



**THE
STATE
OF THE
NATION**

**CAPACITY
AND
SKILLS**



ABOUT ICE

The Institution of Civil Engineers (ICE) is a global membership organisation that promotes and advances civil engineering around the world.

ICE is a leading source of professional expertise in transport, water supply and treatment, flood management, waste and energy. Established in 1818, it has around 80,000 members throughout the world, including over 60,000 in the UK.

ICE's vision is to put civil engineers at the heart of society, delivering sustainable development through knowledge, skills and professional expertise.

ABOUT THIS REPORT

The State of the Nation report has been compiled each year since 2000 by a panel of experts drawn from the various fields of expertise across ICE's membership.

Its aim is to stimulate debate and to highlight the actions that we believe are needed to improve the state of the nation's infrastructure.

The report is issued to a wide range of stakeholders, including politicians, civil servants, local authorities, trade, regulatory and consumer bodies, as well as the media.

This year, instead of providing one report covering all infrastructure issues, ICE is publishing several State of the Nation reports throughout the year, each focused on a specific issue which will affect the delivery of effective infrastructure for the UK.

This, the first of these single issue reports, focuses on capacity and skills.

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WELCOME TO THE STATE OF THE NATION REPORT ON CAPACITY AND SKILLS

 There has rarely been a better time to be a civil engineer. The UK is entering one of its strongest periods of infrastructure investment, and the civil engineering industry is experiencing one of its busiest times.

There is high demand for the profession which is only set to increase in the next few years, offering all sorts of opportunities for young engineers. This increase of planned infrastructure work raises a number of questions which the Institution of Civil Engineers (ICE) explores in this report.

Does the nation have the capacity and skills to deliver its infrastructure programme? How will a lack of capacity affect our infrastructure and what will be the effect on delivery costs? Is industry investing enough in the development of civil engineers? Are sufficient professional civil engineers being trained?

We are concerned that the impact on costs will reach a point where escalating projected expenditure could put whole programmes in jeopardy.

It is vital to understand the causes of rises in cost for infrastructure delivery. ICE believes that many of them are linked to the relationship between government as client, and industry.

One of our great challenges is coping with short-term financial planning while delivering projects which can take 10 years to complete. This is a recipe for stop-start programming - not only frustrating for the public but also wasteful of time and effort.

Successful procurement of public works requires effective and transparent planning from the client and strong partnership between client and industry. So the establishment of an Infrastructure Planning Commission is welcomed. It will speed up the delivery of major projects and give industry confidence that proposed schemes will become a reality.

I now invite government and industry leaders to join me to discuss how we can best take action on the ideas put forward in this report - the dependence between infrastructure planning and industry confidence. And that relationship must be strengthened to allow vital investment in talent and skills to ensure delivery of the infrastructure this nation deserves.

If we do, we shall realise our vision: to see civil engineers at the heart of society, delivering sustainable development through knowledge, skills and professional expertise.

David Orr
President,
Institution of Civil Engineers

INTRODUCTION

In recent years ICE, through its annual State of the Nation reports,¹ has made repeated calls for greater investment in the infrastructure critical to the UK's economic and social well-being. Those calls have met with some success as demonstrated by the commitments in the recent Comprehensive Spending Review. Across the UK there are important road, rail, energy, flood defence, waste management, water supply and many other infrastructure schemes in the pipeline. In addition, major infrastructure works will be needed to facilitate initiatives such as the government's house building programme and the 2012 Olympic Games.

RECOMMENDATIONS

- Long-term, strategic plans for the development of the UK's infrastructure
- An end to stop-start development and short-term planning
- A Commission for Strategic Infrastructure Planning to take responsibility for planning the development of the UK's infrastructure

Civil engineering provides the infrastructure for sustainable growth and community well-being. The outlook for the industry has rarely been more buoyant and exciting. The purpose of this State of the Nation report is to consider capacity and skills constraints, and propose strategic solutions to ensure a vibrant and responsive industry, better able to deliver the government's infrastructure ambition.

Independent research for ICE, including interviews with 30 industry leaders, has revealed the true scale of the challenge. We can see that, as demand reaches record levels and globalisation fuels competition for resources, capacity issues that have long troubled the delivery of schemes need urgently to be addressed.

