

Using technology to 'bend' nature

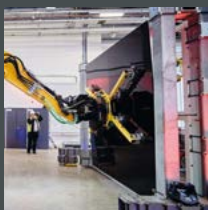
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Message from the editor



A Happy New Year to all our readers. Here's hoping that 2019 will bring more certainty and confidence to our industry so that we can move forward with speed and efficiency to deliver the much-needed infrastructure projects the UK so desperately requires.

It's somewhat disappointing therefore that the year begins, like last year, with still unanswered questions about Brexit and the state of the economy. The politicians really need to get their act together on this issue and sort out what is rapidly becoming a mess. It's also probably time for the sector's representative bodies and key leaders to come together and speak out to inject a dose of reality into the current debate. With the clock ticking, politicians and the country might just take note of what they have to say.

Here at *Infrastructure Intelligence*, we have started the year by refreshing the design of the magazine, which has remained largely unchanged since we were launched back in May 2014. We think that the new changes make our articles easier to read and enable us to use photography and imagery to best effect. We hope you like the new look.

As usual, the magazine is packed with a diverse collection of news, views and opinion and we are always grateful to you our readers for providing us with material, comment and pictures to ensure that we cover the issues that you want to read about. Do keep keeping in touch with us because all your feedback is welcome.

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Magazine subscription: £80 a year.



The views expressed in *Infrastructure Intelligence* are not necessarily those of the Association for Consultancy and Engineering (ACE).

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Produced for the industry by the Association for Consultancy and Engineering (ACE)
 Printer: Complete Print Group (Tonbridge, Kent).
www.cpg-net.co.uk

Greater Manchester to complete 65 new transport projects in next five years

Leaders in the north west have unveiled ambitious plans which aim to see 200,000 new homes built, the net loss of green belt slashed by more than half and hundreds of millions invested into its transport network.

In January, at an event to reveal Greater Manchester's Plan for Jobs, Homes and the Environment – the Greater Manchester Spatial Framework (GMSF), Greater Manchester mayor Andy Burnham, alongside deputy mayors Sir Richard Leese and Bev Hughes and the leaders of Greater Manchester councils, set out a series of bold and far-reaching new housing and transport proposals.

A central aim of the radically rewritten document is a bold vision to build a minimum of 201,000 new homes by 2037, mainly focused in Manchester, Salford, Trafford and Oldham, alongside 6.5m sq ft of employment space.

The plan focuses on making the most of Greater Manchester's brownfield sites, prioritising redevelopment of town



Andy Burnham,
Greater Manchester
mayor.

centres and other sustainable locations. It will also help to address the housing crisis with a minimum target of 50,000 additional affordable homes – 30,000 of which will be social housing.

Elsewhere, the announcement also included more details on Greater Manchester's 2040 Transport Strategy Delivery Plan which sets out all the transport improvements to be implemented by 2025, as well as longer-term plans.

The transport plan identifies more than 65 projects that will be completed within the next five years, including Metrolink's Trafford Park line; the purchase of 27 new trams, an upgrade of Salford Central railway station, a £160m new walking and cycling infrastructure across all 10 districts, expanding the city-region's electric vehicle charging network and new interchanges in Tameside and Stockport.

Commenting on the spatial plan, Burnham said: "In this time of national social and economic uncertainty, and with politics in Westminster paralysed by Brexit, Greater Manchester is taking the initiative and setting out an innovative blueprint to give people, communities and businesses hope and confidence for the future.

"When we consulted people on the first spatial framework, the public were clear that we hadn't got the balance right. We listened, reflected, and can now present a radical re-write as promised. It also lays the foundations for radical reform in other policy areas such as housing, the environment and transport."



Network Rail Digital Railway boss to retire

David Waboso, managing director of Network Rail's Digital Railway programme is set to step down from the position and retire in March, it has been revealed.

Responsible for boosting the use of digital signalling and train control technologies through the Digital Railway



David Waboso,
managing director of
Network Rail's Digital
Railway programme.

programme, Waboso has been the man at the helm of ensuring Network Rail embraces and adopts new technology to drive more efficiency.

Once London Underground's capital programmes director and responsible for heading up the £1.5bn annual tube upgrade programme, Waboso took up the role in summer 2016, replacing Jerry England and reported mainly to former chief executive Mark Carne.

Prior to joining London Underground in 2005, Waboso was executive director at the Strategic Rail Authority from where he led cross-industry national programmes for new signalling and communications systems.

David Clarke, technical director at the Railway Industry Association, said: "Throughout his career in the rail industry, David has been the go-to person for delivering complex rail systems projects efficiently and collaboratively. He retires with a tremendous legacy of projects that will continue to deliver benefits for passengers and freight users long into the future. Most recently, his work on the Digital Railway programme saw the introduction of new procurement practices, like the Early Contractor Involvement scheme, which are revolutionising how the industry delivers new projects, allowing for greater innovation, lower costs and improved delivery."

UK's £413bn infrastructure plan has "long way to go", says KPMG



One of the UK's big four auditors has said the UK government's National Infrastructure and Construction Pipeline is meeting National Infrastructure Commission's spending recommendations but more needs to be done to drive private investment.

KPMG says the pipeline is "gaining ground" with current forecasts currently at 1.5% of GDP, greater than the 1.2% recommended by the NIC. But more work was needed to "bridge the gap" between public and private spending with levels at 3.0% and below the recommended point of 3.7% of GDP.

The analysis shows that energy remains the biggest sector by spend, with £189bn in committed investment, although 73% is

allocated post-2022. Transport is second with £123bn, followed by utilities at £47bn, with funds in these areas being allocated up to 2022. Other key sectors are housing and regeneration (£14.4bn), education (£14bn) and communications (£6.8bn).

The average infrastructure spend per capita is £907 across the UK. Based on a regional breakdown, this is highest in the south west (£26.6bn), north west (£21.4bn) and London (£19.8bn), and the lowest in the West Midlands (£5.3bn).

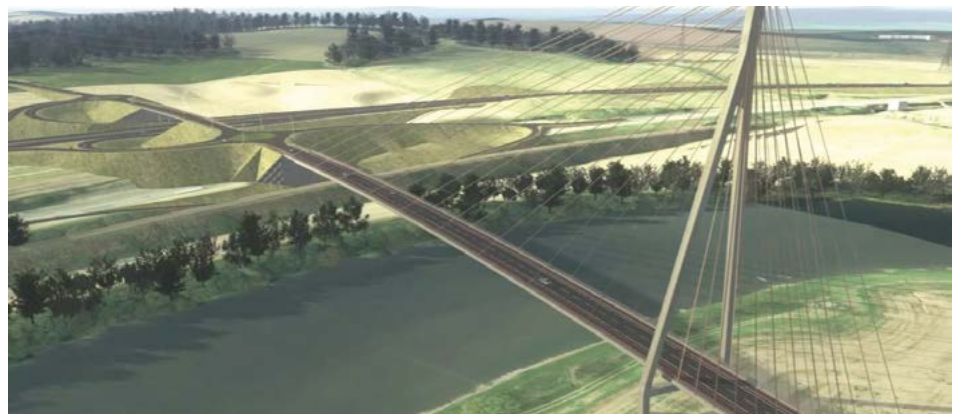
Commenting on the data, Jonathan White, KPMG's UK head of infrastructure, building and construction, said: "The current National Infrastructure and Construction

Pipeline stands at £413bn. With the forecast public pipeline currently accounting for 1.5% of GDP, it's encouraging that this is greater than the 1.2% recommended by the National Infrastructure Committee, so let's keep it up. However, total public and private spend combined currently stands at 3.0% and is, therefore, still below the 3.7% of GDP recommended by the United Nations Sustainable Development Goals. More investment is needed to help bridge this gap."

However, a word of warning has been issued on the amount of money allocated to nuclear power stations, with specific reference to the development of Hinkley Point C and the decommission of four nuclear power stations in the north west. KPMG's infrastructure expert believes levels of spending in this sector "will be disappointing" for many while there remains a "pressing need for investment in transport and digital infrastructure".

The analysis shows that energy remains the biggest sector by spend, with £189bn in committed investment, although 73% is allocated post-FY22.

Tay Crossing project given £40m funding boost



A new bridge river crossing as part of Perth and Kinross Council's biggest ever infrastructure project is to receive an extra £40m from the Scottish government.

The cash injection was confirmed in January by first minister Nicola Sturgeon who also announced that a further £10m will go towards an industrial investment programme to support manufacturing in Dundee, Perth, Angus and the north of Fife.

The investment for the Cross Tay Link Road is part of a £120m project which will link the A9 over the River Tay to the A93 and A94 north of Scone, in the hope of reducing congestion in Perth.

The funding is in addition to the Scottish government's £150m commitment to the Tay Cities Region Deal and brings overall government investment in the area to £200m over the next ten to 15 years.

Commenting on the funding, the

first minister said: "Our further £50m investment in the Tay cities region will support transport infrastructure and manufacturing projects, benefiting people and businesses and ensuring the area continues to grow and thrive. As well opening up land for new housing and employment sites, the Cross Tay Link Road will reduce traffic congestion in and around Perth and improve the air quality in the city centre and Bridgend."

Crossrail delay: Who knew what and when?

Revealing meetings with Sadiq Khan and Sir Terry Morgan have laid bare underlying frictions and left more questions about who really is telling the truth about Crossrail's delay *Ryan Tute* reports.

If recent special meetings on the Crossrail delay tell us anything then it's that the saga shows no sign of letting up and we are not much closer to knowing who is really telling the truth as Transport for London (TfL) become the latest party to have its name dragged through the mud.

The former chair of Crossrail Sir Terry Morgan was put under the microscope by London Assembly's transport committee and during a somewhat heated meeting, he used his time to provide a robust and feisty defence on warnings given to TfL and the mayor of London, while accusing London's transport body of attempting to hide the truth.

During the hearing on 9 January, he told members that TfL staff handed him notes on what to say before important board meetings and even erased a paragraph within one weekly briefing on testing issues that was intended for Sadiq Khan.

His appearance came on the back of an appearance made by Sadiq Khan just a few days before Christmas when he told assembly members there was no "smoking gun" over the project and denied he was told of a delay at a pivotal meeting on 26 July.

The line, which will stretch from Heathrow in the west to Abbey Wood in the east, was due to open on 9 December 2018 but was pushed back to autumn 2019 at the earliest due to issues with signalling testing.

But giving evidence on the Crossrail

delay, Morgan reiterated that he told the mayor of London on 26 July that it was simply not feasible to finish the project for December 2018 - a month before Khan says he was told.

