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# I INFRASTRUCTURE Intelligence

*Produced for the industry by the Association for Consultancy and Engineering*



**Colin  
Matthews**

The Highways Agency's  
£24bn man  
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# INFRASTRUCTURE Intelligence

Produced for the industry by the Association for Consultancy and Engineering

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## MESSAGE FROM THE EDITOR

In his interview with Infrastructure Intelligence this month, new Highways Agency chairman Colin Matthews is very clear about the need for the whole industry to embrace new technologies and new ideas as the Agency embarks on its £2.4bn investment programme.

“This is not a business as usual static environment,” he said. “It is a fantastic opportunity with some really serious investment behind it to take Britain’s roads on a journey.”

And while it is absolutely clear that to accommodate the scary prediction for a 46% growth in traffic on the nation’s strategic road network by 2040 we will have to spend some of that money improving and enhancing the physical network, it is also clear that technology will have to play a massive role.

So as the Agency morphs from an infrastructure-focused organisation to a customer-focused business, the supply chain that delivers the maintenance, management and enhancement of this critical national asset must be similarly prepared for the cultural change required.

In short, our highways network will have to be as sophisticated and digitally connected as the vehicles, drivers and customers that use it. And given the scale of investment going in to this area by vehicle manufacturers and technology businesses, the infrastructure profession is unquestionably going to have to raise its game.

All of which makes it absolutely vital that we encourage the next generation of raw tech-savvy talent now pouring out of schools. As we highlight this week with our analysis of the Technical Apprenticeship Consortium, there is without question a mass of talent available.

The trick for the infrastructure will be to convince this new generation that, against the backdrop of newer, perceived higher tech industries, there are future career paths for them in more “traditional” sectors such as roads, rail, energy or water management.

It is a culture change that must start from the top. The future for infrastructure is being smart. The future for infrastructure professionals means embracing and investing in this new future.



**Antony Oliver,**  
editor, Infrastructure Intelligence

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## News roundup

### ENVIRONMENT

**New delays for the implementation of sustainable drainage systems (SuDS) have been revealed** after Secretary of State for Environment, Food and Rural Affairs, Elizabeth Truss announced a further six week consultation to decide the best way to deliver them. No date has been given for the final implementation of SuDS with Defra simply stating that his new consultation will build on the findings of previous industry consultations.

**Ofwat’s draft determination suggests water bills are set to fall by around 5%** in real terms in the next Amp period between 2015 and 2020. Investment of £4.3bn is included in the determination (see feature page 14).

**New research from University of Southampton says that Britain’s increased flooding events** have been caused by increased building in vulnerable areas. They conclude that when population growth and building growth are taken into account there is no rise in the number of reported major floods events over the past 129 years. The study was published in Hydrological Sciences journal.

### RAIL

**Network Rail became a public sector arm’s-length body of the Department for Transport on 1 September.** DfT says it plans to allow Network Rail to continue to manage its business “with appropriate commercial freedom, within effective regulatory and control frameworks”. DfT will appoint future chairs and approve remuneration policy and pay for executive directors

**Government has launched plans to extend the Crossrail**



**Thames Tideway Tunnel chief executive Andy Mitchell** has welcomed the government’s decision to award planning consent for the £4.2bn super sewer which is now to start construction in 2016. Last year it is claimed 55M tonnes of sewage polluted the Thames due to exceptionally wet weather which caused London’s combined sewerage system to overflow into the river more than normal. “If the tunnel had been in operation last year, it would have captured 97% of the sewage,” said Mitchell. “We are pleased we can now start to tackle this archaic problem.”

**service north west into Hertfordshire** in a bid to ease future pressure from the new High Speed 2 railway on Euston Station. A feasibility study will assess the benefit to passengers from key commuter towns such as Tring, Hemel Hempstead, Harrow and Watford from constructing a new rail link between Old Oak Common and the West Coast Main Line so removing the volume of regional trains that terminate at Euston.

**Balfour Beatty has won the £70M Crossrail Woolwich station fit out contract.** Work also includes finishing works at the two portals where the Crossrail trains will surface from either end of the Thames Tunnel at North Woolwich and Plumstead.

**Protests have taken place at railway stations in the north of England after the introduction of new peak evening fares** on Northern Rail Services where some weekday tickets have gone up 117% as trains between 16.01 and 18.29 are no longer classed as “off peak”. Cost of a ticket from Wigan to

Manchester Piccadilly has risen from £4.20 to £9.10 and from Bradford to Leeds from £4.60 to £6.50.

**Edinburgh’s trams have carried more than 1.5M passengers in their first 100 days** of operation which puts them on track to hit their first-year targets of 4.5M passengers.

### ENERGY

**The increasing threat to the nation’s winter electricity generation capacity from unplanned power station closures and the risk of political risk of Russian gas supplies being cut to Europe has prompted urgent action by National Grid.** It has announced a tender for the Supplemental Balancing Reserve (SBR) designed to bring moth-balled generation plant – usually gas-fired – back into service and available to be held in reserve during this. National Grid has also instigated Demand Side Balancing Reserve (DSBR), which is intended to incentivise energy intensive businesses to cut their usage.

**Installing smart meters in every house in the UK will save consumers “only 2%” on their annual bills,** the Public Accounts Committee has warned. On average, consumers will save just £26 a year and the technology could be out of date by the time the roll out is complete, the committee said. The Department of Energy and Climate Change has said smart meters will lower bills and make switching easier.

**Kellingley Colliery in North Yorkshire is to be transformed into a state-of-the-art energy centre which will use residual waste to generate low carbon electricity and heat.** Peel Environmental has been given the green light to go ahead with the project, which will produce up to 26MW of electricity – enough to power around 63,000 homes in the local area.

### ROADS

**The number of licensed vehicles on the roads has passed the 35 million mark for the first time.** Government figures show that by the end of 2013 there were 35.03 million licensed vehicles in Britain. This included 29.14 million cars, 3.35 million light goods vehicles, and nearly 1.22 million motorcycles. There were only 25.23 million vehicles on the roads in 1994.

**Atkins, in partnership with Hyder, have been awarded a three-year contract by the Highways Agency** to deliver specialist technical support to the seven Regional Control Centres (RCCs) across England.

**London Mayoral candidate and transport expert Christian Wolmar has suggested banning traffic from Oxford Street.** Cutting out cars and buses would double the number of people visiting London’s most famous

shopping street each day, he says. Wolmar says even cycles may have to be banned if the West End landmark is to be saved from a slow decline over coming years.

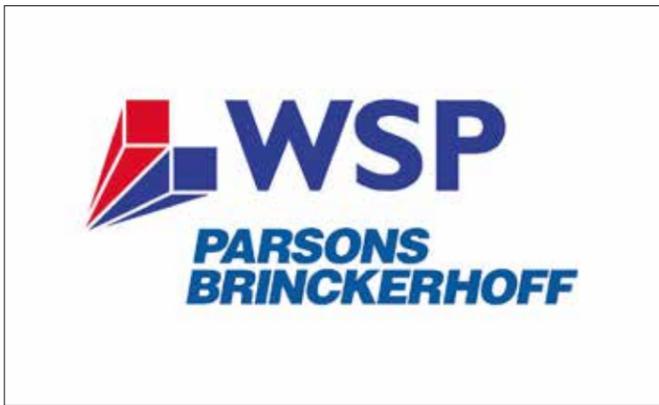
PLANNING

**The Royal Society of Arts has called for central government to grant greater autonomy to regional administrations** to underpin the role that they already play to support the UK economy. It's City Growth Commission report "Powers to Grow: City finance and governance" highlights the importance of cities in driving growth and prosperity but points out that regional cities are still "held back". Radical change can be achieved, it argues, but only with cross party consensus around the need for a "daring package of fiscal devolution".

**Nick Clegg is calling for decentralisation and devolution for the North of England** and is inviting ideas through the Northern Futures project. The speech follows the launch of the Deputy Prime Minister's Northern Futures project in July – a call for ideas on ways to create an economic hub in the north of England.

**Chancellor of the Exchequer George Osborne has welcomed plans for a potential major new National Institute for Materials Research and Innovation in the north of England.** This would build on the north's expertise in materials science – the development of super lightweight, strong and flexible materials that have applications across a range of industries like healthcare, energy or transport.

**England's core cities have called for decade-long public service funding settlements.** Nick Forbes, the leader of Newcastle



**WSP is on course to acquire professional services consultant Parsons Brinckerhoff from Balfour Beatty** in a deal worth \$1.35bn (£820M). WSP will buy the firm for US\$1.24bn (£753M) plus an additional consideration for cash retained by Parsons Brinckerhoff of up to US\$110M (£67M). The combined business will be one of the largest global pure-play professional services firms in its industry, with approximately 31,000 employees a combined net revenues of £2.3bn. Balfour Beatty bought Parsons Brinckerhoff in 2009 for £380M. The deal followed news that Carillion had pulled out of pursuing a merger with Balfour Beatty after its latest offer was rejected.

City Council and Core Cities Cabinet member for reform, said 10-year funding deals in the areas of skills, transport and adult social care would help boost the growth potential of cities. Forbes said the group – which includes the five northern cities of Leeds, Liverpool, Manchester, Newcastle and Sheffield – wanted place-based settlements to form part of Osborne's 'Northern economic powerhouse'.

**The Major Projects Authority (MPA) must be given more formal powers by government to support its project delivery reforms if it is to continue to drive efficiency across central government's growing project portfolio.** According to the powerful Public Accounts Committee, while the MPA's work to date has significantly improved the performance of government major projects, it still faced "significant challenges" as it continues to drive delivery improvement not least as the size of its infrastructure project portfolio grows.

BUSINESS

**CH2M Hill has unveiled plans to cut 1,200 jobs** from its 26,000 workforce to deliver annual savings of around £60M. The firm took over Halcrow in 2011. It said the 'right-sizing' of its overhead structure would impact on all global operating units.

**Nippon Koei has withdrawn from the battle to buy Hyder Consulting.** The announcement followed a move by rival ARCADIS which saw it increase its offer to 750p a share and purchase enough shares to give it a critical 25.9% share ownership in the Hyder business. The new offer values Hyder at £296M. The deal is due to go through on 16 October.

**AECOM's Steve Morriss is to lead the combined Europe Middle East and Africa Design and Consulting Services business once merger the with URS is finalised in October.** AECOM president and CEO Mike Burke this month unveiled the new structure that will allow the business to manage the 95,000 staff resulting from

the imminent merger. The deal is due to be finalised at a shareholders meeting on 16 October and according to Burke "we expect to be operating as one unified company by January 2015".

**Consultant WYG has bought Alliance Planning for £3.2M** to create one of the country's largest planning businesses with around 100 planning specialists.

HOUSING

**Lord Rogers of Riverside has attacked proposals to build up to 40 new garden cities on the greenbelt** as "a ridiculous concept" and has called instead for the developments to be stitched into existing cities using derelict sites. He spoke out after the £250,000 Wolfson Economics Prize was last week awarded to a proposal to take "a confident bite out of the greenbelt" and build 150,000-resident urban extensions to towns and cities across the country.

**House price momentum slowed to the same level it was a year ago and new buyer enquiries fell for the second consecutive month,** according to the August RICS Residential Market Survey. Concern over a potential rise in interest rates could be contributing to the fall in buyer interest it said.

**Plans to build up to 5,000 homes in Kent on a site that is said to be key to the UK's nightingale population have been condemned** by environmental campaigners. The Wildlife Trust said the move could cause "environmental destruction on a scale not seen for more than 20 years". Medway Council approved Land Securities' proposals for Chattenden Woods and Lodge Hill last month. The developer said the area's 84 pairs of nightingales would be re-homed nearby.

AIRPORTS

**The Airports Commission has comprehensively rejected a £100bn plus investment in a four runway inner Thames Estuary hub airport as the solution to the UK's requirement for an extra runway by 2030.** The focus of the commission's work will be on proposals for an extra runway at Gatwick or, at Heathrow, an option of a new runway or a runway extension. The commission "had not been persuaded that a very large airport in the Thames Estuary is the right answer to London's and the UK's connectivity needs", said Airports Commission chair Sir Howard Davies. He also questioned whether a single hub option was an acceptable solution.

**Plans to increase the number of passengers using Stansted Airport could create up 10,000 new jobs** over the next decade. The airport aims to double passenger numbers to 45M a year by introducing new routes and handling more flights from its single runway.

**Dubai has announced plans to invest £19.8bn into its Al Maktoum International airport** which will become the largest in the world, handling 240M passengers a year. That is 100,000 more than the number of travellers who used all of London's airports put together last year.

PEOPLE & CAREERS

**The Institution of Engineering and Technology has warned that Government's proposal to ditch GCSE engineering could add to the profession's looming skills crisis.** The proposal to scrap GCSE, AS and A level courses in engineering were announced in a consultation document published by England's exams regulator Ofqual in June, as

part of a major reform of school exams (see opinion p8).

**Building Information Modelling (BIM) will not boost the construction industry's efficiency unless it truly embraces a world of "soft skills" and interdisciplinary teams,** according to a new report by the Construction Industry Council's BIM2050 Group.

