



**INTERVIEW**  
Structurals Gold  
Medal winner  
Tristram Carfrae  
page 10

**FEATURE**  
Peel Group  
on northern  
investment  
page 25



**TECHNOLOGY**  
3D modelling  
from photos  
page 26



# I INFRASTRUCTURE Intelligence

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



## Creating the Northern Powerhouse

Why infrastructure is key to delivering  
economic growth in the North  
page 14





# INFRASTRUCTURE Intelligence

Produced for the industry by the Association for Consultancy and Engineering

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## MESSAGE FROM THE EDITOR

The political, social and economic imperative to break down the north-south divide with investment in transport, energy and communications infrastructure is clearly growing.

While London has emerged as the UK’s undisputed first city and a global force in its own right, it is plainly obvious that the nation’s other major cities have suffered as a result. And that is bad for everyone.

Not that a successful, powerful and affluent London isn’t really important to the nation. It most certainly is, and there is no benefit whatsoever in policies or practice which hold this growth back in any way. But increasingly it now understood that vital economic rebalancing goes beyond simply being some altruistic act to redress past failings and boost employment, wealth and lives outside London. It must be central to the overall UK-wide policy to drive growth into the whole economy.

As can be read in this month’s series of articles, ensuring that the so-called Northern Powerhouse remains key to the next administration’s economic thinking is both vital and sensible. It is, as many point out, about creating the connectivity and infrastructure that ensures that the north is able, not just willing, to play its part in the future of the UK.

As the RSA’s recent report on “Unleashing the power of Metros” pointed out, this simply cannot be a “them or us” situation. Instead it must be about encouraging the rise of all cities and “the concentration of productivity, innovation and creativity that will drive our economic future”.

Essentially success comes down to driving and harnessing the power of agglomeration – putting in place infrastructure of all scale, from major schemes such as HS2, HS3 and trans-Pennine road tunnels, through to vital investment in smaller schemes such as improved town centre interchanges that transform local connectivity.

Collaborative, cross regional investment plans such as the One North report are a vital step towards the future and highlight the importance of local politicians and businesses working together to make the case for that investment. Creation of the multi regional, multi governmental body Transport for the North is a welcome step forward on this.

Now this momentum must continue if the North and the entire UK is to harness the benefits that can come from great vision and great planning. Opportunity is knocking.



**Antony Oliver,**  
editor, Infrastructure Intelligence

## Contents

News roundup	5	This month’s top infrastructure stories
Opinion	6	Comment from Nick Raynsford, Claire Gott, Nick Roberts, John Betty, Jo Valentine, Charlotte Alldritt, Richard Threlfall and Ann Dowling.
Interview	10	IStructE Gold Medal winner Tristram Carfrae
Analysis	13	How an Infrastructure Department could drive delivery
Policy	14	Northern Powerhouse: connect to prosper
Planning	16	Manchester City Council Chief Sir Howard Bernstein
Transport	18	Connectivity to drive local and regional growth
Rail	20	Why Liverpool is vital to high speed rail
Business	22	Greater Manchester Local Enterprise Partnership
BIM	24	Costain on a new road that is a BIM trailblazer
Investment	25	Developer Peel Group on longterm investment
Technology	26	Bentley Systems on converting photos to 3D models
ACE EIC	28	Engineering growth, ACE National Conference and CDM health and safety reform
	31	Matthew Farrow on air quality

## News roundup

### BUSINESS

**Balfour Beatty has launched its recovery programme under the title “Build to Last”.** The intended transformation in the business involves strengthening financial controls, holding on to valuable expert staff and tightening up on project and risk management. Efficiency savings and working with the supply chain to cut costs are also on the agenda. The move results from a fresh £70M profit warning after a review of its UK construction business by KPMG. The contractor has now cancelled the proposed £200M share buy back, which would have used some of the profits from the sale of Parsons Brinckerhoff in October for £820M to return value to shareholders.

**Globally, almost a third of infrastructure companies are not gathering anti-bribery and corruption policies** from their suppliers prior to awarding a contract. Further, one in five are failing to obtain main suppliers’ financial documents and 12% are not gathering health and safety data. The market survey was commissioned by Achilles, which manages supplier information and supply chain risks on behalf of more than 850 large companies across the globe.

**Capita’s property and infrastructure business has signed a five-year collaboration agreement with Spanish transport engineering and consultancy company Ineco.** This expands the 2011 deal to undertake work on the UK High Speed 2 project, Lot 1 Civils Country North Section. It has also bought 40 strong Leeds and London based BCS Design for an undisclosed sum and has spent £35M buying industry prequalification body Constructionline from the government.



**Infrastructure Intelligence and Griffiths and Armour have launched the new Risk Matters hub at [www.infrastructure-intelligence.com](http://www.infrastructure-intelligence.com).** The hub will help share best practice, improve risk awareness, and assist effective management of risk. On the hub you can find out more about professional risk, often overlooked professional indemnity considerations and ‘lessons learned’ from claims. The Risk Matters Hub brings together all the latest analysis and thought leading articles on critical risk and insurance issues faced by infrastructure professionals. “It is very important in a growing market that businesses do not lose their focus on risk management,” said Griffiths & Armour chief executive Stephen Bamforth. “It can be tempting when times are busy to overlook precautions, but with resources stretched, firms are often at particular risk. If the claims don’t arise straight away, they will when industry turns down again and companies could find themselves very exposed. We are working with Infrastructure Intelligence to help firms better protect themselves.”

**The consumption of structural steelwork in the UK is expected to increase 9% to 895,000t in 2015** according to a recent survey by Construction Markets. This increase in demand comes off the back of a 6% rise in 2014, reflecting the ongoing recovery in the construction sector. Growth is forecast to continue in subsequent years, with structural steel consumption estimated to reach 972,000t in 2018 (the end of the forecast period).

**WYG has announced a strategic review including the potential to sell.** The full list of potential alternatives are: a strategic partnership, a merger or acquisition to enhance the scale and breadth of WYG’s existing business, the acquisition of or subscription for the company’s securities by a third party, a sale of the company, a new or extended

bank facility or continuing to invest in expanding the business organically and through partnerships and bolt-on acquisitions. Since a low point in 2011, WYG is in a period of strong profit growth and is now regarded as a sound business.

### PEOPLE AND CAREERS

**Highways Agency chief executive Graham Dalton is to leave his job in the summer after seven years.** The news comes days after the Infrastructure Act to create the Agency’s successor Highways England became law. Highways England is on course to become a fully fledged, arms length government company on 1 April. “Highways England will need a chief executive who can commit to delivering the first Roads Investment Strategy which runs to 2020. I

will work to ensure an orderly handover to my successor in the summer,” Dalton said.

**KPMG has warned that the UK needs more construction staff to deliver the increase in the government construction pipeline of work.** The analysis indicates that 84% of the projects included in the pipeline (2656) are expected to have commenced construction by 2016. This includes 1279 projects which are reported as being already under construction. “It is not yet clear whether the industry will be in a position to deliver the 84% of projects due to start by 2016,” said KPMG UK head of infrastructure, building and construction Richard Threlfall.

**The construction industry has to recruit more than 200,000 extra workers in the next five years** to keep on top of rising demand across the country according to the CITB. Its latest skills forecast predicts that to deal with growing workload industry needs to recruit almost 45,000 workers a year, 8,000 more than predicted last year at the start of the recovery. Total construction employment is projected to reach 2.74M in 2019, still a little below its peak level in 2008 of 2.86M.

**Ivor Catto, Hyder Consulting chief executive during last October’s £296M purchase of the firm by Dutch consulting giant ARCADIS,** is to step down at the end of February as the new combined business structure rolls out. Alan Brookes the current UK ARCADIS chief executive, will lead the combined UK team of 3,900 staff under a plan which will bring operations together in the UK and the Middle East by July this year. The restructure will also see Graham Reid, currently Hyder’s UK managing director, take up a new global design director role at ARCADIS, leveraging his experience of establishing Hyder’s Indian global design centres.



**Osborne chief executive David Fison is retiring from the business at the end of March.** The contractor’s new CEO will be executive director Andy Steel who is currently managing director of the construction division. Education director John Craig, will become construction MD.

**According to research by recruitment firm Randstad CPE, women are expected to fill a quarter of all construction jobs in the UK by 2020.** The research found that since 2010, the number of women in construction jobs has risen by 4%, from 16% to just over 20%, compared to a 1% rise over the preceding five year period.

**Waterman has appointed Michael Baker as its chairman.** Baker was chairman of Baker Harris Saunders, the first firm of chartered surveyors to float on the London Stock Exchange and was a non executive director of property company Halladale Group.

RAIL

**Government investment in the railways has dropped by 16.4% since 2010/11, the ORR has revealed.** Passengers in contrast have contributed an increasing proportion of the rail industry’s income relative to taxpayers over the past four years, up from 55.6% in 2010–11 to 61.5% in 2013–14. Total government funding was £3.8bn in 2013–14, representing 28.5% of the industry’s total income, the regulator said in its latest rail industry financial report.

**ORR has demanded a new focus on customers by Network Rail** when the rail operator plans possessions but has ruled that the company should escape a fine for its part in the Christmas chaos which left 115,000 people stranded as engineering works overran. Meanwhile contractors



**What is infrastructure, what is engineering and how does it affect me?** That’s all explained to young people in a fun short film called The Engineering Machine courtesy of Bechtel. The firm launched the video to help to raise awareness of how a career in engineering can help solve global challenges of the future. The film, which was made in collaboration with students from Birmingham City University in the UK and features a chain reaction of materials using stop motion animation, encourages young people to consider a career in engineering. “This film continues our tradition of inspiring the next generation of engineers. We want to foster innovation and cultivate a passion for science and technology,” said Charlene Wheelless, Bechtel’s manager of corporate affairs and sustainability. See it at: [www.infrastructure-intelligence.com/video](http://www.infrastructure-intelligence.com/video)

involved in the Christmas engineering work overruns at Kings Cross and Paddington in London are being hit with significant penalties. Amey which with Network Rail forms the Northern S&C Alliance which did the work at Kings Cross “will lose 25% of its total annual alliance prize” and the Balfour Beatty/Alstom Signalling Solutions JV which struggled with paperwork and testing for signal approvals at Paddington will be hit with a penalty of “around £200,000”.

**Track-laying has been completed for the new 50km Borders Rail Link in Scotland** being built by BAM Nuttall for Network Rail. Construction of the completed link between Edinburgh and the Borders is forecast to cost £294M and includes seven new stations. It is set to open on 6 September.

ROADS

**The promised £15bn in roads investment in England is to become reality** after the Infrastructure Act which

contains legislation to allow creation of Highways England – became law on 12 February. Secondary legislation is now needed to create the company. But this is being seen as a formality and means the new arms length government organisation that will replace the Highways Agency will be launched in April this year. See Opinion p6.

**The Highways Agency’s shift to government company status** could be prompting a rethink on its maintenance contracting strategy to take more direct ownership of design, maintenance and construction. The Agency announced that it will use East Midlands area 7 to take forward a change in the way it works with its supply chain and separate the way it runs design, maintenance and construction in the region.

**Highways authorities are being encouraged to borrow cash** at a time when interest rates are historically low to invest in road maintenance to save money in the long

term. The Highways Term Maintenance Association has produced evidence that demonstrates that an investment of £30M, as one example, can save over £70M over 34 years. In its report “Spend to save” the HTMA said there was “compelling argument” that early investment to arrest the decline in condition of roads delivered a cost benefit ratio in excess of 2:1.

POLITICS

**Creation of an independent infrastructure body is top of the list of requirements for whichever party wins the next election, according to the Institution of Civil Engineers.** It said in its ‘Manifesto for infrastructure’ that creating such a body – “ideally by restructuring Infrastructure UK” would reduce delay and uncertainty in a sector that is vital to the UK economy.

**Cross party consensus over plans for a national infrastructure commission can be achieved** if government adopted a “more grown up approach” according to Shadow Chancellor Ed Balls. “I think that the government could be a bit more grown up about this and think harder about the advantages of a cross party consensus,” he said. “Behind the scenes this report has wide support.” First assessment of the nation’s medium to long term infrastructure needs could be published by a National Infrastructure Commission as early as 2016.

**However Government has flatly rejected the concept of an independent National Infrastructure Commission** to decide the country’s investment priorities during the debate on the Infrastructure Bill. Instead it announced it was looking to create a National Infrastructure Investment Strategy. “We have serious

reservations about the model proposed by the Labour party” said local government minister Stephen Williams.

