift in client mentality away from capital cost to the holy grail of defining outcomes. Clients' willingness to pay for these outcomes enables industry to bring forward more productive solutions, such as offsite manufacturing, at scale across a programme.

- **Delivering integrated projects**

This touches on the importance of core disciplines of successful delivery in information management, programme management and production management, but we can go beyond this by exploring our remit as consultancy businesses in integrating funding streams across multiple clients, and perhaps finance across the whole asset lifecycle.

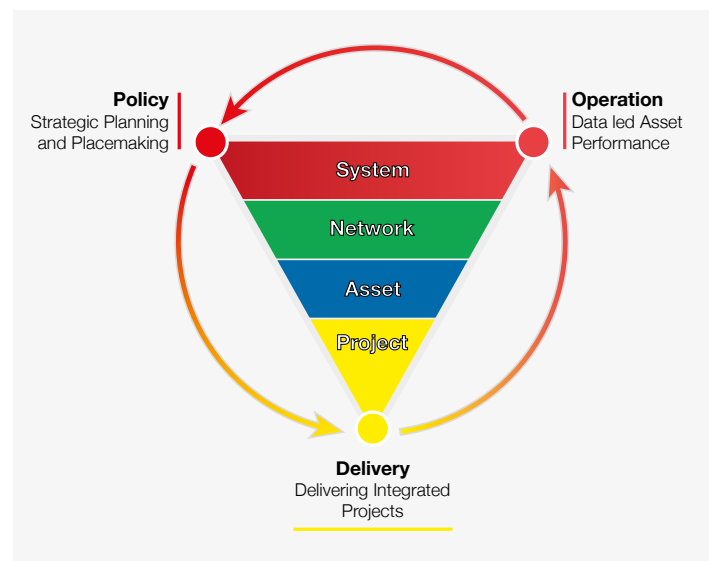
- **Data asset performance**

Combining data and technologies available in both buildings and infrastructure to understand and optimise asset system performance, often against changing user requirements, bringing to bear our tools and expertise to share learning and optimise across sectors and clients at a system level.

While these areas themselves are not new, the opportunities we have to support our clients within them will change as a result of the tools and data available to use in a digitally enabled environment.

The value is in bringing together our collective offer in an integrated way to get the flow of data, products, and expertise working around the whole life cycle, seamlessly across multiple clients. A truly valuable client partner will understand and mitigate risks not just on a project but in how assets contribute to the network and in turn the network of other clients.

For large firms, it builds on the existing model of mentoring,



**Hannah Vickers** is chief executive of the Association for Consultancy and Engineering (ACE).

developing and championing expertise within your firm and your supply chain partners to ensure your integrated offer is a compelling one. For smaller firms, it's about understanding where you add value in this model, often in multiple phases and perhaps in areas that you don't currently get invited into.

This collective vision about how we can add value makes for a more compelling proposition for those looking to a future career in the industry. Between us, we offer different corporate environments, employment structures, and a variety of work for a fulfilling, life-long career within the industry. If we can develop and articulate a more integrated industry with a vision, to an individual, we can find a place within it to suit their needs and ambitions. In turn, this makes us inclusive, representative, and sustainable for the future – without a skills crisis.



# Addressing the UK project delivery pro

After a year which saw more notable major project promises undelivered, *Ryan Tute* asks industry leaders what needs to change to put UK construction back on a good footing.



Workers continue track tests in Crossrail tunnels.

Despite setbacks for high-profile projects like Crossrail, the Aberdeen bypass, the Midland Metropolitan and Liverpool hospitals and Tottenham Hotspur's new stadium, industry bosses stress it's never been more important to keep investing in UK infrastructure as we enter a post-Brexit Britain.

With less than a month until the UK's exit date from the European Union, the case for improving infrastructure in the country has arguably never been stronger and industry leaders say it's vital to promote the image of UK construction. But protecting that image going forward won't be easy after a year which saw more projects fall behind schedule.

Originally planned to open just before last Christmas, Crossrail's £15bn project is most definitely the one that has hit the pockets of government the hardest and attracted the most negative headlines.

Now running about £2bn over budget and its completion date still unknown, new chief executive Mark Wild, who took the reins at the end of last year, has admitted that he can't see the scheme being delivered even this calendar year.

### Crossrail testing issues

Reasons for the major project's delay were centred around complex signalling systems with testing problems and design issues plighting development and leading to a revised delivery schedule. But in the months since, it's been identified that unfinished stations remain a huge issue with an "orange army" of contractors still costing Crossrail £30m a week as they carry out installation work.

The problems in 2018 were not restricted to south of the border, with last year proving to be one to forget for those connected to one of Scotland's biggest ever infrastructure projects – the long-awaited

Aberdeen bypass. The final section of the road finally opened to motorists in February after originally it was meant to open in the spring. It has suffered from numerous setbacks including the collapse of Carillion in January 2018, poor weather conditions and contractual disputes.

But how detrimental was last year for the industry and what can be done to turn the fortunes around?

Colin Wood, AECOM's chief executive for Civil Infrastructure, Europe, Middle East and Africa, believes recent controversies surrounding some projects could be fuelling the public's dissatisfaction with infrastructure management and delivery. "Government and industry must do more to highlight and communicate the benefits and outcomes of schemes, and not just the costs and likely disruptions, to help gain and maintain public acceptance and understanding of necessary infrastructure improvements," he said. Our industry is in a unique position to share learnings, best practice and data across sectors and projects to help with engagement and to promulgate the benefits of high-profile projects."

Wood says that procurement has a "significant role to play in facilitating



How Crossrail's Farringdon and Tottenham Court Road platform

# 's Problem

innovation” and believes there may be a case to move away from the industry’s traditional procurement models. “It’s very hard to show evidence of delivering innovation if this is the first time it’s been done,” the AECOM boss said. “We shouldn’t let rigid procurement models stifle innovation; there needs to be flexibility. The private sector can bring experience and lessons learned from other sectors and countries that will be critical to implementing change.”

## Presenting positive examples

While cost overruns and delays to completion have dominated the column inches, Turner & Townsend’s managing director for UK Infrastructure, David Whysall, stresses the importance of recognising positive examples on current programmes like Highways England’s RIS 1 investment programme and Heathrow’s expansion’s ability to forge a whole new model for success with a focus on collaboration and early engagement of the supply chain.

Whysall believes the time is now for the UK to “home in” on raising professional standards. “Within major projects and programmes, strong professional



Tottenham Hotspur’s new stadium under construction.

disciplines need to be maintained and collaborate effectively to deliver better outcomes for our customers – from design through to engineering, construction delivery, commercial management and project controls,” he said.

Turner & Townsend’s boss says the UK has shown in past, with the 2012 Olympic Games and Heathrow Terminal 5, that it can deliver big projects successfully but to ensure the industry keeps pace with global competitors, there is an ever-increasing case to modernise and replicate the manufacturing-based mentality.

“To date, the adoption of new technologies and digital-led methods has been painfully slow,” Whysall said. “We’ve relied on the supply chain to change, but now there is a growing recognition that clients need to do more. Committing to an offsite approach – encompassing component-led design, manufacture, logistics and construction – will be critical to the process and improving performance,” he said.

## Demise of Carillion

Another big issue which can’t be ignored in adding to the problems of UK construction last year was the demise of Carillion. The industry giant managed to rack up liabilities of nearly £7bn and just £29m in cash when it eventually liquidated in early January 2018.

A host of projects dependent on the firm fell behind as a result including major hospital ventures like the Metropolitan Midland Hospital. The Sandwell and West Birmingham NHS Trust hospital was due to be finished in October 2018, but it’s now expected to open in 2022, after the government agreed to bail out the project at an estimated cost of £315m.