Speaking to assembly members, Morgan said: "I do not suffer from loss of memory. Do you really think when a piece of paper says delivery in 2018 is not feasible that it is what it is? I don't know what other interpretation there is of the presentation I gave the Mayor on 26 July. There was a very clear indication and understanding that we would not be able to deliver Crossrail in 2018."

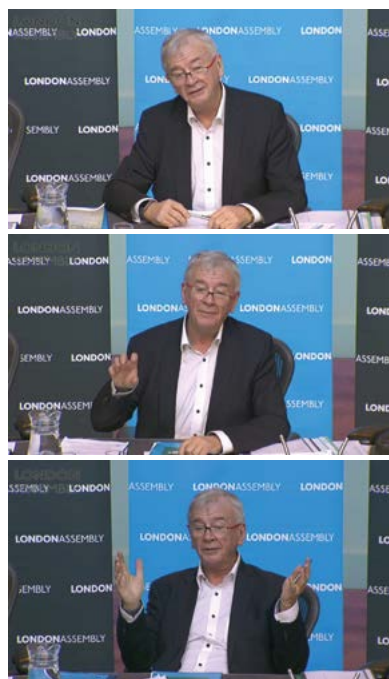
After telling Khan and then the transport secretary on 31 July, Morgan says Crossrail spent the much of the month of August deciding the communications strategy of how best to reveal the news of Crossrail's delay to the public. However, emails "went offline" so there would likely be no record of exchanges.

More remarkably, the former chair also accused London's transport body of feeding him information on what to tell board members. "In a TfL board meeting on 25 July, I was given a briefing as I walked into the room on what to say that took any reference that there was going to be a delay," Morgan explained.

But the former Crossrail boss did not stop there, he went on to say that TfL also deleted a paragraph in a weekly briefing note that was sent to the mayor. He claims the note on 19 June for Khan removed a specific warning about testing issues without explanation.

A major stumbling block of rolling stock was also covered in the hour-long meeting. While acknowledging Crossrail was responsible for systems integration, Morgan reaffirmed that it was TfL who were responsible for the rolling stock

contract. He says a change in contract from PFI to direct meant trains on the line were 18 months behind schedule and this in turn impacted on testing systems integration.



Terry Morgan,
former chair of
Crossrail.



TfL fire back on “completely untrue” claims

On the claim that TfL erased a paragraph within one weekly briefing on testing issues that was intended for Sadiq Khan.

A TfL spokesperson said: “TfL produced regular reports for the mayor, drafted with input from Crossrail Limited and London Underground’s Elizabeth line team. These were TfL’s reports and not those of Crossrail. The reports provided a snapshot of the status of the project. These were in addition to the formal processes in place for Crossrail Limited to provide updates including meetings with the mayor, TfL board meetings and sponsor board meetings.”

On the claim TfL gave Terry Morgan a briefing on 25 July on what to say to board members so no mention of a delay was discussed.

A TfL spokesperson said: “It is completely untrue that TfL chose to draft a script for Sir Terry Morgan to use at the 25 July TfL board meeting. At a pre-meeting for the TfL board held on 24 July, Sir Terry went through what he intended to say and subsequently asked if someone would write this up as an aide memoire for him to use. This short summary purely reflected our understanding of what Sir Terry himself wanted to say. Nothing in this material ‘omitted’ anything about the opening date of Crossrail.”

Morgan officially stepped down from his roles of chair of both Crossrail and HS2 in early December. The government has said a successor for the position of Crossrail chair will be announced as the project moves from construction to testing.

Despite the problems encountered, Morgan remained positive about his

tenure with the organisation but wished things had turned out differently. “I am very proud of my time, nothing will ever change that. Words cannot describe how disappointed I am by the delay but it’s vital we now get Crossrail open and Londoners will see how phenomenal it is.”

In December, it was the mayor of

London on the attack who appeared before London Assembly’s transport committee to accuse the former Crossrail chairman of “misremembering” events and insisted he was not told of the project’s delays earlier than August.

“Either the previous chair is misremembering that meeting or for other reasons he’s decided not to remember what was told,” Khan added. “To reassure ourselves [about the opening] we commissioned experts to give us that reassurance. It was only after these independent pieces of work were done that the former chairman changed his view about a December 2018 opening.”

Transport for London (TfL) commissioner Mike Brown backed the mayor, telling the committee that although he “had concerns” when Crossrail identified some risks to the December date during the meeting in July, the chairman remained committed to opening on time.

Ultimately, the two back and forth meetings don’t see anyone coming out smelling of roses and there is an argument that we are still left with more questions than answers. Outsiders will no doubt query TfL transparency moving forward and the transport body is left to defend its way of working and relationships with organisations helping to deliver vital infrastructure in the capital.

Drone chaos exposes infrastructure security failings



The 36-hour shutdown of Gatwick Airport in December and the ensuing travel chaos has highlighted the issue of infrastructure security, reports *Andy Walker*.

The news that police will be given new powers to tackle the illegal use of drones, will come as cold comfort to the tens of thousands of airline passengers whose Christmas travel plans were thrown into chaos when flights from Gatwick Airport were suspended for more than 36 hours in December after drones were reported over the airfield.

At a time when the government (and the London mayor) are keen to highlight that the capital is open for business, the spectacle of one of the city's main transport infrastructure hubs being shut down as a result of drones being flown willy-nilly over the airfield by persons still unknown was something of an embarrassment. The shambles which ensued has highlighted the issue of just how safe the nation's infrastructure is from malicious attack.

The government can't say they weren't warned about the danger of drone attacks, with the number of aircraft incidents involving drones increasing significantly in the past few years. In 2013 there were no incidents, compared with more than 100 last year. The airline pilots' association have also been raising the issue for years, arguing for technology to be deployed to block drones around airports and the government itself launched a consultation into the use of drones in July last year.

The government now say that the area around airports where drones are banned from flying will be extended. Last year they made it illegal to fly a drone above 400ft (120m) or within 1km (0.62 miles) of an airport and the exclusion zone will now be extended to the current Air Traffic Zone around airports, which is

approximately a 5km (3.1 miles) radius, with additional extensions from runway ends.

Labour said action on drones should have been taken years ago. Shadow transport minister Andy McDonald said while he welcomed the measures taken, they should have been introduced sooner. "Labour has repeatedly warned Department for Transport ministers over the last several years that they needed to take action on drones yet nowhere near enough has been done," he said.

McDonald claimed that the failure to bring forward detailed plans on drones had "disastrous consequences" and it was "astonishing" that the government had little or no procedures in place to tackle the events at Gatwick airport. Embattled transport secretary Chris Grayling has come under renewed attack for the government's failure to act on drones. Given the importance of Gatwick and other transport hubs to the nation's economy, you'd think that the government would have acted quicker to address its infrastructure security issues.

Speaking to MPs in parliament following the Gatwick chaos, Grayling said that the problems at the airport had been resolved by "smart and innovative use of new technology", but he wouldn't reveal what this was for "security reasons". He also said that the Ministry of Defence would be "on standby" to deal with any future issues caused by drones at airports.

To date, no one has been charged with any offence over the drone flights. It remains to be seen whether the events at Gatwick were an isolated incident or whether other airports or infrastructure hubs are similarly disrupted in future. You'd have to hope that the government will be better prepared next time.

Time	Destination	Flight	Status
09:35	New York	AY5937	Cancelled
09:35	Baltimore	AY5514	Expected 11:45
09:40	Bologna	AY5428	Cancelled
09:50	Austin	BA543	Canceled
09:50	Rome	AY5410	Bags arriving
09:50	Madrid	BA551	Cancelled
09:55	Aberdeen	LA5712	Estimated 12:47
10:00	Bucharest	QR6008	Bags arriving
10:05	Toronto	JL7829	Expected 10:30
10:05	Athens	AY5998	Bags arriving
10:10	Boston	BA631	Cancelled
10:10	Los Angeles	AY5414	Landed 10:03
10:15	Oslo	AY5522	Expected 12:09
10:25	Chicago	BA9139	Expected 12:40
10:30	Washington	AY5536	Cancelled
10:30	Madrid	AY5532	Cancelled
10:35	Edinburgh	JL7838	Cancelled
10:40	Amsterdam	AY5962	Landed 10:07
10:45	Leeds/Bradford	JL7100	Estimated 12:14
10:50	London	IB4703	Cancelled
10:55	Dublin	IB7671	Cancelled
11:00	Paris (CdG)	QR5893	Expected 10:50
11:00	Glasgow	BA307	Cancelled
11:00	New York	AY5978	Cancelled
11:00	San Francisco	AY5482	Cancelled
11:00	Geneva	AY5524	Cancelled
11:10	Tel Aviv	BA725	Expected 10:33
11:15	Amman	BA166	Cancelled
11:20	Tehran	BA146	Cancelled
11:20	Bastia	BA152	Cancelled
11:25	Atlanta	BA9239	Cancelled
11:25	Dusseldorf	IB4646	Cancelled
11:25	Hamburg	JL7778	Cancelled
11:35	Munich	JL7166	Cancelled
11:40	Brussels	AB5039	Cancelled
11:45	Houston	BA393	Cancelled
11:45	Frankfurt	AY5496	Cancelled
11:50	Chennai	JL7870	Estimated 12:56
11:55	New Orleans	BA036	Delayed
11:55	Amsterdam	IB7605	Cancelled
11:55	Copenhagen	BA431	Estimated 14:41
12:00	Hanover	RJ3012	Expected 11:34
12:05	Calgary	JL7826	Cancelled

Government vows to create building culture change

The government commits to a full list of recommendations and says it will crackdown on those who choose to not follow stricter building regulations.

Little more than 18 months on from when 72 people lost their lives to a blaze which engulfed a 23-storey tower block in west London, the government has warned that there is “no hiding place” for those who flout regulations and disregard residents’ safety.

Importantly, ministers have vowed to follow in full recommendations made by Dame Judith Hackitt who lead an independent review into building regulations and fire safety following the Grenfell Tower tragedy.

The final review published in May 2018 set out six broad areas for change which included ensuring that regulation and guidance is risk-based, improving levels of competence within the industry and proper enforcement of regulations. It also concluded that an indifference and ignorance of rules had led to a “race to the bottom” in building safety, whereby cost is prioritised over safety.

Announcing the government’s official response to Hackitt’s report on 19 December 2018, communities secretary James Brokenshire said that a “radically new system” would be the best tribute for



Dame Judith Hackitt.



those who tragically died in the early hours of 14 July 2017.