**A new apprenticeship standard for railway engineering design technicians** was one of the new apprenticeships highlighted by Government in its Get in Go Far campaign. The railway apprenticeship standard is the latest to emerge from the engineering consultancy led Technician Apprenticeship Consortium (see feature page 24).

**The Department for Business, Innovation and Skills has confirmed that the construction brief has been handed to skills minister Nick Boles** rather than to business minister Matthew Hancock as previously assumed. Boles will be championing the low carbon agenda by delivering the keynote presentation at the Infrastructure Carbon Review One Year On conference on 27 October. (see analysis p16)

AND FINALLY

**International development charity Construction and Development Partnership (CODEP) has launched an appeal** to support its work in Waterloo, Sierra Leone in preventing the spread of Ebola virus across the city. The charity has been asked to take a lead in training people in how they can protect themselves. "They urgently need funds for basic medical equipment – gowns, gloves, chlorine and buckets – and to build a resilience to the evolving situation," said charity president Mark Whitby. [www.codep.co.uk](http://www.codep.co.uk)

BIM Task Group: A progress update for infrastructure



Mark Bew, HM Government, BIM Task Group chairman

We have been working with the Infrastructure Intelligence team over the last few months to ensure we can bring useful, regular and relevant updates to the BIM programme as we run up to the 2016 public sector mandate and we hope you will find these updates interesting and useful.

The BIM programme headed up by the BIM Task group was commenced as part of the 2011 Government Construction Strategy and has been responsible for three key work streams

1. Defining the Level 2 "Package" of documents and standards to explain clearly and concisely how the BIM process works
2. Engaging with clients to help ensure they can procure BIM data in a practical and efficient manner
3. Engaging with the market, through the creation of the thirty five or so BIM4 groups

We anticipate using this column to bring you information about the task group's activities, but more importantly a series of how to guides and client case studies and interviews to help understand what has gone well and what would be as well to avoid.

For the realistic

achievement of the 2016 adoption date we have a final delivery to make. The contract for this final delivery will be placed by the end of September and we will be bringing you a first-hand interview with the winners of the £1M contract to deliver the "digital Plan of Works" (dPoW).

Those of you familiar with the buildings-led RIBA plan of work or Network Rail Grip process will be familiar with the concept of a staged delivery specification, but for the first time in the world the UK will again be leading the engineering field with a dPoW that not only identifies traditional deliverables such as specifications and reports, but digital deliverables to be provided directly from your BIM tools.

We will also be bringing you news about the UK led EU BIM Task Group and the new Level 3 strategy that is nearing completion, which will start to not only bring further benefits for digital construction and operation, but also bring clarity to some of the aspirational Smart City services of the future.

*If you need further information please visit [www.bimtaskgroup.org](http://www.bimtaskgroup.org) you can also register for our round the parish newsletter by e-mailing: [info@bimtaskgroup.org](mailto:info@bimtaskgroup.org)*





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## Opinion



Peter Hansford, chief construction advisor, HM Government

### Infrastructure Carbon Review: critical challenge

When I started as Government Chief Construction Adviser I was conscious that as an industry we had two apparently conflicting challenges – to reduce the cost of creating our built assets and to reduce the carbon emissions resulting from their construction and operation.

The cost challenge is the domain of the Cabinet Office, Infrastructure UK and the Government Construction Board. The carbon challenge is owned by the Green Construction Board (GCB), an industry-Government partnership.

From the outset I was very keen to find a way of addressing this conflict. In short, we need to do both – but how? The Infrastructure Carbon Review goes a long way to providing the answer.

My predecessor, Paul Morrell worked hard to demonstrate the case for a low carbon built environment. The Low Carbon Routemap to 2050 was published in March 2013. Since then the GCB developed and driven carbon reduction measures across the construction industry. The GCB's Infrastructure Working Group is chaired by Anglian Water's Chris Newsome.

The Infrastructure Carbon Review One-Year-On Conference is on 27 October. This is a valuable opportunity for industry and Government to come

together to explore progress made over the last year since the Infrastructure Carbon Review was published.

The really important finding is that low carbon can equal low cost. This is a game changer. No longer are we looking at reducing carbon emissions at a premium. By finding ways to actively reduce whole-life carbon emissions, we are also reducing whole-life costs. The challenge is to transfer this learning to other parts of the built environment.

Since November 2013, major companies – clients, contractors, consultants and product manufacturers – have endorsed the key principles and pledged their commitment to using new technologies, techniques, processes and materials to reduce carbon and reduce costs. The aim is to cut over 20M tonnes of carbon a year from the construction and operation of the UK's infrastructure assets by 2050, without increasing costs – indeed at lower cost.

I'm looking forward to the conference. We'll be hearing from Government and all parts of industry on the progress being made. And I'm sure many other companies will pledge their commitments. Why wouldn't they? After all it makes great business sense and demonstrates real progress towards caring for our environment.



Ailie MacAdam, Senior Vice President, Bechtel

### HS2: It's all about the people; the right teams and the right relationships

In answer to the question 'who will build HS2?' I am certain that many of my industry counterparts, especially my fellow members of the High Speed Rail Industry Leaders Group, would raise their hand. As would thousands of potential suppliers, HS2 Ltd, Government officials, the many skilled workers, support staff, keen graduates and future apprentices who understand the wealth of opportunities that this project will present. To my mind, HS2 is all about people.

As well as offering a new source of work continuity for the construction industry, a project such as this will provide a golden opportunity to invest in training the next generation of engineers and construction professionals. HS2 will also offer a chance for small business owners (SMEs) to strengthen their enterprises. On the Crossrail project, for example, we have calculated that 58% of the supply chain is made up of SMEs.

And of course HS2's future passengers will experience improved journeys between many of the UK's key cities, and increased capacity will allow for better, local transport connections.

From my time on both High Speed 1 and Crossrail, I know just how challenging it can be to build trust,

understanding and keep everyone on the same page, both inside and outside the project. I remember just before the launch of Eurostar operations at St Pancras International in 2007, just how many people held a stake in getting that station open on time and on budget – and then there were those who would prefer it wasn't there at all! It was certainly a full-time job to work effectively with all of those stakeholders and keep costs under control.

I am often asked what I have found to be the biggest challenge on these mega projects. Developing a common vision of what success looks like and then working together with the multitude of stakeholders and interested parties to achieve that vision (without alternative agendas getting in the way) is definitely up there.

So, a secondary question to 'Who will build HS2?' is: 'Can you grow and maintain support, harnessing input and innovation from disparate groups for a project the size of HS2?'

The industry has gained some great experience from projects like HS1 and Crossrail – there is no doubt it can be done – with the right people, the right teams and the right relationships.



**Nigel Fines**, chief executive, Institution of Engineering and Technology (IET)

## Let's reform engineering GCSE rather than removing it

It's no secret that the engineering and technology sector is facing a significant skills shortfall over the coming years. According to Engineering UK, we need to find 87,000 new engineers each year for the next decade, which is an enormous challenge.

The IET's 2014 Engineering and Technology: Skills & Demand in Industry report found that the engineering skills shortage has become more acute with more than half of employers concerned that they can't recruit the engineers they need for their businesses to expand.

It is incredibly important that we have a range of routes into engineering – both vocational and academic.

That's why the IET is warning that the Government proposal to remove GCSE engineering could make the skills crisis an even bigger cause of concern for UK employers. Instead of scrapping the subject, it would make more sense to ensure it is fit for purpose by developing the qualification – perhaps to include more vocational elements – through the input of employers.

The IET has already highlighted this to Ofqual following their proposals to streamline the number of GCSE courses

as a result of low numbers of students studying the subjects. Engineering is one of the proposed casualties. Others include electronics and manufacturing GCSEs.

The 2014 GCSE engineering results show a 73% increase from 2,897 in 2013 to 5,027 students in 2014 successfully studying GCSE engineering. This suggests that there is a growing appetite for vocational GCSE subjects, so why not capitalise on this as an opportunity to attract more young people into areas of high demand and low supply such as engineering.

It is important that students engage with the discipline of engineering as early as possible. The engineering GCSE builds on key skills applicable to many areas and develops a systems thinking approach in addition to allowing for the application of mathematics. It also helps build awareness of engineering as a vocational career choice. If engineering is absent from schools, we risk fewer young people considering it as a career. This is a risk we can ill afford.

Rather than removing the subject, let's develop it so that we can produce the engineers and technicians we desperately need.



**Eduardo Niebles**, Managing Director, International Business, BST Global

## Big Data – an opportunity to be grasped

The volume of digital data is growing rapidly each year. In fact, it is thought the average person today processes more data in a single day than a person in the 1500s did in an entire lifetime.

Everyone today is an active participant in the amassing and sharing of digital data, whether from tweets, blogs, and video, unstructured data from corporate systems, or the "Internet of Things." The digital universe is expanding at a tremendous pace, creating new challenges and new opportunities for both individuals and businesses.

The current view in most executive meetings is that if you deploy "Big Data," your company will generate new ways of uncovering organization capabilities, or create new value that will separate the company from the rest of its competitors. In general, the consensus is that Big Data is best applicable around business strategy and finance.

But Big Data is much more than that. Big Data is also about the integration of data to better understand the business, clients, and employees at a more discrete level.

Take for example its use around smart cities. It is estimated that the world population will be 8.3bn by 2030 with 65M people added to the world's

urban population each year. That is equivalent to adding seven Chicagos or five Londons annually.

Adopting an integrative approach will be important to meet the strain on power, water and food resources that urban populations will create. Architects, consultancies, planners, and urban designers need access to more data in order to design and manage cities that people will want to live in and prosper. Data will be key to designing a new way of life.

Big Data can support the design and planning of smart cities through:

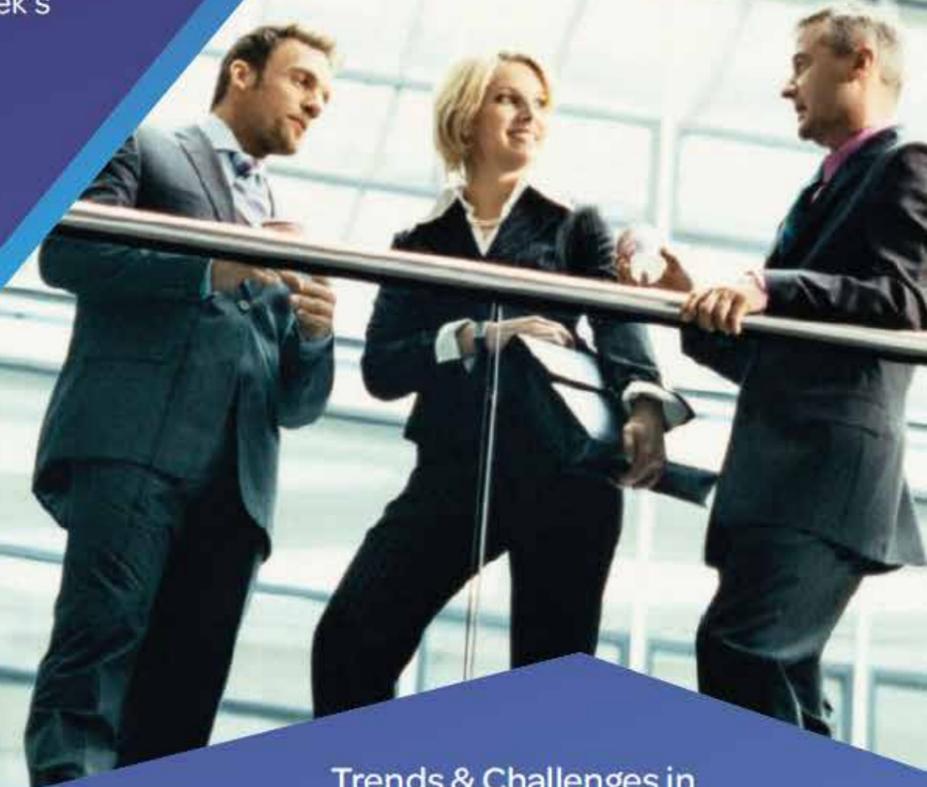
- Monitoring – analyse the data captured from sensors from homes, offices, and factories to determine how a city uses energy.
- Crowdsourcing – to capture and leverage data in real-time from citizens on how they commute or what spaces in a city or building they like the most (or least).
- Automation – to improve on the traditional project planning process.
- Transparency – Increase collaboration between government policy, clients, and contractors.

Big Data is an opportunity. The planning of tomorrow's cities will be reliant on information flow, and firms that are prepared to use the variety of data available are poised for success.

## European A&E firms state 26% of billable time is currently written off.

However, the best in class A&E firms recognise there is opportunity to improve visibility and processes to capture more billable time.

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**Jeannie Edwards**, HR director, MWH Global

## Due diligence around human resources is critical to successful mergers

Due diligence undertaken by companies thinking of merging is typically very dependent on the financials, the projects, backlog, pipeline, IT facilities and the legal aspects. But it must also include due diligence done by human resources.

In an industry where the raw material is people, who have a free choice and an inalienable right to operate in whichever company or industry they choose, understanding the factors influencing that raw material's decision to stay or go has a direct impact on the success or failure of the investment.