**England needs a single department to decide on infrastructure priorities, Stephen Hammond MP has proposed.** “Now is the time for radical change. A unified Department for Infrastructure could overcome past policy failures and bring coherence and skill to project implementation and management. See feature p13.

**Cardiff, Newport and Bristol are uniting under the title Great Western cities** to rival the northern cities in a bid to attract economic investment including on infrastructure. In a 2014 report called ‘Unleashing metro growth’, the City Growth Commission identified the Severn region as one of six “power-house city regions” on which the British economy will rely in the future. See Opinion p8.

ENERGY

**InfraRed Capital Partners is to invest £100M in the £1bn Swansea Bay tidal lagoon** matching the £100M investment already committed by Prudential. The project will generate 500GW of electricity every year for 120 years and is scheduled to reach financial close in the summer with construction scheduled to begin immediately after, creating almost 2,000 jobs.

**Late amendments to the Infrastructure Act mean that fracking will be allowed to take place** beneath national parks and Areas of Outstanding Natural Beauty, even though ministers said there would be a ban.

**The Nuclear Decommissioning Authority is to take a direct grip of Sellafield** and take the site back into public sector control from private sector parent body Nuclear Management

Partners. Government said that its decision to terminate the £9bn NMP deal was the result of “technical uncertainties that made the transfer of responsibility unsuitable”. NMP is made up of AECOM, AMEC and Areva.

**Government has given the go ahead to the UK’s biggest windfarm**, 130km off the Yorkshire coast. The Dogger Bank Creyke Beck wind farm will include up to 400 wind turbines that are expected to generate up to 2.4GW, or 2.5% of UK electricity demand. Only Drax coal fired station produces more output at 3.9GW. Promoter is Forewind, a consortium of SSE, RWE, Statkraft and Statoil.

SUSTAINABILITY

**European cities have emerged as the global leaders in sustainable development** according to the latest ranking and analysis by ARCADIS. Frankfurt top the list of world cities for its impact on people, the planet and profitability followed closely by London, Copenhagen, Amsterdam, Rotterdam and Berlin.

**Infrastructure commitment to a lower carbon, lower cost future is building momentum** with 48 businesses and organisations from across the supply chain now committed to the Infrastructure Carbon Review.

FLOODING

**MPs have expressed concerns about the government’s ability to attract £600M in private sector investment for flood defence schemes in England.** The Environment Committee said it was unclear how targets would be met. Of the £148M secured since new rules were introduced in 2011, only £40M had come from sources other than local government, it said.



**INTERVIEW: David Hancock, Head of Construction for the Government Construction Team at the Cabinet Office.**

David Hancock joined the Cabinet Office from Transport for London (TfL) in October. Interview by *Antony Oliver*.

**How do you describe what you do?** Firstly I have to deliver the Government’s Construction Strategy which is aligned to the Construction 2025 vision for industry. The other part of the role is upskilling government in construction and helping it to be a better, more informed client.

**How do you do that?** There is a government reform strategy going on and part of that is training the project profession. Once government was all about policy – now is has a stream which is all about project delivery. And with the quantum of projects going on across government you might ask why haven’t we had that before?

**So how will government client teams change?** We won’t have all the skills but we will be an intelligent client that knows what skills it needs to have around it.

**How did your time at TfL prepare you for this role?** After the collapse of Metronet, TfL had to move rapidly from being arbiters to suddenly becoming a delivery organisation. We had to get up to speed very fast about the sponsor’s role.

**How does this intelligent client role compare to BAA when you worked on T5?** I think [as a client] T5 was before its time. With delivery you have to understand the criteria that surrounds the project and the T5 model would not fit everything we do in government and it

wasn’t perfect for everything in industry. But a lot of what learnt on T5 we could take into T2 and repeat it.

**So looking back was T5 a success?** We were always criticised on T5 that we overpaid. Now T2 is over we can show that is was a good price – T5 was £3811/m2 whereas T2 was £3780/m2 – both are value for money.

**So how do you replicate this role in government?** There are no easy wins – it is all about hard work and driving forward. We know the industry has to make a step change in performance.

**Does the economic upturn make it easier or harder?** I think it makes it harder because industry can walk away from us. The economic upswing means that the profit margins could be greater elsewhere. If we are not careful industry could opt to work for the private sector.

**How do you ensure that doesn’t happen?** It is back to collaboration. We can’t offer bigger margins so we have to reduce risk and give work over a longer period – the Highways Agency’s 5 year settlement is an example. It is a call to arms for the industry – saying “you asked for a pipeline, for project banks accounts etc – now your part is to deliver”.

**Is the industry is ready to make the change?** We stand at a fork in the road – we either collaborate long term and change the industry or we will go back 20 years to adversarial practices and low profit margins. Which one do you want? We are in charge of our own destiny.





**Rt Hon Nick Raynsford MP,**  
Member of Parliament for  
Greenwich and Woolwich

## The Infrastructure Act – an “extraordinary process”

“It was disappointing that Government refused to accept an amendment which would have brought into effect the proposed Independent Infrastructure Commission.”

Unpredicted mishaps failed to materialise and the Infrastructure Bill has now completed its parliamentary passage and achieved Royal Assent to become the Infrastructure Act.

This tells a story about how, towards the end of a Parliament, there is often a frantic search by civil servants to ‘shoehorn’ odd bits of legislation into any available Bill.

And this explains the extraordinary process by which almost 60 pages of legislation was inserted by the Government into the Infrastructure Bill on the final day of its Committee Stage on 15th January, only to be removed just 10 days later at its Report Stage, when clear that the provisions were badly drafted and had upset most of the interested parties.

Ironically there was no political division about the need for amendments to update the Electronic Communications Code, and had the Government done its homework properly, this could have gone through with unanimous support. Instead it will now have to wait for the next Parliament.

The other main infrastructure provisions in the Bill related to the creation of a new structure for the Highways Agency, some procedural change to arrangements for planning approval of nationally significant

infrastructure projects, and safeguards relating to ‘fracking’.

The latter again involved significant last minute change when the Government was obliged to accept an opposition amendment extending and clarifying the conditions to be satisfied before approval can be given for hydraulic fracturing, and restricting the areas in which such activity can occur.

Regrettably there was less Government willingness to agree constructive amendments over energy efficiency, where the original objective of meeting zero carbon standards in new homes by 2016 has been seriously watered down.

The exclusion of small sites from having to meet even the modified definition of zero carbon is a loophole which could seriously compromise progress towards meeting carbon reduction targets.

Finally it was disappointing that the Government refused to accept an amendment which would have brought into effect the proposed Independent Infrastructure Commission.

It is an issue which will need to be considered again in the next Parliament, and it seems clear that establishing such a Commission will depend on the outcome of the election.



**Nick Roberts, Chief Executive, UK and Europe, Atkins**

## Consequences of an engineering skills deficit

“Young people need to better understand the impact engineering has on society and see engineers standing alongside doctors and astronauts.”

Tackling the shortage of engineers in the UK has long been a topic of debate in our industry. There is an intense focus on inspiring the next generation, which is of course vital, but it will be a decade before these people emerge from university. During this time, we have £460bn of infrastructure to deliver and the skills shortage is already starting to bite.

So in addition to addressing the long-term, we must find sustainable solutions to some very real consequences of a deficit that could hit our profession, our infrastructure and ultimately people’s lives much sooner.

Understanding the potential consequences is the first step in mitigating against them. This is why we commissioned a study – The skills deficit: consequences and opportunities for UK infrastructure – which compiles the views of more than 40 experts from across the infrastructure sector.

One of the main risks identified is a sharp increase in the price we pay to deliver our infrastructure, primarily as a result of wage inflation. This means our budgets won’t go as far as anticipated, so we either get less of what we need, or we pay more for it. As an industry we are already working hard to reduce the costs of delivering infrastructure in the UK, so this adds an additional dimension

which will need to be resolved.

Delays to project delivery was another issue raised, as sectors and companies compete for the most in-demand resources.

One of the ways to tackle both of these issues is through better planning and prioritisation across the whole of the National Infrastructure Plan. Scheduling projects in a way which doesn’t draw on the same resources at the same time will help. Ultimately this could result in more than £6bn of cost savings.

Alongside better planning and resourcing, tempting more young people into a STEM careers must remain a top priority. We need to be more effective at challenging perceptions about the profession. Young people need to better understand the impact engineering has on society and see engineers standing alongside doctors and astronauts.

As engineers we work together in partnerships every day to deliver a common goal. We need parents, teachers, students, politicians and the current science and engineering communities to play an active role in finding the solution. This is the only way we really can reduce the skills deficit and solve the impending challenge for our future infrastructure and the UK economy.



**Claire Gott, founder, Cameroon Catalyst**

## Consultation, collaboration and communication – key to global infrastructure success

Global infrastructure opportunities are growing and as we move into a post-recession environment, businesses all over the world are looking to maximise their outreach abroad once more.

In particular those working in the developing world are keen to build on their investments and continue to break down overseas barriers. These barriers and challenges can face businesses and charities alike and for UK based engineering charity Cameroon Catalyst they are well known.

Since 2009 we have delivered community-led infrastructure projects to improve medical and educational facilities in North East Cameroon. Whilst the design and fundraising of each project is undertaken here in the UK, the successful construction of these projects is largely driven by local influences in Cameroon.

Reliance on existing infrastructure on the ground can leave organisations vulnerable to additional costs, putting projects at risk.

This is something Cameroon Catalyst faced during the recent installation of a solar panelled hub, highlighting that without meticulous planning, unexpected costs can occur due to

delays in transportation and delivery of equipment and supplies. Consultation and collaboration with local governments and NGOs is crucial.

Another matter to consider is language. The use of technical terminology during construction projects elevates the importance of breaking down language barriers to ensure that all parties involved in these projects seek the same end result.

The presence of a multinational consultancy firm can safe-guard against some of the challenges.

One such firm is Article 25, who has collaborated with Cameroon Catalyst to formulate a new five year plan for continued work in North East Cameroon.

With a focus on water and sanitation, the aim is to boost efficiency within the community-led infrastructure development model, accounting for lessons learnt so that similar projects can be put to practice across the region.

Clearly there are still some issues associated with cross border working, but it is the implementation of lessons learnt that is crucial to breaking down overseas barriers.



**John Betty, director of place, Stoke-on-Trent City Council**

## Why HS2: the Stoke Route is the best value for UK Plc

Stoke-on-Trent has put forward a compelling and convincing case for HS2 in the Stoke Route which would deliver exactly the outcome a broad political consensus says HS2 should do for UK plc. But despite all the evidence, HS2 seems determined to shunt the Stoke route into the sidings,

Politicians and analysts all agree HS2 should be about connecting up the nation’s cities, the engines of growth. The Stoke-on-Trent city region is the only major conurbation between Birmingham and Manchester, with a population of over 470,000. If HS2 is about strategic economics and rebalancing the economy towards the north, Stoke-on-Trent is perfectly placed. It’s one of the fastest growing cities in the UK with the shovel-ready development land to absorb a city the size of Milton Keynes.

Experience of high speed rail developments elsewhere in the world has demonstrated that city centre stations deliver much greater impact in generating jobs and growth. And when that city is only 55 minutes from London, 20 from Birmingham and less than 30 from Manchester, the economic transformation will be on a nationally-significant scale.

It’s not just great for Stoke-on-Trent; it is exceptional value for the UK taxpayer. The Stoke route would be at least £2bn cheaper and a lot greener than the alternative route through Crewe using the existing brownfield railway corridor through the city. It uses tried and tested urban high speed rail technology, needs less expensive tunnelling and cuttings and is a shorter route that avoids the complexity, disruption and cost of remodelling one of the most complex rail junctions in Europe.

The Stoke Route is faster, delivering more connections to more people earlier, with HS2 trains direct to Macclesfield and Stockport, Manchester and all other HS2 destinations by 2026, direct HS2 services to West Yorkshire (HS3 ready), journey times to all destinations same or better.

If left unchallenged HS2’s flawed process will lead to the wrong railway being built, at £billions greater cost to the taxpayer, and with £billions less macro-economic value.

The Government says it hasn’t made its mind up yet, but if Stoke-on-Trent is overlooked there will be some serious questions to be answered.

For more information about Cameroon Catalyst visit their website at [www.camerooncatalyst.org](http://www.camerooncatalyst.org).