A reform programme, *Building a Safer Future*, comes on the back of Hackitt’s final report and commits the government to a number of changes over the coming years. Furthermore, the government has pledged to establish the joint regulators’ group to trial elements of a new regulatory system ahead of any new proposed legislation.

Building a Safer Future commitments:

- Take forward all the recommendations in the Hackitt review
- Create a more effective regulatory and accountability framework to provide greater oversight of the industry
- Introduce clearer standards and guidance, including establishing a new standards committee to advise on construction product and system standards and regulations
- Put residents at the heart of the new system of building safety, empowering them with more effective routes for engagement and redress
- Help to create a culture change and a more responsible building industry, from design, through to construction and management

The anticipated new regulatory framework will apply to multi-occupancy buildings of at least ten storeys, with a consultation in the spring 2019 on whether additional buildings should be included. The government has issued a call for evidence that will gather expert advice on the full range of fire safety issues to enable guidance to be revised.

Commenting on the response, Brokenshire said: “There is nothing more important than being safe in your own home and I am determined to improve building safety. My plan for stronger, tougher rules will make sure there is no hiding place for those who flout building safety rules. By making people responsible and more accountable for safety, we will create a more rigorous system so residents will always have peace of mind that they are safe in their own homes.”

The campaign group Grenfell United called it a “long overdue shake-up” of the industry but had a word of warning that changes must not be diluted over time. A spokesman added: “We must be vigilant to ensure government and industry, that so badly failed us, do not water down these changes. Resident voices must be given weight and parliament must keep a watchful eye on progress.”

The technology allowing engineers to “bend nature”

New technology is allowing firms like AECOM to deliver major projects which would have not been possible a generation ago. *Ryan Tute* investigates.

Designing bridges, airports and sporting stadia is no longer how we once knew it. The dizzying speed at which technology has moved on is allowing those involved to interact with the physical world like never before and deliver projects in unprecedented timescales.

This is no better demonstrated than with the design and construction of a brand new 50,000-seater stadium in Cameroon for the Africa Cup of Nations this year. Despite only starting work little more than two years ago, the state-of-the-art ground is not far from completion.

AECOM, which is responsible for delivering a range of engineering services including structural, building services and fire engineering, as well as architectural, masterplanning and design management expertise, has lauded the impact of immersive technology in terms of allowing teams to show ideas to a client, improving collaboration and aiding quality control by reducing mistakes.

The firm was given an intimidating checklist to deliver on with a key challenge of the design to find a

way of accommodating both football and athletics, without resorting to expensive, high maintenance solutions.

But the advent and implementation of Virtual Reality (VR) technology has changed the game when it comes to planning and design. By popping on a set of goggles and connecting to 3D models, clients, architects, and even end users are being able to interact with the physical world thousands of miles away in the digital realm.

Stakeholders who need the construction of the Japoma Sports Complex in Douala in Cameroon to succeed are able to see for themselves the very finer details of the development and check that everything is coming together before a brick is laid.

Peter Ayres, director of buildings and places at AECOM, explains how the technology is delivering two-fold benefits. “To try and analyse construction drawings with 2D models is almost impossible but if you can put the VR goggles on then you can literally walk inside it and make sure everything is coming sweetly together and that things don’t misalign,” he said. “We simply

“To try and analyse construction drawings with 2D models is almost impossible but if you can put the VR goggles on then you can literally walk inside it and make sure everything is coming sweetly together and that things don’t misalign,”

Peter Ayres,
director of Buildings & Places, AECOM



could have not taken on these projects without these tools now available to us. It’s a production tool without which we could not do our job. Projects like this could not have been designed a generation ago,” said Ayres.

Commissioned by the Cameroon government, once complete, the stadium will be covered with a semi translucent material on the roof and seats will be foldable. It will have facilities like restaurants, a media room, a public announcement system as well as telecommunication system and will be surrounded by a concrete fence with metallic gates.



The Japoma Sports Complex in Douala, Cameroon.



Carlos Lopes is AECOM's visualisation manager and an expert in the VR field. He says projects of the past would not have uncovered mistakes and problems in design at such early stages as now.

"You are replicating the physical world in the safety of a digital environment," said Lopes. "Imagine there was a mistake on this project and you didn't check it on VR, you would have to wait for the builders to actually build before realising there was a mistake which would result in them having to demolish a structure and start again," he explained. "Once you create a model, you can zoom into any level of detail you like and examine every attribute, so it becomes

that huge database of information that can be used to test all these different ideas," he said.

Possibly the most impressive aspect of the project in Cameroon is the savings in time that have been delivered for the country. Managing to design and build in just two years is described as "exceptional" by AECOM's building director. This is something which Ayres believes could not have done without using the technology both in terms of speeding up the design process and sharing the ideas with stakeholders across multiple countries.

"To deliver a design and construct a stadium in under two years is almost unprecedented," he said. "It's not just because of this but it's been a major factor. Usually the process would take at least three years, so I would say we have done stadium from concept to delivery in probably a year less than normal," said Ayres.

But the technology is also providing a revolution in fan experience for sporting events. Gone are the days of supporters of teams leaning round pillars to see the action or having their views obstructed by other fans.

"When you are designing a bowl-shaped

stadium, it's vital you check the sight lines are correct and that people in all sections get a clear view of the pitch without obstruction," Lopes says. "Up until very recently, the only way we could understand those sight lines were via sections of the bowl through 2D drawings but now an architect can sit in any seat of the stadium and identify any restricted view," he said.

Ayres believes that these are exciting times for engineers and architects as now those who are in charge of making important infrastructure projects a reality have the tools to do things that have never been possible before.

"If you look at what I call organic architecture and go back to the days of architects like Luigi Nervi, what they were doing was creating blobby architecture by mimicking nature," the director explained. "Nature has determined that certain shapes work efficiently so they would use catenary, domes and natural shapes but what we can do now with the technology we possess is bend nature, we can create shapes that are not natural, organic shapes. It is allowing us to push the boundaries and create geometries that we would not have been able to a generation ago."

We need to see HS2 as more than just a railway line



Maria Machancoses is director of the sub-national transport body, Midlands Connect.

HS2 is the defining infrastructure project of a generation. It's the most tangible opportunity we've had for decades to rebalance our national economy. However, if we're to realise the full breadth of benefits high speed rail could bring, civic leaders, industry bodies and businesses must all band together to provide organised, route-wide support.

By ensuring HS2 is effectively integrated with the wider transport network and that businesses are 'HS2 ready', we can guarantee services are accessed, used and enjoyed by passengers across the UK. As take up increases so will productivity, economic output and quality of life.

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.

Although Phase One of the project is already underway, much work remains to secure Royal Assent for Phase Two – a 'Y' shaped extension that will radically transform social and economic

connectivity between the midlands and the north.

By linking vital industrial centres in the UK's regions, such as Birmingham, Solihull, Toton, Manchester, Sheffield, York, Newcastle and beyond, this second phase of the project forms the basis for HS2's entire economic case. Our nation has the most unequal economy in northern Europe, boosting the connectivity between the UK's biggest economic centres is central to reversing this.

Ultimately, customers must be able to access and use HS2 services, which is why sub-national transport Bodies (STBs) like Midlands Connect and Transport for the North are working to plug the line into the rest of the transport network. Rather than existing in relative isolation, integration with other rail services, highways, buses and light rail, will vastly increase demand and widen the geographical reach of investment.

STBs have their part to play in joining the dots. For example, at Midlands Connect, we're working to improve regional rail

“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.”

connections to HS2 in the East and West Midlands, as well as suggesting strategic improvements to surrounding roads such as the A52 between Nottingham and Derby and the M42 around Birmingham.

This, together with local transport integration – like the work being led by Transport for West Midlands, the Constellation Partnership and East Midlands Councils around Birmingham, Crewe and Toton respectively – will greatly enhance the economic impact of HS2.

It's time that we stopped regarding HS2 as a series of long-term developmental phases and started acknowledging the vast potential of this nationwide high-speed rail project, by acting now to properly integrate the line with the existing network, plugging it in to future improvements to ensure the benefits of HS2 are felt UK-wide.



William Rimington
is associate managing director in risk consultant Kroll's cyber risk practice.

Preparing for critical infrastructure cyber-attacks

Attacks on critical national infrastructure are nothing new. Well-publicised activities in Estonia, Georgia, Ukraine and Iran over the last decade or so, widely attributed to state actors, show the potential power of such targeted attacks.

The dangers and risks associated with nation states launching offensive attacks go beyond the initial strike. The re-use, re-engineering and re-deployment of so-called "weapons grade" malware time and again amplifies the threat.

So, what does this mean for 'ordinary' organisations or public services? Continued collaboration is key. Private and public sector companies, departments and agencies must continue to share indicators of compromise, methods of reaction and actions to help remediation. The blocking of 'WannaCry' (actually, discovery and publication of a 'kill switch') that had spread within the UK National Health Service was, at the time, a very well-publicised example of private sector research and response rapidly shared and implemented for the common good.

The cyber security sector abounds with individuals with a passion for combating adversaries and making organisational

defences stronger. We may compete against one another commercially, but our experiences show that a widespread cyber-attack tends to bring out the best in everyone in terms of collaboration, not just locally but on an international stage as well.

Infrastructure owners and operators also need to keep pushing for basic information security hygiene. In complex legacy environments with lots of elements and vintages of operating systems and bespoke applications, the basics are hard work. Keeping an environment patched and security as current as possible is not easy but must be a priority.

The aim, therefore, must be to make compromise more difficult to accomplish and at the same time less impactful by planning for the worst and practising your response. This should happen not just in the IT department, but also at the board and all operational levels in between.

"Keeping an environment patched and security as current as possible is not easy but must be a priority."



Martin Wilcox
is Mott MacDonald's global practice leader for integrated energy systems.

Global upsurge in renewables poses dilemma for energy investors

With exciting developments in the renewables market across the world, it's an exciting time for energy investors. Should you invest in markets with aggressive renewables targets where you know money can be made, such as the Middle East, China or India? Or should you be encouraged to invest in developing countries in Africa and Asia where you can make a real difference to people's lives by providing access to affordable and clean energy, often for the first time?

All of these contribute to the UN's Sustainable Development Goals (SDGs) but the balance of weighing up where reasonable profits can be made and making a real difference to peoples' lives is complex.

Is it possible for focused investments to shift the most coal-reliant economies towards renewables? There are many interesting stories emerging from the Middle East. Jordan, for example, relies heavily on energy imports. This includes meeting over 97% of its fuel needs for oil- or gas-powered thermal plants. Being dependent on a pipeline in a politically-fractious region brings its risks, so renewables can boost energy security and reduce energy costs.