The UK civil engineering industry faces a capacity and skills crisis. In the unprecedented global rush for resources expected over the next five years, demands on the currently limited capacity of the sector could cause construction inflation to spiral, taking a heavy toll on project budgets and timescales.

Construction inflation has been running at a rate well above the Consumer Price Index (CPI), the measure used by government to calculate inflation across the economy as a whole. We have calculated that, if left unchecked, this gap will have reached nearly £8 billion by 2015:² Inflation on this scale threatens vital investments as government, which is by far the biggest client for infrastructure, only allows for CPI inflation in its future spending plans.³

Investment now in skills and innovation will help to stem those added costs and safeguard public works that the UK cannot do without. Government can help to give industry the confidence to make these investments by providing a higher degree of visibility and certainty on its own investment plans for the UK's infrastructure.

What is urgently needed is an independent national commission for strategic infrastructure planning, tasked to coordinate spending programmes across government and bring an end to unpredictable, stop-start procurement.

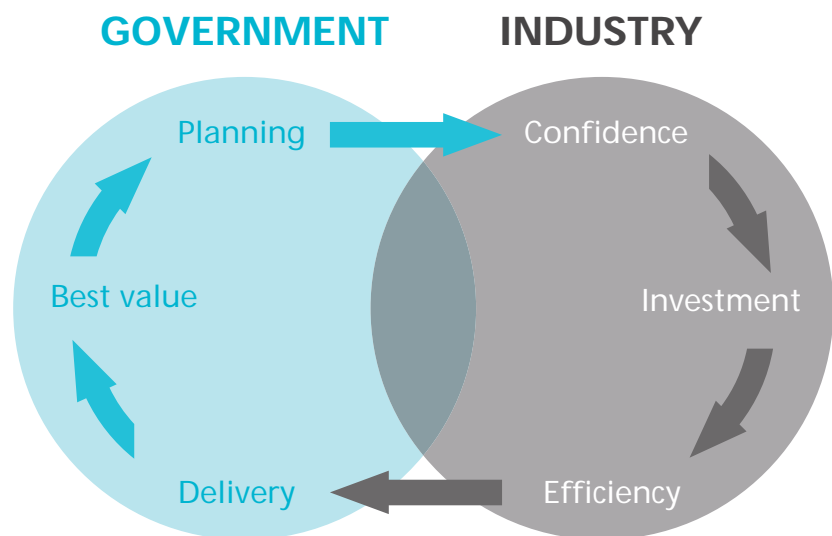
WE ESTIMATE THAT IN 2007, THE GAP BETWEEN WHAT THE TREASURY ALLOWS FOR CONSTRUCTION INFLATION AND ITS ACTUAL LEVEL IS £1.8 BILLION. IF THIS GOES UNCHECKED THIS FIGURE WOULD RISE TO NEARLY £8 BILLION IN 2015

A virtuous circle must be established (see Figure 1). Greater client leadership and transparent forward planning will provide a much needed, clearer picture of demand across the nation's infrastructure and the confidence to schedule their own projects to avoid supply problems. A more visible, even flow of work will provide the industry with the assurance to be able to go ahead and invest in its workforce and innovative practices.

A more dynamic, modern industry will be able to attract a more diverse workforce. Graduates of UK universities, both home-grown and from overseas, will be encouraged to enter the UK civil engineering profession in greater numbers. The government's spending plans would be implemented more effectively, with reduced stress on the supply of skills and other resources.

Most importantly, the UK would receive the modern, efficient, sustainable infrastructure it needs to prosper, at prices it can afford.

FIGURE 1. A VIRTUOUS CIRCLE OF INFRASTRUCTURE PLANNING, INVESTMENT AND DELIVERY.



¹ Institution of Civil Engineers (2004, 2005, 2006), The State of the Nation – An Assessment of the UK's Infrastructure, ICE, London
² University of Warwick, Institute for Employment Research (IER).
³ HM Treasury (2007) Meeting the Aspirations of the British People, 2007 Pre Budget Report and Comprehensive Spending Review, HMSO, London.

HEADING FOR A TOUGH PERIOD

In 2008, the demand for civil engineering looks strong. The Office of Government Commerce predicts average annual growth in the infrastructure sector of 4.2% between 2005 and 2015⁴. But, historically, predictions have been of limited benefit to civil engineering companies. There is always uncertainty about which planned projects will materialise, and when.