The likelihood of retaining people can be assessed by understanding the culture of the workforce as well as a desk study to understand the profile of the organisation's workforce and its stability.

The major risks should be identified and any potential deal breakers highlighted. Generally, but not always, these are related to culture, profiles including staff turnover as well as the cost of benefits and pensions.

Understanding the stability of the workforce, what entices people to stay and drives people to go, is critical to a good due diligence. Analysing staff turnover, length of service, and other metrics helps to form a picture of not

only the stability of the workforce but the style of management.

A very low turnover might indicate a workforce too comfortable and resistant to change. A very high turnover might indicate poor leadership. It's less likely to be related to poor pay and benefits; generally pay and benefits loom large only when other issues are involved.

Whether the deal is TUPE or not, the most important aim is to reap reward from the investment. It is of the highest importance then to identify the issues likely to emerge after integration.

It doesn't matter if these risks do not materialise, but it does matter if they do and hadn't been anticipated.

The risks must be quantified. "People will want to feel part of this company and feel valued" will mean little to decision makers. However, quantifying the potential loss of intellectual capital and corporate memory related to key individuals or the potential impact of the other risks identified enables more informed decisions.

Failure to highlight such potential issues puts the investment at risk. If these risks are not understood before the deal is struck then they can't contribute to the "go/no-go" assessment, nor can the price be adjusted to mitigate any likely effects.



**Derek Drysdale**, divisional director - Lean Improvement, Highways Agency & chairman, Lean Construction Institute UK

## Lean Construction - the way forward?

Lean construction has been around for some time but what really puzzles me is why it has not been adopted across the whole of the construction industry.

The excellent Government Construction Strategy 2025 initiative has made a great start with a 'pipeline' of work, the leadership council and BIM strategy. However, without lean thinking the ambitious targets will, in my opinion, not be achieved.

Although my day job is divisional director lean improvement with the Highways Agency I am also a trustee and director of the Lean Construction Institute - UK which is a registered educational charity the key aim of which is to encourage the adoption of lean thinking across the whole of the UK construction industry.

Over the last five years in the Highways Agency, where lean has been adopted enthusiastically across all aspects of the business, we have gathered a wealth of hard evidence which shows that lean works brilliantly.

It not only works for the benefit of the client and, in the case of the Highways Agency, the tax payer, but also supports the profitability of the supply chain. Today there are many pockets of good practice in lean construction, thanks to the work of some far sighted

and gifted individuals such as Professor Lauri Koskela and Glenn Ballard.

One of the most common questions I am asked is 'What is lean construction?' Well, put simply, it involves firstly understanding the needs of the customer whilst pulling value through the processes but relentlessly removing waste in all its forms. It sounds easy but it requires, like many good things in life, a lot of hard work!

The methodology is very much based on the Toyota Production system but massively adapted for construction. You don't even have to call it LEAN. The real danger is that you can lose your way and think that you are lean but in reality you are just touching the edges of waste!

Finally although I tend to shy away from Japanese terminologies there is one important word used in Lean which is Gemba - which means literally 'the place'. The best way to understand lean construction is to see it in action! So the LCI-UK Summit would be a great starting point to find out where you can see lean in action!

*Why not get involved in LCI-UK or come along to our summit on the 30th October 2014 at the Birmingham Metropolitan University? [www.leanconstruction.org.uk](http://www.leanconstruction.org.uk) for full details of the summit and much more*



**Paul Jackson**, chief executive, Engineering UK

## Careers in infrastructure must start in the classroom

A recent poll saw engineering come second in the top ten professions parents would like for their children. At 45% it was only four points behind doctors, slightly above lawyers and far more popular than banking.

Yes, it's fantastic that engineering is enjoying this level of status and desirability, but the next step is to generate a real understanding of everything the sector does so that in turn more young people are inspired to go into engineering.

If we're going to get the fresh talent required we need to ensure young people have access to first class careers information, advice and guidance.

We have been working with the Royal Academy of Engineering and major engineering institutions to present clear policy recommendations to address engineering's critical skills shortage. We need more specialist teachers in schools to drive teenagers' achievement and aspiration and we need to tie in Ofsted ratings with the rating of careers provision for 11 to 16 year olds.

All science, mathematics and design and technology teacher training should include a compulsory STEM careers module and that all teachers should spend one day a year in industry. We want

schools to be incentivised to increase take-up of maths and physics at A level.

To highlight the relevance of classroom learning, we are recommending that all 11-14 year-olds have at least four days a year of extra-curricular STEM activities.

For many the route into engineering will be a vocational one and driving take up of that option will need more than just an apprenticeships advertising campaign. It needs real support for real people taking (or considering taking) the vocational route.

As a proud father I helped my daughter on her journey to university, a well-trodden path that has clear steps. This simplified process and ease of application needs to be extended to would-be apprentices.

We must make it easier for young people who are keen to build on their learning with a single UCAS style application system for academic and higher vocational routes.

At every decision point we want our future engineers to receive up-to-date information, sound advice and a clear route to their chosen career. Whatever stage they're at we want to ensure they are inspired, encouraged and developed.



**Steve Bamforth**, chief executive, Griffiths and Armour

## A changing liability regime - back to the past?

The early 1980's saw the introduction and growth of new kinds of procurement mechanisms into the UK construction market, particularly design and build.

They were often hailed as a new way of working, delivering great efficiencies, more integrated ways of working and an unflinching approach to the management of risk, - all in the name of producing better, more consistent outcomes for clients and at a "guaranteed" price. Whether any or all of these aims were achieved is the subject of much debate but let's leave that for another day.

What is clear is that design and construct as a procurement mechanism drastically changed the liability regime for contractors and consultants alike. Substantially more liabilities were transferred down the supply chain - some may say "risk dumped" - in a way in which I don't believe too many were aware.

Until it was too late and design and build began to create legal issues that had not been seen before. Contractors and their consultants were faced with the problems of GMP contracts not to mention the legal complexities of

## "The buzz words are now integrated teams, BIM, a blame-free culture... etc etc..."

novation. By the time these issues were fully appreciated they had been locked into hundreds of thousands of contracts - and the impact on the professional indemnity market was inevitable.

Fast forward to the early stages of this decade and are we facing a similar situation. The buzz words are now integrated teams, BIM, a blame-free culture etc etc. All with the aims of delivering. Well yes, see above.

Are we in danger of falling into the same trap? Integrated teams and a blame-free environment (supported by BIM) are simply incompatible with traditional insurance arrangements.

We are faced with a choice. Do we ignore the problem and hope it goes away? It won't, they never do.

Or do we rise to the challenge and work with the insurance world to design innovative insurance products which fully support this brave new world of construction? A step back to the past or a leap to the future?

# Drive to the future of roads

Colin Matthews took over as the new chairman of the Highways Agency this month. He joins at a critical moment as the organisation reshapes from a government agency to a new Strategic Highways Company. *Antony Oliver* talks to him about the challenges ahead.

For the last six years Colin Matthews sat in the hot seat as chief executive of Heathrow while the business morphed, under direction from the Competition Commission, from giant airports monopoly BAA to a customer focused operation based around the world's biggest hub airport.

His new role as chairman of the Highways Agency clearly excites him, not least because government has committed to a long term investment plan to spend £24bn by 2021 on the nation's major road network – a radical turnaround after years of piecemeal underfunding.

Trunk roads and motorways are an integral part of the nation's economy. Yet they face unprecedented challenge with traffic forecast to grow a whopping 46% by 2040.

However, the planned restructure of the Agency into a customer focused private sector led business presents a major opportunity for Matthews to lead the transformation of this vast asset.

The Department for Transport outlined plans to convert the Highways Agency into a new government-owned Strategic Highways Company (SHC) in June when it published a suite of draft documents detailing the key elements that will create “a cohesive and robust governance framework for the new company”.

Critically, under this arrangement the new company will be granted a five year budget built to deliver against a newly agreed Roads Investment Strategy (RIS) which must now be developed by the end of the year ahead of a Spring launch of the new business.

The RIS will for the first time set out



Colin Matthews, chairman, Highways Agency

the long term vision for the strategic road network in England and, the DfT's draft documents say, will offer “long term funding certainty to enable the SHC to plan more confidently and effectively for the future, enter into long term contracts with suppliers and consider alternative and novel solutions to problems.”

“The RIS will, for the first time, provide the longer-term clarity that is vital for the companies who help plan, build and maintain our roads.”

That means being more efficient and the goal is to shave £2.6bn off the cost of running the roads over ten years. But it also means setting the business up to cope with the future demands of travellers. And that means embracing technology, building resilience in the face of climate change and working out where the funding streams will come from.

## Interview by Antony Oliver

**Government has committed to investing £24bn on national roads – a trebling of investment – by 2021. Is the Agency in shape to cope?**

Now is exactly the right moment to ensure that the organisation is in shape to spend that money efficiently. One of the key characteristics of the structural change that is going on is that we will be able to plan our investment over five years. Other industries have had five year plans for decades. You are obviously going to get better value for money if you can negotiate with your suppliers over a predictable flow of work across a reasonable period of time.

**British Airports Authority morphed from a public authority to a privatised customer-focused business. Will you take the Agency on a similar journey?**

It is categorically not about that. The roads are really important to the nation. They are a public asset and public owned and that is how I expect them to continue. What interests me is the operations and finding improvement – through new investment and in some cases through new technology. People in our organisation and elsewhere keep having ideas about making the network work better. That is my interest – no one has talked to me about ownership.

**But moving from infrastructure focus to customer focus is surely a critical part of your future plans?**

I think that it is an aspect. Thinking of users as individual people who want to know what is going on is something that customers expect and technology now

makes that more practical today. People understand that things go wrong but they want to know that someone is doing their utmost to fix it. I hope that we will become an organisation that is better at communicating to individuals rather than treating everyone as statistic. Each journey – each driver – matters.

**Traffic demand is estimated by the Department for Transport to rise by 46% by 2040 – how will we meet this target?**

The investment programme over the coming years is not going to deliver loads of new roads. It is going to be about improving junctions and connections and bottlenecks and all of the things that I think frustrate drivers. You can't do that overnight but progressively I hope users will be able to say that the network is getting better.

**At Heathrow you radically improved customer satisfaction. The Highways Agency now talks about roads users as customers? Is that important?**

I hope that is how we come to think of them. Historically the work of the Agency has not been tremendously visible and perhaps people take roads for granted. But I think that customers – drivers – will want to know more about what is going on and we are going to have to find better ways to tell them. If there is a hold-up we must be able to tell them accurately what it is, what is being done to fix it and how long it is going to take to clear. Certainly when I am driving those are the things that I want to know.

**Is tolling on your agenda to look at?**

It is not. As it happens personally I am not nearly as interested in all of those questions as I am in operational improvement – that is my job. The government owns the roads and it is up to them to decide the policy and how to run it. We will be looking to successive governments to be clear about that and as long as that is clear and stable it will put us in a good position to do a good job for the nation. Our job is to deliver.

**The Strategic Highways Company has to be set up ready to go by the end of the year – can that be achieved?**

My role is to make sure that the governance arrangements with the board work correctly and there is a lot to do. But don't let's get carried away – the really fundamental thing is to make the roads work better and if we successfully find ways to improve today's network then that is the basis for everything else working.



**The first Road Investment Strategy has to be ready by the end of the year. Are there risks that this will be rushed?**

I wouldn't put it that way. This is the first time we have done this so in subsequent years, of course, the routines mean that things will improve. But what I can say is that I am sure that, even in its first year it will be a better proposition than looking at it afresh each year. So of course it won't be perfect first time around but it will be better than it has been in the past.

**An independent watchdog will be created to represent the interests of road users. Does that require changes in attitudes at the Agency?**

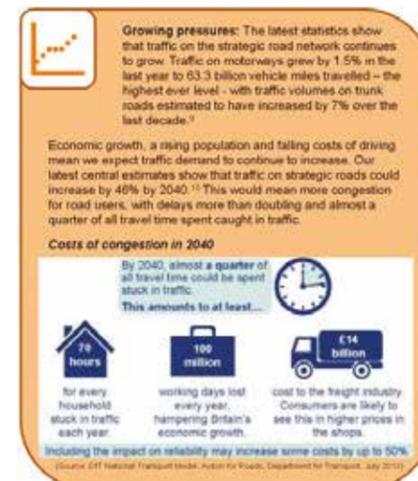
The public needs to have a means of knowing that we are doing a good job. So it is right that we have someone looking to see that we are efficient and that customer interests are being properly responded to. It is how other industries already operate so I don't think its revolutionary but it is a big change for us. And if it causes us to find better ways of working then that is also good.

**Can civil servants move towards a private sector model?**

All organisations need to continue to up their game and to provide better services to customers for less money. The Highways Agency has fantastic strengths and its people really care about doing a good job. It has much to be proud of. But all of that is history – judge us now on how much we can improve in the present and the future.

**Will there be a need to bring in new skills?**

A new structure will mean that there are things that we haven't done in the past that we will now have to do in the future. So there will be certain new skills for sure. Obviously with customer service and new technology I hope that we have our minds open to ideas from other people who run roads or other forms of transport.