Moving beyond troubled firms, there

are more troubling matters for UK construction such as tackling the industry-wide skills shortage and finding the skilled workers to undertake important jobs after the UK leaves the European Union. Any shortfall could potentially exacerbate cost overruns and forecast completion schedules.

Donald Morrison, buildings and infrastructure Europe senior vice president and general manager at Jacobs, says while the issue poses a short-term growth challenge for industry generally, it also presents a longer-term opportunity to better match the skills of the workforce to the needs of the British economy.

“While industry is working with education providers and the government to provide better access to training and jobs and develop transferable skills, undoubtedly there is more work to be done,” Morrison said. “Particularly, in ensuring the curriculum is aligned to current and future expected roles within industry, that effective access routes are there for people to pursue the right sort of training and work experience at all levels and, that we collectively engage and inspire our future talent at an early age,” he said.

Morrison also believes that a long-term view and integrated strategies sector-wide are crucial moving forward. “To achieve best outcomes, we need aligned planning and development of our vital infrastructure, where all stakeholders from water and energy to transport and the environment integrate their strategies,” he said. “Understanding society’s changing preferences and behaviours is a vital part of this process before considering whether or not to build something. And, data and analytics have to be at the heart of informed decision making to deliver inclusive growth,” said Morrison.



ns look.

# Preparing for a no deal Brexit



Andy Mitchell is chief executive of Thames Tideway and the chair of the Construction Leadership Council.

A no deal Brexit would hit our industry hard. It would affect over £10bn of the products we import and around £5bn of those we export, our ability to recruit and retain the 13% of the construction workforce – or the 30% in London, who are foreign nationals, most from the EU, and the regulation and certification of construction products. Firms would be affected, regardless of whether they are large or small, or their place in the supply chain.

The prospect of the UK leaving the EU without a formal agreement is unlikely. It is probably less likely than most other outcomes. But whilst it remains a possibility, a responsible construction industry has to prepare for it. We owe this to those who work in our firms, our clients and to our own suppliers to ensure that we understand what the key risks are and act to mitigate them.

The Construction Leadership Council (CLC) will convene a group to address support for foreign nationals working in the sector, and to engage with the consultations on the government's immigration white paper. We will also

work with trade associations and other bodies to understand the impact of changes to the rules on the import and export of goods.

We will also develop guidance on potential changes to the rules on demonstrating compliance with product regulations. Finally, the CLC will ensure the government is aware of the cost and complexity of mitigation and the potential impact on the sustainability and productivity of the industry. The CLC will be setting out detailed plans for follow up action shortly.

Individual firms should also start the conversation about this issue with your own suppliers and clients. Do they know where materials come from? What plans do they have to manage delays? Have they decided how to handle the costs of those delays? By having these collaborative and open conversations now, we can ensure that we are prepared as possible, throughout the supply chain.

The past year has seen genuine collaboration across the industry on a range of issues. The development of the Construction Sector Deal, and more recently, the collaboration

between nine trade associations to identify those occupations that should be included on the shortage occupations list, demonstrate this is an industry that can work together across tiers and subsectors to deliver what is in our collective interest.

We need more of the same behaviours in relation to planning for a no deal, and for the future challenges alternative Brexit outcomes may bring. I am looking forward to continuing this discussion with the industry.

*“The prospect of the UK leaving the EU without a formal agreement is unlikely. It is probably less likely than most other outcomes. But whilst it remains a possibility, a responsible construction industry has to prepare for it.”*



**Dawn Childs**  
is president of the  
Women's Engineering  
Society.

## Women in Engineering Day - a time to transform

On Sunday 23 June, the 2019 International Women in Engineering Day (#INWED19) will be encouraging participants to show the world how they are transforming the future in pursuit of more diversity in engineering. This global awareness campaign, coordinated by the Women's Engineering Society (WES), aims to increase the profile of women in engineering worldwide and focus attention on the amazing career opportunities available to girls in engineering and related industries.

In 2019, WES' own centenary year, our sixth INWED will aim to inspire even greater participation across the globe, both online and through physical activities, by individuals, schools, colleges, groups and organisations. The theme will be supported by the hashtags #INWED19 and #TransformTheFuture and we hope that the industry will join us in recognising the outstanding achievements of women engineers throughout the world.

While we will be celebrating the rich history of many inspirational women who have made their mark in the engineering world, there are still far too few women who even understand what engineering is let alone choose to become an engineer. International Women in Engineering Day is therefore so important to raise the profile and awareness of the fabulous opportunities that a career in engineering can bring.

This year it is more pertinent than ever because our theme is #TransformTheFuture and so many forms of engineering do exactly that. So not only do we want to transform the future for girls and women by encouraging them to start a career in engineering or supporting them to excel and thrive in their current engineering career, we will of course also be transforming the future of so much more with the engineering that they will do.



**Lee Rogers**  
is an associate in  
Weightmans LLP's  
employment team.

## Protecting commercially sensitive information

With Crossrail recently announcing that it will stop requiring departing staff to sign non-disclosure agreements (NDAs), more organisations involved in infrastructure projects are set to be put under the microscope for their use - but how can the public sector still safeguard themselves from sensitive information being leaked?

The problem with NDAs in the context of public sector infrastructure projects is the potential for them to be used to prevent employees from raising genuine concerns about matters in the 'public interest', such as malpractice or overspending. When the Crossrail delay was announced, TfL, the chair of the London Assembly's transport committee Caroline Pidgeon and London mayor Sadiq Khan, questioned whether NDAs were being used to stop ex-Crossrail employees from revealing the causes of the delay.

Now that Crossrail has made a public commitment to stop using NDAs, their use by other organisations is likely to come under scrutiny. In the public sector, it is not a stretch to anticipate that a requirement not to use NDAs could become a feature of future tenders. It is therefore important that organisations involved in public sector infrastructure

projects ensure their contracts of employment include provisions to protect commercially sensitive information, both during the term of the employment relationship and following its termination.

As a part of its commitment to stop using NDAs, Crossrail made clear it would still use appropriate confidentiality provisions in settlement agreements with departing employees. So, if an organisation is concerned a departing employee could disclose commercially sensitive information, it should consider using this more nuanced approach to outline exactly what information the employee can't disclose.

Such restrictions should be no wider than is necessary and cannot prevent former employees from reporting concerns in the public interest, such as malpractice to a regulator. Equally, the increased focus on transparency should highlight the need for an appropriately drafted 'whistleblowing' policy to organisations bidding for public sector infrastructure work.

Such policies should promote a culture of openness and enable staff to raise genuine concerns of suspected wrongdoing in the knowledge their concerns will be taken seriously and investigated, without fear of reprisal.

# Let's end DfM wider view of

All parties need to work more collaboratively to achieve a more sustainable, profitable and attractive construction industry with an improved impact on society, says *Keith Waller*.



**Keith Waller** is the programme director for the Transforming Construction Alliance, the organisation delivering the Core Innovation Hub for construction.

**T**erms like DfMA (Design for Manufacture and Assembly) and MMC (Modern Methods of Construction) seem omnipresent in our industry. But by simply describing a process to improve how we build, they do not explain how this will enhance operational performance or deliver benefits to users and society.

Of the around £200bn construction sector in the UK, we invest about one third - over £60bn each year - in our economic and social infrastructure. This means improving our schools, hospitals, social housing, roads, railways, airports, flood defences, utilities, power networks and much more.

What should UK plc expect from this investment? This is not just about whether we can build cheaper, faster and safer – we can. It should also be about creating inspiring places to live and work and effective ways to move between them. It is about making the most of our built environment, delivering more and better for its users, owners and operators.