The pattern is one of stop-start, with very busy periods followed by dramatic slowdowns. In recent years, new orders for infrastructure projects have fluctuated erratically, even within relatively short timeframes. Our research also suggests that poor coordination of public procurement leads to publicly funded projects competing with each other for resources. This increases the cost to the taxpayer and introduces a boom-bust cycle for the delivery of infrastructure, making it very difficult for companies to make long-term investment in skills and innovation.

Increased infrastructure investment is not being matched by the capacity to deliver. Importantly, this includes highly skilled civil engineers, who are increasingly in short supply.

The Construction Skills Network (CSN) forecasts an average need for some 12,300 new industry professionals each year until at least 2011⁵. Our research suggests that, while an emphasis on engineering skills needs to be maintained, there are gaps in higher level project management skills, which have a long-term impact on the efficiency with which infrastructure projects can be delivered. These project management skills must be developed, underpinned by engineering knowledge.

Industry believes that the supply of graduate civil engineers is being eroded by recruitment directly from university into other professions, such as the financial sector, offering higher starting salaries. Civil engineering salaries are rising at above average levels⁶, which is adding to the gap between government budgets and the real construction cost price index, but these salary rises are still not competitive with those offered by other sectors.

In recent years, the civil engineering industry has been looking beyond the UK to fill its skills gap, recruiting heavily from Australia, South Africa, Poland, China and India.

Relatively few UK companies are big enough to lead on major UK infrastructure projects.

With a lack of certainty in UK infrastructure planning and more lucrative opportunities overseas, our research shows a reduction in the number of tenderers for UK projects, creating an unnecessary capacity constraint.

All of these factors are fuelling construction inflation which currently runs well above the rate allowed by the Treasury when setting its spending plans. If this situation continues the UK's infrastructure investment programme will become unaffordable. (See Figure 2)

A stronger partnership between government and its suppliers is needed to provide greater clarity and help tackle this capacity issue.

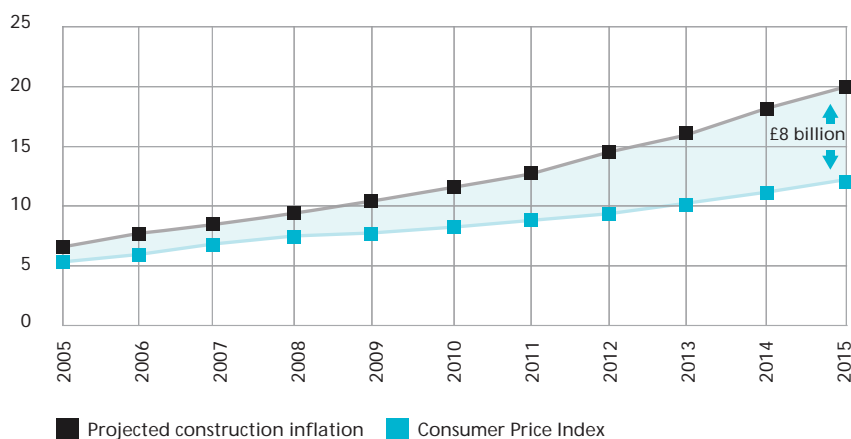
The Gershon Report advocated better procurement as one of the keys to improved efficiency, a view endorsed by ICE. There are good examples of implementation of Gershon recommendations such as the formation of an alliance between highway authorities in the East Midlands and the Highways Agency to pursue joint procurement with the aim of securing significant efficiency gain.

⁴ Office of Government Commerce (2006), 2005-2015 Construction Demand / Capacity Study, OGC, London

⁵ Construction Skills Network (2007), Blueprint for UK Construction Skills 2007-2011 Construction Skills, Bircham Newton

⁶ ICE Salary Survey 2007, ICE

FIGURE 2. PROJECTIONS OF VALUE OF NEW INFRASTRUCTURE UNDER DIFFERENT PRICE ASSUMPTIONS (ALL OUTPUT DATA IN £BILLION CURRENT PRICES)



Full text of the University of Warwick, Institute for Employment Research report to support these figures is available at ice.org.uk/stateofthenation

SIGNS OF GREATER CERTAINTY?

There are signs of such partnerships forming, and there is a need for this to be replicated more widely. Encouraged by Constructing Excellence following the recommendations of Sir John Egan's 'Rethinking Construction' report in 1998⁷, there has been some success in the development of framework agreements and other partnering mechanisms. These are evening out the flow of work and increasing the capabilities of both sides.