**Stability for the supply chain is critical – do you agree?**

For a supplier to be really efficient then predictability is really important – they can build up their resources and capability because they will have a consistent relationship with us over five years. You won't hear me talking in strident terms about one contracting model and that nothing else works. But you will see us focused on the best possible relationships with suppliers – commercially sharp with tension but with collaboration to ensure delivery.

**How will you create a sustainable highway network embracing new and emerging technologies and trends in climate and weather conditions.**

There are big challenges and motor manufacturers and others will be working on technologies that will increase efficiency and we need to make sure that we can exploit those. This is not a business as usual, static environment. But who knows where the technology will go? Is it going to be in the car, in gantries or in the road? I don't know. But we need to make sure that we are up with the best ideas developing around how to make roads more efficient and carbon efficient.

**And finally...where is the next runway going to be built in the UK?**

I will leave you to debate that with others who are part of the industry. But it is worth saying that every journey, whether by rail or aeroplane, typically starts off with a road. So when we are planning our roads we need to make sure that it serves the country well by connecting well to rail and well to airports. We are interested in rail investment and in airport investment so that we can make sure that roads serve those other modes.

# Water: Ofwat gets tough

Collaboration with customers and the supply chain is essential if water companies are to deliver the challenging cost savings demanded by the regulator for AMP 6, writes *Bernadette Ballantyne*.

**A**chieving a five percent reduction in water bills across the industry between 2015 and 2020, while delivering better service, will not be an easy challenge for water companies. Investment plans are still huge, at £43bn for AMP 6 but the pressure to justify investment is greater than ever.

Right now water companies are cogitating over the draft determination delivered by Ofwat at the end of August and have until 3 October to respond. In some cases this means providing more evidence to justify why their proposed spend is higher than that expected by the regulator. "Some companies provided excellent, customer-focused plans. Others did not include sufficient evidence to justify their plans, and so we stepped in to make sure customers get a fair deal," says Sonia Brown, chief regulation officer at Ofwat.

"These are draft decisions and things could still change. Companies will be looking hard at where they need to submit new evidence and we will also continue to challenge hard to make sure that our final decisions result in the best possible deal for customers," she adds.

Water companies with the most work to do are Bristol Water, Thames Water and United Utilities. The regulator wrote to the three firms ahead of the draft determination to highlight its concerns and give them additional time to respond. At £562M Bristol Water's estimates for wholesale water costs were 57 percent higher than those of the regulator who proposed investment of £359M. United Utilities meanwhile proposes investment in wastewater of £3.41bn compared to a regulatory estimate of £2.65bn.

And Thames Water has been forced to reconsider its cost estimates for the Tideway Tunnel during the next five years, which are forecast at £655M compared to a regulatory estimate of £324M.

A significant proportion of this is related to Thames' assertion that it



**"We stepped in to make sure customers get a fair deal"**

**Sonia Brown, chief regulation officer at Ofwat**

might have to delay the appointment of an Infrastructure Provider (IP) until October 2015 – after the general election. In this scenario Thames Water says it will need to invest an additional £110M however it did not identify what activities this investment would be required for meaning that Ofwat won't sanction it without more data.

United Utilities meanwhile failed to demonstrate the need for several major wastewater programmes as well as adequately justify its costs.

At the other end of the spectrum South West Water and Affinity Water have been granted "enhanced status" by the regulator, meaning that Ofwat is already convinced that their plans offer best value for the customer and has therefore approved their spending plans early.

Whether the water companies have enhanced status or not the challenge to maintain and upgrade their assets more cost effectively remains. "For the industry this is not about driving savings through cheaper widgets, it is about the

outcomes that we are looking to provide and how we deliver those outcomes through different delivery models that are more about collaboration and taking out the inefficiency that is perceived to be in asset creation," says Andrew Cowell, head of the ACE Utilities Group and engineering director at MWH.

As the regulatory feedback shows, data is all important for this. "BIM is going to play a role in AMP 6 because it enables some of these more efficient processes linking asset creation and operations through data and then into asset life cycle information management which completely aligns with the totex agenda," says Cowell.

Water companies are already embracing collaborative working. This month Anglian Water announced two new AMP6 alliances worth £450M, which could run for as long as 15 years. From 2015 to 2020 Clancy Docwra and Kier MG will deliver Anglian Water's £200M Integrated Metering and Developer Services (IMDS) programme. Barhale, Kier MG and Morrison Utility Services will deliver the £250M Integrated Operational Solutions (IOS) programme, consisting of small replacement and refurbishment projects.

These awards followed on from an earlier announcement in May that Balfour Beatty, Barhale, Grontmij, Mott MacDonald, JN Bentley, MWH and Skanska would be delivery partners for the main capital works programme. All of Anglian Water's alliance arrangements have the potential to run until 2030 subject to five year reviews.

Ofwat will publish its final determinations on 12th December.

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# Putting a new lens on carbon

Since 2006 Anglian Water has gone through a step change in its understanding of carbon management Carbon manager David Riley explains the challenge.

To those leading organisations who have driven carbon reductions through their business the link between reducing carbon and boosting business efficiency will come as no surprise.

Carbon is an excellent proxy for the raw materials and energy used in constructing and operating assets and where lower carbon solutions have been delivered the evidence also points to lower cost.

We have seen significant business efficiencies delivered through our £2bn capital programme.

The vision of investors and directors to deliver sustainable low carbon solutions is understood and implemented through the business and supply chain.

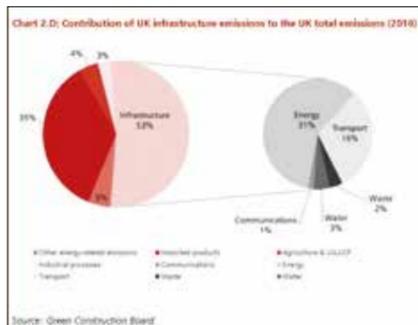
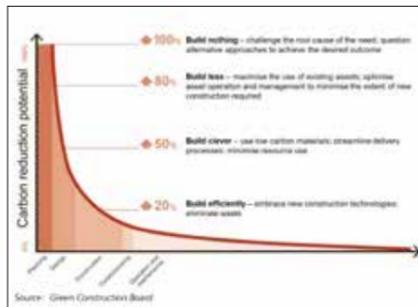
This has been backed up by clear goals within our 'Love Every Drop' campaign to:

- Halve the capital (embodied) carbon of assets built in 2015 from a 2010 baseline
- A 10% reduction in operational carbon in real terms by 2015 from a 2010 baseline.

At a tactical level we have in place a robust governance process, where both capital carbon and operational carbon are challenged against a baseline in the capital delivery process on three separate occasions. This is one of the steps we have taken to ensure the lowest carbon and cost solutions are identified and delivered, together with a programme of training workshops and an in house developed carbon modelling tool assisting engineers in optioneering designs.

With leadership creating the environment and driver for low carbon low cost solutions, innovation is the engine especially within the value chain.

As Chris Newsome, director of asset management at Anglian Water stated in the HM Treasury Infrastructure Carbon Review, "We have gained real value from



**Building a strong link between low carbon solutions and cost reduction is critical to the future of infrastructure.**

lower carbon solutions. The greatest benefit comes from joining up the value chain, with the client taking the lead in defining clear 'low carbon' targets and being responsive to the opportunities that are offered. That's what leads to positive sustainable outcomes."

Early collaboration in the design process and the setting of clear expectations, have been fundamental in allowing our supply chain to deliver innovation, together with the rewarding of results that benefit all parties.

Avoiding over prescriptive specifications and enabling the supply chain to challenge standards, has also removed some of the previous blockers to innovation.

Along with leadership and innovation, procurement has been

recognised as the third vital step. We have made clear within our procurement tendering process that we want to work with suppliers who measure carbon and have clear reduction strategies in place.

The HM Treasury Infrastructure Carbon Review, launched in November 2013, aligns very closely with the principles being applied within Anglian Water. In reducing capital and operational carbon, the key messages of the report highlighted:

- It reduces costs
- It unlocks innovation and drives better solutions
- It drives resource efficiency
- It provides competitive advantage and export potential
- It contributes to climate change mitigation

At the start of our carbon journey we understood that individual parts of our supply chain could all deliver small carbon reductions when required. However, significant reductions could not be delivered without the whole of the supply chain being aligned and incentivised with the same objectives of reducing carbon.

The response to the carbon challenge from both engineers within Anglian Water and the supply chain has been fantastic.

In 2012 an extension to Bedford Water Recycling Centre was completed to treat a 30,000 population increase.

The scheme was delivered with a 66% reduction in capital carbon against baseline, 43% reduction in cost against baseline and the site having an overall reduction in operational carbon against a forecast increase due to significant improvements in site energy and process efficiency.

## Progress review

The Green Construction Board's Infrastructure Carbon Review One-Year-On conference takes place on the 27th October will provide an insight into how other leading infrastructure organisations are responding to the carbon challenge.

To register your interest in attending this free event email [nicola.walters@bis.gsi.gov.uk](mailto:nicola.walters@bis.gsi.gov.uk).

For detail of the Infrastructure Carbon Review visit: <http://www.greenconstructionboard.org/index.php/resources/infrastructure-carbon-review>

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**Maria Eagle MP**  
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**John Cridland CBE**  
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# A new world of risk

The effective management of risk has always been a crucial factor in the success of businesses in the infrastructure sector. *Antony Oliver* explores the challenges of a changing professional and commercial environment.

As every professional in infrastructure knows, risk is an integral and unavoidable part of the business. And to be successful, it is something that must be embraced, understood, managed properly and, of course, priced for accordingly.

Yet history is littered with examples of things going wrong.

Tales of unexpected ground conditions and poorly specified waterproofing; of misunderstood contract obligations and limits of

liability; of badly drafted clauses; of overestimated revenue models; and of misaligned expectations between partners and across the supply chain.

The reality is that infrastructure, and the projects that deliver it, are complex beasts involving a multitude of different stakeholders whose objectives and drivers are quite often, usually for very good reasons, misaligned.

The net result of this misalignment continues to be time-consuming, business damaging and costly

professional liability claims.

Ten years ago insurance broker and risk management specialist Griffiths & Armour put the spotlight on the causes and consequences of poor risk management across the construction industry. The work was a blatant attempt to help the industry to embrace better business practice and so avoid the rising tide of these professional liability claims.

Today, the challenges of managing risk in this already complex sector continue to increase. Whether it is

the drive towards collaboration, the emergence of new technology such as Building Information Modelling, the rapid rise in post-recession workload, the integration of teams to meet changing client needs or the emergence of truly global businesses, it is clear the professionals need to constantly review their approach.

And with this end in mind Infrastructure Intelligence is working with Griffiths & Armour over the next 18 months to help identify the best approaches to meeting these new challenges.

Using some new research work, regular conversations with the industry at special breakfast meetings and a comprehensive review of the best practice (and worst practice) examples currently in the business, the aim is to help the industry to really understand the business and professional benefits of properly managed risk.

That said, the messages from Griffiths & Armour's report still ring loud and clear about the sheer waste of time and resources caused by poorly managed risk on projects. And while some might say it is in the interests of the insurance industry to limit the number of claims against professional indemnity policies, few would disagree that it is unquestionably in the industry's interest to stay out of court.

As this 2005 work points out, risk is an inherent part of any engineering and architectural project and as such is a critical business issue in infrastructure. Implementing robust and effective strategies to manage risk is therefore vital to the long term health of the sector.

The key issues to bear in mind when assembling these strategies to manage risk and avoid claims remain as true today as they did ten years ago and come down to three simple ideas based around:

- Identifying the risks
- Quantifying the harm arising from the adverse effect
- Minimising the likelihood of the harm being realised

Across each of these headings there remains a critical need to share best practice across the industry as a fundamental step in helping to raise the collective performance when it comes to managing risk. Only by learning from the successes and failings and embracing behaviour change will we move towards a lower cost, less adversarial future.

With support from Griffith & Armour, Infrastructure Intelligence has already brought together a number of

important case studies on-line at [www.infrastructure-intelligence.com](http://www.infrastructure-intelligence.com) that highlight lessons to be learned when avoiding contractual liability claims.

This work will be expanded over the next 18 months to assemble a comprehensive information resource to help guide professionals towards a lower claim, lower cost future.

Along the way some new issues must be tackled and discussed as the industry embraces the 21st century world of global infrastructure. These new critical issues include:

**The impact of BIM technology on the market:**

- Technology and in particular the introduction and potentially mandatory use of Building Information Modelling to public sector procurement is having a major impact on the way the industry operates.
- But do businesses recognise this change as a potential risk to manage? And are steps being taken to identify and minimise the risks and costs of the impacts of this new technology?

**The role and challenge of integrated project insurance**

- With BIM technology comes a desire and an inherent obligation to embrace silo-busting – and blame sharing – collaboration across the project team in which the old model of individual professionals shouldering proportions of risk is exchanged for a collective approach to achieving the client's outcome.
- But is the industry, clients or, indeed the insurance market, ready and prepared physically or emotionally to move from the traditional liability, and corresponding professional indemnity, model towards an integrated project insurance future?