If like me you share this ambition, then we must think beyond the *project* – the capital phase – and consider how the built environment performs throughout its life – a key theme of the Infrastructure and Projects Authority's *Transforming Infrastructure Performance* initiative. And, crucially, it is about delivering better economic, social and environmental outcomes from this investment. Our challenge is to redefine “value”, so we don't just think “cheap”.

This is not something the construction industry can fix by itself. It requires all parties, in particular government and clients, to measure value differently in terms of the outcomes they want delivered. It must support not just an improved deal for taxpayers, users and industry, but for society as a whole.

There is now a real opportunity for the public sector to step up to the plate. Government must be bold in setting out its ambitions as it heads toward the next Spending Review. In fact, its own Green Book and policy to consider social value in procurement actively encourage such an approach. But these are not yet consistently applied, often constraining industry with input-focused, process-driven procurement. No one is calling for another ill-conceived, multi-lot, zero-value framework, and yet...

So, if not “DfMA”, what instead? What should we be designing for?

Yes, we should be designing for a modern delivery process consistent with digitally-enabled manufacturing and assembly. But we should also design for sustainability, for resilience,



for whole-life performance; we should design to build in flexibility, accessibility, interoperability and security-mindedness; we should be supporting communities, building capability and opening opportunities for local business. We should use smarter, shareable data that drives performance and informs decision making. And much more.

Therefore, we shouldn't be designing just for manufacturing and assembly; we should be designing for all of the factors above, the sum of all of these parts – DfΣ.

We also need to start asking different questions: How sustainable is the

# A and take a construction

production process? Do we understand where materials and products have come from, who produced them and how? How much waste are we creating? How much carbon and energy are we using? Are the businesses we are engaging with ethical? Do they invest in skills, promoting a more productive workforce? Do they pay their suppliers in a responsible way?

So, what does this mean for government, for clients, for designers, for contractors and for product suppliers?

Answering these questions is a key part of my role helping to transform construction.

Already we are engaging with government departments, building a fuller picture of what data they have and how they use it to inform their decisions. The Construction Innovation Hub team is taking a lead in setting out how industry can engage to help us kick start this transformation.

I believe passionately that seeking better outcomes delivers better value.

But for businesses to invest in the skills, solutions, products and methods that deliver these outcomes, then government and clients must get in the habit of both asking for and valuing them. Only then will construction be able to transform into a more sustainable, profitable and attractive industry with an improved impact on society.

For 20 years we have spoken about MMC and DfMA and, whilst they have their place, now is the time to embrace DfΣ.



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# HS2: Can it stay on track or will it be derailed?

With HS2 coming under increasing political scrutiny and with the next year likely to prove a defining period for the high-speed network, *Ryan Tute* looks at the current state of play of the engineering super-project.

**I**t's been a project which has invariably divided the nation, described as a "vital engine for growth" by one side and a "white elephant of massive proportions" by the other but under a cloud of escalating costs, does HS2 still boast the same social and economic case it did when it got the green light more than six years ago?

It was January 2012 when the government ended months of speculation and approved a new £32.7bn high-speed rail network for the UK. After receiving around 55,000 responses on a public consultation for the rail line, the Department for Transport (DfT) revealed that Phase One of the network, between London and Birmingham, would go ahead.

Described as "working like a motorway", business leaders took it in turns to come out in favour of the project which was seen as a mechanism to end the north-south divide as well as creating thousands of jobs up and down the country for years to come.

But ten years since plans were first proposed in 2009, a piece of track is still yet to be laid. In that time, official projected costs have nearly doubled to £56bn due to inflation, outdated price models and the increase to tunnelling required on the route. It was not until February 2017 that the first phase was given royal assent by the Queen, paving the way for construction to begin, while legislation needed for Phase 2b, extending the railway to Manchester and Leeds, has been delayed.

Recently, the former chair of HS2, Sir Terry Morgan, has said "something will have to give" on the triangle of time, cost and scope of the proposed high-speed rail network. While current chief executive Mark Thurston conceded that the final cost could not be



established until all the contractors had been appointed.

The concessions have only added fuel to the fire and allowed for more sceptics to have their say in recent months. The former chancellor, Lord Darling, who actually signed off Crossrail during his time in government, has said he believes smaller projects along the line would have been better. "HS2 was not the product of investigation into what was needed," he added. "It was just decided it should happen and justified afterwards. This thing is never going to get to the north of England in any of our lifetimes."

But the DfT has reiterated how there will be no U-turn on the project despite mounting concerns. The transport secretary Chris Grayling has insisted how not completing HS2 would be a betrayal of the Midlands and the north and failure to deliver beyond Birmingham would be a "dereliction of our duties".

The new chair of HS2, Allan Cook, who took over from the ousted Morgan, has reiterated the need for the project as it will "fundamentally change the way we live and travel". Cook said: "We must remember





two important factors - one the scale of the prize, the chance to transform our economy as a whole and secondly we need the full co-operation of all our stakeholders to make this programme as successful as possible. HS2 is not an end in itself, it is an enabler," said Cook.

Political disputes have only added to the delays with several cabinet members today still believed to be at odds with the rail link and wanting Theresa May to order a full review due to spiralling costs.

However, the Labour the opposition has never officially wavered from its long-term support for HS2. Labour's 2017 general election manifesto pledged that the party was in favour of completing HS2 from London through Birmingham to Leeds and Manchester and then into Scotland, consulting with communities affected about the optimal route.

Labour's shadow transport secretary Andy McDonald responded to recent negative stories by claiming "this sort of talk is dangerous", while stating HS2 is critical in delivering needed capacity for Britain. But he insists its construction should not be at the loss of much-needed local upgrades.

***“Like Northern Powerhouse Rail, HS2 will deliver an economic transformation with tens of thousands of apprenticeships and jobs across the construction industry and the wider rail supply chain.”***

“Like Northern Powerhouse Rail, HS2 will deliver an economic transformation with tens of thousands of apprenticeships and jobs across the construction industry and the wider rail supply chain,” McDonald said. “It’s essential that the phases of HS2 align with the much-needed upgrades to railways in the Midlands and the development of Northern Powerhouse Rail. In terms of investment in high speed rail versus the existing network, I say: ‘it’s not a question of either-or. It is both’. Having said that, there will be no blank cheque from Labour,” he warned.

With the high-speed network estimated to pass through as many as 70 constituencies in the UK, building the line has not been without controversy and opposition from backbench MPs or campaign groups. The most prominent of these groups is Stop HS2, whose chair Penny Gaines says that HS2 is like “building a Waitrose on rails, whilst commuters queue in Aldi”. Gaines claims that HS2 is unlikely to stay on budget and the £50bn projected cost is likely to be an underestimate. “We know that cabinet ministers think it should be scrapped and the government should cut its losses now,” she said.

Meanwhile, with pre-construction work for stations already underway in Birmingham, businesses have begun to bank on the 7,000 jobs which are set to be supported by the programme. The Midlands is due to see construction of two new stations with one centrally at Curzon Street, and the other acting as an “interchange station” near Birmingham International Airport, outside Solihull.

Maria Machancoses, director of sub-national transport body Midlands Connect, believes success will only be achieved if regions in the Midlands and the north collaborate. “HS2 is the defining infrastructure project of a generation,” she said. “It’s the most tangible opportunity we’ve had for decades to rebalance our national economy. Realising the full potential of HS2 hinges on a single, simple message – one that must continue to be shared. The project is so much more than just a railway line, it’s a catalyst for growth, regeneration and inward investment,” said Machancose.

# Total risk approach needed to fire safety

Following the Hackitt review into fire safety, the time to take a proactive approach and address total risk is now, says *Tony Jones* of The Concrete Centre.