Organisations with large scale infrastructure programmes such as the Highways Agency and National Grid, for whom supply constraints are critical, have adopted 'early supplier involvement' arrangements. The suppliers have been granted a valuable role in the planning stages of projects, which has led to lower costs, fewer errors and duplications, and more secure resources.

In addition to partnering arrangements, there is recognition in the public sector of the need to manage demand with greater foresight and transparency. Ofwat, for example, is consulting on plans to smooth out the five-year investment and pricing cycle that dictates the timing of large schemes in the water industry⁸. The development by the Department for Transport of a 30-year national rail strategy⁹, the creation of the Public Sector Construction Database by the Office of Government Commerce¹⁰ and the highly strategic approach of Transport Scotland are all positive signs.

⁷ Egan, J. (1998), "Rethinking construction" The report of the Construction Task Force to the Deputy Prime Minister, UK, John Prescott, on the scope for improving the quality and efficiency of UK construction DETR, London.

⁸ Ofwat (2007), Setting price limits for 2010-2015 – Framework and Approach – a consultation paper, Ofwat, Birmingham.

⁹ Department for Transport (2007), Delivering a Sustainable Railway, HMSO, London.

¹⁰ Office of Government Commerce (2007), Public Sector Construction Database, www.ogc.gov.uk/construction_procurement_public_sector_construction_database.asp





POLITICS IN INFRASTRUCTURE PLANNING

The fundamental lack of clarity of government's future investment plans, stop-start spending, a lack of planning in public infrastructure procurement, and lengthy delays in the planning process, are having a profound effect on the efficiency of the civil engineering industry. The uneven demand for work makes it difficult for the industry to anticipate change.

Ministers, although formally accountable to Parliament, remain free to make short-term decisions to cut spending which can have negative long-term impacts for the country's economic and environmental performance. Those decisions are often impossible to predict, particularly when the reasons behind them have nothing to do with the business of improving the nation's infrastructure.

One such case has been the budget for the Environment Agency flood risk management in England and Wales. In 2006-07 it fell heavily, by around £80 million, according to National Audit Office (NAO) figures¹¹. The cut was one of many forced on its agencies by the Department for Environment Food and Rural Affairs (Defra) as a result of the Department's problems in funding the Single Farm Payments Scheme. Flood defences lost out because of problems in farming. Thankfully there has been a reversal and spending on flood defence is to rise again in the period to 2010. However this trend is not new and NAO figures show that the flood defence budget has been cut and then increased on three occasions in the last decade.

REMOVING THE POLITICS

As highlighted in previous State of the Nation reports, swathes of the UK's infrastructure – from power stations and flood defences to roads and railways – are in need of refurbishment or replacement, all of it vital for our economy and quality of life. Now, more than ever before, the country needs a coordinated programme of infrastructure spending that has the full commitment of the government behind it. We need new political structures that prevent stop-start procurement and bring to an end the kind of short-term decision-making that ultimately costs the UK dearly.

That means building on the proposals contained in the Planning White Paper of May 2007¹² for the publication of national policy statements for highways, energy, water and other key infrastructure networks.

In addition ICE wants to see the creation of an independent national infrastructure planning body, chaired by a Chief Infrastructure Advisor to ensure transparency.

The national infrastructure body would:

- Work with all stakeholders to deliver improved coordination and predictability of the government's infrastructure investment programme;
- Deliver regular and high-profile reporting of progress against the programme, holding government and industry to account, identifying capacity bottlenecks, cost constraints and so on.

Such a body would act as a critical friend to government, taking the transparency and foresight roles of the Monetary Policy Unit and proposed climate committee, overseeing the whole picture of infrastructure planning and identifying the impact on other areas of public works when new plans are being considered.

An example of this direction is the establishment of the Strategic Investment Board in Northern Ireland. See panel (right) for details.

ICE is willing to take a lead in developing a model for such a body, by bringing government and industry together to plan the way forward.

¹¹ National Audit Office (2007) Environment Agency: Building and maintaining river and coastal flood defences in England, HMSO, London.