**The expert client versus the inexperienced client**

- As the recovery builds we see a distinct difference in approach emerging between expert clients compared to inexperienced clients. But there remains huge questions around how infrastructure firms, both large and SME, understand, embrace and exploit the risks associated with this change.

**The consequences for business in a growing market**

- The infrastructure market in the UK is expanding rapidly putting increasing demands on the supply chain while clients become increasingly demanding in terms of price and

service. Management of risk is becoming increasingly difficult across the supply chain.

**Working around the world – geographic liability issues**

- Infrastructure is now a global business, not least as we see the recent rash of business mergers increase the number of super-large global businesses tackling a workload on multiple continents.
- Managing risk up and down the supply chain is therefore increasingly complex and without proper global strategies in place to manage risk there is increasing opportunity for claims and disputes to arise on a global scale.

These and many other issues will be tackled and discussed over the next 18 months as we work with the Griffiths & Armour team and its partners to help prepare the industry for the 21st century risk environment.

“Management of risk and the avoidance of claims is a key priority for every firm. Best practice brought to light must be considered by all for possible adoption within their own businesses,” said the 2005 research paper. Words that remain equally relevant today.

## 80th Anniversary Charity Challenge

This year, Griffiths & Armour celebrates its 80th year as insurance brokers.

To mark the anniversary the partners and staff have committed to make a difference by taking part in a number of challenges to raise £80,000 for two chosen charities, KIND and Prostate Cancer UK.

Major fundraising events have included a 10k run and 15 mile walk in May and an 80 mile bike ride in June. This month the firm hosts its special anniversary gala at Liverpool Town Hall.

To support the work visit Griffiths and Armour's web page at [www.griffithsandarmour.com](http://www.griffithsandarmour.com)

Griffiths & Armour

# Chinese infrastructure dominates shortlist for 2014 FIDIC project awards

Just one UK infrastructure project has made it to the shortlist for the 2014 International Federation of Consulting Engineers (FIDIC) Awards for outstanding major projects.



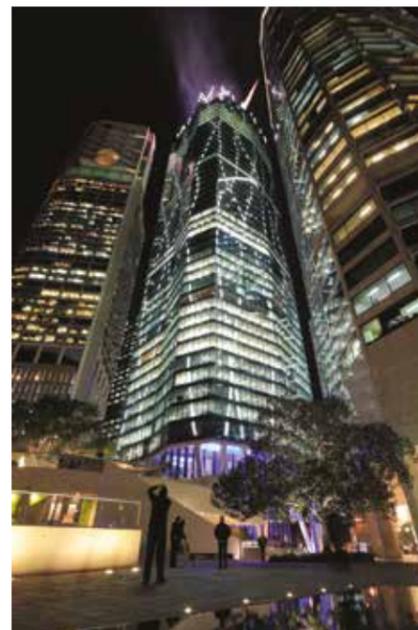
**Above:** AECOM was design consultant on China's Taizhou Yangtze River highway bridge.



**Left:** Mott MacDonald has been technical advisor to Southern Water's Cleaner Seas for Sussex scheme from the very beginning of the project. Flows from the Brighton & Hove catchment are diverted to the new treatment works, at Peacehaven, where preliminary, primary and secondary treatment are provided to a high standard before treated effluent is discharged via a 2.5km long sea outfall.

**Top right:** Arup Australia's One One One Eagle Street

**Bottom right:** WSP's Hearst Headquarters



in the global projects shortlisted such as AECOM which was design consultant on China's Taizhou Yangtze River highway bridge – the world's first long-span, three-pylon suspension bridge.

The awards recognise outstanding projects that support and promote the aims of the federation which are to promote the use of international FIDIC best practice and resources to achieve quality projects that help world economies and communities to develop.

Eight Chinese projects made the shortlist, with six coming from the USA and three from Australia and Spain.

Winners will be revealed during the FIDIC International Infrastructure Conference in Rio de Janeiro at the end of September.

## THE SHORTLIST:

### Australia

- Ipswich motorway upgrade Dinmore to Goodna project – Parsons Brinckerhoff (PB) and SMEC Australia (SMEC)
- Airport Link, Northern Busway and Airport Roundabout upgrade project – Parsons Brinckerhoff and Arup
- One One One Eagle Street – Arup Australia

### Brazil

- Tucuruí Locks System: Studies, preliminary and final design and technical assistance – Engecorps Engenharia S.A – Grupo TYPASA

### China

- Xi'an Metro Line 2 – China Railway First Survey & Design Institute Group.
- Hangzhou Bay Bridge – CCCC Highway Consultants.
- Taizhou Yangtze River Highway Bridge – Jiangsu Province Communications Planning and Design Institute, CREC Bridge Survey and Design Institute Group & Tongji University Architectural Design Institute (Group).
- Megaton Ethylene Project of Sinopec Zhenhai Refinery & Chemical Company (ZRCC) – China International Engineering Consulting Corporation and Sinopec Engineering Incorporation
- The First Line of West-East Gas Transportation Pipelines – China Petroleum Pipeline Engineering Corporation, China Petroleum, Southwest Company, Petrochina

Planning and Engineering Institute, CNPC PetroAdvisory and China International Engineering Consulting Corporation

- Shuibuya Hydropower Project – Changjiang Institute of Survey, Planning, Design and Research
- Zhengzhou Rail-cum-Road Yellow River Bridge on Beijing-Guangzhou High Speed Railway – China Railway Major Bridge Reconnaissance & Design Institute and The Third Railway Survey and Design Institute Group Corporation (TSDI)
- Taihang Mountain Extra-Long Tunnel Group of Shijiazhuang -Taiyuan High Speed Railway Project – The Third Railway Survey and Design Institute Group Corporation (TSDI)

### France

- La Caserne Dam on the Couesnon River – BRL Ingénierie – Luc Weizmann Architecte – SPRETEC – ANTEA
- Jacques Chaban-Delmas vertical lift bridge – Egis Jmi – France

### Portugal

- Braga Municipal Stadium – PROAFA – Serviços de Engenharia (AFACONSULT)

### Spain

- Cerro Prieto. PV Technology Evaluation Plant – Iberdrola Ingeniería y Construcción.
- Madrid M-30 M-RÍO Acciona Ingeniería – GINPROSA Ingeniería S.L. – Tecnica y Proyectos (TYPSA) – Intecsa-Inarsa.
- Ciudad Grupo Santander – Santander Group City – Tecnica y Proyectos (TYPSA)

### Turkey

- Konya Science Center – Icosa Systems – Endeco Engineering Design Consultancy Co.

### UK

- Cleaner Seas for Sussex – Mott MacDonald

### USA

- Rion-Antiron Bridge – An Ode to Poseidon – Langan International
- Montgomery Point Lock and Dam (MPLD) – MWH Global
- Hearst Headquarters – WSP Group Inc.
- Mokelumme River Project – GHD.
- Inner Harbor Navigation Canal Lake Borgne Surge Barrier Project – Tetra Tech
- Central Link Section 710: Beacon Hill station and tunnels – Hatch Mott MacDonald

**M**ott MacDonald's mammoth £300M Cleaner Seas for Sussex sewerage upgrade project for Southern Water is the only UK project on the 26 strong FIDIC Awards shortlist which this year is dominated by major infrastructure projects in China.

However, other UK firms are represented on the list of outstanding global projects this year, including Parsons Brinckerhoff and Arup on the shortlist for their joint venture work on Brisbane's Airport Link in Australia. Also on the list is Parsons Brinckerhoff with SMEC Australia for the Ipswich motorway upgrade project in Brisbane and WSP Group for the Hearst Headquarters in New York.

Other UK firms have been involved

# Closing the deals

Summer merger romances are moving towards marriage.

**C**H2MHill said this month that it is to cut 1200 jobs or 5% of its staff worldwide in a bid to “right size” the business in response to anticipated growth that did not materialise. The business purchased Halcrow back in 2011.

It is the latest company involved in recession prompted UK merger activity to have something of a strategic rethink.

Elsewhere URS, purchaser of Scott Wilson in 2010, is well on the way to being sold to AECOM in a game-changing \$6bn deal. And Balfour Beatty is about to offload its 2009 Parsons Brinckerhoff buy to WSP at a whopping 100% profit, a deal which followed and epic tussle with rival contractor Carillion which wanted to merge with Balfour’s and hang on to PB.

Even Hyder Consulting, which having floated in 2002 managed to avoid falling prey to larger competitors until now, is succumbing to the embrace of ARCADIS – which itself worked hard to see off rival Hyder suitor Nippon Koei.

And while no one is saying that the past merger activities have led directly to the current rash of business sales and job cuts, it does seem that strategies dreamed up before or during recession haven’t necessarily carried through to recovery.

Both in terms of sustainable growth and in creating an integrated service offering it seems that much of the early aspiration for business development and cost savings hasn’t necessarily played out.

So having put tens of thousands of employees through a summer of turmoil will the latest merger victors do better this time around?

One of the main justifications for the new round of mergers is that size brings synergies (otherwise known as economies of scale) that will benefit clients. And for multi-national, private sector clients that could well be right.

But for public sector clients operating only in their home markets the case has still to be made.

Highways Agency chief executive Graham Dalton voices the concerns of many. “When a supplier gets to a huge scale it is far more likely to want to shape the service it offers round what it thinks will generate margin or turnover, not on what the client wants,” he says.

“And because that sort of business will

have a large range of what seems relatively small customers in terms of percentage of turnover, it will be much less responsive and potentially less innovative.

“A smaller firm will put some very high quality intellect into being innovative and demonstrating that it is aligned with a client’s needs whereas bigger businesses can be slow to change and over time there is the potential for a worse deal for the client.”

There is also a fear that the UK’s major clients may also find themselves not quite as important to the new breed of globally focussed mega-businesses as they once were.

For example, will a giant, international organisation send its chief executive or chairman into meetings with clients to demonstrate commitment as the “traditional” mid-sized businesses do now? Perhaps yes; perhaps no; perhaps don’t know.

But those questions are some that the men and women driving the newly merged super-companies will want to answer as a priority, because they also know that the UK’s infrastructure clients do also see potential benefits from the creation of bigger consultancies.

“If consolidation results in stable businesses, better able to promote great engineering, great people and great supply chain capability, that’s good for us,” says London Underground capital programmes director Miles Ashley.

And at a time when good human resources are in high demand, working with one supplier which a client knows has the ability to respond to programme changes or new requirements by bringing in the necessary people in terms of numbers or knowledge would be a big advantage. “That’s what scale ought to get us,” Dalton says.

So right now all eyes will be on the men in the hot seats of the latest rash of mergers. And arguable with AECOM’s Steve Morriss taking on the role of leading what will be an 18,000 strong AECOM Europe Middle East and Africa operation post URS merger, that puts him in the hottest seat of all when it comes to building client confidence.

How he and his new management team manages the size and power in favour of local public sector client satisfaction could be a model others will want to emulate. And given the size of the challenges being set by 21st century public clients, it is unlikely that scaled up business-as-usual will be the solution. A more compelling offer can – and surely must – now be put on the table.

So across the public and private infrastructure sector we should expect that, to generate the necessary synergies and savings, the on-going trend of business consolidation will lead to some exciting and game changing shifts in procurement and delivery. JW

## Watch out for 16 October

Completion date for the AECOM/URS merger and ARCADIS/Hyder is 16 October. WSP/PB will follow before Christmas it is anticipated.

US consultant AECOM is paying £3.7bn for URS and the move will create a business of 95,000 staff with annual revenues of £11.7bn and pretax profits of £800,000.

Dutch consultancy ARCADIS’ offer for Hyder of £7.50 a share puts the value of the UK consultancy at £296M. The combined business will employ 26,000.

Canadian firm WSP is currently on track to buy Parsons Brinckerhoff from Balfour Beatty for £820M creating a combined business of 31,000 employees with net revenues of £1.4bn.

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# The apprentices

Consultants and young people alike have grabbed the opportunities offered by new engineering technician apprenticeship schemes. This month 600 will be in training and for the future 1500 is an achievable target. *Jackie Whitelaw reports.*



Technical Apprenticeship Consortium chairman Graham Nicholson (third right) with some of Tony Gee & Partners apprentices; left to right, Craig Rigden, Karim Mahrach, James Edmed, Luca Turner and Sam Ashman.

This month three hundred apprentices start out to become engineering technicians through the Technician Apprenticeship Consortium – led by a group of 19 engineering consultancy firms from around the country.

Overall 600 young people will be in training with UK consultancies and a further 100 will have qualified under the scheme to Engineering Council competence standards for engineering technicians. This makes them eligible for membership of a professional institution as technician engineers.

The enthusiasm from young people for the apprenticeship opportunity is evidence of the need for the scheme. "This is not just to do with the financial issue of wanting to avoid a huge university student loan," says TAC programme manager Sheila Hoile.

"The TAC scheme gives people a genuine choice about whether they go to university or not. As an industry

we have a fixation about academic qualifications but people all learn in different ways. It is very telling to hear a large number of our apprentices say 'I wanted to do engineering but I couldn't stick another three years of book learning; I wanted to work.'

According to current TAC chairman Graham Nicholson, executive managing director of Tony Gee & Partners: "The real power of TAC is that it can influence the colleges who provide the day release training. We help set the curriculum and make sure the colleges deliver what they have said they would.