**Tony Jones** is principal structural engineer at The Concrete Centre.

One of the longstanding flaws afflicting our building regulations is that our system is too reactive, built on responses to tragedy. The Ronan Point collapse, the King's Cross disaster and latterly the Grenfell Tower fire - incidents like these leave indelible marks on our national consciousness and inevitably lead to an outcry for change.

However, we must ensure that alterations to regulations address total risk, safeguarding against all eventualities, rather than addressing only specific failings. This is essential if we are to tackle the industry "complacency" criticised by Dame Judith Hackitt. Simply put, we can't wait for something to go wrong before moving to prevent it. As Hackitt states in her report, we should pursue a "holistic approach" to meeting building safety objectives. This means that the scrutiny rightly applied

to combustible cladding should now be broadened.

When it comes to protecting a building's occupants and surrounding people and properties, there is little more important than structural safety. While the government has stated that it accepts Hackitt's recommendation for "facilitating the prioritisation of fire and structural safety", there is little indication of structural safety being prioritised. For example, it has not been included as part of Westminster's proposed review of the current Approved Documents, the technical guidance that forms the bedrock of our building regulations.

The current advice in *Approved Document B3 (1)* undermines the serious nature of any potential collapse with its ambiguity, stating only that a building's stability should last for a "reasonable period" in a fire. What a 'reasonable period' may be, of course, depends on several factors, including differing evacuation policies and specific uses - a high concentration of elderly or vulnerable residents will need more time to escape.

Moreover, Building Regulation 8 reminds us that designers must think not only of occupants but also of securing safety for "persons in or about" a building. As it stands there is no difference in structural fire resistance requirements whether a building is isolated or urban, even though a collapse in a built-up environment could have far greater consequences. This should change to adequately reflect the industry's responsibility and duty of care for communities.

While the use of combustible external elements, like cladding systems, has now been restricted, we need to avoid making 'skin deep' changes that don't address risk built into the core of our buildings.

Current testing regimes for structural elements fail to consider any contribution to the fire load from the material being tested. This is despite some structural options, such as timber frames, being combustible and having the potential to feed a fire and impact its growth. Where structure forms part of the fire load, this must be considered to enable informed specification decisions.

Hackitt recently made it clear that she fears a 'loss of momentum' from waiting for the government's response. Crucially, we shouldn't be waiting for another incident to spur change. The time to take a proactive approach and address total risk is now.



# Putting people at the heart of infrastructure

The industry needs to respond to the challenge to engage effectively with the public about infrastructure by telling a better story, says *Michael Vivona*.

National Infrastructure Commission chair, Sir John Armitt, identified public engagement as one of the biggest challenges for the sector. In the digital age, where individuals can influence decision-making with a single click, the quality of public engagement determines a project's success.

As the Association for Consultancy and Engineering develops its *Future of Consultancy* campaign, there is great opportunity to put public and community engagement front and centre. Public consultation is too often approached as an exercise in risk mitigation, rather than meaningful dialogue with communities. The discussion is shaped by the need to respond to opposition, rather than the opportunity to tell a compelling story about the benefits of a project.

In shaping the future of public engagement in planning consultation and infrastructure delivery, we should be guided by the following priorities:

## Engaging the silent majority

We have the opportunity to reach beyond the usual suspects and unlock a representative cross-section of community opinion across all demographics. Political support flows from social consent. By giving a voice to those under-represented in traditional consultation – busy families, students and young professionals, minority communities – we gain a truer picture of opinion, secure better feedback and deliver greater legitimacy for a project's objectives.

## Deploying new technologies

The underlying principle remains to



The Connswater Community Greenway project in Belfast has won awards for its community engagement work.



**Michael Vivona** is head of major projects at Social Communications.

engage where people congregate. Public exhibitions in village halls still have their place, but where people gather is just as likely to be on Twitter or in the pub. We should aim to harness the potential of artificial intelligence and social listening tools to understand the widest target audience, in ways which suit our busy and digital lives.

## Committing for the long term

Planning consultation is one step in a wider process of continuous dialogue with communities. People see through token consultation. To be effective and representative, engagement should be early, authentic and repeated. The game-changing ability to harness and compare data, consistent with privacy and data rights, allows us to build an in-depth picture of public opinion over time. Decision-makers want to see how public opinion evolves rather than being presented with a single snapshot.

## Being bold

The onus is on our sector to have the confidence to get our message across. Public engagement can be difficult. Social media can feel like a bear-pit. It is easy to shy away from difficult conversations. But experience shows us that not engaging is not an option. Vocal opposition will shape public, media and political perception if it is the only side of the story. We must engage head on.

Opposition and criticism are facts of life. It is those projects which listen and respond to feedback confidently which earn public trust. Each project has a persuasive story to tell, not just about what it brings to local community, but about the contribution infrastructure makes to the wellbeing and prosperity of the nation.

Hannah Vickers, ACE's chief executive, describes this as a "perfect moment for change", as we enter a new era of design and delivery in the built environment. Putting people's views at the heart of future infrastructure planning and delivery will be a huge part of that.

# More talk not tech will deliver better infrastructure

The UK has a real opportunity with a longer-term strategic planning horizon to plan, design and deliver infrastructure in a completely new way. *Andy Walker* reports on a recent industry roundtable looking at how this might be achieved.

The first of three *Infrastructure Intelligence* roundtables looking at the strategic, economic, financial, commercial and delivery components of a fundamentally different approach to infrastructure delivery, focused on Hyperloop to illustrate the challenges innovating within current systems. Attendees at the roundtable, sponsored by Costain, heard Continuum Industries' Adam Anyszewski say that despite the hi-tech nature of projects like Hyperloop, "it's not about the technology, it's about the delivery of that technology and overcoming the mismatch between the 'languages' that people speak".

Having the best idea in the world, or thinking you have, is not enough, he said. You have to convince a range of stakeholders – government, politicians, civil servants and crucially the public – that any given project is going to make a material difference, especially to people's lives. This approach was endorsed by roundtable chair, National Infrastructure Commission chair Sir John Armitt, who said that "technology is secondary to persuading a variety of stakeholders of the benefits of a particular solution".

Those present were in total agreement that although talk of a 'systems of systems' approach might be exciting to an engineering and construction audience, to the general public such talk was next to meaningless. What was key was to marry public views with the potential and possibilities inherent in projects and show how they could positively impact on communities and citizens' lives in both the short and long term.

As a result, a different approach to infrastructure project development needed to have a bounded political safe space built in to evaluation models to take account of politicians' views and their responsibility to take account of their constituents' views without undermining long-term nationwide benefits. Phil Blythe from the Department for Transport said there was a particular challenge for transport in this regard as there were many great solutions out there, like Hyperloop, that don't deliver for all.



**Adam Anyszewski,**  
co-founder and system  
architect at Continuum  
Industries.



Sometimes the sheer ambition and effect of revolutionary transport projects made it difficult to gain public acceptance. "Transport impacts so much on people's lives and you almost can't imagine a world where it could take 35 minutes to get from Edinburgh to London," said Sayeh Ghanbari of Ernst & Young.

Finding out what the public want and need – even when they don't really know themselves – was crucial in winning public acceptance for major projects. All attendees agreed that the industry needed to do much more work to engage effectively with people affected by infrastructure development. Central to this was taking an approach to projects that considered the wider social outcomes of infrastructure and the benefits that can be delivered to society as

***"Technology is secondary to persuading a variety of stakeholders of the benefits of a particular solution".***

**Sir John Armitt, chair,**  
National Infrastructure Commission



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whole. There was some frustration expressed by those present that this wasn't done enough currently and some of that ire was directed at political interference.