For more details on the Stoke Route visit: [www.stoke.gov.uk/hs2](http://www.stoke.gov.uk/hs2)



**Baroness Jo Valentine,**  
Chief Executive, London  
First

# Making the capital’s infrastructure case to politicians

For details of the London Infrastructure Summit on 25 March 2015 visit [www.londonfirst.co.uk](http://www.londonfirst.co.uk)

With an election careering towards us – and an inevitable Spending Review thereafter – now is the time for everyone with an interest in the huge infrastructure challenges facing London to direct as much noise as possible towards our elected leaders.

There are plenty of handy stats to support effective noise making. For example, London may have just passed a record population high of 8.6M, but that pales in comparison to the 10M head count we are scheduled to hit by 2036 and the attendant pressures on infrastructure.

Think travelling round London is tough now? Demand is set to double by 2050. Think housing is expensive and tough to come by now? Take a moment to remember that we are only building half the homes needed.

Stats like these explain why the Mayor’s price tag for prospective infrastructure spending to 2050 has 12 zeros in it. Yup, that’s a nice round trillion pounds.

At London First we are bringing together key business leaders, politicians, and senior representatives from the property, investment, construction, transport and public sectors at the London Infrastructure Summit on 25 March 2015.

There we will discuss our ‘Manifesto

for Jobs and Growth’ which sets out what we want the new government, whatever its make-up, to focus on after the General Election on 7 May.

Our priorities include calls to build an additional runway in the South East, step up momentum on Crossrail 2, deliver the Thames Tideway Tunnel, encourage utility regulators to better support growth, and more support to improve digital infrastructure.

The government also needs to provide long-term funding certainty to TfL to support the essential renewal and enhancement of London’s public transport system; as a minimum to reaffirm the core five year capital funding settlement for Transport for London, though further moves to give the capital greater control over local taxes would be welcome.

In housing terms, urgent steps to tackle the housing shortage should include giving the Mayor power to lead on identifying and disposing of publicly own land that is surplus to requirements, as well as setting hard evidence-based targets.

The fact that the list goes on just shows the scope of the challenges ahead. We are entering a crucial time to make the case and all hands need to man the pumps.



**Richard Threlfall,** Partner,  
UK Head, Infrastructure,  
Building and Construction  
KPMG

# Fifty Shades of Fiscal Freedom

“It won’t be Fifty Shades of Devolution. It will be Fifty Shades of Disappointment.”

The latest KPMG Focus on Infrastructure, Building and Construction: Skills digital magazine is available to download at [www.kpmg.com/uk/en/industry/buildingandconstruction](http://www.kpmg.com/uk/en/industry/buildingandconstruction)

The closer we get to the General Election the more our politicians tell us how keen they are on devolution. It stands to reason – the electorate is spread all over the country and the suggestion of more money to spend locally is bound to be a vote winner.

But so far I have seen nothing that looks remotely like a concrete commitment and until we get that, the devolution debate is just hot air.

There is a very real problem. Over the last decade the economic centre of gravity of the country has moved relentlessly south. According to the Office of National Statistics, in 1999 31.9% of UK output came from London and the South East. By 2011 it was 36.6%. These are substantial shifts in a very short timeframe, and there seems little prospect of them reversing soon.

In part this is the story of the success of London where total employment has risen so fast that it is already at the level that the 2010 London Plan forecast would be reached in 2024. But it also reflects long-term underinvestment in the UK’s second tier cities.

The Institute for Public Policy Research noted last year that the country was spending on infrastructure 10 times as much per person in London than in Yorkshire.

There seems little prospect of the Treasury adopting spending policies that would deliberately drive economic growth in our regions, so the only solution is substantive devolution of funding to pass more buying power into local hands. That ask is not radical by international standards – UK local authorities currently control less than 2% of GDP in local taxes, compared to an OECD average of around 10%.

But which taxes to devolve? The London Financing Commission proposed devolution of property taxes. The City Growth Commission suggested all Council Tax and Business Rates. The Government has suggested that a proportion of a shale gas levy might be retained locally. And more recently Nick Clegg declared himself personally in favour of devolution of stamp duty.

I have no reason to doubt Nick’s sincerity on that, but it was interesting it was pitched as a personal not party position. That makes me sceptical as to whether, post-election, fiscal devolution will actually happen.

I fear that we, the electorate, are being teased on devolution. We are being played with. Everyone is getting very excited, but I suspect the morning after (the election) we will feel the pain. It won’t be Fifty Shades of Devolution. It will be Fifty Shades of Disappointment.



**Charlotte Alldritt,**  
Secretary to the City  
Growth Commission, RSA

# Is there a new spatial awareness in Whitehall?

“As we get closer to the election, it is unlikely technical debates about the infrastructure appraisal or city-regional devolution will be headline issues.”

Charlotte Alldritt is the author of the RSA City Growth Commission’s recent series of reports which investigated what is needed to enable our cities to thrive - [www.thersa.org](http://www.thersa.org)

“We haven’t seen another government focus so much on infrastructure investment for quite some time,” said one speaker at a recent conference on Northern infrastructure. Whether or not this is true, the hope that this government and the next understand the urgency for higher infrastructure investment is one to cling to.

As the World Bank and others have shown, the UK is failing relative to our competitors in the quantity and quality of our infrastructure. While central government investment is due to increase over the next few years, much of this will be focussed on energy.

At the RSA City Growth Commission we pushed early on for a greater emphasis on investment in connectivity, particularly transport links between our northern metros where the untapped agglomeration potential is huge. Our analysis found that inter-metro commuting across the Northern Powerhouse increased by 21% between 2001 and 2011. The daily flow from South Yorkshire to Greater Manchester increased 110% over the same period – 19,000 extra daily commuters. The Chancellor was persuaded, and the development of HS3 (unlike its sister,

HS2) shows government is starting to look for answers to at least the right questions: what infrastructure investment do we need to make this place more productive and competitive?

However, while the ‘Devolution Deal’ between HM Treasury and Greater Manchester shows that Whitehall may have started to think about the spatial dimension of economic development and public service reform, cities continue to be frustrated by fragmented processes and bureaucracy. Instead, cities need to be able to plan investment over long periods of time, meeting the priorities of their functional economic areas. They also need to have greater financial flexibility to pool and leverage mixed sources of finance.

As we get closer to the election, it is unlikely technical debates about the infrastructure appraisal or city-regional devolution will be headline issues. However, they underpin many salient policy areas. We’ve seen what cities can do to demonstrate their capacity for sophisticated collaboration and drive effective policy and delivery. Now is the time for them to take a leading role in determining the infrastructure that will create a thriving system of UK cities.



**Professor Dame Ann Dowling,** President of  
the Royal Academy of  
Engineering

# My challenge: building powerful academia-industry collaboration

For more information or to submit evidence to the Dowling Review, please see [www.raeng.org.uk/policy/dowling-review](http://www.raeng.org.uk/policy/dowling-review)

Engineers are drivers of innovation and competitiveness. Engineers have the skills and ability to tackle the grandest of challenges and find solutions that work. Whether in research, technology, business or policy, we are equipped to analyse problems, synthesise solutions, manage projects that create the right outcomes and turn those experiences into new opportunities.

With this in mind, my first major challenge as President of the Royal Academy of Engineering is to lead a review advising government on how to support development of productive relationships between UK businesses and UK university researchers.

We are collecting evidence from both the private and academic sectors on how people have managed collaborations and ventures and suggestions for how government can help facilitate the process in the future.

I want to help businesses and academia to better understand each other’s needs, interests and constraints and to develop trusting relationships which will allow them to share long-term strategic plans.

We also want to hear from those who did not succeed. As in the world of

research, a negative result is still a very valuable result and will be essential in generating a comprehensive body of evidence.

Another great challenge for our profession is the major skills shortage. EngineeringUK estimates that by 2022 the UK will need at least 1.82M people with engineering skills. We need to inspire many more young people to take up careers in these crucial areas. We must also improve inclusion – only 7% of engineering professionals in the UK are female. The Academy’s Diversity Leadership Group is working hard to remove obstacles and encourage more women and other underrepresented groups to join our profession.

Outshining our global competitors means focusing harder on the UK’s own, longstanding advantage – engineering innovation – as the key to the development of world-leading engineered services and products.

Engineering is evolving all the time. Many of the jobs we will need in 20 years’ time have not been invented yet, just as many of the jobs advertised today did not exist 20 years ago. The future holds a huge variety of fascinating new jobs.



# Tristram Carfrae: “I’ve had luck all my life”

Arup deputy chairman, engineer for the Garden Bridge and designer of the Beijing Olympic Aquatic Centre Tristram Carfrae picked up his Gold Medal from the Institution of Structural Engineers last month. *Jackie Whitelaw* went to meet him.

**T**ristram Carfrae is unique among structural engineers in being able to say one of his projects has been judged more desirable even than lipstick and high heels. That scheme was the Beijing Olympics Aquatic Centre – the Water Cube – and in 2008, women’s magazine *Marie Claire* placed it in top spot in its list of the world’s 101 most sexy things.

It is an accolade he is incredibly proud of because the beauty of structural engineering received mainstream recognition and because it demonstrated that the right design can resonate positively with the public, something which he believes all engineering design should be doing.

As he said when his Gold Medal award was announced: “The next decade will be full of opportunity for structural engineers; engineering will become more relevant to ordinary people’s lives as we respond to challenges like climate change and sustainability, designing the new, resilient structures required for increasingly challenging environments – while also attempting to make a better built environment.”

The Beijing Aquatic Centre, he says, is his best engineering solution to date.

“We did something then that no one had ever done before,” he says. “We got the engineers to tell the architects what the perfect swimming centre would look like.” That included the acoustic engineers saying they didn’t want a glass box as it reflects sound but the mechanical engineers saying they needed a glasshouse to keep the costs



**“I was chosen apparently because I knew about steel and lightweight structures rely on steel. But all I had said was that I knew nothing about concrete.”**

**Tristram Carfrae, deputy chairman, Arup**

of heating the water down. Out of that came the solution to use ETFE plastic that let the sound out and the light in.

“The right engineering solution led to the right structure” as Carfrae says and the deep blue box of bubbles became for the public the enduring symbol of the 2008 Games, more even than Arup’s other triumphs, the Bird’s Nest stadium and the CCTV tower.

The Aquatic Centre was, excuse the pun, something of a watershed moment for Carfrae himself. Use of ETFE, if you look back over his career, was inevitable given that he had pioneered and developed lightweight structures since the early 1980s. “But up until Beijing all my structures had been about efficiency.



**Top: Carfrae is working with Thomas Heatherwick on the proposed Garden Bridge in London.**

**Right: One One One Eagle Street in Brisbane – a design Carfrae says is from a phase when he has become more “poetic”.**

Afterwards I became more poetic,” he says.

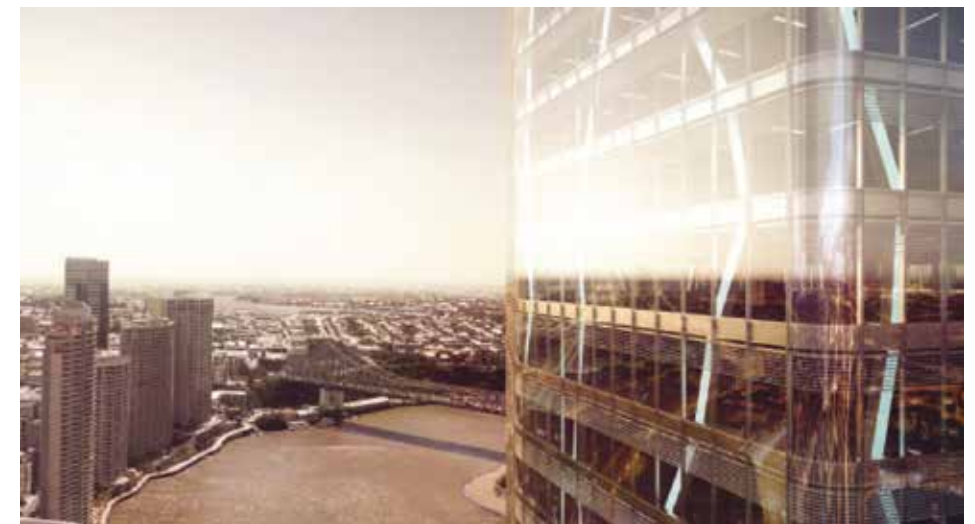
Singapore’s Marina Bay double helix bridge, the AAMI Park Stadium in Melbourne and 111 Eagle Street Brisbane are all late flowering Carfrae designs.

Carfrae is now 55 and has spent his whole career with Arup which he joined fresh from a Cambridge degree in mechanical sciences.