"In the old days the issue used to be that the students didn't turn up. But in extreme cases now it is the lecturers who don't turn up. If we are not happy we have much more power as a group of employers to demand change."

TAC has withdrawn students and therefore funding from colleges that are not meeting its standards.

"These institutions are slowly

beginning to realise that it is a commercial world out there," Nicholson says.

From Sheila Hoile's point of view the employers too are changing their ways. "In the 1990s consultancies became complacent about their workforce planning. The default was to hire graduates whether they needed graduates or not and the result was that you got demotivated graduates doing work they shouldn't be doing.

"What TAC has done for nearly all the member companies is that it has set them back looking at workforce planning and that has had a significant effect. They are now asking themselves do we need as many graduates or is it better to have a mixture of technician apprentices and graduates."

Nicholson agrees. "For years at Tony Gee we have sponsored 10 undergraduates a year through university and that has provided us with our talent for last 15 years. We see the

apprenticeship scheme doing exactly the same, building our talent for the future. We are recruiting three apprentices this year taking our total to eight in a staff of 350 but that is just the start."

The intention is to bring people in who want to be technicians though some will want to go on to a full degree and Nicholson says the companies will help with that.

"But really we want our apprentices to reach a level where they feel comfortable. That will be a very high technical status – incorporated engineer level – and they will be delivering the modelling and drawing capability we need to meet all the changing BIM requirements," he says.

"The young have a natural ability to work with the software but no engineering expertise. We can harness that ability and teach the engineering. Ten years on, with experience, these young people will be incredibly valuable and useful."

TAC is not, however, planning to develop a BIM apprenticeship. "BIM is a process," says Hoile. "You need to understand the engineering first in order to be able to use it to best effect so we want our apprentices to learn their

engineering skills."

The age range of apprentices is quite wide. The requirement is for five GCSEs at grade A-C including Maths (B), English and a science subject. So most apprentices start at 16-17 fresh from GCSEs. But there are also those who realised A levels were not for them, people who want to be engineers but studied the wrong A levels for a university course or those in their 20s who realise that an apprenticeship is the best way to retrain.

Apart from getting their education paid for by their employers, apprentices also receive an average starting wage of between £12,000 and £14,000 a year. There is no shortage of enthusiastic applicants.

One of the purposes of TAC when it was created was to increase the diversity of the engineering workforce including women, ethnic minorities, the disabled and those from disadvantaged backgrounds.

This says Hoile takes some work. "Last year with the Royal Academy of Engineering, the Construction Youth Trust and WISE, we focused on young people with no university family background and schools in socially

deprived areas. We ran some day courses and gave them a day's work experience. In particular, we helped them fill in the application forms – most application processes put these young people at a serious disadvantage. We took our ethnic mix from an apprenticeship standard of 5% to closer to 20%. What we realised was that if companies are serious about diversity they are going to have to put the effort in."

TAC is expecting to grow further. In terms of apprentice numbers "the exponential growth – 8-600 in four years – is not going to carry on," Hoile says. But I think taking on 500 apprentices a year is possible in the short term.

Are more employers welcome to join TAC? "Yes of course," says Nicholson. "But we are determined that we want employers who will be passionate about the scheme and will get involved especially with the colleges.

"It is for the companies to realise that there is this huge potential source of talent out there. And it is up to us all to bring them in and train them. And help our own resources down the line.

"The real benefits will be realised in five or 10 years time. It's about building for the future."

## TAC: Companies united to get the training their employees need

The 600 apprentices now in training in consultancy is a remarkable step forward from 2010 when the first eight in the TAC scheme went into training.

Back then Transport for London, through its engineering and project management framework, demanded that companies wishing to work for it accept the Greater London Authority's strategic labour needs and training commitment which included a target for recruiting apprentices.

There were very few apprentices in training with consultants at that time and if there were they were not associated with an apprenticeship framework.

It was Mott MacDonald that grabbed the bull by the horns and established a consortium of six large engineering consultancy practices to plan and deliver an advanced technician apprenticeship in civil engineering. Those six were Mott MacDonald itself, Arup, Capita Symonds, CH2MHill, Hyder and WSP. In the space of nine months the consortium had gained approval for an apprenticeship framework, chosen a training provider by tender and started those first eight technicians on a day

release course at South Thames College while employing them.

Since then TAC has gone from strength to strength. Forty apprentices started course in September 2011, 140 in September 2012, 200 in 2013 and now 300 this year.

Advanced Technician Apprenticeship Frameworks are in place not just for civil but also building services engineering with graduates of the scheme able to join the Institution of Civil Engineers and Chartered Institution of Building Services Engineers.

A new Railway Engineering Design Technician Apprenticeship has now been approved and will start in September 2015 with another to follow for



"What TAC has done for nearly all member companies is set them back looking at workforce planning"

Sheila Hoile, TAC programme manager

Transport Planning shortly afterwards.

Fourteen colleges are now members of the network with a service level agreement in place as to what employers expect from them in respect of the care and education of their apprentices.

### TAC companies – national level

AECOM  
Arup  
Atkins  
BDP  
Capita  
Clancy Consulting  
Crofton Design  
CH2M Hill  
Hyder Consulting  
Jacobs Engineering  
Mott MacDonald  
Mouchel  
Parsons Brinckerhoff  
Peter Brett Associates  
Tony Gee & Partners  
Troup Bywaters and Anders  
URS  
Waterman  
WSP Group

[www.tacnet.org.uk](http://www.tacnet.org.uk)

# A star apprentice

Hyder's apprentice programme is going from strength to strength. In the current intake, the design and engineering consultancy has 10 apprentices working across the typically core civil engineering sectors such as geotechnical, highways and rail, as well as two with its IT team. As one of the founding members of The Apprenticeship Consortium, Hyder has remained committed to supporting young talent find alternative routes into the profession.

According to Chantelle Ludski, Hyder's HR and Change Director: "I'm a firm believer that an apprenticeship programme adds value to both the individuals and the business. Our apprentices are enrolled onto Hyder's industry recognised Steps to Excellence Programme (STEP), which adds a broader



Alexandra Ayres and Aaron French-Gibbens

business dimension to their technical experience. Whilst they are applying the theory they're learning in college, they are also boosting their commercial awareness through modules such as project management, key account management and general management principles. From a business perspective, their enthusiasm and contribution to the team cannot be underestimated."

Aaron French-Gibbens is an apprentice who recently qualified as a Technician in the Transport Planning and Urban Design team. He said: "I would recommend an apprenticeship without a shadow of a doubt. I believe if you know what you want to do,

then you should jump straight in. An experienced Apprentice/ Technician and eventually Graduate can have 7-8 years' more experience than someone who has gone the university route. Both are excellent options, but it is all about what suits the individual. An apprenticeship suited me and I feel I am progressing each day."

Alexandra Ayres is an Apprentice Civil Engineer in the London transportation team. She joined Hyder in August 2013 whilst studying for a Level 3 BTEC at The College of North West London. She said: "I think an apprenticeship is the best way to start a career as you are able to experience and understand exactly what you are learning at college. I'm able to apply the concepts and theories to the projects with which I'm involved. Plus, you can take it as far as you are willing to go. Working for a multinational like Hyder, I have the opportunity to be involved with major infrastructure projects all over the world, such as Doha Expressway, as well as those closer to home, such as a city cycle scheme."

# Infrastructure Intelligence launches new digital career hub

The brand new Infrastructure Intelligence Careers Hub gives the insight and information to build your career in infrastructure plus unique access to the best employers and greatest opportunities around.

The new resource also gives unique access to the best employers and greatest opportunities in the recruitment market, acting to support the industry in its efforts to both hire and retain the best staff across the global market place.

Infrastructure Intelligence has been working with launch partners Arup, Amey, Mott MacDonald and Tony Gee and Partners to create a resource that includes real career opportunities plus inspiration and insight into employers



**"This new hub will work to help you to both build and be part of the winning teams that will deliver the vital infrastructure of the future."**

and opportunities for the future.

"This new resource is an exciting new addition to Infrastructure Intelligence's growing portfolio of services for the rapidly expanding infrastructure market," said Infrastructure Intelligence editor Antony Oliver. "Working with our launch partners we are creating a resource that genuinely sets out to help the entire market to build better careers with the best employers around."

He added: "The message is simple: wherever you are in the infrastructure supply chain, this new hub will work to help you to both build and be part of the winning teams that will deliver the

vital infrastructure of the future."

The hub features thought leading articles, expert view and comment to help prospective employers and employees understand the challenges being faced across the industry.

The site is divided into clear sections to focus on:

- Latest analysis of the issues that are driving and influencing careers in infrastructure
- Learning and Development – how to build your career in infrastructure – insight from across the profession.
- Career Paths – key figures from across the industry explain what drove their careers and others reveal what their working day involves
- Careers advice – critical careers advice and information from the most influential names in infrastructure.
- Employers – the firms offering the best career opportunities
- Jobs – real opportunities to build your career in infrastructure.

Infrastructure Intelligence and its partners will be constantly updating the Careers Hub with new content and new career opportunities to ensure that the industry meets its on-going post-recession challenge to find and retain the best staff to solve the needs of modern clients.

Visit the Careers Hub at [www.infrastructure-intelligence.com/careers-hub](http://www.infrastructure-intelligence.com/careers-hub)



The UMIST civil engineering class of 2001 celebrate their degrees.

# Career women

As the government calls for more women to enter the engineering profession Bernadette Ballantyne asks her former engineering classmates about their career paths.

The lack of women in engineering has been at the forefront of media attention in 2014. As a former civil engineer that graduated in 2001 and worked in consultancy before moving into journalism I studied with several bright young female engineers in the late 1990s at the University of Manchester Institute of Science and Technology (UMIST, now part of Manchester University). I set about reconnecting with them to discover how many had gone into engineering roles, whether these promising graduates had remained within the industry. And if not what other career paths had opened up to them.

The results paint a very positive picture about the opportunities that studying engineering offer. Of the 10 of the women that I was able to contact, (which was nearly all of the females)

eight are now working in engineering related roles, and two have built successful careers in other sectors. Not only that the group are excelling in their roles, winning national awards, working on high level government projects and most importantly enjoying their work.

Over half are now working for leading consultants such as Atkins, Arup, Mott MacDonald and PricewaterhouseCoopers, while others are client side with the Highways Agency, United Utilities and Guernsey Water. All of them said that it was relatively easy to get a job, having several offers after graduation and none of them had suffered recession redundancies that blighted the sector.

The most popular choice by far has been consulting and the group pointed

to a variety of reasons for that. Some said that it was due to the variety of work available, others to the mix of site and design experience offered. A few said they just preferred to be office based and as one of the group said "I didn't fancy spending most of my days outside in the rain." A common comment was that consulting offered more flexibility than site work, which enabled a better balance between work and family life.

### Maria Manidaki

Two of the engineers are now at consultant Mott MacDonald including Maria Manidaki who is now a sustainability leader at the firm. "After UMIST, I did an MSc in Environmental Economics and then took a few months off travelling before I returned to the UK and found a job with Mott MacDonald in Yorkshire," she



Career women (from the top): Professor Denise Bower; Bernadette Ballantyne today and (below that) as a graduate; Katy Brown; Nicky Leighton

### Taking an alternative route

Although the majority of the group moved into engineering careers, studying civil engineering has created some great opportunities in other fields. Rebecca Barclay's exciting career illustrates this more than most. After graduation she moved to Paris where she became the finance assistant to finance director of Virgin Continental Europe, the holding company for Virgin Music. On her return to the UK she decided to join Bechtel as a graduate trainee and had over three "brilliant" years at the company. "I worked on various projects including the Channel Tunnel rail link, Cross County Route Modernisation and bid work for major projects such as a Doha Airport and Port. My final project with them was out in Romania on their motorway and was involved in the environmental impact assessments."

After taking a maternity break Rebecca decided not to return to the London based role which meant a long commute, and so she retrained as a

says. This meant working in the Mott MacDonald Bentley joint venture (MMB JV) being both onsite and doing design which accelerated Maria's progress, enabling her to become chartered in just three years. "I got some really good design and construction experience on water and wastewater infrastructure including some of the biggest projects in the UK," she says. She then worked on designing renewable energy technologies before working on energy efficiency schemes for Yorkshire Water. After developing an energy team within the Mott MacDonald Bentley joint venture she moved south. "I decided I wanted to get more strategic planning experience in water in the UK and overseas with a stronger focus on sustainability and carbon so I moved to our water headquarters in Cambridge," she says where most recently she has been contributing to Mott MacDonald's work on the government's Infrastructure Carbon Review.

#### Nicky Leighton

Another water industry specialist is Nicky Leighton who joined consultant Parkman (which became part of Mouchel in September 2003) after graduation. "I knew that I wanted to do civil engineering ever since I was little. I think I liked the idea of building things and I knew that meant undertaking a vocational degree. I had an uncle who

maths teacher.

Caroline Dunn also took an alternative path after graduation applying for flexible graduate employment schemes in finance and insurance. She received several job offers and decided to work with RSA, which was then Royal Sun Alliance. "I was attracted to them as they had a programme of rotations where you could try out a few different job roles and find something that suited you before you made a decision."