"Are we too democratic to deliver the infrastructure society needs?" was one question posed, referring to the over-regulated statutory and regulatory environment that the industry had to navigate. While there was some sympathy with this view – and examples given of tortuous environmental impact assessments that read like *War and Peace* – the collective view around the table was that more could be done to win over the public's hearts in support of infrastructure.

"We are good at describing what we are going to do, but bad at describing what people are going to get," said Keith Waller from the Core Innovation Hub for Construction. Arup's Tim Chapman agreed, saying that the industry needed to "go behind the red lines of the project and look at the effect on society".

Speaker after speaker said that there was a real need to articulate much more the effects of what the industry is doing. Sometimes this might lead to a trade off between what is going to be done and what a community is going to get in return, but that dialogue had to take place if the public were not to be disengaged from infrastructure development, or worse, driven into active opposition to it. It brings into sharp focus the dichotomy between short term



**Sir John Armitt, chair,  
National Infrastructure  
Commission.**

direct impacts on people and the long-term benefits to the public at large.

The challenge behind any major infrastructure development was to get the public to value what was being planned. This in turn was crucial in winning over political support. John Armitt highlighted the example of France where it was not uncommon for state officials to spend two or three years in a particular area earmarked for infrastructure development consulting with and listening to the local population. "It's also crucial to inform people that this is what will happen if we don't build a piece of infrastructure as well as saying what will happen if we do," Armitt said.

Giving people the full picture and taking a holistic view was important. People need information to make decisions and the age of social media means that the infrastructure industry must engage and join the conversation. That means speaking directly with the public as well as politicians and being able to get out of the detail and intricacies of projects and instead focus on outcomes and delivering value for multiple stakeholders.

Technology, as we see with the amazing Hyperloop initiative, is moving so fast that the infrastructure sector can achieve almost anything. The challenge for the industry though is how to create the chance and the opportunity to do those things and that can only be done by meaningful, real and sustained engagement with the public.

Recognising that what people value is likely to be significantly different to the anticipated outcomes in any business case (short-term immediate benefits like jobs on the project, or long-term like reliability rather than capacity or speed) and although there was a need to engage and debate, the industry also needed to focus more on 'knowing' what will matter to the psychology of stakeholders (people) in a project environment.

Many attendees were positively evangelical about putting the social outcomes of projects more prominently into the business case for infrastructure and there was a feeling that such an approach would make it easier to have often difficult conversations about project cost, timelines and disruption to communities.

So, notwithstanding the technological innovations the industry has at its disposal, attendees at this first of three industry roundtables were in broad agreement that planning and delivering better infrastructure should firstly focus on people rather than process and be more about talk than tech.

# Making tangible change happen quickly

The Transforming Construction initiative will see £170m of government research and innovation investment, matched by £250m from industry, to create new construction processes and techniques for building manufacture in the UK. *Andy Walker* spoke to the man heading up the initiative.



**Sam Stacey, director of the Industrial Strategy Challenge Fund's Transforming Construction Challenge.**

**S**am Stacey, director of the Industrial Strategy Challenge Fund's Transforming Construction Challenge, is no stranger to construction change. As Skanska's director of innovation, he was instrumental in driving change through the development and application of new technology, business processes and partnerships. His new role will give him the opportunity to implement change across a whole industry through the promotion of new ways of working.

He told me that the bulk of the £170m government cash for Transforming Construction had already been committed and the initiative was raring to go. "£72m will go to the Core Innovation Hub at three centres – Cambridge, Watford and the Manufacturing Technology Centre in Coventry. Those combined will be producing standard products and processes for the construction industry," said Stacey.

The centres will take forward the government's presumption for offsite manufacturing, concentrate on whole life value and "promote a very strong use of digital techniques" in the drive to change the industry. "There is also £36m for the Active Building Centre at Swansea which is commercialising energy positive buildings. It's all about producing more efficient buildings with massively improved carbon performance," he said.

It's clear that the hubs and the active building centre are being encouraged to be 'ideas and action factories' to create tangible change that construction industry clients and the supply chain can pick up and run with. "We are also in the process of allocating money to various forms of research to support the Transforming Construction challenges, such as applications of artificial intelligence (AI)," Stacey explained.

This will be done by a range of private sector organisations and academia, with the bulk of this work being industry-led collaborate R&D," he said. Transforming Construction has selected around 25 research bids to fund and half have an AI element. Digital modelling techniques, robotics and automation will be more visible in the industry's future," Stacey said.

So, how does he see the Transforming Construction programme progressing over the next 12 months? "The overall concept is that we develop solutions that we advise the procurers to ask for from the supply chain," he said. "The people buying construction ask for those solutions and we advise the supply chain in delivering those solutions. That's the



The Active Building Centre at Swansea.

Credit: SPECIFIC IKC at Swansea University

joined-up system that works to do that.” In the early stages of the initiative, Stacey said that he expected to see an influence in the school sector as they are “a perfect example of buildings that can be standardised and made better”.

Stacey’s priorities over the coming months will be to link up the buying of construction solutions with the outputs being created by the initiative. “We want to generate as much creativity and activity as possible,” he said. “If we make it really simple, you can imagine a scenario where a client can essentially go to a website, configure their building from that website, press go and then mobilise the production from a whole lot of different suppliers. I think that’s where we are headed in terms of the construction industry,” he explained.

“Stacey sees a more efficient future with an industry structured to be much more vertically integrated, “so that instead of having to do competitive bidding at different layers, you’re bidding for one complete turnkey delivery,” he said. “What we’re going to be doing with the programme is to demonstrate: a) that there is a much better way of doing things and b) the ‘kit of parts’ or platform approach to buildings where relationships between different actors should be different,” he said.

Such significant change will need to be explained clearly and communicated throughout

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***“I’m confident that we can demonstrate that there is a better way to do construction and that to construct in any other way is foolish.”***

the industry. Can he be confident that Transforming Construction will succeed where previous initiatives have failed? “The formula for transforming construction is very simple - digital techniques, a manufacturing approach to buildings, whole-life value delivered through innovation that the customers ask for (smart procurement) and somewhere in the mix there needs to be a change in the skills provided by the industry and we hope to influence that too,” he said.

Reaching out to the industry and connecting with industry bodies is also important to Transforming Construction. “The chair of our Transforming Construction advisory board is chief executive of the Construction Products Association so there’s a very strong link there. Our whole programme has been worked up in collaboration with the Construction Leadership Council and we are very aligned with their agenda,” he said.

Stacey said that he was keen to talk to industry trade associations and explain to their member companies about how the initiative can make a difference to their businesses. “The best thing we can do is give those companies confidence that there’s going to be a consistent high level of demand for the sort of things that we are talking about. Supply and demand has been the biggest barrier to efficiency in our industry. It’s about breaking down the barriers to doing things differently,” said Stacey.

He said that if the “consistency of government procurement” could get firms to invest in new methods of construction then the initiative will be making the right steps. “All companies should be able to respond to Transforming Construction in some way,” he said.

Stacey wants to be able to point to real improvement. “People are convinced by tangible examples. Take the energy positive buildings at Swansea’s Active Building Centre. You can look at the school. It works, has been up and running for more than a year and produces 50% more energy than it needs,” he said.

“Pioneering work like this can dramatically reduce the costs of these buildings in the future. We need to get there quickly. We will do it first with schools - within a year - but there is no reason why we can do this in transport and across other areas of construction. I’m confident that we can demonstrate that there is a better way to do construction and that to construct in any other way is foolish,” he said.