Saudi Arabia, on the other hand, is moving away from electricity subsidisation as the cost is no longer economically sustainable. When you charge people the true price of their electricity, it becomes cheaper to install new solar panels, particularly in such a sunny part of the world. While Europe has shifted towards renewables largely due to climate change concerns, other markets have multiple incentives based around political, economic or social benefits.

In many countries, a new wave of renewables is acting as a catalyst for resilience, independence, political stability and increasingly economic benefits. Are renewables now passing the tipping point where they are deemed attractive as a financial consideration rather than just a conscientious choice, reliant on subsidy? Some investors are beginning to think so.

"Saudi Arabia, on the other hand, is moving away from electricity subsidisation as the cost is no longer economically sustainable."

A new catalyst to transform construction

The new Core Innovation Hub for construction is set to transform the sector. *Keith Waller*, who leads the Transforming Construction Alliance which will deliver the new hub, highlights how the initiative can act as a catalyst to transform construction.



Keith Waller is the programme director for the Transforming Construction Alliance. Keith has been seconded from Costain into HM Treasury for over eight years, working across government and industry to boost performance and improve outcomes for the construction sector.

The construction sector employs around 10% of the UK workforce, but remains fragmented and mired in a transactional, low-margin cycle. As a result, productivity growth, investment in innovation and skills development lag other sectors of the economy.

Both the government's 2017 industrial strategy and the Infrastructure and Projects Authority's Transforming Infrastructure Performance plan point to solutions which incentivise investment in a more productive, digitally enabled, manufacturing-led approach to delivery.

In a fragmented market of both clients and industry, the Construction Sector Deal can help to coalesce action and best practice. The Core Innovation Hub (CIH) will play a central role in the meeting the sector deal's ambitions, developing the 'rules' for new products, platforms and solutions that embed best practice for data management and advanced digital and manufacturing from other sectors of the economy such as automotive and aerospace.

Potential to transform the sector

The potential for this to be transformational to the sector is enormous. It will unlock new and innovative businesses to bring products and solutions to market, creating long-term and sustainable jobs. It can help to improve the delivery of the UK's ambitious infrastructure plans, enabling government to become a more innovative client, and for this approach to scale to projects across the whole sector.

But not only will it help boost the productivity of the sector, it will also deliver better outcomes for society, the environment and the economy. By driving advanced manufactured solutions, we will be helping to rebalance the economy by creating jobs and economic activity in manufacturing heartlands and areas of high unemployment, over time replacing concentrations of non-productive, labour-intensive activity on construction sites.

Manufacturing can support significant reductions in the volumes of waste sent to landfill, driving cleaner, more sustainable buildings, kinder to the environment and using less carbon ion production and operation.

Data will become an increasingly valuable commodity, not just for measuring performance, but giving material traceability,



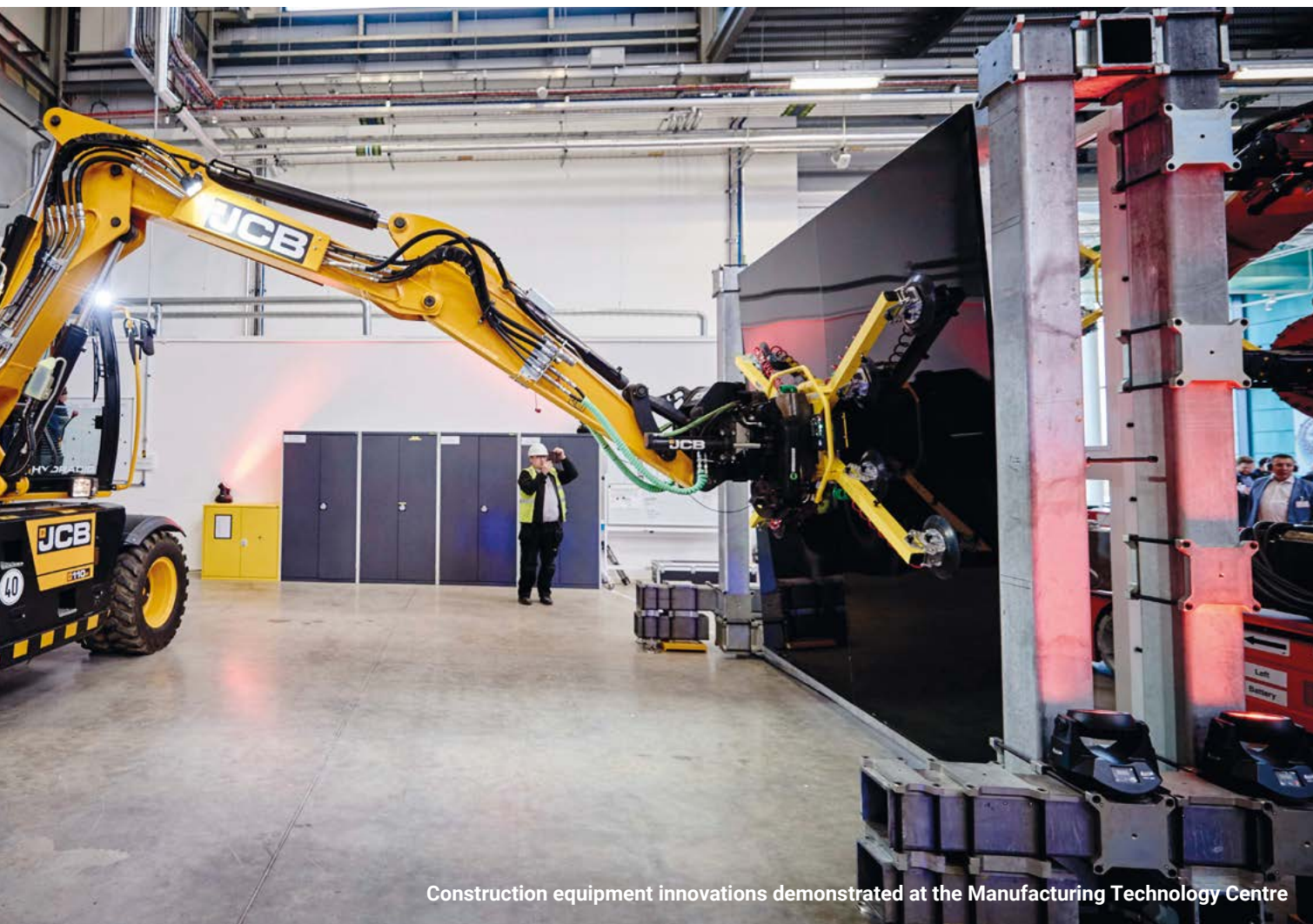
so we will know what has been installed, where, by who and to what standard. This will help address many of the concerns raised in Dame Judith Hackitt's report following the tragedy at Grenfell.

Quality will improve, with fewer defects and rework – another key Hackitt finding – improving the users' experience and speeding delivery, reducing disruption to businesses and communities.

Safety on site will improve, with fewer interfaces and activities taking place outside a controlled environment and less workers put into dangerous environments. This in turn should help boost the attractiveness of the sector to a more diverse workforce that better represents the society our built environment serves.

A clear plan is needed

However, these outcomes will not happen without co-ordinated effort and a clear plan. We still build too many prototypes. Projects are often unnecessarily bespoke; designed differently, procured individually and built inconsistently. Changing this is what this Construction Sector Deal offers



Construction equipment innovations demonstrated at the Manufacturing Technology Centre

and what the Core Innovation Hub will deliver.

So as the Core Innovation Hub creates the standards that unlock productive, digitally-enabled manufacturing at scale, it will need close collaboration with industry to develop the products, platforms and procedures that will increasingly become a key part of a smarter built environment.

But clients, and in particular government, must play their part. To deliver this transformation will require them not to ask for the same things in the same way. It cannot be about asking “how cheap can you design and build it?” and “how much risk are you willing to take?” We must start to value beyond just the initial cost and start looking at the whole life performance and how investment in the built environment can better support delivery of wider social, economic and environmental outcomes.

Whole industry must work together

The way clients procure, contract, pay and incentivise must change – and the business models of industry must adapt to unlock

the latent productivity and innovation that sits across our suppliers.

I am really excited about the opportunity to help lead this transformation. As the CIH mobilises, we will be working across industry with the Construction Leadership Council and key trade associations, including CECA, ACE and CPA, to establish a framework that can deliver. We will also be seeking input from individual product suppliers, designers and contractors to develop solutions that can be used across projects and sectors. If you want to get involved, you can register interest through our website at www.transformingconstruction.org.uk

If we all get this right, the UK will be

“Delivering this transformation will require not asking for the same things in the same way. It cannot be about asking ‘how cheap can you design and build it?’ and ‘how much risk are you willing to take?’ We must start to value beyond just the initial cost and start looking at the whole life performance.”

able to deliver more for less, with buildings and infrastructure that perform better over their whole lives, delivering better services and less disruption. We will have an innovative, profitable and productive industry that invests in continuous improvement, supporting a diverse, skilled workforce.

Through this, the UK's ongoing, long-term investment in our built environment will deliver better social, economic and environmental outcomes, boosting productivity and earning power throughout the UK.

I look forward to your input and to keeping you updated on our progress as we embark on this journey of transformation.

The eye in the sky keeping HS2 on track

The boss of tech start-up Sensat talks to *Ryan Tute* about how large-scale projects need to look more digitally, after his firm helped HS2 reap the rewards on phase one.



James Dean,
founder and CEO of
Sensat.

After another year which saw a number of high-profile UK projects fail to be completed on time, is this the year finally for real change and for those leading the charge on infrastructure to look elsewhere for innovation?

Start-ups filled with some of the brightest minds across the country are using the latest technical advancements to provide solutions and answers to an industry which still falls behind its competitors when it comes to productivity and embracing new ways of working.

One such example is London-based start-up, Sensat, founded by James Dean and Harry Atkinson, in May 2017. Over the last year they have been involved in delivering one of the largest strategic unmanned air vehicle surveying jobs in the UK across the entire phase one route of HS2.

Using autonomous mapping drones, the team has produced digital topographical surveys of the proposed rail line and with a corresponding data set made up of 18.4 billion data points and could therefore boast visuals of the terrain that can be more than 100 times more accurate than satellite data.

Not only were the team able to shave off time by negating constant landowner engagement, but they could also produce



cost savings, reach areas thought to be inaccessible before and take workers off site where potential health and safety hazards may have been. What typically would have required 470 individual drone flights to map 147km, instead took just 47 individual flights.