¹² Department for Communities and Local Government (2007), Planning for a Sustainable Future: White Paper, HMSO, London



NORTHERN IRELAND STRATEGIC INVESTMENT BOARD

The Strategic Investment Board Limited (SIB) is a company limited by guarantee and owned by the Office of the First Minister and Deputy First Minister and currently funded by grant in aid.

SIB's vision is to help the public sector to deliver major value-for-money infrastructure programmes in Northern Ireland – at speed. In practice, that means using our extensive experience of funding and implementing major investment projects, and deploying specialist skills and approaches.

SIB acts as a bridge between the public and private sectors. It works with Northern Ireland departments and agencies to help them accelerate the delivery of major public-infrastructure projects. In parallel, SIB works with the private sector to generate confidence and stimulate market interest, thus improving competition and delivering value for money for the taxpayer.

Infrastructure investment in Northern Ireland is growing at a remarkable rate leading to an increasing demand for expertise from SIB to support the delivery of investment projects and programmes.

- SIB helps to inform and implement ministers' policy for public infrastructure in Northern Ireland, and
- Assists government departments to deliver a step change in public infrastructure.

SIB was established as a limited company rather than a government agency. Staff have extensive experience and highly-developed expertise. They work on projects rather than in individual government departments, which allow them to better support cross-cutting projects and programmes more efficiently.



We've got to give the industry more stability and a better planning

base and get away from the boom and bust cycle to the acceptance that there is a base load of work. Of course it will fluctuate and different firms will experience peaks and troughs, but within the sector if we can persuade people or let people understand that you can rely on at least £500 million worth of work in Scotland a year, there is a base load and therefore the supply side can resource up to that level. We hope that that will grow the market.

MALCOLM REED, CHIEF EXECUTIVE, TRANSPORT SCOTLAND.

EDUCATION

The government's most important role for the long-term provision of skills starts with education. The importance of STEM education (Science, Technology, Engineering and Maths) has risen on the political agenda. The 14-19 diploma scheme, due to go live in September, has brought the needs of employers to the education system. ICE hopes that this will be an effective way to interest students at a younger age in technical courses which will eventually feed into the industry.

However, employers have noted that there have been many years of decline in the standards of maths and science knowledge. If children are unable to understand maths at primary school it will be much harder for them to progress to diplomas and university courses in order to become qualified and knowledgeable engineers.

The UK has a reputation as one of the best places in the world to study civil engineering. Students from across the world come to study in the UK and now account for nearly 30%¹³ of the entire student population. The number has grown rapidly in recent years, principally because universities are seeking new streams of funding for the more expensive civil engineering degrees.

Between 1995 and 2005, university civil engineering departments often struggled to meet their admissions targets, and graduates from the courses sometimes found it difficult to obtain suitable employment within the sector.

Some universities closed their civil engineering departments. Contractors, consultants and the public sector were usually able to satisfy their recruitment needs from this supply of graduates, without the need to significantly raise starting salaries or to invest in any student sponsorship. Over the last few years this situation has changed, but much university capacity is still based on experience from the earlier period.

It is not easy for universities to increase the number of entrants onto their courses. These numbers are set at faculty levels across the universities and civil engineering departments must adhere to their determined quota of students. Numbers are fixed with respect to teaching space, laboratory facilities, technician support and staff levels. Unless the universities receive additional funding specifically earmarked for civil engineering expansion, there is little short-term likelihood of any growth in admissions. In any event, the traditional universities are primarily concerned with maintaining the quality of their provision, rather than the quantity of graduates produced.

¹³ Engineering and Technology Board (2007), Engineering UK 2007, ETB, London.





Network Rail's approach has been to offer new recruits, and particularly graduates, an excellent career which would set them up for life. The company places great emphasis on developing its employees in technical and leadership capabilities, and retains an extremely high proportion of them for long periods. Where they do leave, they tend to stay within the industry. There were opportunities for graduates to work on multi-million pound projects, often much sooner than was possible in others companies, due to the support structures at Network Rail.

The company had also expanded its training capability by acquiring a £25 million leadership development centre in Coventry. It has the UK's largest apprenticeship scheme, currently involving 250 school leavers aged 17-19 years, who are gaining NVQs in technical skills. Network Rail is the prime sponsor of the Rail Engineering Foundation degree at Sheffield Hallam. The company's approach overall was to invest more in its own capabilities. It was casting its recruitment net wide, by looking beyond the rail industry and by expanding its supplier base. **IAIN COUCHER, CHIEF EXECUTIVE, NETWORK RAIL**





TIME FOR THE INDUSTRY TO CHANGE

Fluctuating demand exacerbated by stop-start government procurement has created a short-term mentality in many businesses and led to problems with skills supply and labour costs. When the road ahead is foggy, you slow down. Skills and resource pressures are bound to make planning and cost control a major issue for the next wave of infrastructure projects.