# Can London catch Copenhagen?

A shift in culture, changing behaviours and small-level interventions are vital in meeting healthy city goals, argue environmental and design experts, Barton Willmore. *Ryan Tute* reported.

Consistently ranked at the top of healthy city indexes, Copenhagen is a world leader when it comes to scores of happiness, mental health and activity levels but as London strives to play catch up, are its aims ambitious enough to inspire serious change?

The difference between the two cities is plain to see. With five times as many bikes as there are cars and its streets connected by approximately 300 miles of 'super bikeways' - dedicated specifically for two-wheelers - it's little wonder that Copenhagen is highly decorated when it comes to attaining healthy city status.

London's challenge is no doubt a much more daunting one as it is at least ten times bigger than the Scandinavian city but in its attempts to find itself on a level footing, questions on how committed the government and the mayor of London is to make the city a greener, sustainable and happier place to live continue to mount.

John Haxworth, a partner and head of the landscape design team at planning and design consultancy Barton Willmore, says convenience is always key. "If it's quicker, easier and cheaper than whatever

your environmental point of view, you're going to support it," Haxworth claims. "If you provide the right type of infrastructure, people will use it."

But how has Copenhagen become the leader it is when it comes to attaining healthy city goals? Haxworth, who recently visited the Danish capital on a study trip, believes the real triumph is how high-level infrastructure has



**John Haxworth,** partner and head of the landscape design team at Barton Willmore.

*"People in Copenhagen haven't suddenly decided to use greener forms of transport because they believe it's morally right, it's because it's the easiest and quickest way of getting to work or the kids to school."*



**Cyclists in Copenhagen.**

been delivered across the city and not just a series of high-profile, high-cost major interventions that don't filter down to everyone.

"It's the all-pervasive provision of infrastructure on all scales that comes down to the individual city blocks and the creation of a culture that nudges people into going out into open green spaces by increasing the rate of walking or cycling," Haxworth claims. "People in Copenhagen haven't suddenly decided to use greener forms of transport because they believe it's morally right, it's because it's the easiest and quickest way of getting to work or the kids to school," he said.

Keeping people active is also a central theme in Copenhagen's healthy journey. The 2017 *Annual Bicycle Report* revealed how cycling is king for inhabitants with 62% choosing to bike to work or school/college. In total, 1.4 million km is cycled in the city on an average weekday, which was recorded as an increase of 22% since 2006.



But despite efforts in London to pick up the pace for cycling infrastructure with the development of cycle superhighways, what has the Danish capital been able to achieve that its European competitors haven't?

"At the moment the infrastructure we are putting in place within London like the cycle superhighways is quite a lumpy approach," Haxworth said. "It's a large piece of infrastructure that has met some resistance and is only ever used by men in lycra - you don't get lots of mums and dads taking kids to school or people using them from one block to another. There is not that cultural acceptance that cycling is the right thing to do. It comes down in part to the infrastructure not yet in place across the city with lots of areas still unconnected," he said.

The issue of air quality is another vital component that cities around the world need to consider if they are to match targets set by the World Health Organisation.

Next month (8 April) marks another pivotal moment for London with Sadiq Khan poised to introduce London's Ultra Low Emissions Zone. It means that every vehicle entering the congestion charge zone will have to pay £12.50 if it does not meet basic emission standards and will be in addition to the congestion charge.

Lucy Wood, environmental and planning director at Barton Willmore, is part of the London team and is very interested in air quality within the capital. She believes that decision makers within London "still need to take the bull by the horns" when it comes to environment challenges. "This is a real issue and it's not only killing people, but we are missing out on an opportunity of huge investment," Wood explains. "If the UK was driving industry towards better technology and cleaner ways of living then economic benefits would also ensue."

Wood thinks the "jury is still out" when it comes to how feasible it is for the UK to achieve targets set out in its clean air strategy which aims to cut air pollution and save lives, backed up through primary legislation and believes the government's track record does not fill many with confidence.

She said: "If you look at things like carbon reduction and air quality, in the past we have failed to meet EU target levels time and time again. I'm always a little frustrated that timescales aren't

***"If you close Regent Street or Oxford Street to traffic then you potentially have quite a wide piece of green infrastructure."***



An artist's impression of what a cycle superhighway in Hammersmith could look like.



The proposed Oxford Street pedestrianisation.



**Lucy Wood,**  
environmental and  
planning director at  
Barton Willmore.

set sooner, for example, the clean air strategy aims to stop producing conventional petrol and diesel cars by 2040 and for me that's just not soon enough."

A controversial idea in some circles, the environmental expert would like to see the mayor and council leaders look once again at closing central London roads like Oxford Street to all vehicles, something Copenhagen did in its central district more than 30 years ago despite the initial backlash from shopkeepers.

Wood said: "If you close Regent Street or Oxford Street to traffic then you potentially have quite a wide piece of green infrastructure. This then brings a community effect with lots of pop-up stalls and play areas. To say we need to keep some central roads open to buses is a bit ludicrous when it would be quicker to walk. It's about taking a brave step and not just always looking at challenges but also the opportunities."

But while top-down approaches filtered down from the powers that be are important in building hard infrastructure, the Barton Willmore team members agree that this is not enough on its own to see change.

Haxworth added: "What we are finding is that you can provide all the infrastructure but without a shift in culture, changing the mindset of people and bringing everyone with you, then it's difficult for a city or a country to achieve real health gains."

# Preparing for Brexit

ACE holds two webinars to help members through uncertain times.

As of time of writing, the outcome of the political discussions at Westminster and in Brussels is still unsure. The negotiations look set to go to the wire and the uncertainty is adversely impacting on all businesses, no matter what sector they work in. The odds of a 'no deal' Brexit have certainly increased and the disruptive effects of trading on WTO rules will have huge impacts for all ACE members and the wider industry.

To help members navigate the uncharted and uncertain waters, ACE has held two Brexit webinars. Featuring



Replay the webinar now on ACE's website:

<https://www.acenet.co.uk/news/ace-news/replay-our-brexit-webinars-now/>

a guest panel of political and industry experts, they explored the impact of various Brexit scenarios on the economy, skills and contracts and what trading on WTO rules actually means in practice.

Hosted by ACE chief executive Hannah Vickers, they featured guests from CECA, CPA, Beale & Co and Delphi Technologies. In addition, ACE advisory board member Geoffrey Spence shared his insights on working in government at a time of crisis following his time as a special advisor to chancellor Alistair Darling at the time of the financial crisis of 2007/08.

The webinars can be replayed now at the ACE website and, once logged in, members can also download the FAQ which contains answers to a host of related questions, as well as links to other resources of interest and a copy of the presentations shared.

# Essential ingredients for a successful outcome

Working within a clear legal framework is vital, writes *Rosemary Beales*, contracts advisor at ACE.

Within consultancy and engineering it is often the case that there is no formal agreement, perhaps just an exchange of emails which can ultimately lead to disagreements and disputes to the detriment of all involved. Do you know what you are signing up to when a proposal is accepted by a client? Has any agreement been signed? There may have been negotiations but what terms and conditions cover the delivery of services and are they clearly defined?

These questions are fundamental for those providing consultancy services, regardless of their client. It is for this reason that ACE has, for many years, produced standard forms of agreement to assist members, their clients and others, ensuring there are a suite of documents which cover the requirements, rights and liabilities of the parties who sign up to them in a fair and comprehensive way.

Whatever the value or complexity of the



**Rosemary Beales** is contracts advisor at Association for Consultancy and Engineering (ACE).

services commissioned and delivered, the business case for clarity on the proper allocation of risk and responsibility is irrefutable and working within a clear legal framework is a key part of this.