His decision to study engineering was the result of seeing his mother at work as an architect. “I remember clearly saying to my mum at 16 that I fancied being an architect. She took one look at me and said no, no, no! You are not arty enough but you could be an engineer and work with a firm like Arup who collaborate well with architects. I’d forgotten that until I joined Arup and then it all came back to me.”

His whole career, he says, has hinged on what happened in the first week at Arup in 1981. In those days all the new graduate employees gathered together for a residential two week induction. “Someone stood up during that and talked to us about lightweight structures,” Carfrae remembers. “A week later they asked who wanted to join and I was one of about 15 who put their hand up.

“I was chosen apparently because I knew about steel and lightweight structures rely on steel. But all I had said



was that I knew nothing about concrete. In fact I knew nothing about either!”

Starting out in a whole new field suited him down to the ground. “There were no codes of practice, no regulations, you had to work everything out from first principles. And we were just moving from physical models to using computer analysis so I became a computer programmer. I helped write something then that I am still using now – the Fablon non linear analysis program. That was just a list of numbers to start with, numerical co-ordinates for the structure, fine for engineers but not good for explaining the structure to clients and architects.

“But I found a colour VDU sitting idle – no one had worked out what to use it for – and managed to make it draw lightweight structures. Then I photographed the screen with a polaroid

camera on a tripod under a black sheet like a Victorian. Even then, I could only get an image by taking the photograph after dark with the lights off.”

Carfrae spent a year with lightweight structures but with no live projects moved on to join the team on the Richard Rogers Lloyds of London building.

It was his first spell working with Sydney Opera House roof engineer Peter Rice who with John Thornton was leading the Lloyds engineering. Carfrae helped design the steel for the atrium using U-frame theory for the stability of the out-stand truss chords, as he says “a common enough technique for bridge design then but rarely used in buildings”.

In 1983 he was back working on lightweight structures, this time on a real project, Michael Hopkins research laboratory for Schlumberger



in Cambridge which was the first major use of PTFE coated woven glass fibre fabric in the UK. “That was very exciting; I wrote the program to calculate the cutting patterns.”

It was a startling first three years of career in hindsight. Are there the same opportunities for young people now? “That’s difficult to answer,” Carfrae says. “Arup was a smaller place and scale changes culture whether you like it or not. You could move about more freely but we are by no means stolid now.

“But I was incredibly fortunate to be part of the first generation using computer design. I know we haven’t fully explored its use yet, but there won’t be the same vertical curve.

“That said what is changing is that engineers are able to work faster. Ove Arup always said that if architects, engineers and builders could talk to each other more there would be better buildings. The problem in the past has been that engineering calculations take a long time and we were out of the loop. Now we have become faster we can get more involved.”

Carfrae’s next opportunity came when he moved to Australia. “Almost as soon as I landed Arup won Sydney Football stadium with architect Philip Cox and they needed me to sort out the roof so I was given a fantastic project on a plate.

“That’s the advantage of moving place; you don’t have a whole history burdening you. People thought I was more experienced that I was and I took the chance offered.”

My most formative job in Australia was the Brisbane Convention and Exhibition Centre,” Carfrae says. “It introduced me to the way construction is done. A lot of major public jobs are tendered for design and construct so the biggest and most reputable contractors all compete and their reputation depends on them doing a good job. They get their architects and engineers involved right from the start and it’s all about speed, efficiency and cost control.

“For Brisbane we decided to do a hyperbolic paraboloid steel shell and I committed to using only 50kg/m² of steel.

“I’ve had luck all my life and here is where I understood that. I had specified T50 steel reinforcement to economically increase the tensile capacity of some steel tubes. But then I was told they didn’t make those in Australia. They used Y’s and at 40mm maximum. Before I had time to say anything to the contractor he had called to say he’d found a stockpile of T50s that he’d bought cheap and he wanted to use. So I



The Beijing Olympics Aquatic Centre – no 1 in Marie Claire magazine’s 2008 list of the world’s sexiest things.

was seen as supremely clever.”

For a two year interlude he came back to the UK in 1998 to help run Arup’s architectural practice, Arup Associates, “which had just won the Manchester Commonwealth Games stadium and the roof was mine.”

“Working with Arup Associates changed my approach to design,” Carfrae says. “I was interested in what all the different engineers in the team did. I moved from being a technical structural engineer to an integrator, picking up an understanding of all the other disciplines. Back home in Sydney, Khalifa stadium for the Asian Games 2006 was soon on the books and then it was on to the heights of Beijing and groundbreaking projects like the Helix bridge.

In 2007 Carfrae was promoted to be global leader of the building sector practice and in 2011 he came back to the UK to be at the centre of the Arup business.

“I found that a difficult transition,” Carfrae says. “I hadn’t realised how much a part of the Sydney industry I had become. In London I had 2,500 people working with me but I was unknown to them and think I was slightly unwelcome.

“Three years and more on its becoming good and now I am deputy chairman I am out of people’s everyday hair. The developing relationship with Thomas Heatherwick has been a particular pleasure for Carfrae. “I saw his work on the British pavilion at the Shanghai expo – the best space that I

have ever been in – and wanted to work with him after that. The bridge is going to be the most beautiful environment. I’m working with Mike Glover, another Gold Medal winner, and the only niggle is that Thomas came up with structural layout before we were involved which is slightly frustrating,” he says, smiling.

Carfrae will ultimately probably return to Australia but has at least ten years in which to make even more of a mark at Arup. “What do I want to achieve? I want to spend half my time on projects with clients to demonstrate that though we are a very large firm, Arup can still be led by people practising professionally.

“I am intrigued by the mechanisation of the industry too. Now we can represent accurately every element of the end product we will effectively be manufacturing. So will builders become manufacturers or will manufacturers become builders? And if we will be employing less of the “wet” trades, how will that affect the economy, education and training?

“And I am fascinated by the potential of timber. The more timber we put in buildings the more carbon dioxide we lock up. Construction is the only place to put it that will lock it away for 50 to 100 years.

“Our focus as an industry and a profession could change to being carbon positive! The potential is enormous.”

*This article first appeared in The Structural Engineer*

# Infrastructure department could push delivery to next level

Last month Stephen Hammond MP and ACE published a paper designed to start a debate around the need for a fully-fledged Department for Infrastructure at a breakfast event hosted by Arup. Here *Peter Campbell* runs down some of the recommendations.

As the election approaches, those involved in infrastructure should be happy. It has never enjoyed as high a profile, yet all the main parties are vying to brandish their credentials, and demonstrate why they are the party of our transport, utilities, and communications networks.

The Conservatives and Liberal Democrats will run on their record of pushing forward with new power generation, High Speed Two, and a £15bn Road Investment Strategy. Labour, for its part, is trumpeting ambitious new house building targets and a new National Infrastructure Commission to determine the UK’s future needs.

This last policy is a particularly interesting one. The brainchild of Sir John Armitt, one half of the dynamic duo who oversaw delivery of such a successful Olympics in 2012 (the other being Lord Deighton), the NIC promises to address the problems that result from the inconsistency between the time horizon of individual governments and that required for planning major infrastructure.

The view of this new paper, however, is that this is only half of the story, and a NIC could be most effective as part of a dedicated Department for Infrastructure (Dfi). By placing it at the very heart of government, infrastructure would enjoy the kind of influence and have the kind of voice currently only enjoyed by the ‘Big Four’ offices of state.

Clear leadership would be provided, with a single point of contact for everyone involved in strategic infrastructure, which would lead to better interfaces across central, devolved national, and local policy makers. In addition, bringing all the infrastructure under one roof will ensure a better understanding of the interdependencies of our infrastructure, and better planning.

This could also lead to more effective programme management, and the adoption of more of a ‘whole life cost’



Stephen Hammond (top) suggests that John Armitt’s (below) proposed National Infrastructure Commission would be most effective as part of a Department for Infrastructure

approach to infrastructure provision, as greater knowledge and expertise is developed through closer collaboration across different infrastructure modes. Ultimately, this could lead to cost savings through reduced maintenance costs, greater innovation, and the elimination of duplicate departmental functions within Whitehall.

The global precedent for this is clear, and if the UK is to move to a more federated structure in the coming years, there are a number of countries from whom we can learn. Australia, Canada, and Japan all have something akin to a Dfi as described above, with the equivalent position of Secretary of State a key cabinet position in each. There is no doubt of the benefits of this approach to planning, with both Canada (19th) and Japan (9th) above the UK (27th) in the World Economic Forum’s table ranking ‘Quality of Infrastructure’.

The hope is that, in the run up to the election, this paper will spark a debate among the main parties about how our strategic infrastructure is developed. This is just one solution that could work and we will be watching to see what others come to light as we approach Thursday 7 May and beyond.

**Some of the report’s key recommendations include:**

- Establishing a Dfi with responsibility for long term strategic planning of our national networks, ensuring a cross-party consensus can be developed more readily,
- The proposed NIC would sit within Dfi fulfilling a similar role to the Office of Budget Responsibility (OBR) at Treasury, providing a rigorous assessment of the UK’s needs and analysing the efficacy of government infrastructure policy.
- Once developed, this assessment would then be implemented via the National Infrastructure Plan (NIP), and through the various sector regulators (Ofwat, Ofgem, Ofcom, ORR, etc.) via the investment cycles they oversee.
- Infrastructure UK would move to the new Dfi to provide oversight of financing and delivery, and continue to have strong links with its former landlords at Treasury.
- Existing infrastructure departments would operate and maintain any new infrastructure once delivered, as well as continue to have responsibility for non-strategic infrastructure.



# Creating the UK’s Northern Powerhouse

Collaboration, connectivity and unity over infrastructure planning will create vital regional economic growth, reports *Antony Oliver* to kick off this special focus on the role of infrastructure in the development of the regions.

The expectation of relentless pressure on public finances is, according to Manchester City Council chief executive Sir Howard Bernstein, precisely why now is the critical moment for central government to invest to boost regional economies. Without a substantial uplift in business, employment and economic activity to redress the growing imbalance in the nation’s economic fortune, the situation is only set to get worse and impact further on the nation’s economy, he explained.

“Local government spend has been decimated but the reality is that in Greater Manchester we are spending exactly the same amount as we were five years ago,” he said addressing a conference on Northern economic opportunity hosted by KPMG in Manchester last month.

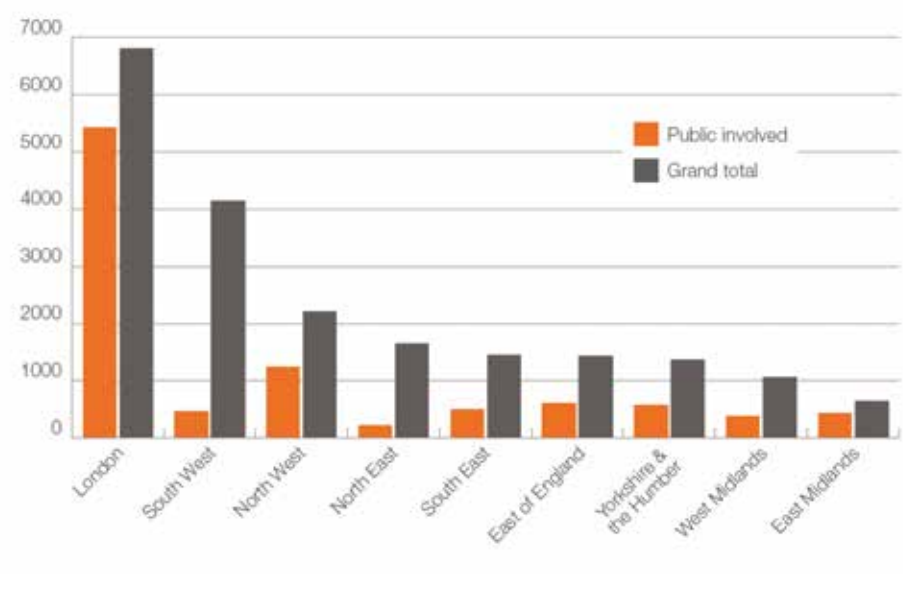
“We are spending less on success and more on dependency and therefore failure,” he pointed out, highlighting the critical national imperative to boost economic growth in northern cities.

“The deficit between levels of tax raised and what we spend is of the order of £5bn a year – the objective must be how do you significantly reduce that deficit?” he added. “Those are the fundamental challenges. Productivity in the region has to be increased and devolution makes that possible.”