Where are the people with the civil engineering skills going to come from? Civil engineering employers have been unable to attract and retain skilled staff in sufficient numbers, or to diversify their workforce. The uncertainty over future demand for their services has, for many, inhibited investment in the kind of training and work-life balance measures that are now part-and-parcel of employee packages in other professions.

Civil engineering, in many people's eyes, remains a male, middle-class profession. Career paths in the profession are unclear to young people, and work-life balance is a concept that parts of the industry have yet to come to grips with. Some companies have made determined efforts to provide the kind of flexibility and facilities that support a fulfilling life for employees both inside and outside work. However the industry as a whole has failed to appeal to women. They fill around 10% of construction jobs yet make up 49% of the entire UK working population¹⁴. Only 7.6% of ICE members are women.

Ethnic minorities also continue to be under-represented across construction, despite industry initiatives¹⁵. More also needs to be done to harness the experience of workers in their 60s and beyond – a looming issue as the large baby-boomer segment of the profession reaches retirement age.

It is unlikely that in the long-term the gaps in capacity can be met with imported labour. As soon as demand increases elsewhere in the world, as it is now doing, the workforce will start to dry up. It is also questionable whether the UK should be depriving developing countries of so much home-grown talent. It is a short-term fix.

MORE THAN JUST SKILLS

It is not just spending on professional skills and training that is in short supply. Technical innovation can also increase the industry's capacity to deliver the nation's infrastructure. As with skills, strong confidence in the future and a climate of greater trust in medium- to long-term promises of infrastructure procurement workload will provide the right climate for that investment.

Much is already being done to promote best practice in construction and the business benefits of strong management, particularly by Constructing Excellence, through its Demonstration programme (see opposite). But this could fall on deaf ears without a stable infrastructure programme.

¹⁴ Hill McGlynn Recruitment (2005) Women in Construction Survey - Research for EOC, EOC, London.

¹⁵ Briscoe, G. (2005) Women and Minority Groups in UK Construction: Recent Trends, Construction Management and Economics, Special Issue on Diversity and Equality in Construction, Volume 23, Number 10, pp 1001-1005.



Another set of associated problems for the industry lies around the loss of the older skilled worker and the state of retirement pensions. The company is investing in training and other schemes to ensure availability of skills; a buddy scheme is in place for new recruits. I think we have to recognise that pensions are not going to allow everyone to retire at their normal age and that construction is a tough life, so most people come 65 have had enough. So, if we want them to go on working, we have to buddy them up with the younger person, so the young person takes the pain and the older person provides the wisdom. This buddying scheme allows the older person to work a few more years and grow their pension, retains skills for the company, and trains younger people for the future.

DAVID FISON, CHIEF EXECUTIVE, SKANSKA.