ACE has consistently promoted the use of standard terms of engagement to assist the delivery of services and has also highlighted the pitfalls inherent in many contractual terms, especially bespoke conditions. Even if the parties believe they understand what they have agreed to, it may well, if tested, differ significantly from what they initially thought. This can prove costly both financially and in terms of the ongoing relationship between consultant and client.

For standard terms of engagement to remain relevant to the profession, they need to be kept up-to-date. This is why in 2017 ACE published a new form of *Professional Services Agreement, Sub-Consultancy Agreement and Schedules of Services* to ensure that consultancy and engineering professionals have access to terms and conditions suitable for use in today's world.

Recognising new developments, such as legislation around procurement, advances in technology, and the management of projects, often involving several parties in the process, the documents are written in a clear language and assist everyone in understanding their roles and responsibilities in a project.

Use of these agreements can provide confidence to both clients and consultants that the terms under which they do business are relevant, insurable, balanced and fair. In short, they are the essential ingredients for a successful outcome.



Browse ACE's agreements and contracts online now: <https://www.acenet.co.uk/agreements/>



# Addressing skills ‘pinch points’

ACE joins eight other industry bodies to press for post-Brexit migration reform.



## The 18 jobs identified as having severe shortages:

**A**CE has joined Build UK, Civil Engineering Contractors Association, Construction Plant-hire Association, Construction Products Association, Federation of Master Builders, Highways Term Maintenance Association, National Federation of Builders and the Chartered Institute of Building in calling for the sector to work together to accelerate recruitment for 18 severe shortage roles across industry.

Identified through research from across the members of each organisation and the wider industry as those that are hardest to recruit for, they are vital to the delivery of projects nationwide. The groups recommend that wherever possible, steps should be taken to recruit for these roles within the UK, bringing in new workers or upskilling the existing workforce.

Where this is not possible, it is

proposed that the government add the roles to its shortage occupation list as part of its current review of migration as the UK leaves the EU. Additions to the list would allow these roles to be prioritised in future migration from the rest of the world, helping industry to fill these essential roles.

Hannah Vickers, ACE chief executive, said: “Whichever Brexit scenario becomes reality, we look forward to engaging with the government so that the particular skills needs of our members, who design and deliver our national infrastructure, are met - whether that be through further developing apprenticeships or migration, or most realistically a combination of both. They play a vital role in unlocking economic growth and will be crucial to helping establish the strong foundations of a post-Brexit UK.”

- Acoustic Engineers
- Bricklayers
- Carpenters
- Ceiling Fixers
- Chartered Surveyors
- Civil Engineers
- Construction & building trades supervisors
- Construction Project Managers
- Design engineers
- Dry Liners
- General Labourers
- Groundworkers
- Mechanical & Electrical Engineers
- Planners
- Plant and Machine Operatives
- Production Managers and Directors
- Quantity Surveyors
- Structural Engineers

# Rising to the challenge of offsite manufacturing

A government-led initiative has the potential to revolutionise the construction industry, argues *Hannah Vickers*.



**Hannah Vickers** is chief executive of the Association for Consultancy and Engineering (ACE).

Following last year's budget, the chancellor announced that the government would "adopt a presumption in favour of offsite construction". While a minor footnote in the announcement, it has huge repercussions for the future of our industry and how we work.

Viewed at its best, this announcement is about leveraging the government's significant buying power to support the modernisation of the construction sector and an investment in high-quality design and increased performance. On the other hand, it could increase the "race to the bottom" mentality.

It will take careful engagement and collaboration to ensure the correct outcome and it's vital we get this right, especially in light of Dame Judith Hackitt's recommendations. However, before this can become a reality, the government needs to address the elephant in the room. Are they, and the industry, really ready to work in this way?

ACE is advocating that clients implement a strategy based around "customer segmented design", similar to the car industry, where they identify the market they are aiming a design at – luxury 4x4s for wealthier individuals or practical cars for families. For buildings, this could mean segments for a specific customer base such as affordable social housing, care homes or schools. For major infrastructure, a similar approach could be taken, albeit these will be determined by defining segments around existing networks, such as footbridges for a single road, dual carriageway or motorway.

The impact of this approach could be further enhanced through making these solutions available on the open market on long-term agreements, aggregating demand across public sector

*“Will contractors be able to control production and develop logistical capabilities? What will lawyers and insurers make of our new approach?”*

clients and allowing the private sector access too. In response, we will see experts emerge from our industry with an innate understanding of specific needs, an incentive to continuously improve design and the opportunity to learn from performance.

We will need to adapt our mindset to deliver

quality and user-experience instead of a pipeline of fully bespoke work, but the move to offsite and manufacturing processes presents an opportunity to seize and reinforce our value across the supply chain. There will also be positive impacts for skills as this new way of working is likely to be more attractive and rewarding. After all, most engineers are problem solvers and harnessing expertise in this way and with the digital tools now at our disposal, will unlock frustrated creativity.

Of course, there will be some major issues to deal as we transition to new business models. What will this mean for partners across the supply chain and how will they need to evolve? Will contractors be able to control production and develop logistical capabilities? What will lawyers and insurers make of our new approach? We will also need to develop transparent measurements of quality and performance – i.e. a "Trustpilot for consultants".

These are just some of the issues which remain, but there is no doubt in my mind where we are heading. Through our *Future of Consultancy* campaign, ACE will develop the collective vision from the industry, in parallel with continuous engagement with government, our partners and clients. We will also develop the new business models and capability within the industry to ensure all our members are able to benefit from the coming revolution in construction delivery.



# Futureproofing the environmental consultancy sector

The work of environmental consultancies will play a key role in creating a greener Britain over the course of the next generation, says *Matthew Farrow*.



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

Under its new chief executive, Hannah Vickers, one of ACE's key 2019 campaigns is the *Future of Consultancy*, a major piece of work bringing together the key stakeholders in the infrastructure world to think through how the engineering consultancy sector can be fit for the future and deliver what clients and society need in a fast-changing, digitalised world.

EIC's focus is on the environment, but a third of our members are consultancies, a mix of traditional environmental consultancies and a number of multidisciplinary ACE members who have large environmental consulting teams. So, I have agreed with Hannah that EIC will work jointly with ACE to develop an environmental consultancy strand to the campaign. Rapid change in the environmental world means that futureproofing is just as important for EIC's consultancy members.

Some challenges are common across both sets of consultancies. Take creating a diverse workforce with the right skills mix. The gender balance among environmental consultants is probably better than across the more engineering-focused consultancy disciplines but there are similar challenges in other areas of diversity. IEMA, one of the main professional bodies for environmentalists, is very focused on this issue, and EIC will be drawing on its work.

Digital is another common challenge. EIC held its inaugural Green Data conference last year with the Natural Environment Research Council and the Geospatial Commission to explore how digital techniques and big data are changing the way we understand, prioritise and tackle environmental issues. Increasing digitalisation means that we need to understand how future consultancy products and business models will adapt.

Potential new entrants to traditional consultancy markets is also a shared concern. The biggest waste management firms now position themselves as environmental services firms who are well-placed to advise their waste-producing clients on how to prepare for the circular economy. There are also issues more specific to environmental consulting. Some concern the structure of the industry with many traditional environmental consultancies now part of global engineering consultancies.

Brexit too will have a more direct impact on environmental consultancies. If leaving the EU led to a dilution of environmental regulation (something EIC is lobbying hard to avoid) that would affect the consultancy market. There are also indirect risks for smaller consultancies who may find it harder to get access to work from the EU institutions.

Other policy trends though are more positive.