Greater Manchester made national headlines in November when it signed a landmark devolution deal with Chancellor of the Exchequer George Osborne. In 2017 this will see a Mayor elected to a newly created 11th seat on the Greater Manchester Combined Authority. The deal brings with it a host of new powers for the Mayor and the city region including control over transport, spatial planning and skills training (see feature page 22).

According to Bernstein poor transport connectivity is a key part of

National Infrastructure Pipeline by Region (£ per capita )



Source: IPPR North, HMT 2014

the productivity problem. “The way we organise transport in the UK, for example, has been a national disgrace,” he said highlighting the a fact that the silo decision making meant ports were still built in isolation from the road system.

### One North

At the heart of the Manchester infrastructure debate was the deliverability of the plan set out in last August’s “One North” report by an alliance of six local authorities. This report set out how an interconnected North could benefit the nation in response to the challenge set by HS2 chair Sir David Higgins and the Chancellor George Osborne in his Northern Powerhouse speech in June.

The £15bn, 15-year investment plan to maximise economic growth across the north, boost transport links and help rebalance the national economy

also predicted benefits for the whole of the North of England and was, he said, fundamental to turning this situation around.

“We need to create a focus around multimodal travel,” said Bernstein. “One North is not just about rail. It is multi-modal and a fundamentally different way of looking at transport planning and delivery.”

He added. “It is a fundamental part of how we drive agglomeration and connectivity and the key to growing and strengthening the diversity and depth of our business base in each particular place. We have to continue this focus. One North is about vision and planning, it is not about setting up a new bureaucracy.

“We want the ability to retain the overarching vision about what sort of places we want to create.”

Cities in the north for the first time,

he said, understood the benefit of working together to boost connectivity and, working with business, can create “a very powerful noise about investment in the north”.

Not least, he added, given that the government was genuinely committed to rebalancing the UK economy.

### Collaboration is key

KPMG partner Richard Threlfall also underlined Bernstein’s view pointing out that unified regional government was clearly critical to making headway, not least to ensure that the issue doesn’t drop off the radar in the face of growing political and economic post-Election pressures.

“We do seem to be within grasping distance of political consensus around investment in the north,” he said, referring to progress on projects such HS2 and HS3. “The North report is a very important document, not so much for what it says but for the fact that it was written – for the first time we have got political leaders to talk about the future of the north together.

Threlfall referred to the opening paragraph of the RSA’s City Commission’s final report Unleashing Metro Growth published last October as summing up the scale of the current opportunity and impact that cities and city leaders had to have in driving the agenda.

“A new global picture of growth is taking shape,” says the report. “This is not about a transfer of economic power from North to South, or West to East. It is about the rise of cities, the concentration of productivity, innovation and creativity that will drive our economic future.”

Threlfall highlighted the relentless North to South shift in economic performance seen over the last few decades and pointed out that turning this around was possible but required cities of the north were able to take advantage of their collective power by investing in better connectivity.

“There is huge agglomeration potential in the North West but it doesn’t perform largely due to the lack of connectivity,” he said pointing to figures showing that a combined population of the North West was, at 6.7M roughly equivalent to London’s 7.2M but had half the jobs and a third of London’s £300bn contribution to the national economy.

Furthermore 62% of the total UK infrastructure spend in 2014 was focused on London – great for London, said Threlfall but a problem for the rest of the country. And while the growth of London has been fantastic for the UK, continued investment at this proportion will, he

“One North is not just about rail. It is multi-modal and a fundamentally different way of looking at transport planning and delivery.”

added, only exacerbate the situation.

“This is in part correcting for what has not been done right over the last 50-60 years but for me it is far more about the north gearing up to play the most powerful position it can in a future of a changing world. A key element of that is what is going on in cities.”

As Bernstein also made clear, while devolution is important, devolution with money is critical. Threlfall pointed out that in this respect the UK was way below other parts of the world with only 1.7% of UK spending controlled by the regions compared to a world average of around 10%.

“There is no fundamental problem with a centralised system provided money is allocated with a view to boosting regional economies,” he said, “And if the level of productivity in the north can be increased to that of the south then we really will have a Northern Powerhouse.”

“But there is a demographic time bomb in the north – it has an inability to hold high earning population,” he added. “And if we carry on like this the north will become the retirement home for the south.”

### Investment case

Yet with the current case for investment in London and the South East still very strong, local authorities in the north highlighted the critical need to underline the national value of boosting investment outside the capital. “The north needs to make the proposition,” said John Mothersole, chief executive of Sheffield City Council. “What does the north deliver? The answer is not enough so the challenge is a national plan by the north for the nation. We have won the [argument for devolved spending in] theory, now we need to win the practice,” said Mothersole. “Not by demonstrating how badly done by we have been [in the North] but by showing what we can offer the country.”

The solution, agreed local authorities speaking at the KPMG event was to boost the case for investment in the north as a solution to the national economy. “We need to win the argument about new

rail in the north to avoid more funding flowing into new Crossrail style projects in the south,” said Ged Fitzgerald chief executive of Liverpool City Council.

Tom Bridges, chief economic development officer at Leeds City Council agreed that the arguments were there to be made. “We have huge economic potential and economic scale. We are a significant element of the national economy so it is important for the UK economy,” he said. “We need investment in infrastructure to cope with the growth that we have got and the growth we are expecting.”

Newcastle City Council chief executive Pat Ritchie pointed out that while there had been focus on investment in the north before this time it felt different. “At the heart is strong political leadership from across the north and across the north cities regions,” she said. “There is also collaboration around priorities and making the case for those priorities,” she added that there was also a strong championing in central government that recognised the need to invest in the north and to work with regional authorities to make the case. “This is about creating a step change and it is about leadership,” she said. “We have much to bring to this partnership.”



Recent work by KPMG highlighted so-called “Magnet Cities” to uncover what makes cities successful? Seven key attributes were highlighted as being central to success:

1. Strong leadership
2. Fundraisers
3. Connectivity
4. Constant physical renewal
5. Definable identity
6. Cultivate new ideas
7. Attract young wealth creators



# Global thinking on local issues: Sir Howard Bernstein

From devolution to international investment, Manchester City Council chief executive Sir Howard Bernstein discusses the key issues.

Even the thick snow which beset the North of England at the end of January was not enough to prevent a full house from attending the Forum for the Built Environment (FBE) breakfast briefing with Sir Howard Bernstein. Regional director of the FBE and director of environment, health and safety at 1000 strong consultant RSK, Warren Percival interviewed Sir Howard to find out more about plans for the city region from investment in housing and attracting foreign investors to planning for high speed 2 and 3.

**Local Government Secretary Eric Pickles has been quoted as saying that Birmingham is in danger of losing its second city status to Manchester for good. What is your view?**

Birmingham lost its second city status 20 years ago and is now fighting that out with London! At the end of the day we can all have a view about our cities but what matters is what the market thinks. It is what global investors and international occupiers think. In the last 10-20 years Manchester has continued to move forward and show itself as progressive, business community that can expand its base and make sound investment decisions.

**Sport has been very important as a regeneration catalyst. Is that still core to development in the city region?**

There is a lot more to come on and off the field. We recognise that football is worth £300M per year to the Greater Manchester economy. That is the equivalent of hosting an Olympic Games every 4 years. The number of jobs associated with that are phenomenal and football is fundamental to our economic success. What we have to do is build on these opportunities and what is happening in the Etihad campus [where the council signed a 10 year deal to build 6000 homes] is unprecedented



**Better delivery frameworks needed says Sir Howard Bernstein**

anywhere in the world and there is more to come.

**The devolution deal proposes £300M for housing over 10 years with 10,000-15,000 new homes in the city. Could you give us a view on housing?**

People have heard me say for a long time that if you look at various national housing initiatives which this and previous governments have implemented they were not always relevant to the particular circumstances of Greater Manchester. If we are to grow our economy we need the capacity to intervene in markets that have failed and that is about acquiring the sites, remediating brownfield sites, and handing them over to the private sector to build housing for sale or for rent.

**In Summer George Osborne was in Manchester talking about the need for better and more integrated transport. After the General Election do you see plans for HS3 moving forward?**

I think that the current government's commitment to One North is absolutely

clear. The next Higgins report is due at end of February in time for the March budget. I am hoping we will see something in the budget to give more clarity on the formal government position. I think we are in a good place.

One North is more than HS3. There is a whole range of different options that need to be addressed but the one thing that is absolutely clear is that we need more fast trains between Manchester and Leeds. But it is more than that. We need our port facilities in Liverpool connected to our rail freight and road systems. At the moment they aren't which is extraordinary. We need to ensure that we are joined up with Hull and the North East and in Manchester we have to ensure that the Northern Hub is brought forward and delivered as efficiently as possible and secure the access to the commuter services serving Manchester and the wider region as soon as possible.

Fundamentally we have to create the framework within which those activities over next 10-20 years can comfortably progress. We have got to sequence these interventions in a much better way and that will be quite challenging because we are thinking about public expenditure incurred over 3 or 4 Comprehensive Spending Review periods. We have got to think about what happens first in order to use this hugely significant transport investment over the next 10-15 years as a positive platform for growth.

## RSK Environmental Consultants

Consultant RSK describes itself as the largest land remediation company in the country with over 1000 staff, 17 offices in the UK and offices throughout Europe and the Middle East. "We turned 25 in December last year, and it has been quite a 25 years. We were started by one man in a back bedroom in Aberdeen who is still thankfully at the helm today, and we are still independently owned," says Warren Percival, director of environment, health and safety. Turnover of £73m in 2013/2014 was a record year but thanks to growth in emerging markets such as Iraq the firm is on track to deliver in excess of £95M in 2015/2016. "A lot of that growth is in the UK but we have had double digit growth internationally, predominantly site investigation work in oil and gas," says Percival.

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# Investment in transport is creating economic gains in Greater Manchester

Connectivity improvements are critical for Northern economic growth. *Bernadette Ballantyne* talks to Transport for Greater Manchester about local and regional investment plans.

As the transport delivery arm of the Greater Manchester Combined Authority, Transport for Greater Manchester (TfGM) has an important role to play in the ambitions of the city and the wider region in becoming a true Northern Powerhouse.

"We are all about economic growth and the way that Greater Manchester works is by aligning planning with housing, with education and transport," says Dr Jon Lamonte, chief executive of TfGM. At one level this means supporting more people into work and education by giving them the ability to reach opportunities whether workplaces, schools or colleges.

"We have schemes with job centres where in their first few weeks of work people have a voucher, for public transport. We are working with health agencies to help people to get to and from hospitals and planning our transport network around hospitals so that it all links up," he explains.

At another level this means investment in more integrated infrastructure locally and regionally. Manchester sits at a critical juncture as in the future incoming high speed rail from the north-west HS2 link will connect it to London in 68 minutes and at the same time it is at the centre of the band of major cities spanning the Northern region from east to west. In transport terms there is a lot to do.

"Since One North the region has been developing a programme of transformational interventions, a multimodal strategy, which is not just about moving people, it is also about moving goods and freight," explains Dave Newton, transport strategy director at TfGM. This work is being carried out by a new organisation called Transport for the North consisting of council leaders from the six northern city regions: Liverpool, Greater



The new £11.5M interchange at Rochdale has transformed connectivity in the town

Manchester, Leeds, Sheffield, the North East and Hull and the Humber, along with representatives from the Department for Transport, the Highways Agency, Network Rail and High Speed 2. It met for the first time in January alongside a regional reference group made up of the political leaders of the non metropolitan councils. "We are all now working on the interim report which will be submitted to the Chancellor in early March. It has to bring forward the strategic case that One North set out to create a programme of strategic interventions and a long term vision of what transport needs to do over a 20 to 40 year period to deliver growth."

The One North document published in July 2014 called for £15bn in transport investment over the next 15-20 years and highlighted the potential for high speed rail links from east to west across the North, which was then promptly labelled HS3. "The One

North investment was mainly on big strategic interventions around the rail and highway network and about how do we provide better connectivity to ports and airports in the north of England," says Newton. "There is a lot more work to be done about what that could mean for Liverpool, Leeds and Manchester - primarily about how to build on city to city connectivity to improve the economic potential of city areas."

Potentially one of the largest schemes that could flow from this is a new rail tunnel across the Pennines between Leeds and Manchester. Tunnelling is also being considered by the Highways Agency for a new cross Pennine road link which could slash current journey times between Sheffield and Manchester by 30 minutes. Newton also points to the need to improve road links to Liverpool with a need to "unblock" the congested M62 to M60 link North West of Manchester.

With major projects on the horizon

all eyes then are on Transport for the North as it works on the interim report.