Starting out on their venture, Dean, CEO of Sensat, says he never had a particular client or business case in mind. He just wanted to show that the technology was there and believes only by proving such advantages will the uptake improve.

"We know by using objectively that using technology will provide many benefits involving time, costs, safety and quality – that is very clear cut," Dean said. "However, if that can't be presented in a clear and accurate way then it's difficult sometimes to encourage clients to switch from the way they work so there is an onus on the technologies companies to prove this before we take it to market. The technology is here to keep major projects on time."

Once the data is captured, clients can then use Sensat's simulated reality platform, Mapp®, which has supported many civil infrastructure projects for dozens of tier one clients such as Jacobs, Costain, Atkins, Kier and Mott MacDonald.

The technology is said to turn



complex visual and spatial data into “real-time simulated reality” designed to enable computers to solve problems and understand the physical world. The cloud-based technology allows companies to operate in physical domains, providing them with a deeper understanding of how things are progressing on the ground which the founders refer to as “visual intelligence”.

Describing the software, Sensat’s CEO said: “Think of it as the game Sim City, in terms of getting a very realistic and accurate digital copy of what’s happening in real time and the idea that it’s a mirror image of what is actually happening in the real world. Start-ups like ourselves are vital to change and the way infrastructure is delivered. HS2 is a really good example for this and the emphasis is now almost on the technology companies to prove it as it’s a very risk averse industry with the margins being so tight.”

But vital to the process has been Sensat’s ability to fly their mapping drones 12km beyond visual line of sight, compared to the standard permissions which only permit drone flights up to 500m from the pilot, whilst maintaining direct visual contact.

The tech-savvy workers have been able to do this thanks to a special dispensation that was granted to them by the Department of Transport. This



Harry Atkinson,
co-founder of Sensat.

came about back in 2016 when Amazon came to the UK and wanted to test air deliveries via drones after being denied by the US government. An exemplary safety record played a big part in Sensat being selected for a two- and half-year licence in the field of infrastructure for flying outside of the usual permissions.

Using unique operating permissions, theoretically drones could cover over 23km per day and complete an aerial survey of the HS2 rail line first phase in just seven flights, to an accuracy of 30-50mm and a 200m width. However, with no time specific time needs, they were able to take it a bit slower.

“If you were to manually survey the whole of HS2 route to a similar level of detail then it would take a team one to two years,” Dean said. “Despite that, this is by far still probably the largest drone data capture exercise in the world, so a lot of co-ordination went into it operationally and in terms of planning and executing that. For example, the route goes past a number of airports and in London there are very congested areas so that in itself provides a number of difficulties.”

Commercial opportunities are part of the reason for Sensat’s focus on big infrastructure projects with highways its biggest market so far. The man at the helm of Sensat points to the fact that construction lies pretty much bottom of the pile when it comes to innovation and ranked against other sectors. “As a sector it has seen a 0% productivity increase since 1970, meaning there are lots of opportunities for automation,” Dean says.

The start-up boss now feels like the onus is on more companies like Sensat to present the positives of digitalisation, so they too can help big civil infrastructure projects in the UK stay on time and on budget.

“While digitalisation can deliver immediate returns on investment, the latest technologies also ushers in a new way of working which overall means there is a lot more transparency and consistency and I believe both are crucial for major projects,” said Dean.

Underpinning a national digital twin

A national digital twin means better data, better decisions and better outcomes. *Mark Enzer*, chair of the digital framework task group, writes about a landmark digital development for infrastructure.

Digital transformation is advancing apace in the built environment. While technology greatly facilitates progress, the information that sits behind technology is the longer-lasting golden thread that connects everything together. And the 'information value chain' reveals the core value proposition – the connection between better data, better decisions and better outcomes for the public.

Clearly, information is an asset that should be valued and managed effectively. So, setting clear definitions and principles will help the industry to align on the shared journey towards effective information management across the built environment.

In developing the Gemini Principles, which will underpin the development of an ecosystem of digital twins, the Digital Framework Task Group (DFTG) has brought together stakeholders from government, industry and academia to start building consensus on the definitions and values that will guide the development of digital twins and enable improved information management in our sector.

Digital twins are realistic digital representations of physical things. They unlock value by enabling improved insights that support better decisions, leading to better outcomes in the physical world. Connecting digital twins to create a national digital twin (NDT) will unlock additional value.

The National Infrastructure Commission's report, *Data for the*



Mark Enzer is chair of the digital framework task group at the Centre for Digital Built Britain.

public good, recommended the development of a national digital twin, which will become a national resource for improving the performance, quality of service and value delivered by assets, processes and systems in the built environment. The NDT will not be a huge singular model of the entire built environment. Rather, it will be an ecosystem of digital twins connected via securely shared data.

And a practical framework is required to enable the effective management of information that is fundamental for the creation of a national digital twin. The information management framework, and the move towards an NDT, will enable better use, operation, maintenance, planning and delivery of national and local assets, systems and services.

Fundamentally, digital twins must have clear purpose, must be trustworthy and must function effectively. All the Gemini Principles flow from this. They are deliberately simple, but their implications are far-reaching and challenging. They are descriptive of intent, but agnostic on solutions, so they are meant to encourage flexibility for innovation and development over time. We intend the Gemini Principles to be a living document that will respond to innovation as the NDT develops, so industry feedback is not just welcome, but invited. Please contact us at enquiries@cdbb.cam.ac.uk

The next output of the DFTG is intended to be a roadmap that will provide a prioritised plan for delivering the information management framework and we plan to publish this in early 2019. Now is the time for action. We invite asset owners, mayors and other leaders in the built environment to embrace the Gemini Principles in the development of their own digital twins.



You can download
The Gemini Principles at
<https://bit.ly/2VKCRns>

Seizing the opportunity to change the industry

ACE's chief executive *Hannah Vickers* outlines the next steps for the *Future of Consultancy* campaign.



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

At the European CEO Conference back in November, I announced ACE's *Future of Consultancy* campaign. Helping our sector to be fit-for-purpose, now and into the future, the campaign will enable all companies to exploit the huge opportunities offered by AI, digital engineering and more advanced delivery models which are revolutionising how we operate.

In my regular column in the last edition of this magazine, I outlined the challenges facing our industry in more detail. It's clear to me, that we are on the brink of huge upheaval, that many are unprepared for this, and that we need to do more to ensure our industry remains a vital cog in the system and a trusted partner for government and private clients. The environment around us is changing and we cannot continue with a "business as usual" attitude, there are huge opportunities for our clients which we need to help them define.

I'm sure many of you reading this will understand that things are changing, but you may not be sure on how to adapt to this new prism. We need change at a tactical contract level, as well at strategic market levels and I believe the solution to all of this is greater collaboration between industry, government, clients and the end-users of infrastructure.

I have spent the last few weeks with the team at ACE designing the initial campaign, identifying four workstreams outlined above right.

As well as a number of smaller events taking place in the coming weeks and months, we will hold a *Future of Consultancy* conference in June where the initial work will be shared, discussed and debated. This will then influence the two reports we are producing - one focussing on the business opportunities at home and abroad and another

Domestic opportunities

- What are the opportunities for applying technology to develop new products and services in strategic planning and placemaking, delivering integrated projects, or data driven asset performance?
- What do clients and customers value and what are the opportunities for consultancy to maximise that?
- What is the role of the integrator in delivering integrated projects?
- How can consultants best add value in manufactured solutions?

Export opportunities

- Where in the world can UK consultancy and engineering expertise add the most value and what's the route to market?
- What do consultants need to know and where can they access support when working internationally?

Skills and capability

- What is the skills profile of the future workforce?
- What should the businesses of the future look like in terms of people, planet and profit to attract the best talent?

Business models and contracts

- What are the ownership structures and business models of the consultancy businesses of the future?
- How do we need to reform our contracts to deliver these future services?

helping businesses to make the changes required to seize them. Furthermore, we will showcase best practice in this space with the *Future of Consultancy* categories at this year's Consultancy and Engineering Awards.

For customers, partners, large companies, SMEs and individuals there are a number of opportunities to get involved and engage with the campaign which will bring us all together and support the emergence of a vibrant, profitable and sustainable industry.

Want to get involved in the campaign?
Email FutureOfConsultancy@acenet.co.uk



More than just designing a station

Arcadis rail directors speak to *Ryan Tute* about the complexities and challenges of HS2's Old Oak Common after the company was awarded a £7m contract to design rail systems.



Chris Pike,
UK rail sector director
Arcadis.

Designing a new station is never easy but doing that while ensuring services pass through a key section of the UK's rail network multiplies the complexities, but that is why HS2's Old Oak Common is described as a pivotal part of future-proofing the country's railways.

These thoughts are shared by rail experts who form part of the team working on the station design at Arcadis. The engineering consultants received the news in late 2018 that they had won a £7m contract to future-proof the proposed Old Oak Common HS2 station and would be responsible for track work, signalling power supply systems and electrification.

HS2 says the Old Oak Common HS2 station is due to be ready by 2026, offering a multimodal transport interchange providing easier transitions between a number of other mainline and commuter services, including the Elizabeth Line and the Great Western Main Line.

But in the race to 2026 comes many complexities and challenges as Arcadis UK rail sector director Chris Pike explains. He describes the design task of Old Oak Common as one "massive jigsaw with lots of moveable pieces" by which one action can have a big knock-on effect for another.

"We are dealing with a very, very complex railway system with such a vast array of stakeholders and interfaces, so making sure you understand each of those and how they could impact the project is essential to the final solution," Pike says. "What you don't want is not understanding those properly early on for you to make a fundamental decision on a solution for something to then

"We are dealing with a very, very complex railway system with such a vast array of stakeholders and interfaces, so making sure you understand each of those and how they could impact the project is essential to the final solution."



come out the woodwork and trip you up."

The new station is projected to be the biggest sub-surface station to be built in the UK at around 1 kilometre in length and 20 metres below ground level. It will be built on an urban brownfield site in London Zone 2 and have eight platforms above ground for commuters.

Pike discusses how teams need to splay existing lines out, ensure platforms are a certain width for safe access on and off, while contemplating that some trains won't be stopping at the station meaning there are plenty of operational performance-type issues.

"The big issue is really while you are doing all of that, you still have to preserve existing services, so much like London Bridge our biggest challenge delivering it was ensuring all of the station remained operational without impacting services," Pike added.



A central aim Network Rail has for the station in north west London is to get more trains running through at rush hour times in the day but Arcadis's vision goes beyond just designing Old Oak Common.