Today she is an executive responsible for employers and general liability insurance at world leading insurance market, Lloyd's of London. She says that her engineering degree prepared her better for a career in insurance than many others. "The degree taught me so many things that I use every day now. A civil engineering degree gives you a broad background and a lot of the subjects such as project management, problem solving and the strong numeracy focus are useful whatever career you go into"

was a civil engineer in the US and he used to build playgrounds, incredible playgrounds imagined by children and he made them into reality."

Nicky now specialises in network modelling and has been seconded to water company United Utilities having progressed up from engineer to project manager with Mouchel.

#### Catherine Harris

Catherine Harris has also built a successful career in the water industry and recently moved from consulting to become a project engineer in the wastewater sector at Guernsey Water. "The role challenges me technically. I am doing detailed design, outline design and everything in between. It also challenges me commercially as I have more responsibility for the contractual arrangements and management," she says. At the same time Catherine wants to encourage more young people to embark upon an engineering career. "There are few Chartered Engineers on the island, especially female ones. I hope to work with States of Guernsey to help civil engineers gain their qualifications, and with schools to promote engineering in general, especially to girls."

#### Sarah Leavey Tod

Sarah Leavey Tod was one of the few girls to start her career with a contractor

### A flexible career choice

Katy Brown particularly appreciates the flexibility offered in consulting having just returned to work at consultant Atkins after her second maternity break. A group engineer Katy joined Atkins after graduation and manages projects and programmes in the transport sector most recently working on rail franchising. Although she was expecting to be able to return to work part time, she was concerned about travelling so far from home to be based in the office, which was a 40 minute commute by train. Her line manager suggested that she be home based, a solution which has enabled her to return to Atkins and the rail project.

Sarah Humphrey too has been impressed with her employer Arup's approach to her maternity leave having just extended her second maternity break by a further year.

after graduation having been inspired to study civil engineering by a major project happening right on her doorstep in Kent, the Channel Tunnel Rail Link. Joining Skanska in 2000 as a student engineer, Sarah started out as a chain girl. "I was the only woman onsite and I progressed from the bottom up. It could be rather dirty and macho at times but I didn't mind it, it was a great experience," she says. She then became a graduate environmental engineer at Skanska, before joining AMEC where she worked as a design engineer, quantity surveyor and onsite project manager. After becoming chartered in 2007 Sarah decided to embark upon a new chapter in her career becoming a project management specialist at one of the world's "Big 4" consulting firms; PricewaterhouseCoopers. "I was ready for a professional services environment and I needed to achieve a better work life balance," she says pointing to the long hours onsite as being prohibitive to raising a family. "Being on site can be a bit like a travelling circus, some form a family on the project but then it can be hard to maintain that elsewhere," she says. Using all of the expertise she gleaned from major projects such as CTRL and large PFI hospital schemes Sarah now works in project management and governance and in the future is keen to undertake more work on delay analysis.

#### Amy Williams

Another high flier from the course is the Highways Agency's Amy Williams, who spent five years in

Working in the infrastructure team as a senior engineer Sarah returned to work part time after the arrival of her first child. "They were very accommodating and really supportive," she says.

However not all firms have been this encouraging. In her previous consulting role before moving to Guernsey Water, Catherine Harris was asked to extend her maternity break for a further 6 months when she tried to return to work in 2009 after the birth of her first child. With just two days notice she was told that if she didn't take the incentivised sabbatical she would probably face redundancy. "The recession hit everyone in different ways," she says philosophically. "It was assumed that I would want the additional break but I just wanted to get back to work."

consultancy with Atkins and Babbie (now part of Jacobs), won the NCE Graduate Engineer of the Year Award in 2002, and then became chartered before moving client side. As contract assurance audit manager she essentially manages the independent audits of the Agency's maintenance and renewal contracts that maintain the highways network. "I always wanted to be a civil engineer and picked my GCSE choices around that. I worked in the structures teams for Atkins and Babbie but mainly worked on Highways Agency assets throughout this time."

After joining the Agency in 2006 Amy has been a route performance manager, a project sponsor and a contract manager, while also finding time to have two children. "I work with a number of really good female engineers and have done throughout my career. My role is very busy but does offer flexibility around family life," she says.

#### Professor Denise Bower

Professor Denise Bower is also a UMIST alumni and was one of just two female lecturers that taught on the course during the late 1990s. A specialist in project management she now leads the Engineering Project Academy at the University of Leeds and is the Executive Director of the Major Projects Association. "At the Major Projects Association we are founding members of the Portrait Club. This has been established to help improve the initiation and delivery of major projects

### Why study engineering?

"One of the really good things about a civil engineering course is that it is all problem solving and once you have that background you can apply it to anything,"

*Katy Brown, group engineer, Atkins.*

"I wanted to make a difference to the world, and engineering seemed like a good idea. I was initially interested in the remediation of contaminated ground, environmental buildings and developments,"

*Catherine Harris, project engineer wastewater new works, Guernsey Water.*

"I liked the idea of building things and that meant undertaking a vocational degree."

*Nicky Leighton, modelling project manager, United Utilities.*

"I always liked maths and physics at school and engineering was suggested to me as a good way of using those subjects," -

*Sarah Humphrey, senior engineer, Arup*

"A civil engineering degree gives you a broad background and a lot of the subjects such as project management, problem solving and the strong numeracy focus are useful whatever career you go into,"

*Caroline Dunn, executive, employers liability and general liability, Lloyds of London.*

by improving the gender-diversity balance," she says. "We would really like to encourage all those involved with major projects to support this initiative as we believe that more diverse teams, particularly at the senior level, will lead to improved decision making and therefore better project outcomes. We would also like to a much better representation of senior women on the speaker platforms at key events and in the media."

So despite the low representation of women in the engineering sector as a whole, this experience shows that for those that do embark upon a career in the sector there is a huge variety of options available. An incredible 80 per cent of the female engineering students from one year group are now active in the industry and I am proud to have been part of this class of inspirational students who are all now incredibly successful professionals.

# Orla Fitzpatrick: searching for the sustainable 200

Orla Fitzpatrick is Amey Consulting's lead environmental consultant, heading the company's recently amalgamated environment and sustainability team. Her typical day is all about finding new recruits to build the group.

Six months ago Amey's Consulting business created one environment and sustainability team from the experts it had sitting in engineering teams around the group. The woman since chosen to lead the team is 38 year old Orla Fitzpatrick who has been with company since 2009. She's based in Belfast but travels around Amey's offices all the time.

Her job now is to expand the group from 40 to 90 people by next year and then to 200 in five years.

"We've spoken about creating a single team for years and now we are doing it. If we want the environment team to grow it needs to be managed by environmental people and have its own career progression and training. That's what I am putting in place," she says.

"My major priority is to recruit a number of high level principles to manage a team that needs to grow to 90 just to serve requirements within Amey. Then when we are bigger we can compete for outside work. It's exciting and there's a lot of opportunity for career development."

Workload is coming from roads, rail and increasingly utilities – something which Fitzpatrick says will be a significant growth area in the future.

Having one single environmental team does not mean we have one single base, Fitzpatrick stresses. "We are a forward looking business," she says. "You can join the team pretty much wherever Amey is located around Scotland, England and Northern Ireland. And there are opportunities internationally as well. It's a dynamic way of working that is proving very attractive to people. Amey makes good use of people's skills; it looks for the best in individuals and lets them work flexibly."

Currently a typical day for Fitzpatrick revolves around assessing CVs, completing the five year business plan



**"As specialists we have to explain the benefits of what we do in an engineer's language – how best environmental practice can improve value in terms of cost and time efficiencies."**

and finding out about her staff. "I'm doing a lot of professional development reviews – understanding the experience we have already, who can do what and where, joining the dots so to speak.

"We've also had 100 applications for graduate positions. We knew we had a compelling graduate offering but that's more than we were expecting so we are very pleased."

The new team is going to help drive culture change in Amey related to the environment. "You have to be clever about it," she says. "The infrastructure sector is becoming more environmentally aware but as specialists we have to explain the benefits of what we do in an engineer's language – how best environmental practice can improve value in terms of cost and time efficiencies.

## Orla Fitzpatrick: Career path

**Who was your first employer and why?**

I studied a BSc in Geophysical Science and then a Masters in Environmental Consultancy. My first job was with the United States Geological Survey in California as this was the epicenter (excuse the pun) of earthquake hazard research, and also I got to live in San Francisco for three years.

**What can employers offer to make you most happy in your career?**

Support from senior management, for you to never feel like they don't have your back.

**What advice would you give your younger self?**

Every day in the environmental consultancy profession is worthwhile experience. Even all those cold and wet mornings undertaking water quality monitoring at a landfill site on the side of a very exposed hill will provide you with some useful skills.

**What is the best thing so far in your career?**

The opportunity this role has given me in growing a small team to a significant national team.

"I need strong willed people with a passion for the environment because they are going to be constantly challenged. They need to be able to say 'no, that's not the best way; this is what we should do'."

The skill sets Fitzpatrick is recruiting for include ecology, noise and air quality assessment, waste strategy development, archaeology and landscape design.

"The key to being a successful environment consultant is to plan for the environmental issues right at the start of a project rather than bolt them on later. That's what we are doing at Amey."

Fitzpatrick is delighted with her new role, one she didn't want to miss even though she's juggling being a mother of three young children including an eight month old baby. "I've never worked at a company before where you feel there is so much opportunity. No one puts any limits on what you can do. You could start in one part of the business and end up somewhere else; you are never pigeon-holed."

Find out more about the Amey Environment & Sustainability Team at: [www.amey.co.uk](http://www.amey.co.uk)

# Addressing the skills shortage – act now and prevent a crisis later



Matchtech operations director *Grahame Carter* says there is still time to get on with workforce planning and avoid the panic buying of previous skills shortages.

Research released recently by the EEF, The Manufacturers' Organisation, a regular commentator and reviewer of infrastructure has highlighted strong wage growth in the UK.

Good news for UK engineering, you might think, but the EEF believes this wage growth is a result of a growing skills shortage, especially in the infrastructure sector as it recruits staff to meet the demands of major projects like Crossrail, HS2 and the AMP6 water framework.

The findings mirror the conclusions of an earlier, separate study conducted by The Prince's Trust and HSBC which revealed that three-quarters of British businesses think a significant skills crisis is looming.

As an engineering recruitment specialist, Matchtech has a better view than most as to the health of the jobs market for the UK's engineering sector and we are certainly seeing growing signs of serious skills shortages. While we don't believe now is the time to panic, it's certainly the time to act.

In the years leading up to the past two significant recessions (in 1990 and 2008) we saw very serious skills shortages with many engineering and manufacturing organisations recruiting staff from overseas because that was the only way they could fill positions.

At peak, we reached the situation where contractors would move jobs for a 1% rise in hourly rates, and permanent salaries looked increasingly less attractive against contractor rates.

Today, we aren't in the same situation because the UK engineering sector is handling talent attraction and retention more effectively. In-house HR teams are using their experience, contacts and new communications channels to target potential staff far more efficiently – particularly at entry-level to mid-management level.

Firms need to keep doing this.



**Crossrail tunnelling work may be close to completion but fitting out the operational railway will call in a lot of scarce rail and signalling resources.**

**"Wage growth is a sign of the growing value that employers place on key engineering staff"**

Cultivating industry contacts and a good alumni network can reap rich rewards in maintaining a pipeline of potential recruits.

In addition, firms need to look at how they use recruitment consultants more strategically. At Matchtech we seek to work in partnership with employers, focusing our expertise on helping them identify recruitment pressure points and reach hard-to-find candidates with niche specialist skills.

This partnership approach helps firms develop recruitment strategies that foresee pinch points and plan around them. This is particularly important today for key sectors facing more acute

skills gaps, such as rail and transport infrastructure, water and utilities, property and power and energy.

In the water industry, the recession coincided with the closing of the AMP5 and opening of the AMP6 framework periods, creating a perfect storm that saw many projects put on hold or dropped.

Now the industry is reinvesting in infrastructure to meet AMP6 requirements – only to find that many of the skilled engineers have transferred to other sectors.

Strategic planning means the skills gap can be mitigated by working smarter, e.g. by setting up ECI (Early Contractor Involvement) and pushing work out earlier, so there is less of a slump between cycles, to smooth demand for staff.

The highways sector is also experiencing skills gaps as a direct result of the recession, when graduate recruitment dropped sharply, causing a shortage of skilled engineers with 3-4 years' experience. Now infrastructure investment is rising and the best graduates have a pick of jobs from eager employers and we are seeing firms increasingly turning to contractors in the absence of permanent staff. It's a telling sign that Matchtech's Highways department is seeing an increase in vacancies.

On this basis, the wage growth highlighted by the EEF report isn't bad news. Wage growth is a sign of the growing value that employers place on key engineering staff and these rising salaries should make engineering more attractive, enabling the industry to open up the supply of high-quality candidates it needs for the future.