"A report like this jointly owned by city leaders with shared intent to make it happen is unique. The very act of getting this in place is an achievement," says Lamonte.

## Local progress

Of course the priorities and projects laid out by One North are about long term planning and build on work already underway in the region such as the £1bn Northern Hub rail scheme.

"This is a series of interventions across the North that really builds on the problem that we have of the interaction between Manchester Victoria and Manchester Piccadilly," says Lamonte explaining that the lack of connectivity between the two major stations which sit at opposite sides of the city and constrain north-south and east-west movement.

One of the biggest elements of this is the £560M Ordsall Chord scheme which will see a new viaduct connecting the stations hugely improving capacity at the stations themselves.

"Building on that is the north west electrification programme which is already well developed between Liverpool and Manchester and should complete within a month or so, giving better, faster services. Then we start on the north and some of the bits up towards Preston and then to the east of Manchester towards Leeds. That £300M programme is critical to moving from a diesel to an electric railway," he says.

Unlike many conurbations Manchester benefits from an extensive light rail system – Metrolink – which has recently been significantly expanded under a £1.5bn investment programme.

"We have completed phase 3 of the expansion which essentially trebled the size of the network, we have 92 stops now. We raised over £1bn of local contribution into a £1.5bn transport fund which was quite unique to Manchester and the first of its kind. In the two years that I have been here the tram has gone from 22 million passengers per year to 30 million and it is growing all the time," says Lamonte.

TfGM is investigating a range of options to improve connectivity. "We have already looked at getting out to the south east to Stockport and Marple not by tram but by tram-train, where we can start mixing trams with heavy rail," says Lamonte. This means trams using the heavy rail lines to cover longer distances and then switching to the tram tracks once they reach the inner city, a method



TfGM chief executive Dr Jon Lamonte (above) says Manchester has completed phase 3 of its Metrolink extension (top)

**"People should be looking at us and seeing the largest, most ambitious transport infrastructure programme outside of London so the opportunities are enormous."**

Dr Jon Lamonte, chief executive, TfGM

that is famously used in the German city of Karlsruhe. In the early 1990s the German city saw passenger numbers rise 400% when it introduced dual mode vehicles onto its heavy rail lines.

## Transformational interchanges

From the perspective of local conurbations TfGM's interchange programme is perhaps one of the most transformational projects underway. "Rochdale was the first and it has completely changed the dynamic of the town," says Lamonte explaining that the new £11.5m interchange which opened in 2013, not only connects bus, tram and road services but also harnesses renewable energy through a hydroelectric turbine harnessing hydropower from the River Roch. "Suddenly you have something sustainable that changes the nature of the town and builds on the sense of place and that is really what we are trying to do," says Lamonte.

A totally revamped interchange in Altrincham has now provided a well lit, fully accessible transport interchange with good access to car parks. TfGM has also taken on ticket sales responsibility. As local Dave Newton says, the effect has been transformational. "People love it. The town centre needs a lot of regeneration and the interchange is front and centre of the development plans to get more people in to the town centre."

A new interchange at Wythenshawe is also under construction and works have also begun in Bolton.

New interchanges at Wigan, Stockport and Ashton will follow and Wigan is also set to benefit from a 7km guided busway as part of a 25km series of bus priority interventions. This will be built by Balfour Beatty with First Group as the operator.

Major road projects are also critical from the new £290M airport link from Stockport to the A49 improvements. The managed motorways programme has also started on the M60. "That will make a massive difference to the congestion problem and what is going to happen in the future," says Lamonte.

Just as important as the road and rail links, TfGM is also actively supporting cyclists and claims to have the biggest cycling investment programme outside London having invested £45M since 2011. As it seeks to treble the number of cyclists in Greater Manchester it has just bid for another £30M cycle city ambition grant to build more cycle routes and integrated cycle paths.

Of course delivery of these important projects means working with consultants and contractors to get the best quality projects. So what does TfGM look for in its delivery partners? "We are looking for best value for money for the taxpayer and at the end of the day that is not always the cheapest. It is about getting the best quality product that we can afford," says Lamonte. "We are really interested in maximising SMEs and local employment."

Innovation too is vital, as is a strong delivery track record. "When we are out delivering the new interchanges we can't afford to get it wrong," says Lamonte.

For those that can demonstrate quality, value, innovative thinking, a strong delivery record and local content, TfGM has a range of frameworks in place for delivery. "People should be looking at us and seeing the largest, most ambitious transport infrastructure programme outside of London so the opportunities are enormous."



# Stepping stones: Improving rail services in the North

**W**ith the Northern Rail and TransPennine franchise tenders imminent the Campaign for Better Transport and Greengauge 21 set out the case for service improvements moving forwards. Their report "Rail in the North – Stepping Stones to a Rebalanced Britain" calls for a series of measures to be implemented over the next 5-10 years towards ensuring future high speed services.

"The ITT needs to set the tone for service improvements and reject the minimum cost approach that has prevailed," explains John Jarvis, associate director at Greengauge 21.

Among the recommendations in the report is the need to devolve planning, modernise rolling stock, improve stations, reform fares and transform

customer experience.

"Over the last 10 years customer demand increased by 150 percent into Leeds and Huddersfield, almost doubled into places like Bolton and Sheffield and increased by 60 percent into Newcastle. This compares to 50 percent nationally. So there has been very significant growth in rail and the question now is 'how does the franchise cater for future growth?'" he says.

Expectations from the government's Autumn statement are that franchisees will be expected to deliver at least a 20 percent capacity increase. "That is good news but evidence in our report suggests that demand growth will rapidly eat up that increase," says Jarvis.

Government has committed to introducing new rolling stock and

replacing the diesel Pacers that dominate the regional railway.

"Evidence shows that when better rolling stock is added it is quickly absorbed. On the TransPennine franchise new Class 185 trains were added in 2006 increasing capacity by a third. But by as early as 2008 they were experiencing overcrowding again and needing more carriages," says Jarvis.

"The rolling stock plan for the new Northern franchise needs to address the pressing current and future needs for additional capacity, refurbishment options as well as the approach to Pacers," says Jarvis.

Further electrification, as is underway through the Northern Hub scheme, and station capacity increases are also important says Jarvis.

The invitation to tender (ITT) was scheduled to be published by the Department for Transport in December 2014 but this has been delayed and a new date has not been confirmed although it is understood to be imminent.

Read the full report at: <http://www.greengauge21.net/resources>

## Andrew Morris, chair of business led campaign 20 Miles More on why a high speed rail link to Liverpool is vital

*"Together our northern cities can be more than the sum of their parts"*  
Chancellor, George Osborne,  
Northern Powerhouse speech



GVA. The Northern Powerhouse needs a labour market and economy of critical mass if it is to counterbalance London and the South East. The triumvirate of northern cities has that critical mass.

The Port of Liverpool is a national strategic asset. It's the gateway to our two largest trading partners: Ireland and America. The £300M private sector investment in Liverpool 2, the post-Panamax port facility, will double port capacity. So why is it that HS2's proposals will see Liverpool 2 being marooned, unable to access additional rail freight capacity released south of Crewe as high-speed trains crowd the existing lines in the North West? The

Chancellor risks building a Northern Powerhouse without critical mass and critical capabilities.

Liverpool is uniquely positioned for HS2 and HS3. It's the largest city not on HS2, despite being only 20 miles from the main line. A western link from Liverpool would not only link Liverpool to the North-South HS2 route, but would simultaneously start a West-East HS3 route from Liverpool to Manchester, Leeds and the North. But a lack of joined-up thinking between the various proposals and bodies has failed to realise this unique opportunity.

20 Miles More understand Liverpool must take the initiative as it did in 1830, when, with its growth constrained by poor transport infrastructure, it financed and built the world's first intercity railway. 20 Miles More and the Mayor of Liverpool are working with Respublica to demonstrate Liverpool's link is not only affordable, and fundable, but provides greater benefits than any other part of the high-speed network. We will be publishing our report imminently.

In 1830 Liverpool linked Britain to the world and built a railway that heralded the modern age. The Northern Powerhouse of the 2030's needs to recapture that spirit and breadth of ambition.

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# Seeking strategic influence and control

Improving transport, housing and public services will boost economic growth in the North West, LEP chair Mike Blackburn tells *Bernadette Ballantyne*.

Greater Manchester is moving forward with some exciting plans over the coming years, not least a target to become a net contributor to the UK economy by 2020.

"At the moment net tax revenues are £16.5-£17bn and public sector spend is £21-£22bn. Our ambition is to be a net contributor," explains Mike Blackburn, chair of the Greater Manchester Local Enterprise Partnership.

"We want to grow the economy at one end and reduce spend on the other but this is not about cuts, it is about re-sequencing activities locally and working better with providers and stakeholders."

Blackburn, who is also regional director for BT, says that the trailblazing devolution deal signed by the Greater Manchester Combined Authority (GMCA) in November, will help the city meet its goal. From early 2017 a directly elected Mayor will control spending in key areas such as transport, strategic planning, housing and policing. At the same time the GMCA will gain powers over existing health and social care budgets, skills and training.

"The deal is about how you get local areas to have more strategic impact on spend from Whitehall. At the moment decisions are made in London and implemented in Manchester with no real understanding of what is required here," he says.

"We want much more strategic influence and control alongside government on things like how the skills budget gets spent, on how transport impacts on the economy, how we deal with apprentices, how we get better integration of health and social care."

The mechanics of the deal are quite rightly unique to Manchester. The Mayor will become part of the combined authority taking a new 11th seat. "The current arrangements are very integrated with the combined



**"We can't let city regions fall any further behind. We have to get them back where they should be."**

**Mike Blackburn, chair, GMLEP**

authorities and not the same as London. Each of the Leaders holds a strategic portfolio and accountability for each of these goes back to the Combined Authority," says Blackburn. This means that majority votes are needed and the new Mayor would not be able to implement plans that are "at odds" with the rest of the city.

**Long term planning is vital**  
Having more power over transport and

spatial planning should in theory give the Greater Manchester region the ability to plan long term, something which Blackburn, who is also deputy chair of the North West Business Leadership Team, says is very much needed. "A couple of weeks ago we put forward the business views on infrastructure to the Department for Transport which means more integration and having a 20 to 50 year aspirational plan rather than just working in control periods of 5 years so that nothing really gets done on the big scale."

Just as importantly he says, short term activity has to be linked to the long term vision to give certainty to business and a great example of the potential for this is around future high speed rail plans. "A lot of businesses don't want to invest their time in thinking about high speed as it is 15-20 years away. They want to hear what is happening today, but the communication of these plans is not integrated. There needs to be an integrated set of plans on what is happening today to alleviate issues and how that links to the medium and long term."

At the moment Blackburn says that the current approach sees short term projects and action plans integrated with funding opportunities. "It feels a bit like a land of unintended consequences. Good gets done but makes things worse elsewhere."

Fortunately this is now being addressed. The new Transport for the North (TFN) organisation, which was formed following recommendations from HS2 chairman David Higgins in his report "Rebalancing Britain – from High Speed 2 towards a national transport strategy", is a truly integrated organisation comprising of local authorities, central government bodies such as the Highways Agency and Network Rail as well as businesses. "It is looking at how to make the rail, road and air links strategically advantageous for the north not just individual needs," says Blackburn.

That is not to say that good work is not being done. Blackburn points to the incredible development of Manchester Airport, which is the region's only international hub handling 22 million passengers per year. Its long term plan saw it invest in a second runway which opened in 2001. "It is growing and growing and growing," he says. "At a local level they integrated that airport growth with the production of local plans for the tram and for the rail links in negotiation with the train providers ... and that has all worked." But he

says there is more that could be done to support future growth. "Looking at national intercity rail and motorway activity, that is where it is a bit less connected than it should be."

## High Speed 2 link

An interim report on high speed rail will be published by TfN in March but it is expected that following on from recommendations in the Higgins report there will be a direct link to Manchester Airport. This will be a powerful draw for long term investment, in an area which is already growing with the Airport City North and World Logistics Hub developments which sit alongside the M56. "If we are definite that there will be a station there and start developing the plans around it, then developers and investors start to see the land in a very different way knowing that a high speed link is going to come in," says Blackburn.

For anywhere that will connect in to the high speed network planning for the future now is vital. "It all comes back to having an integrated plan. High speed rail in our view is set to answer a challenge about intercity connections between London and the northern cities," says Blackburn pointing out that this also means resolving the cross Pennine challenge where both road and rail links are under capacity.