Tom Constantine, a technical director at Arcadis who led the bid, explains: "The role Arcadis is playing in designing the new track layout and signalling will be pivotal in helping Network Rail meet their target of achieving 24 trains per hour, passing through the station at peak times," he says. "This isn't just about designing a railway station for 2026, this is about future-proofing the railway, so it can operate safely and efficiently for decades to come," Constantine explains.

A crucial element in the successful Arcadis bid was its strong digital and innovation focus with teams able to

leverage digital rail expertise from the Netherlands and experience of using 4D BIM, which adds 'time' measures to a 3D model. Chis Pike says the technological advancements allow customers to go on a journey through current state to finished product.

"Tools like 4D and 5D BIM are critical for managing a wide range of stakeholders and can help to accelerate the design and approvals process," Pike added. "Equally using complimentary approaches such as Virtual Reality (VR), Augmented Reality (AR) can support project development and offer safer alternatives to

site-based activities. With VR, anyone can pick up their iPad, move it around and really get it and around the model to see what the design looks like internally."

The use of 4D BIM allowing for more of a collaborative approach is seen as vital

"The role Arcadis is playing in designing the new track layout and signalling will be pivotal in helping Network Rail meet their target of achieving 24 trains per hour, passing through the station at peak times."

asset while Old Oak Common remains in the development stage.

"We are now at a stage with Old Oak Common where we are putting together the three, four, five options on how we can deliver this. So, within this stage of the process, collaboration between designer, customer and stakeholders is really important whereby being able to create an environment where you can unite and have those digital tools that enable you to look as a collective, pull it apart, identify any flaws and risk them out is vital," says Pike.

But with Network Rail under increasing monetary pressures, the need to ensure efficiency and value for money has never been felt more than in CP6, when compared to previous control periods. This is something firms like Arcadis is well aware of when bidding for contracts, says Pike.

He said: "When you lodge a bid for a contract like this you are always looking for an edge, firms will always look to see how they can optimise their position and enable them to come up with a solution that adds value to the client and delivers efficiencies especially in today's current climate. Our focus is now not just about our customer but it's also about the passenger and end user. The agenda has changed, Network Rail are under pressure and for us as a business, we are not looking to be just a designer anymore."

The Arcadis rail business has been transformed over the last decade, growing from approximately just 75 staff in 2009 compared to the 650-plus which are currently involved in UK operations.

The Old Oak Common work is seen a massively important for the business moving forward and while essentially teams are working to ensure Network Rail get the station the way they want it in a way they approve of, Old Oak Common is seen as a real test in implementing new technologies and making them a success to bring a positive benefit on future projects, according to Pike.

"This win is really important to us because as a UK business we have come from a position where we worked very much in the contractual end in design and build," Pike explains. "Our roots started in civil structures and moved into railway systems but this contract in terms of size is one of the first where we have been doing purely railways systems, so strategically it's significant for us and comes at a point where we are trying to bring in new technology and a new way of working," says Pike.

Assessing the state of play in Scotland

Our round-up of some of the latest developments north of the border includes news of a major infrastructure investment review, Brexit preparations and the ongoing Aberdeen bypass saga.



The Queensferry Crossing bridge which opened in 2017.

Another missed deadline for Aberdeen bypass

Motorists in north east Scotland did not receive the Christmas present promised to them as the contractor responsible for one of Scotland's biggest infrastructure projects failed to make yet another deadline.

Despite Aberdeen Roads Limited (ARL) publicly committing to opening the final 4.5 mile stretch of the Aberdeen Western Peripheral Route by Christmas, the 25 December deadline was confirmed as a stretch too far by Transport Scotland in the week before.

It is the latest blow for the major roads project which has seen problems

across the route after it was originally intended to open in Spring 2018. One of the biggest stumbling has been the Don crossing with bosses saying during intensive investigations on the alignment of the ducts, it was discovered they were displaced causing unexpected pressure in the concrete.

A special hearing held in Holyrood in December was also where Balfour Beatty and Galliford Try bosses revealed that the final cost of the Aberdeen bypass would skyrocket above the £1bn mark, with the cost originally forecast to cost just £745m.

Scotland's cabinet secretary

for transport, infrastructure and connectivity, Michael Matheson, has been critical of the missed Christmas deadline and said it "came as no surprise".

"I have consistently urged caution and realism about ARL's ambitious timescales," he added. "In order for this government to protect the public purse, it is imperative that ARL provides the necessary technical and commercial assurances for the Don Crossing. We cannot and will not contemplate releasing payments for this structure without these critical assurances," Matheson said.

Holyrood probe to investigate impact of Brexit on construction

The potential impact Brexit could have on Scotland's construction sector is to be investigated by a Holyrood committee.

The economy, energy and fair work committee inquiry will also consider the effect technological changes and automation will have on the industry - which employs more than 154,000 people, 7% of the Scottish workforce.

The construction sector recruits more apprentices than any other industry, with 6,104 people starting modern apprenticeships in 2017-18. But only 1% of this group were female, showing work is needed to boost gender balance.

Consultants have also suggested that productivity in the sector has flat-lined since 1994, in contrast to a 30% increase that has been seen across the economy as a whole. Committee convener Gordon Lindhurst said MSPs are keen to discover how challenges facing the building industry can be overcome. "Construction is a vital sector in Scotland as it drives and underpins the economy with its knock-on effect on other sectors," he said. "As well as being a major employer, the sector also delivers infrastructure for housing, transport, education and community, and contributes £21.5bn to Scotland's gross domestic product. However, the sector has its challenges and we want to hear views and suggestions on how these can be overcome. We also want to find out how we can encourage young people to work in the industry," said Lindhurst.

The inquiry will also examine the role of the Construction Scotland Innovation Centre, which aims to help businesses "deliver transformational change in construction".

"Construction is a vital sector in Scotland as it drives and underpins the economy with its knock-on effect on other sectors."

Gordon Lindhurst, convener, economy, energy and fair work committee.

Shaping Scotland's infrastructure takes a step forward

AECOM and Jacobs have been unveiled as the firms responsible for supporting a review which will shape the future of Scotland's transport infrastructure investment.

A contract to support the second Strategic Transport Projects Review (STPR2) has been awarded to the combined team of consultants will consider future investment in all transport modes including the strategic road and rail networks as well as active travel, island connectivity, ferries and buses.

Subject to the mandatory standstill period, they will be appointed to begin their commission early in 2019.

Commenting on the appointment, cabinet secretary for

transport, infrastructure and connectivity, Michael Matheson, reaffirmed how the Scottish government was fully committed to building a sustainable transport system that supports the economy and helps deliver inclusive growth.

He added: "Work is already underway on the review of the National Transport Strategy which will set out a shared vision for a future of our transport system and the second Strategic Transport Projects Review will build on that by identifying the infrastructure required to make this a reality.

"We have given a commitment to a collaborative review that considers the views of other bodies, for example, transport authorities and stakeholders, businesses, community groups and special interest groups."

Michael Matheson, cabinet secretary for transport, infrastructure and connectivity.

"We have given a commitment to a collaborative review that considers the views of other bodies, for example, transport authorities and stakeholders, businesses, community groups and special interest groups. We will be inviting parties to engage in due course and look forward to continuing with our ongoing conversations on transport and its wider benefits and impacts."



Questions the committee would like to explore include:

- 1 How important is the construction sector in Scotland as an economic enabler?
- 2 What are the causes of the sector's productivity challenges?
- 3 What is the future economic outlook and implications of Brexit for the sector?
- 4 What are the sources of and barriers to accessing finance in the sector?
- 5 Suggestions on opportunities to enhance procurement practices across the sector
- 6 Views on the Construction Scotland Innovation Centre
- 7 How will technological changes (e.g. robotics, automation) impact the sector and how can Scotland take advantage of this change?

World governments need to invest more in infrastructure

The latest Global Infrastructure Index highlights the need for governments to do more on infrastructure investment, especially in the areas of road, rail and flood defences.

Almost three quarters (73%) of people across the world agree that investing in infrastructure is vital to their country's future economic growth, but more than half (59%) do not believe enough is being done by governments to meet infrastructure needs.

The findings come from the latest Global Infrastructure Index survey conducted by Ipsos Mori in partnership with the Global Infrastructure Investor Association (GIIA). The survey, which polled nearly 20,000 people, collected ratings of ten infrastructure sectors with airports (67%), digital (54%) and water supply and sewerage (52%) performing particularly strongly.

Europe scored the lowest of any region in terms of overall satisfaction, with only 26% of Europeans saying they are satisfied with their national infrastructure compared with 32% globally and 28% in the US. Romania, Italy, Hungary, Spain and Belgium occupy five of the bottom six countries. Overall satisfaction has declined in Europe but also in G8 nations and globally since the previous Global Infrastructure Index in summer 2017.

The top priorities for investment worldwide are improving local roads (chosen by 45%) and water supply and sewerage (43%). Motorways (42%), flood defences (41%) and rail infrastructure (40%) also featured among top-ranked sectors. The survey found 64% of people agreeing that local communities' views on infrastructure plans should be heard



Ben Marshall,
research director at
Ipsos Mori.

properly, even if it means delays, whilst 61% feel that their country does not do enough to involve people in decisions about which infrastructure to invest in.

Globally, more say they are comfortable with foreign investment in new infrastructure if it means it gets built more quickly than are not, by a margin of two and a half to one (49% to 19%).

Andy Rose, CEO of GIIA, said: "Our survey shows a global decline in public satisfaction with infrastructure since 2017 reinforcing the message that governments need to prioritise creating the right environment for investment. Across the world, the public are relatively more positive about sectors where private investment features prominently although there remains room for improvement."

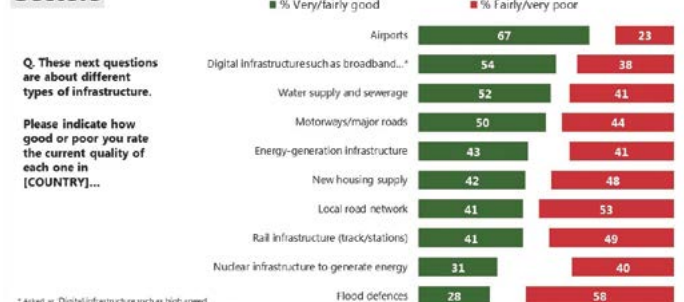
Ben Marshall, research director at Ipsos MORI, commented: "Our annual survey underlines peoples' strongly held conviction that governments need to do more on infrastructure. Globally, publics single out particular sectors as priorities for investment including road, rail and flood defences, but this varies by region and country.