If the industry adopts a cohesive approach to long-term term recruitment planning: developing a network and pipeline of talent, promoting diversity, exploring skills transfer, looking at flexible working and career development to attract and retain talent; then I believe the UK is in a strong position to build and develop its engineering sector as a centre of excellence and to avoid the negative impact of a full recruitment crisis. There is much to celebrate for UK engineering.

## Want advice?

You can contact Grahame at [grahame.carter@matchtech.com](mailto:grahame.carter@matchtech.com) or on [LinkedIn](#)

# Nelson Ogunshakin is finalist in Black British Business Awards



**BBBA Infrastructure finalists: Nelson Ogunshakin (left), David Waboso (top right) and Myrtle Dawes (bottom right).**

ACE chief executive Nelson Ogunshakin has been shortlisted in the first ever Black British Business Awards which take place in October. He is a finalist for leader of the year in the infrastructure and manufacturing category.

Other finalists in the infrastructure leader category are Centrica E&P (UK and Netherlands) director of projects Myrtle Dawes and London Underground capital programmes director David Waboso – also a regular columnist for Infrastructure-Intelligence.com.

The Black British Business Awards is the only Awards programme to celebrate exceptional performance and outstanding achievements of black people in businesses in Great Britain. The inaugural ceremony takes place at start of Black History Month on 2 October at the Grange City Hotel, Tower Hill in London.

Supported and endorsed by Prime Minister David Cameron, deputy prime minister Nick Clegg and business secretary Vince Cable, the BBB Awards are intended uncover inspirational role models; ambassadors who represent the very best talent in organisations across various sectors in the British economy.

The aim is to promote a good understanding of the economic contributions and potential of the Black community within the workforce, in the boardroom, and as a key customer segment.

In the infrastructure rising star category the finalists are: Tobi Lawal, business development manager, BP; Jim Lenga-Kroma, human resources graduate, RWE npower; Naomi Williams-Taylor, business development associate, Metro Design Consultants.

Other categories are financial services, fast moving consumer goods, media and the arts, professional services, STEM and entrepreneur of the year.

For more information go to [www.thebbawards.com](http://www.thebbawards.com)



## BWB boss Steve Wooler is new ACE Midlands chairman



New man in the chairman's hotseat at the ACE Midlands region is BWB managing director Steve Wooler. He has been running the 200 strong consultancy since a management buyout in 2008 and has been with the business for 20 years.

Steve is a champion of the abilities of SMEs and believes that as the bigger consultants get bigger there is huge opportunity for smaller, more responsive firms to offer clients a more tailored service. "But we need to facilitate better opportunities for SMEs to get involved in major infrastructure projects," he said. "Prequalification and selection processes, particularly for larger public sector frameworks, mean SME firms are being set up to fail."

He is an enthusiast for ACE. Membership he says brings great opportunities for networking, profile raising and collaboration with other like minded firms. "But the key is the opportunity to have a voice when talking to Government."

Read more about Steve Wooler and his career path at [www.infrastructure-intelligence.com/careers-hub](http://www.infrastructure-intelligence.com/careers-hub)

## Where should Britain's next runway be?

The Davies Commission is hard at work deciding where Britain's next south east runway should be but what do you think?

ACE companies have been at the heart of the commission's work, providing technical advice for the various options. On 30 September ACE's Progress Network is holding an event, mirroring the national Runways UK debates, for professionals – many of whom will have direct airport experience in the UK and overseas – to



share their views.

ACE has been an active supporter of Runways UK which has hosted several conferences to enable the promoters of the options to discuss and debate their merits.

The four speakers at the Progress Network "Flying high – UK airport expansion" event are:

- **Tony Caccavone**, Heathrow Airport – representing the third runway at Heathrow option
- **Christina Petrides**, URS – representing the Heathrow Hub option
- **Alastair McDermid**, Gatwick Airport – representing the second runway at Gatwick option
- **Huw Thomas**, Fosters – representing the Inner Estuary Airport option

Venue is the Marriott Grosvenor Square Hotel and facilitator will be Progress Network London & South East's Sharlene Hay.

The event starts with a drinks reception at 6.30pm, with brief presentations of the four options commencing at 7pm. This will be followed by what promises to be a lively Q & A session. The target audience is young professionals, generally under 35, many of whom have worked on aviation and other large infrastructure projects.

"While the South-East runways debate has and will continue to be discussed in front of many audiences over the coming months, what makes this event different is that many of the young professionals in the audience have worked on aviation or other large infrastructure projects both in UK and internationally," said ACE chief operating officer Anil Iyer.

"They hence have recent experience and I expect will be more open-minded than many other audiences. The international perspective is of particular

relevance in respect of the scale of what is currently envisaged, the single hub versus two hub debate and also the incremental build versus a single large scale build debate.

"I would invite you to encourage the young professionals in ACE organisations to join what I expect to be an enjoyable and informative evening."

For more details visit [www.acenet.co.uk/events](http://www.acenet.co.uk/events)



## SMEs vital to growth

This month, writes Nelson Ogunshakin, I attended the networking event for ACE's small and medium enterprises [SMEs] held at the London offices of our affiliate partner BLM. SME membership is the lifeblood of our organisation and as the UK economy grows small businesses will play an increasingly important part.

The ability of our SME members to compete within the market will become essential as future growth will be tied to their success, and I was very interested to listen to the issues concerning them.

The recent shift in government policy has recognised that in order to create an even playing field the regulations affecting public sector procurement need to be opened up to fair competition. ACE believes that in collaboration with our SME members our collective voice can influence the changes that will allow smaller businesses to trade more openly and effectively.

The Government has set itself a

target of procuring 25% of goods and services by value from SMEs by 2015.

At the same time the Government has also been looking at ways to change and simplify the procurement process for smaller companies.

ACE contributed to the Prime Minister's 2013 consultation on public sector procurement and decided to pursue the following objectives:

- Cut down on lengthy process by abolishing Pre-Qualification Questionnaires (PQQs) for low value contracts;
- Mandate the use of standard core PQQ for high-value contracts and ensure small business needs are taken into account in the design of procurement processes;
- Make contract opportunities easier to find by making them all accessible on a single on-line portal;
- Make sure small firms get treated fairly by mandating prompt payment terms;
- Require all public bodies to formally document their procurement expenditure and prompt payment performance with SMEs.

The SMEs sector would value a decision by the Government to respond to the industry request for a single market principle to be applied to all public sector bodies in their procurement process.

This would ensure a simple and consistent approach across all public sector authorities, so that SMEs can gain better and more direct access.

As a start, in order to maintain momentum around our industry campaign, a new "ACE Procurement Commission Group" has been established. Under the chairmanship of Matthew Riley of EC Harris, its mandate is to establish a best practice procurement process that can be adopted by public sector and develop a sets of recommendations for the future.

I am very pleased that this initiative is supported by the Department for Business, Innovation and Skills, the Treasury and the Cabinet Office. As a first step we are encouraging the wider industry to participate by opening an engagement process on our ACE website [www.acenet.co.uk](http://www.acenet.co.uk) where we are asking our SME members to submit evidence on the issues and challenges they face when pitching for public sector contracts.

ACE has listened, and I have faith that through our on going collaboration with our SME members we are building a road map to guide us to do the right thing in the future.

## ACE – Our voice means business

The best way to get the most out of being a member of an association, is to get involved

ACE represents a vibrant and innovative business community with an ambitious vision for the future

ACE shapes and influences the development of infrastructure policy for firms operating within the built and natural environment, for the benefit of sustainable economic growth and prosperity

As part of our community ACE members have access to a wide range of products and services to ensure that as an organisation, and as individuals, they are supported professionally

Amongst the many benefits an ACE member receives are:

- The promotion of your business to clients, investors, all levels of government and through the media
- Extensive business support services including dedicated helplines staffed by specialists in the areas of legal, insurance and HR issues
- A wide range of specially negotiated ACE member discounts on business products and services covering everything from industry publications and contracts to office space and hotel discounts
- Exceptional opportunities to network at events, seminars and sector working groups all tailored to engage young professionals through to global industry leaders
- Local representation in the devolved nations and English regions identifying the latest industry intelligence and trends



Find out more on Association for Consultancy and Engineering and how to become a member or affiliate by visiting [www.acenet.co.uk/membership](http://www.acenet.co.uk/membership) or call the ACE membership team on 020 7222 6557

### ACE news

#### New director of policy and external affairs



ACE has appointed Julian Francis as its new director of policy and external affairs.

He was previously head of government affairs at the London Taxi Company. Prior to this, he worked in a variety of policy roles including as political advisor to the London Borough of Tower Hamlets. He graduated from Cambridge University with BA and MA in Law, qualified as a Barrister and also holds a PhD Degree from the Institute of Commonwealth Studies.

“We are delighted to have Julian join the team at the beginning of rolling out the new ACE Corporate Plan,” said Nelson Ogunshakin. He added that the 2015 election meant ACE had to ensure it maintained its proactive advocacy.

Francis said: “Over the coming months and years the main policy debate in this country will be over the provision and regeneration of the infrastructure network and I look forward to helping shape this debate with ACE’s wide membership.”

#### Who are Europe’s top CEO’s. Find out on 17 November

The Institution of Civil Engineers’ Great Hall is the venue for this year’s ACE European CEO Awards dinner on 17 November, under the stunning painted ceiling commemorating the sacrifices of World War One.

Last year top prize winners included Paul Westbury, then with Buro Happold, now with Laing O’Rourke, WYG’s Paul Hamer and Dr Wilem Frischmann. Who will it be this time?

The categories are:

- European CEO of the Year (less than 250 – Small Firm)
- European CEO of Year (more than 250 – Medium Firm)
- European CEO of Year (more than 1000 – Large Firm)
- Sterling CEO of the Year – click here to enter
- Lifetime Achievement Award

The awards dinner will be attended by CEOs from across Europe, as well as representatives of client organisations, members of parliament and other stakeholders.

To find out more and to book your place at the event go to [www.acenet.co.uk/eca2014](http://www.acenet.co.uk/eca2014)

### EIC news

#### How smart are smart cities?



EIC executive director Matthew Farrow has instigated a project to find out if IT led smart cities are also addressing issues like air quality and recycling fatigue.

When I took over at the Environmental Industries Commission, nearly a year ago, it was clear that we were good at technical lobbying on the detail of environmental policies. We continue to do this, but I wanted EIC to also spend time thinking and talking about some of the broader trends and issues that the environmental and business world is talking about.

So in 2014 alongside our standard work on issues such as Category 4 Screening Levels for contaminated land and the HMRC definition of materials qualifying for lower rate Landfill Tax (more exciting than they sound, believe me!) we’ve undertaken a number of broader ‘thought leadership type reports.

Our current one is on the concept of ‘smart cities’ and the environment. Barely a day goes past without me being invited to a seminar on smart cities or receiving some glossy literature from a global technology company about how they are helping to realise the potential of one global city or another through the ‘internet of things’ or ‘real time city dashboards’.

Most of the discussion and marketing material around smart cities makes the assumption that these wired-up (or wireless-ed up) conurbations will be clean and pure, with sweet air to breathe, no recognisable ‘waste’, and a few discreet turbines flicking round in the breeze.

But I know from our work here at EIC both in the UK and with our partners in countries like China that in reality most cities are grappling with deep seated and intractable environmental problems. In most UK cities for example, urban air quality is outside EU limits and not getting much better, recycling rates have stagnated well below the national average, and CO<sub>2</sub> emissions are still too high if we are to meet the Climate Change Act.

I decided it would be good to understand in depth whether ‘smart city’ initiatives were likely to provide new ways to tackle these problems and what could be done to encourage this. And given the UK has a lot of business strength in environmental technology and in areas such as city planning and data visualisation, we also wanted to see if enough was being done to promote opportunities for UK companies in this sphere.

The project is steered by a task force made up of EIC members such as WSP Group, URS, Schneider Electric, Veolia, AECOM, Landmark Information Services, Honeywell Building Solutions and others (We also have representatives of cities and academia on the group).

As the work has progressed some interesting issues have come to light. It is clear there are a number of cities doing some innovative things. The city of Utrecht, for example, has explored using smart technology to route freight road traffic in real time to try to manage air pollution hot spots.

Equally, the majority of smart city initiatives are not environment related. Only about one in six of the examples we found were directed at

**“The majority of smart city initiatives are not environment related. Only about one in six of the examples we found were directed at environmental goals such as reducing carbon emissions.”**

environmental goals such as reducing carbon emissions. And in other cases the enthusiasm of city administrators is not matched by the public. For example the environment page of the GLA ‘dashboard’ – an open data portal making available large amounts of London data to citizens – only received 55 page views in July.

So, plenty of potential but also some challenges. Our Task Force will report in the Autumn, and then at our Annual Conference on 2 December ([www.eic-conference.co.uk](http://www.eic-conference.co.uk)) there will be a session on cities to explore this agenda, at which Mark Watts, CEO of global cities network C40, will be one of the speakers.

*The Environmental Industries Commission is the leading trade body for environmental firms. [www.eic-uk.co.uk](http://www.eic-uk.co.uk)*

*Find out about the political parties views on air pollution at the EIC conference “Establishing a Green Agenda” on 2 December. For details go to [www.eic-conference.co.uk](http://www.eic-conference.co.uk)*

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