"The Manchester to Leeds route takes over an hour, but it is less than 30 miles so it is almost the same journey as it was 100 years ago. If you get it down to 30 minutes people then think about commuting from Leeds to Manchester and vice versa, and businesses can access different labour pools. You would get better productivity," he says. "In my view the first priority is linking Manchester to Leeds in a better way, then Liverpool to Manchester, then to Sheffield and Hull."

This then is an interesting time for Manchester, which sits at a pivotal position along the high speed rail route, and is also no stranger to making major investments in transport infrastructure. "Building the [original] tram network cost more than a billion and nothing came from Department for Transport until more recently. We have proved that we have a vision and can bring it to reality on big investment projects."

For future projects this is vital as cities in the North vie for funding against the rest of the UK. Blackburn says that High Speed 3, can be compared to London's Crossrail in its scale. "If Crossrail was overlaid on to the North it runs approximately 15 miles west of

Manchester and almost touches Leeds. HS3 is the equivalent in the North."

Investing in such major projects is vital, says Blackburn if Northern cities are to grow their economic contributions and ensure that the UK is a multi-regional economy. "We can't let the city regions fall any further behind. We have to get the regions back where they should be. Productivity and economic growth are inextricably linked to quality of housing, quality of transport, skills and health, which are all public sector activities. So we have always had the plan to link growth and reform at the same time."

## LEP Growth fund

In July 2014 Greater Manchester secured its £476.7M growth deal covering investment between 2015 and 2021. In November it was announced that the city had secured an additional £56.7M to spend on transport, skills and business services. During 2015/2016 there is a particular focus on town centres.

"Each town has its own priority areas from better information systems and multi modal ticketing to new junctions, cycle and bus facilities. Projects are being funded in Bolton, Bury, Prestwich, Stockport, Oldham, Ashton, Stretford, Airport City and others," says Blackburn.

Major growth fund schemes include:

- A £40M life sciences inward investment fund, in partnership with Cheshire and Warrington Local Enterprise Partnership.
- A £35M investment programme for further education colleges and further education providers in Greater Manchester.
- Establishment of a new Quality Bus Network to deliver major improvements to bus services on the Route 8 from Bolton to Manchester.
- Acquisition of 12 additional light rail vehicles for the Metrolink network.
- A new Ashton Town Centre public transport interchange.
- A new Stockport Interchange and town centre access programme
- Key centre transport improvements: A range of transport improvements in local town centres. These will improve junctions; cycle and bus facilities; and pedestrian facilities.



# Northern road is a BIM trailblazer

The team on the nationally significant A556 have used a lot of ingenuity to successfully employ BIM on the 7.5km Greenfield road scheme.

At first glance construction of a new A556 dual carriageway that will link the M56 junction 7 with the M6 at junction 19, seems quite straightforward. But the 7.5km road, which will enable the existing congested A556 to become “Chester Road,” has a number of remarkable characteristics that make it a trailblazer from innovating on the use of BIM to being the first Highways Agency road to go through the Nationally Significant Infrastructure Planning (NSIP) process.

However its start was not very auspicious. Despite being put on the Major Trunk Roads programme in 1987, the project was dropped after a change of government in 1998 and then rejected during a review of options in 2003. However by 2005 it was back on the table and in October 2010 it was announced in the comprehensive spending review.

Also in 2010 contractor Costain had been brought into the scheme under an early contractor involvement arrangement. By August 2014 when the development consent order was granted by the Planning Inspectorate the contractor was ready to go.

“We had already worked up a detailed design so that when we got the DCO we could go straight on site,” says David Owens, Costain’s design manager for the project.

The timing for the scheme was important in other ways too with publication of the government’s construction strategy in May 2011 mandating the use of collaborative building information modelling (BIM) on all projects by 2016. With the project set for construction completion in April 2017 Costain working with designer Capita, was pioneering BIM on the greenfield road.

“The technology for producing a 3D design for buildings are very different to the tools that we have at our disposal for roads, rail, utilities or anything linear,” says Owens. Proprietary systems were used where available for



The new road link will relieve congestion on the existing A556

“It might seem like a straightforward road project but we have done some really innovative things here, which will inform BIM on future projects”

David Owens, design manager, Costain

each of the disciplines on the project. Highway design was modelled using AutoCAD Civil 3D 2013, while structures such as the six bridges on the scheme were modelled in REVIT 2014, and other packages used for the objects such as signs, lighting and drainage.

“Discreet objects like signs or lighting columns are designed in tools which embed asset data. For other assets such as pavement and road safety barrier we expanded the information we needed to know about them through a link to a database, a technique usually only seen in GIS community,” he says.

The team then created what Owens describes as “middlewear” to allow each of the BIM elements to talk to each other. This meant linking the information from the various packages making connections to the database which could then be used to derive the data required for handover to the client as part of the Construction Operators Building Information Exchange process or COBie.

“In building projects the Level 2 BIM deliverable information can be obtained from the workflow of REVIT or AECOSIM but we don’t have this for our tools,” says Owens. By collaborating with software developers Owens expects this to change in later versions. “This means we have informed change and overcome a significant hurdle at the same time,” he says.

“Currently it is difficult to go from my design model to COBie but we have a theory and mechanism for doing it in a slow production sense. Over the next two years it might just be design and hit the button to get what we need.”

Although it has required investment and dedication Owens says the benefits are clear. “The design team were resolving interface issues before we even looked at clash detection because this is a coordination model. I feel that we have a better product as a result.”

For example on the Chapel Lane overpass construction activities were not allowed to disturb a large diameter underground service, with vibrations or loadings not permitted. Using the model the team created the structure with piled foundations and longitudinal and transverse drainage runs and worked with the service owner to develop a solution which in the end saved £1.2M.

Now that the project is under construction the model is being used in its 4D application as a simulation tool. “It might seem like a straightforward road project but we have done some really innovative things here, which will inform BIM on future projects,” he says.

# Long term thinking brings new opportunities

The North West’s largest developer Peel Group says now is a time of fantastic potential as the region demonstrates vision and leadership

Developer Peel Group has been investing in the North West for over 40 years and is currently delivering some of the UK’s biggest projects. Liverpool2, the £350M new container terminal that will double Liverpool’s container capacity to 1.5M TEU, is set to complete at the end of 2015 and will bring over 5000 direct and indirect jobs.

This is complemented by a £150M development at Port Salford which is adjacent to the Manchester Ship Canal. New connections from here into the Liverpool to Manchester railway will boost freight traffic and the improved inland port facility will increase trade significantly along the Ship Canal, offering a more efficient, higher capacity transport option from Liverpool Port than road freight. At the same time, Peel is creating a 153,000sqm warehousing facility called the National Import Centre and upgrading the A57 road links.

“There is going to be a real boost to trade coming through Liverpool2 and then feeding up the Ship Canal into the core of the Manchester conurbation,” says Peter Nears, strategic planning director for Peel Group. He points to development of the US’ east coast ports, completion of the Panama Canal in 2016 and the trend for larger container ships

“Much more cross boundary working is going on which is good”

Peter Nears, strategic planning director, Peel Group

that Liverpool will be able to receive at the new terminal as being key drivers for future growth.

Having this long term view is one of the reasons that the developer was able to launch these schemes at a time of recession. Collectively its 56 projects around the Port and along the Manchester Ship Canal corridor are known as the Ocean Gateway. Launched in 2008, construction began in 2009 and long term investment potential is estimated at £50bn. “We did an update last year and found that we had invested £1bn, others had invested £1bn and it had generated around 12,000 jobs. Given that this was a period of recession, we thought that was a pretty worthy output.”

For Peel then, the recent focus on the North and the renewed government commitment to cross regional transport investment is very welcome. “One North and the formulation of Transport for the

North is very positive and much more cross boundary working is going on, which is good. We are very anxious to see that succeed,” says Nears. He says that taking a strategic view is critical. “It is not just about transport, but is actually about what that means in terms of the economic arguments and spatially in terms of major investment areas. Part of the process of One North is a national rebalancing and that needs to ensure that everyone gets to contribute according to their potential, not just where they are now but where they might be with investment support that One North might bring.”

That this is also seeing more collaboration across cities and regions is also positive, as are the new powers that a devolved Manchester will get on spatial planning. But more local control and the changing processes can also mean delay, warns Nears.

“That Combined Authorities are now getting together and doing more strategic economic plans and frameworks is really good, because it will give more certainty for projects moving forwards. The downside is, does everything stop while that is being done and momentum is lost? Does it become a situation where people talk the aspirations but there is a concern about green belt or about housing numbers and actually it becomes a document of constraint rather than a document of opportunity?”

On the transport side, Nears describes HS3, the proposed high speed rail east-west across the North, as “crucial” if the region is to get the benefits of HS2. “If HS3 is moving ahead before or at the same time as HS2, then HS2 can plug in to a much more developed system where people can move around the North more quickly. Otherwise there is a risk that it will take longer to get across the North than it does to get down to London.”

Importantly he says that although the Northern Hub project is delivering some benefits (see feature page 18), more radical strategic improvements are needed in rail across the Pennines.

Of course, Peel is investing in other sectors too: energy, aviation, retail, leisure and real estate and, although some policy decisions still need to be made on airports and energy, Nears says that now is an exciting time. “We are in a time of fantastic potential with new opportunities created from more global connectivity. But making the most of this will require long term vision, political leadership and an outward focus.” BB



Liverpool2 will double capacity and create a 1.5M TEU container hub in the North West



# Bentley opens door to 3D modelling from your phone

Infrastructure professionals will soon be able to instantly model the real world using the camera on their phone following the latest acquisition by construction software business Bentley Systems.

Antony Oliver reports.

The acquisition of specialist digital photography firm Acute3D by Bentley Systems means that digital photography rather than expensive specialist laser scanning techniques can now be used to capture and convert real situations into scalable 3D models.

Greg Bentley, chief executive of Bentley described the acquisition as being “more exciting” than any other in the company’s 30 year history for its ability to at last put “reality modelling front and centre so that it can be part of every project and every asset”.

The ability to create a 3D model using digital photographs means that the gap between the real infrastructure on the ground and the data in digital models used by designers, constructors and asset managers will be more effectively bridged using this software breakthrough.

“We started with laser scanning and point clouds and that is integrated into our design and construction modelling and, in fact, many of our users now start

every project with laser scanning and point clouds,” said Bentley highlighting the growing demand for so-called reality modelling across the sector.

“But the bridge is a better bridge if it does not have to start from rare and exotic observations that you might not have to hand,” he added. “Laser scanning is useful but you have to do it with a laser scanning device and specialist equipment and personnel.”

## Photographs to 3D mesh model

The Acute3D software automatically converts any digital photographs into 3D meshes, scaled to the resolution of the photograph so that the closer you are to the object photographed, the greater the resolution of the mesh allowing either whole cities to be photographed and modelled or individual objects.

Any overlapping digital image can be used – from the camera on the phone in your pocket through to more sophisticated digital SLR cameras mounted on cars or on aircraft of

unmanned UAVs.

And while the technology is not in itself new – it uses the same basic techniques currently seen on mapping such as used by Google – the key to the Acute3D solution is the ability to automatically output to a 3D mesh which is measurable and interfaces with design and construction models.

“There are two breakthroughs – first is that there is no laser scanning – it’s what is in your pocket or on your UAV,” explained Bentley. “But the other breakthrough is that the output is not a point cloud that is dumb and bulky but is a mesh in the same medium as our design and modelling environment.”

## Data alignment

Reality modelling processes observations of existing asset conditions using data from conventional survey, laser scans, from digital photographs or a combination of all. However, for the output to be really useful to infrastructure professionals it must align with the data in the design and construction model.

Until now the only way to achieve this was to laser scan and create a point cloud model which is converted to a mesh to interface with the design and construction modelling. While still useful, the downside to point clouds is that they generate large data files and specialist equipment to is required to create them.

Acute3D research work has taken the state of the art of photogrammetry forward and the business was recently rewarded at the French “most innovative start-up” Awards. A free version of the software is available on Acute3D’s website.

The smart 3D capture product has emerged from a “think tank” of 25 man-years of research at two major European research institutes, École des Ponts ParisTech and Centre Scientifique et Technique du Bâtiment.

## Unmanned Aerial Vehicles (UAVs)

The use of UAVs for surveying is already becoming increasingly common across the industry. However, as Bentley explains, this new technology also enables the technique to move towards inspection by creating output that can be measured and interrogated as a part of the digital design and construction model.

He says: “The fastest takers of this software are UAV makers. It will only be one or two years before UAVs are customarily purposed to regularly photograph each asset.