"People are both pragmatic, saying they are comfortable with foreign investment, and principled – wanting to see a democratic deficit narrowed with people more involved in decision making."

Key findings from the research include:

- 1 Almost three quarters (73%) of people worldwide agree that investing in infrastructure is vital to their country's future economic growth
- 2 59% do not believe enough is being done to meet infrastructure needs
- 3 26% of Europeans are satisfied with their national infrastructure, the lowest of any region. This compares to 32% globally and 28% in the US, indicating that more needs to be done to secure better infrastructure in all markets.
- 4 67% of people rated their country's airport infrastructure as good or better, the highest satisfaction rate of ten surveyed sectors

Sectors



* Asked as: Digital infrastructure such as high speed broadband in 2016 and 2017 and Digital infrastructure such as high speed broadband, full fibre networks (FTTP), 5G in 2018

Source: Ipsos/GIA

Ranked by % very/fairly good
Base: 19,786 adults (online) Aug-Sept 2018

We must show how infrastructure improves lives

A new report highlights the real and tangible effect that infrastructure has on people's lives. CECA chief executive, *Alasdair Reisner*, explains more.



I was delighted to launch our latest research, *The social benefits of infrastructure investment*, in December last year. It's a report I've been wanting to produce for a while because I believe that the social impact of investment in housing, transport, energy or bridging the rural/urban divide is still to be effectively articulated by our industry.

Here at the Civil Engineering Contractors Association (CECA), the representative body for companies who work day-to-day to deliver, upgrade, and maintain the country's infrastructure, we're as guilty as anyone else of highlighting the big numbers – the billions of pounds spent, the millions of litres of concrete, the hundreds of miles of motorway, or the billions of economic activity that an infrastructure project generates.

But the reality is that infrastructure is intrinsically social. It creates opportunities for people to get on the housing ladder, to be better connected to friends and family and it helps to nurture vibrant local communities across the country. More than the numbers, it provides a social good delivering quality of life, health and wellbeing.

We wanted our report to provide a fresh look at infrastructure and in doing so, a fresh understanding of why we need to build. Alongside the concept that infrastructure is essential to creating a strong and prosperous economy, we also need to be saying that it improves people's lives. To help us to do so effectively, we have called on the government to establish and champion a new national framework for the measurement of social benefit.

Furthermore, by looking at the social impacts of infrastructure alongside the financial, we should be able to



Alasdair Reisner is chief executive of CECA, the Civil Engineering Contractors Association.

find new ways of working which ensure that major projects deliver benefits to communities across the country, and not just where they are based. For example, logistics and manufacturing hubs could be placed in former industrial towns and cities, creating new heartlands that support multiple infrastructure projects, create jobs, and help to rebalance the economy. Given the wider trend to offsite and modular construction, this is no longer a pipe-dream, but a realistic proposition.

One thing is certain, we will need the entire supply chain to look at infrastructure in a new light. As well as contractors, architects, engineers and consultants will need to think of our infrastructure in a new and different way.

To encourage and lead this new way of thinking, the government should lead by example. Which is why we've called on them to not only maintain their commitment to 1.2% of GDP on infrastructure investment, as outlined by the National Infrastructure Commission, but also to examine the case for increasing the ceiling to deliver increased social value too.



Download *The social benefits of infrastructure investment* from <https://bit.ly/2Fht3LY>



Mathew Riley to continue as ACE chair

Riley continues in role to support ACE through transitional period, while new board appointments are announced.

ACE has announced that Ramboll UK managing director Mathew Riley will continue as chair for a second year to support the organisation through a transitional period, owing to Hannah Vickers joining ACE as chief executive in September 2018. While chairs usually hold office on an annual basis, ACE's articles of association allow for it to extend the tenure of the chair by one year "if considered appropriate to address exceptional circumstances."

Mathew Riley said: "With Hannah's recent arrival at ACE, the board felt that maintaining a degree of continuity would be beneficial to the organisation. One of my key roles in 2018 was to oversee a smooth transition between Nelson Ogunshakin and Hannah and I'm delighted to be able to continue to do that over the coming year on behalf of ACE's members."

A number of new appointments to the board have also been made:

- Vice Chair (SMEs and devolved nations) – Simon Innes, Goodsons
- Vice Chair (Future of Consultancy) – Craig Huntbatch, Royal HaskoningDHV
- Vice chair (Voice of Consultancy) – Rajiv Sudan, WYG
- Chair of Large Consultancy group – Geoff Hunt, Arup
- Chair of Progress Network – Georgia Hughes, Arcadis
- Chair of Wales – Catherine Wenger, Arup



Mathew Riley,
Ramboll's UK managing
director and ACE chair
for a further year.

They join existing board members:

- Chair 2019 – Mathew Riley, Ramboll
 - Immediate Past Chair – Mike Haigh, Mott MacDonald
 - ACE Treasurer – Paul Reilly, Peter Brett Associates
 - Chair International Business group – Clive Anderson, WYG
 - Chair Major Projects group – Dave Barwell, AECOM
 - Chair SME group – Steven Hale, Crofton Design
 - Chair ACE Business Academy – Mark Naysmith, WSP
 - Chair ACE Midlands – Ruth Jeffs, Waterman
 - Chair of Scotland – Mark Arthur, Hurley Palmer Flatt
 - Chair of Northern Ireland – Stuart MacKenzie, JCP Consulting
- In addition to this, ACE has also announced new appointments to its advisory board with Phill Cartwright (executive chairman, CFMS), Ruth Mallors-Ray OBE (director, RMR Consultants) and Lord Robert Mair (head of civil and environmental engineering, University of Cambridge) joining.

Progress Network updates

Group for emerging consultants and engineers' latest Future of Infrastructure event and new board appointments.

Future of Transport in Wales

ACE's group for emerging consultants and engineers welcomed Dr Rosie Hughes, innovation lead at AECOM, to discuss the future of transport in the principality at the end of 2018. Leading the debate, Dr Hughes posed challenging questions to encourage delegates to consider how best to accommodate historically vast increases

in rail passenger numbers, how to improve wellbeing through infrastructure and how it can also positively influence people's lives.

Sponsored by Arup, the event also touched on a growing body of work in this space by the Institute of Welsh Affairs, CECA Wales and the Welsh government. These all fed into discussions and ideas around solving congestion on the M4,

increasing uptake of public transport through an oyster-like system and minimising energy usage, the largest contributor to transport's carbon emissions.

The event was the latest in Progress Network Wales' series on the Future of Infrastructure. The group brings together emerging professionals from across the industry for networking and career

Consultancy and Engineering Awards 2019

Early bird tickets available and nominations now open for this year's Consultancy and Engineering Awards.

Celebrating the best that the industry has to offer, the Consultancy and Engineering Awards champion the people, projects and companies who make a difference in the sector, go beyond the norm and lead by example. They recognise the achievements of ACE and non-members alike.

Nominations are now open for this year's awards which feature four new categories to tie into ACE's Future of Consultancy campaign: Strategic Planning and Placemaking Champion, Integrated Project Team of the Year, Data Driven Asset Performance Champion and Design for Manufacture Champion.

Other categories include Best Business Performance (micro, small and large), Sustainability and Social Value Initiative of the Year, Progress Network Employer of the Year, Client of the Year (private and public), Apprentice of the Year and Emerging Professional of the Year. Nominations can be made online via ACE's website and close on 21 February 2019.

The gala award ceremony and dinner takes place on 6 June 2019 at the Royal Lancaster Hotel in London. To coincide with nominations opening, early bird tickets are available until 31 January 2019. These offer 10% off all full-price packages, a saving worth up to £300 for a VIP table for ACE members.



**Consultancy
& Engineering
AWARDS 2019**



Further details can be found at the events page on ACE's website at <https://bit.ly/2C7Zau1>

Helping ACE members prepare for Brexit

Webinar helps sector prepare as uncertainty continues.

With the ongoing uncertainty around Brexit and time running out for politicians to reach agreement, both at Westminster and in Brussels, ACE has held an exclusive webinar on Brexit for members.

With the ongoing uncertainty around Brexit and time running out for politicians to reach agreement, both at Westminster and in Brussels, ACE has held an exclusive webinar on Brexit for members.

On 17 January, ACE in partnership with the Civil Engineering Contractors Association (CECA) and the Construction Products Association (CPA), hosted a webinar on Brexit for members of all business associations.

Joining ACE's chief executive Hannah Vickers were Geoffrey Spence (former global head of infrastructure, resources and energy at Lloyds Bank and head of infrastructure UK), Alasdair Reisner (chief executive at CECA) and Noble Francis (economics director at the Construction Products Association). The webinar explored issues around Theresa May's proposed plan, what a 'no-deal' scenario might mean in practice and what might happen over the coming weeks.

With Theresa May's deal failing to make it through parliament last December, the prospect of the UK exiting the EU with no deal in place has become a more realistic scenario. With this in mind, all businesses will need to make difficult decisions in the coming weeks as we approach Brexit Day. The webinar and updated briefings will help all ACE members navigate the uncharted waters, make informed decisions and implement appropriate and proportionate contingency plans.



Replay the webinar now on ACE's website. Once logged in, ACE members can also view and download all Brexit Briefings at www.acenet.co.uk/policy/policy-library/



development opportunities across the country.

A full report on the event has been published on ACE's website. Our thanks to Thomas Ashworth (Tony Gee and Partners) and Ben Richards (Faithful + Gould) for their input.

New chair and first vice chair
Georgia Hughes of Arcadis has been

appointed as chair and Katherine Theobald of Ramboll, UK as first vice chair of the Progress Network. Other appointments will be made to fill the remaining Progress Network board positions in the coming months. They replace former chair Athena Livesey of WSP and vice-chair Rebecca Wooding of DFID, who have reached the end of their two-year tenure.

Hughes said: "I'm delighted to be taking up the reins at Progress Network. We'll be actively engaging with ACE's Future of Consultancy campaign, as well as working on issues such as sustainability, and professional capability development. It's an ambitious remit, but I'm looking forward to tackling some big issues with the Network during my tenure."

Learning lessons from Carillion one year on

One year after the collapse of Carillion, key lessons still need to be learned if the sector is to avoid further damaging liquidations, says *Hannah Vickers*.



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

A year since its collapse and Carillion continues to cast a shadow over our industry. The company's fall from grace has had huge social, political and economic ramifications and with the business pages continuing to speculate on the health of similar outsourcing and contracting companies, have we learnt enough to avoid further liquidations?