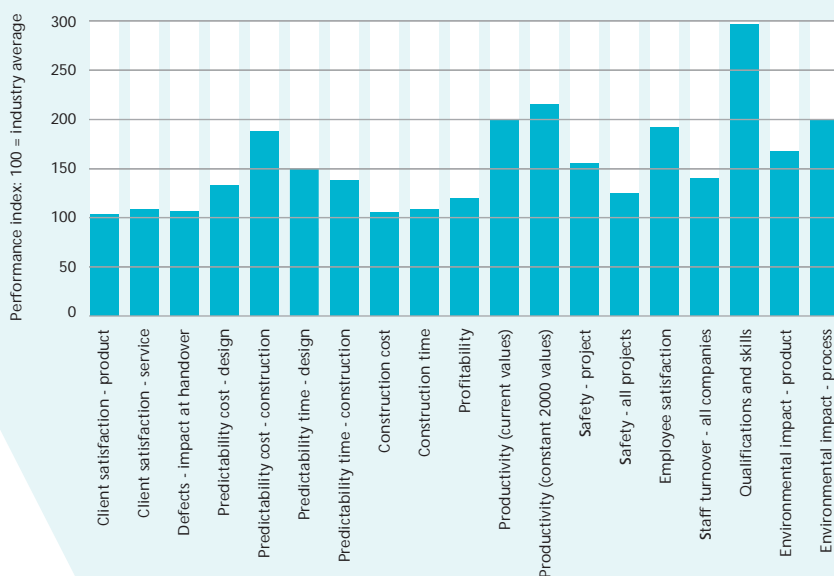


We regard the government's agenda to prolong working lives as a positive step and are happy for people to work beyond the state pension age of 65 years. We increased our company retirement age from 60 to 65 years around six to seven years ago. We are happy to use post-retirement contracts for project-specific work and although this is used only occasionally at present, I predict this will grow.

We see increasing capacity problems, exacerbated by 'the demographic boulder which has yet to hit us'. A large proportion of the workforce was coming to retirement age and they hadn't been adequately replaced. This would be a problem with an escalating impact.

PETER GAMMIE, CHIEF EXECUTIVE OFFICER, HALCROW.

FIGURE 3: PERFORMANCE OF COMPANIES INVOLVED WITH DEMONSTRATION PROGRAMME



**CONSTRUCTING EXCELLENCE
DEMONSTRATION PROGRAMME**

- Implementing the principles of Rethinking Construction
- 476 projects since 1998
- 285 general construction and infrastructure
- 191 housing sector
- Value £12.5 billion
- 382 completed, 94 live and active
- Involvement of 1,176 organisations UK wide
- 176 case histories
- 60 associated reports and publications

Organisations that regularly participate in demonstration activities have achieved:

- Greater levels of qualifications and skills
- More predictability on cost and time
- Greater productivity than the industry average

As well as:

- Achieving twice the impact on reducing the effect on the environment
- Having fewer defects at handover
- Achieving higher customer satisfaction scores

TIME TO CHOOSE

A clear choice is before us. Should we continue to commission infrastructure in a disjointed, stop-start manner, without true regard for securing the best long-term value for the country? Do we want the UK to continue to pay too much for new infrastructure today, and thereby put at risk the systems and networks we will depend upon tomorrow?

WORKING AS ONE, WE CAN DELIVER OUR VISION:

- Clear, coordinated forward plans for future national infrastructure investment
- Skills, labour and material costs that are not rising out of control
- A more skilled and diverse civil engineering workforce
- A safer, healthier, more productive and more profitable industry
- More secure, collaborative working relationships between the industry's partners
- And, above all, high quality, modern infrastructure to help the UK prosper, delivered at a cost the country can afford

Do do we want to create the transport, energy, water, waste and flood management systems of the quality and quantity we need, at a price we can afford?

We can achieve the virtuous circle, but it needs to start somewhere. As the UK's number one sponsor of infrastructure projects, the government has the power to change the mood of the industry from one of doubt to one of greater certainty and confidence.

By establishing a national, strategic body to oversee an all-sector infrastructure procurement programme, government can provide transparency and long-term commitment to major public works. The confidence that would flow from this through the civil engineering community would liberate businesses to invest in their people and workplaces, and to attract a more diverse workforce. Innovation in new techniques and technologies would also grow, paving the way to faster, safer and more efficient construction methods.

The benefit – new infrastructure, delivered on time, to budget and to the quality the country requires – would be felt by all. Government and the civil engineering community must start to work together now – or pay the price in the near future.

WHAT WE WANT TO SEE

If the industry had a higher degree of visibility and certainty from government on its investment plans for the UK's infrastructure, then it could justify and commit more investment in skills and innovation. That could help to stem the spiralling costs and safeguard the public works that the country cannot do without.

What is urgently needed is a new infrastructure commission; a national strategic body tasked to bring an end to unpredictable, stop-start procurement by government departments and give increased confidence in the future.

Greater procurement leadership and visible forward planning would provide a much needed clearer picture of demand for construction and would allow better scheduling of vital projects to avoid supply problems.



THE RESULT

A more visible, even flow of work would provide the civil engineering industry with the assurance to make greater investment in its workforce. A more dynamic, modern industry would be able to attract a more diverse workforce. National and international graduates of UK universities would then be encouraged to enter the civil engineering profession in increasing numbers.

With a more vibrant industry the government's infrastructure plans would be implemented more effectively, with reduced stress on the supply of skills and other resources.



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