Digital images are converted to a 3D mesh scaled to the photo resolution

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## Look no further

With the government’s planned 2014-15 investment in infrastructure likely to support over 150,000 jobs, recruitment activity in this sector is on the up.

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## MPs quiz ACE on Strategic River Crossings

ACE's Mike Llewelyn-Jones and Tim Healey have told MPs that strategic river crossings should be planned against demand 30 years in the future, not 15.

The Transport Select Committee quizzed Healey and Llewelyn-Jones about the intricacies of building strategic river crossings after ACE submitted evidence to a review of river crossings last June. As chairs of ACE's Road Sector Interest Group, Healey and Llewelyn-Jones argued government should adopt an even longer-term approach to delivering infrastructure.

"We want to see a vision of what the transport map of the UK will look like in 2050," said Healey. "The National Infrastructure Plan is a good start, but does not go far enough in setting this vision."

The demand for new river crossings in the UK has been on the agenda in recent months with three slated for construction east of Tower Bridge in London. The Transport Select Committee has since launched an inquiry to judge the economic merits of building new crossings.

## Cabinet secretary confirms £8bn for infrastructure at ACE Scotland reception

New cabinet secretary for infrastructure, investment and cities for the Scottish government Keith Brown confirmed a commitment to invest £8bn in Scottish infrastructure over the next two years at ACE's parliamentary reception in Edinburgh.

Brown said the secured funding will support 40,000 full time jobs in Scotland, along with on the job training and local employment opportunities.

He outlined the £3.5bn of non profit distribution revenue finance projects – the country's alternative to PFI where contractors invest solely in the debt of a project, not putting in any equity and not receiving any returns on their capital investment.

He explained how the NPD programme is allowing construction of the £550M Aberdeen Western Peripheral

Route to happen much sooner than would otherwise have been possible previously, stating that this is critical to the economy in bringing forward £6bn of additional local economic benefit that will result when the road is in use.

## ACE National Conference highlights...three important issues

Nelson Ogunshakin reviews the ACE National Conference.



The 2015 ACE National Conference on Engineering Growth in March came at a critical juncture in the political calendar, with the general election in just a few weeks.

So, with that in mind, what is the key to engineering growth? Well the answer is simple – infrastructure investment. Without that investment, there is limited opportunity for growth.

It creates employment, employment creates revenue, and revenue generates income and tax, ultimately steering the economy in the right direction.

There were three topics open to debate at the conference that particularly piqued my interest...

### Financing Infrastructure

When it comes to alternative methods of financing infrastructure, investment doesn't strictly have to come from either the public or private sector. Indeed, it could well be a collaboration formed at different stages in the development process.

Essentially the onus falls on government to create an enabling environment, one which allows both the public and private sector, either in collaboration or separately, to go ahead with projects where the cost of construction is effective, is delivered and offloaded at a price that is reasonable, and can either be paid for in one go or received over a period of time. But it is important that government sets a target where financiers are likely to see a return on investment.



**Infrastructure Intelligence celebrates its first anniversary: Infrastructure professionals from across the industry gathered at a reception in Arup's London offices last month to toast Infrastructure Intelligence's first year. ACE chairman John Turzynski and ACE chief executive Nelson Ogunshakin led the celebrations and editor Antony Oliver presented Griffiths and Armour director Paul Berg with a £5000 donation towards their 80th birthday appeal to support charities Kind and Prostate Cancer.**

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Involvement of SMEs on large-scale projects

When I look at the London Olympics, to my mind, the preparatory work behind the event was a classic example of a proper procurement process being implemented.

The same model adopted for the Olympics was also used for Crossrail. There the procurement process encouraged SMEs to bid for projects. And how did it do that? It used a tiering process where large firms with large turnovers were involved in projects at various points in the process, but were conditioned to employ SMEs.

It's absolutely imperative that large companies partner with SMEs because they are specialised firms with resources worth tapping into. The opportunity for SMEs is great, but a lot boils down to the government adopting an effective procurement process.

#### Regions' response to devolution

One major criticism levelled at government by the industry is that everything is London centric. If government redistributes the wealth via devolution, it is important the industry follows its lead.

Most of the companies in the industry have regional branches, and those branches will benefit from devolution because of the increased pipeline and workload. But I would say that those regional branches have to be on their toes and be ready for the challenges that lie in wait.

We need to seize the opportunities the current political landscape presents and the challenges that go with it. Let us be aware, prepare and deliver on the expectations that have been set.

## Global McKinsey infrastructure guru to headline at ACE international conference

McKinsey principal Julian Mills, co-founder and chief executive of the Global Infrastructure Initiative is to kick off the 2015 ACE International Conference on 20 May.

The new "Maximising Global Infrastructure Opportunities" one day conference is designed as the annual gathering for UK-based global infrastructure experts and professionals

and will feature a range of powerful and influential speakers and panellists from across the global market.

Mills will set the scene for the conference and draw on his experience of leading thinking at the Global Infrastructure Initiative. This group marshals the world's 150 most influential infrastructure leaders controlling much of the \$20 trillion that the world will spend on infrastructure over the next decade.

The conference is supported by the ACE's International Business Group and follows last year's half day event during the ACE annual conference.

"The first ACE International Conference in May 2014 was an outstanding success," explained Gavin English, managing director of IMC Worldwide and chair of the ACE International Business Group. "Building on last year, the quality of the high profile speakers and discussions planned on the growing global infrastructure opportunities this year is tremendous."

Alongside Mills, speakers already confirmed include:

- Uwe Krueger, chief executive, Atkins
- Mike Haigh, UK managing director, Mott MacDonald
- Malcolm Bairstow, senior partner, EY
- John Horgan, AECOM, managing director, EMEA and India
- Gavin English, MD IMC Worldwide, chair ACE International business group
- Bernard Obika, managing director, Roughton Group
- Mat Riley, managing director, infrastructure, EC Harris
- Mark Whitby, Whitby Mulhair
- Henry Kerali, World Bank
- Julia Prescott, chief strategy officer, Meridiam
- Ben Mellors, partner, Beale and Company
- Andrew Ivison, partner, CMS Cameron McKenna
- Ailie MacAdam, senior vice president, Infrastructure, Bechtel
- Paul Westbury, group technical director, Laing O'Rourke
- Peter Chamley, director, Arup

The conference will also be a critical event to help young professionals to understand the complex and exciting career opportunities on offer around the world of infrastructure. To assist, concessionary pricing is offered to ACE Progress Network members.

For details of the conference, programme and speakers and to book your place at the event on 20 May, visit the International Conference website at [www.ace-international-conference.co.uk](http://www.ace-international-conference.co.uk).

## Spotlight on: ACE Health & Safety Group



Group chair and WSP head of health and safety Lorne Clarke looks back, and forward.

Health & Safety has come a long way over the last 150 years or so.

The first HM Factory Inspectorate was formed in 1833, with the main duty to prevent injury and overworking in child textile workers. In 1893 the first women factory inspectors, May Abraham and Mary Patterson, were appointed with much of their early work involved in investigating women's hours of employment and enforcing health and safety in the laundries.

And in 1902, Adelaide Anderson, the Inspector of Factories in Britain, included asbestos in a list of harmful industrial substances, and incredibly it took another 97 years for asbestos to finally be banned from use in the UK.

Last year we celebrated the 40th anniversary of the Health & Safety at Work Act, which has arguably saved more lives than any other legislation. Before the Act more than 700 workers in Great Britain were being killed each year at work and hundreds of thousands were being injured. Last year the number of fatalities was down to 148 with non-fatal injuries having been reduced by 75%. By comparison there have been almost 1000 fatalities amongst migrants on the World Cup construction sites in Qatar since 2012.

So what is ACE doing regarding Health & Safety?

The aim of the ACE Health & Safety Group is to promote best practices to enable organisations ranging from SME's to large corporates to receive the most up to date knowledge in this area and represents this ACE interest within bodies such as the Construction Industry Council (CIC).

Over the last four years the group has made some significant progress. Highlights include challenging the HSE regarding Fees for Intervention and routes for communication for health and safety advice, lobbying for better mutual recognition of Safety Schemes in Procurement (SSIP) member accreditations and submitting a formal response to the CDM 2015 public consultation. We have also given the ACE health & safety webpages an overhaul to ensure we are effectively communicating to the membership.

What will the next few years will bring for the ACE H&S Group?

As we come out of recession there will be many opportunities and challenges for engineering consultancies, all of which will potentially have an impact on health and safety, whether it be increased liabilities for businesses, increased health risks for workers, increased safety risk transfer from clients, unusual safety and health risks from innovative technologies or increased legislative change from Government.

The group plans to be at the forefront during this period, supporting our members through the lobbying of Government and major stakeholders, and supporting large and SME companies alike. Our major focus over the next few months will be to understand the requirements of the proposed CDM 2015 regulations and helping signpost ACE members to industry guidance and support. Underlying this will also be our ongoing support of SME's in all matters of health and safety, an initiative which has developed recently with increased collaboration between the ACE H&S Group and the ACE SME Group.

If you would like to know more about the work of the ACE Health & Safety Group or would like to know more about becoming a member of the Group then please contact Hannah Paul at [hpaul@acenet.co.uk](mailto:hpaul@acenet.co.uk).

## Book now for the ACE Engineering Excellence Awards gala dinner



**Book now: First class comedian Matt Forde - who has a nice line in dry wit - will be one of the highlights at the ACE Engineering Excellence Awards gala dinner on 20 May. The entries are in and the judging is underway so it is time to make sure you are your team are there at the Grand Connaught Rooms in London to celebrate the results. Details at [www.acenet.co.uk/awards](http://www.acenet.co.uk/awards)**

# New government must tackle air quality

Improving air quality across the UK "is the most important" environmental issue the next government must tackle, says director of the Environmental Industries Commission *Matthew Farrow*.

His comments come ahead of the release of EIC's 2015 Manifesto that calls for the creation of a Committee on Air Quality, which would be accountable to Parliament. The manifesto outlines five challenges any future conservative, labour or coalition government must prioritise, with delivering real air quality chief among them.

Farrow said the understandable need for a future government to secure economic growth will place further pressure on ecosystems.

"While we at EIC want a future government to deliver prosperity," he said, "that future government needs to give quite a lot of thought to how to combine economic growth with a good environment."

To manage the sustainable dilemma facing the UK will require innovative thinking and political imagination, according to the EIC Manifesto. It also lists delivering sustainable infrastructure, improving energy efficiency, and properly enforcing environmental policies as issues the next government should confront head on. It also points out the potential to increase exports of green products and services.

#### Air quality

As the result of an improved economy and increased economic activity, Farrow said pollution in the UK's major cities is above European limits, to the point where it's threatening people's health.

"An estimated 29,000 people a year in Britain die prematurely because they're breathing polluted air," he said. "There's no other environmental issue which has that sort of impact in people's lives, so real action is needed."

While the creation of a new Committee on Air Quality would address this growing problem, the manifesto has also proposed a package of policies. It suggests tighter restrictions on emissions from construction site machinery, more diesel engine buses to be retrofitted, as well as continued development of electric vehicles.

#### Sustainable Infrastructure

In a concerted push to improve Britain's global competitiveness and standard of

living, a flurry of infrastructure projects are underway, from new high speed rail lines to new housing projects. "The next government has to make sure when it is building infrastructure, it is doing it in a way that enhances sustainability ... rather than opposing it," he said.

New houses should be energy efficient and built on brownfield sites if possible, while incorporating drainage systems that are sustainable. Airport expansion must be compatible with UK climate change obligations.

#### Recommendations

The EIC Manifesto also suggests existing environmental policies be properly enforced, less energy be used in commercial buildings, and UKTI work closely with EIC to examine the UK's export market opportunities. But crucially, the manifesto has made policy recommendations the next UK government should adopt in the coming years, some of which are listed below:

- Establish a statutory Committee on Air Quality
  - National Framework of Low Emission Zones with proper enforcement
  - Revenue-neutral changes to vehicle tax to halt the current trend of displacement of petrol by diesel vehicles
  - Reduce motorway speed limit to 60mph in Air Quality Management Areas
  - Prompt implementation of energy efficiency policies such as Minimum Energy Performance Standards proposals and Allowable Solutions
- "Ten years ago, low carbon and climate change became the dominant issue and a lot less thinking was being done about broader environmental issues," said Farrow. "The next government needs to rebalance this with a wider range of environmental priorities while also showing that economic growth and sustainability can go hand in hand. No easy task, but EIC and our members are ready and willing to work with whoever comes into power to make it happen."

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



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