I believe that there are five forces which all contributed to Carillion's collapse. Client behaviours, abuse of its supplier power, poor internal governance, limited independent regulation and a competitive and low-margin market. In retrospect this was a toxic mix and, as these forces increased, it was always destined to fail. Hindsight is a wonderful thing, but the warning signs were there for those who cared, and dared, to look closely enough.

All businesses should learn from the mistakes Carillion made. They need diversity of thought around the board table. Management and board members need a better understanding of the purpose, capability and the appetite for risk of the organisations they represent. In short, they need to be confident enough to say "no". Secondly, they need to proactively monitor their stakeholders and the wider business environment and consider the impact of decisions on the entire supply chain.

From a client perspective, there are lessons too. There should be a focus on quality and outcomes for the end-user and an appreciation that they are working within one interconnected system which cannot be insulated from risk. A longer-term approach should be adopted. While there may be short-term gains from value engineering savings, does it increase the cost of the asset over its lifetime or the likelihood of failure? The approach

should be more akin to that taken by an investor working in partnership, rather than seeking to fulfil a contract. This would enable clients to support a sustainable market, leading to the incentivisation of risk mitigation, rather than its transfer down the supply chain.

It must be said that a lot of good work has already taken place following the collapse of Carillion. We've had a number of select committee inquiries, announcements on 'living wills' and new consideration of social value in procurement, the Aldous bill (which will introduce a mandatory deposit scheme for construction) and Project 13 has gathered pace. Over the coming months we'll see the government's new construction strategy, a new chair of the Construction Leadership Council focussed on implanting reform and the response to the Hackitt enquiry which should lead to a risk-based approach.

From ACE's perspective, we'll be engaging with all of those and also championing relevant initiatives of our own, including publishing a standard on fair contracting terms and introducing a whistleblowing service for members. In the medium term, our *Future of Consultancy* campaign will define opportunities to best apply the skills and capabilities of consultants and in doing so, influence wider systematic change.

However, there is a collective responsibility for all of those affected by Carillion's collapse to fix this. Clients and businesses, large and small, all have an ongoing role to play to ensure we eventually emerge from this crisis with systematic reform and business models which are robust and sustainable in the long-term.



Draft bill offers chance to transform UK environmental policy

The government's draft environment bill could be the most important piece of environmental legislation for a generation, says *Matthew Farrow*.



Christmas came early for us environment policy nerds, with Defra publishing its long-awaited *Resources and Waste Strategy* on the 17 December, followed two days later by a draft environment bill.

The *Resources and Waste Strategy* is a significant document, containing ideas that if implemented could give a real push towards a more circular economy. But the environment bill seeks to change the entire way that we create and implement environmental policy. If it survives the political vicissitudes of the next few months, it could be the most important piece of environmental legislation for a generation.

Current environment policy is driven by the EU. Post-Brexit this changes, and the mainstream business uncertainty over what Brexit means for the economy is mirrored in policy uncertainty faced by the environmental business sector, most of whose markets are created and structured by policy and regulation. Will subsidies for green power be maintained or slashed post Brexit? Will habitats regulation be loosened to accommodate housebuilders or strengthened to match ministers' rhetoric around natural capital?

The environment bill is a chance to address these concerns, not just during the Brexit period but for the next 20 years. The bill does three things.

First, it recreates in UK law the legal principles that underpin EU green policy thinking. These are concepts such as 'polluter

pays' or the 'precautionary principle' and they have greatly influenced the green regulations we have today.

Second, it sets up an environmental watchdog, the Office of Environmental Protection (OEP). This body would hold the government to account, by publishing an annual report on the state of the environment and the government's progress in meeting its own goals and targets. The OEP as a last resort can even take ministers to court. Third, it puts the 25 Year *Environment Plan* on a statutory footing.

The end result is an ambitious piece of legislation undreamt-of by the green community in the immediate aftermath of Brexit. It has its flaws though, which will be picked over in the coming months. There are fears that the OEP will be 'captured' by Defra if it is directly accountable to the department as opposed to reporting only to parliament (The chairman of another Defra-sponsored body - Natural England - told MPs last November this had happened to them).

Another concern is that the body will be England-only so may accentuate the divergence of environmental policy across the UK devolved regions and nations. There is also a question as to how specific the environmental targets within the bill should be.

Overall though there is much to play for. EIC worked through a group like-minded business associations (including my former colleagues at CBI) called the Broadway Initiative to define what would make the environment bill truly world-leading. We want the bill to:

- Define shared objectives for the environment
- Contain predictable processes to ensure appropriate policies are in place
- Include clear principles for incorporating the environment during policy development
- Provide for spatial planning which integrates environmental and other objectives
- Include clear and stable responsibilities
- Provide for independent oversight of progress towards targets
- Include a common framework at UK level where beneficial.

Chances to reshape the UK environmental policy framework don't come around often. An Environment Act along the lines above could unlock an unprecedented amount of green business investment and innovation, to the benefit of all.



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

Will Labour's nationalisation plans for water work?

Will Labour's nationalisation plans solve the water industry 'trilemma' of affordability, population growth and demand? *Noel Beale* considers the issues.

The Labour Party's intention to nationalise the water sector has caused considerable consternation in the industry and for many of its stakeholders. A key driver for the policy appears to be the profits made by water companies over the last 15+ years by relying on the unexpectedly cheap cost of debt rather than equity investment through 'financial engineering'.

This is something Ofwat has its eye on as part of its 2019 price review intending that financing risks/rewards will be shared with customers. However, this could ultimately be both good and bad for customers. It is difficult to square the suggestion of nationalisation with another key driver in the water sector which is the need for long-term investment in infrastructure.

Since privatisation, approximately £130bn has been invested into the water and wastewater sector resulting in



Noel Beale is a director in the competition team at the law firm, Burges Salmon.

significant improvements in quality. It is generally recognised that more long-term investment is required as the sector faces the 'trilemma' of affordability, population growth and demand (particularly in the south east) and growing environmental pressures as a result of climate change.

The Labour Party's exact intentions are unclear. The talk is of putting public services irreversibly in the hands of workers so that they could never be taken away again and everyone having and 'feeling' ownership of the services rather than them being in the hands of a 'remote' bureaucracy. What this actually means in terms of ownership models is unclear.

The Labour Party's publication on *Alternative Models of Ownership* from 2017 considers cooperative ownership, municipal ownership and national ownership but there are no conclusions about a preferred model. Labour's shadow chancellor John McDonnell claims that bringing services into public ownership will cost "absolutely nothing". However, it is likely that a Labour government would need to compensate current owners and shareholders.

The market value of the English companies is estimated to be around £83bn. This is on the basis that the combined regulatory capital values (RCV) of the English water and sewerage companies come to about £64bn and, where companies have changed hands in recent years, the valuation has been of the order of 1.3 times the RCV. However, others argue that these were at the top of the market (driven by financial engineering by the companies) and that the acquirers generally overpaid.

A new Labour government might be tempted to see if it can pay less than the above figures, though there would be very likely to be significant legal challenges to this and in addition, such an approach would fundamentally undermine investor confidence in the UK which would have far reaching effects.

Labour argues that their plans can be financed with government debt, which is cheaper than private water companies can achieve. The reality in the current climate is that there is not a lot of difference. Moreover, public ownership means the public taking on the risks of ownership which can be significant for large water companies.

The real question is whether a change in ownership would in fact bring about the increases in long-term investment, changes in consumer behaviour and decreases in costs which are required to solve the water sector 'trilemma'. The reality is that there is little or no evidence either way.



Labour's shadow chancellor John McDonnell claims that bringing services into public ownership will cost "absolutely nothing".

Gove unveils new blueprint for resources and waste

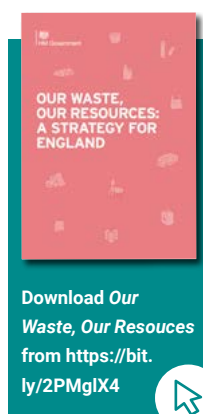
Businesses and manufacturers will pay the full cost of recycling or disposing packaging waste under the government's *Resources and Waste Strategy*, writes Andy Walker.

The government's new *Resources and Waste Strategy* will see businesses and manufacturers paying the full cost of recycling or disposing of their packaging waste. Unveiling the strategy at the end of last year, environment secretary Michael Gove said: "Together we can move away from being a 'throw-away' society, to one that looks at waste as a valuable resource."

The strategy signals an overhaul of England's waste system, putting a legal onus on those responsible for producing damaging waste to take greater responsibility and foot the bill, and is the first comprehensive update in more than a decade. It will eliminate avoidable plastic waste and aims to leave the environment in a better state for future generations.

Producers will also be expected to take more responsibility for items that can be harder or costly to recycle including cars, electrical goods, and batteries. Householders will also see the existing complicated recycling system simplified, with new plans for a consistent approach to recycling across England. Timings for introduction will be subject to discussions at the Spending Review and many of the measures outlined in the strategy will be subject to consultation with industry and the public.

Launching the strategy, environment secretary Michael Gove said: "We will cut our reliance on single-use plastics,



Download Our
Waste, Our Resources
from <https://bit.ly/2PMgIX4>

end confusion over household recycling, tackle the problem of packaging by making polluters pay, and end the economic, environmental and moral scandal that is food waste. Through this plan we will cement our place as a world leader in resource efficiency, leaving our environment in a better state than we inherited it."

To help drive up recycling levels further, the government will introduce consistent set of recyclable material for collection, subject to consultation. This will be funded by industry through 'extended producer responsibility' (EPR), which will see industry pay higher fees if their products are harder to reuse, repair or recycle and will encourage sustainable design, subject to consultation. EPR for packaging will raise between £0.5bn and £1bn a year for recycling and disposal.

The *Resources and Waste Strategy* contains a range of ambitious measures – many subject to further consultation – including setting out how government will ensure producers pay the full net costs of disposal or recycling of packaging they place on the market, reviewing producer responsibility schemes for items that can be harder or costly to recycle, including materials from construction and demolition, ensuring weekly collections of food waste for every household and introducing a deposit return scheme to increase the recycling of single-use drinks containers.

Commenting on the strategy, Matthew Farrow, director of the Environmental Industries Commission, said: "There is plenty to welcome in the *Resources and Waste Strategy* especially the intentions to ramp up producer responsibility, move away from purely weight-based targets, match or exceed EU Ecodesign policy and introduce more consistency into household collections. However, if the goodwill from the resources sector towards the strategy is to be maintained we need to see strong progress in the first months of 2019 in pressing ahead with the array of consultations and planning needed to turn the encouraging intentions into real progress in achieving a circular economy."



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