*"I have agreed with Hannah that EIC will work jointly with ACE to develop an environmental consultancy strand to the campaign."*



Traditionally much environmental consultancy work has been compliance-led - enabling clients to meet specific regulatory or planning requirements. The environmental policy trend now is towards more holistic, systems-led thinking, typified by the government's *25 Year Environment Plan*, the natural capital agenda and the forthcoming environment bill. This will lead to new expectations for clients and gives environmental consultancies the chance to leverage their ability to combine expertise across all environmental disciplines.

Our work with ACE in this campaign will give EIC member consultancies a platform to consider how to best prepare their firms for future success and help EIC demonstrate the vital role of the environmental consultancy sector in helping deliver the prime minister's pledge to significantly improve Britain's environment over the course of the next generation.

# Engineering behavioural change

Behavioural change, as well as system change, is essential and needs to be understood if construction is to be truly transformed, say *Craig McMaster* and *Garry Sanderson*.

**E**nvironmental upheaval, technological revolution, economic pressures and shifting customer expectations mean the challenge faced by our modern infrastructure sector has never been more complex. In the UK, the need for substantive improvement in our infrastructure efficiency and productivity is evident, driving the development of the Project 13 industry improvement initiative.

This aims to deliver major capital infrastructure outcomes more efficiently, collaboratively and innovatively. Similar calls for change in the 1994 Latham and 1998 Egan reports looked at many of the challenges Project 13 seeks to resolve. Given that, arguably, these initiatives left no lasting legacy, how can Project 13 deliver *sustainable change*?

Decades working within alliances as the engineer, integrator, programme manager or contractor gives us a unique perspective and we strongly support the core Project 13 themes. We also firmly believe in the importance of behavioural change, underpinned and catalysed by the use of *behavioural insights*. Great change is needed in the infrastructure sector and we believe it is the behaviours adopted by people within the industry that will underpin the success of Project 13.

Recently, the application of evidence-based behavioural insights to influence policy decisions has gained significant traction. The UK Behavioural Insights Team was established in 2010 to improve government policy and services, a model now followed by numerous countries. Its work is founded on behavioural economics, drawing on economics, psychology and neuroscience to focus on how we make choices and judgements. Behavioural economists seek to understand *why people do the things they do*, rather than the things they say they'll do.

We are all unconsciously influenced by internal biases and external environmental cues, affecting our judgements and actions. Our choices aren't always 'economically rational' – such as paying for expensive, unused gym memberships, yet failing to save for retirement. We may *think* our choices are based on careful thought processes, but in reality, we choose based on our *subjective perception* of options and how we *feel* about them.

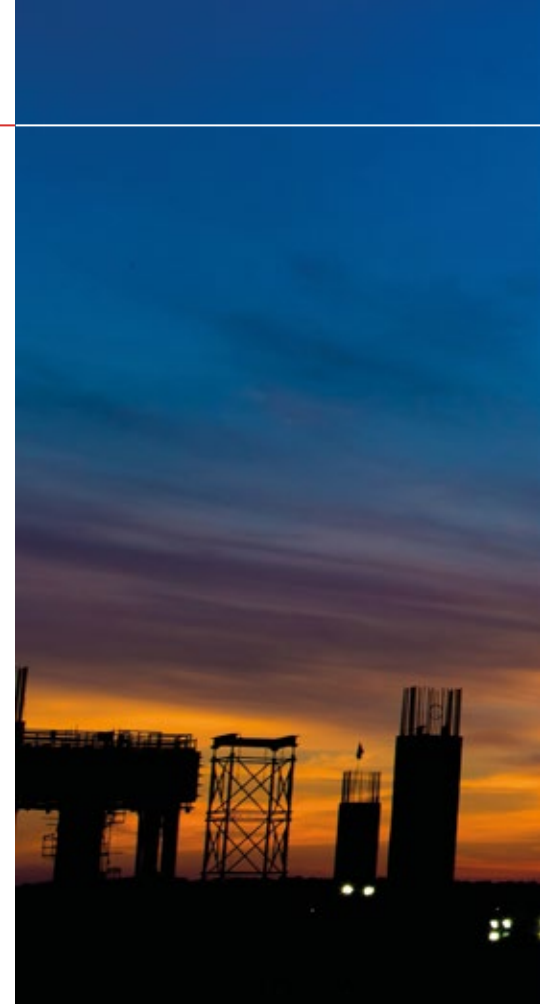
Behavioural insights can help organisations positively engage their people with change. This engagement relies on recognising that people are implicitly risk and loss averse. Through natural



**Craig McMaster**  
is a director at Stantec.



**Garry Sanderson**  
is founder and managing director of Visualyze.



selection, these biases were coded into our thought processes as we evolved to survive in threatening environments. Change initiatives trigger these Darwinian responses in individuals. Overcoming the inertia resulting from perceived personal risk requires understanding and modification of the environment. The power of behavioural insights can be used to influence positive change in the delivery of UK infrastructure.

Traditional change processes involve a roll-out of a new 'initiative' accompanied by messaging from management intended to explain how and why it has to be done. However, leadership attention is usually concentrated at the 'exciting' front end of any strategy doing little to create the right environment for meaningful, sustainable change. The right approach empowers people to make their own choices, in an environment that has been carefully





designed to influence and reinforce action in the desired direction.

Engineers are uniquely placed to capitalise as much on behavioural insights as on their problem-solving mindsets. In many cases, they are well positioned to understand, influence and balance behaviour across multiple systems – technical, environmental, commercial, political and societal.

It is of fundamental importance that engineers expand their influence across the people systems. Engineers are not often renowned for their ‘touchy feely’ capabilities, yet there is a great opportunity for engineers to influence the people, political and societal aspects relating to infrastructure. An evidence-based behavioural approach can help to bridge the gap between ‘engineering assets’ and ‘engineering behavioural change’.

**We have identified three relevant hypotheses to support the Project 13 agenda:**

- **Performance = Capability + Behaviour**

This simple equation drives an awareness of the human aspects of delivering any significant outcome through the collaborative efforts of people, in a dynamic environment. Why would individuals do things differently if nothing has really changed in their environment?

Without this clarity we cannot expect to achieve sustainable change at the coalface.

Project 13 is different from its predecessor initiatives in this area. Firstly, it advocates change in infrastructure delivery models and their procurement. Secondly, it is a client-driven movement, rather than a supply chain or industry group initiative. This creates the potential for the strong behavioural forces of peer comparison and social pressure to help accelerate change.

- **Digital transformation and behavioural transformation are two sides of the same coin**

The world is undergoing rapid digital transformation. Applications that should theoretically be improving our lives are claiming a growing percentage of our already precious attention. Often this benefits those who have captured our attention more than it benefits us.

Project 13 has had digital transformation at its heart from the outset and all will be aware of the fast pace of development of data technology in the infrastructure sector, particularly BIM. Equal effort must be put in to creating the environment in which these technologies are adopted and used to their maximum benefit.

- **Commercial incentives are from Mars and motivation is from Venus**

*Organisations* follow strategies, interacting through commercial mechanisms based on rational processes. *People*, however, are influenced by their environment to make choices based on what they feel. Commercial incentives can drive organisations to perform. People are motivated by meaning, autonomy and an environment where the positive and negative consequences of actions are clear and consistent. These two worlds need to be carefully interconnected as Project 13 develops approaches to commercial incentives.

In support of Project 13, we are seeking to test these hypotheses through engagement with our clients, partners and others working in this field. Our industry is founded upon the ‘hard mechanics’ of things like engineering, construction, contracts and safety statistics. To fully embrace a different future, we must accept that behavioural change is also essential. The necessary efficiency improvements identified through Project 13 will only be realised if the behaviours within the infrastructure sector also change. However, as with delivering any improved system, these behavioural changes must happen *by design*, through a rigorous and evidence-based approach.

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