Charlie Schouten, Construction News – New Journalist of the Year

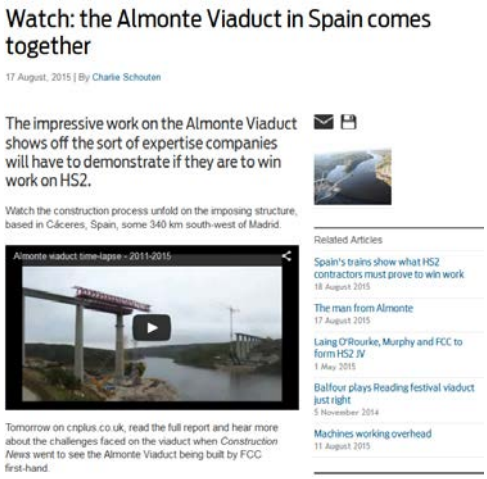
I have been with Construction News as editorial analyst since August 2014. Since then I have taken ownership of the magazine's data coverage, written news analysis features and assisted the team with data-driven news coverage, taking it to new levels of engagement with our readers.

The construction industry is hungry for genuinely useful data and I have used my background as an analyst to ensure we provide the insight our readers require while working hard to develop more traditional journalism skills of my own.

1) **Feature – Almonte Viaduct project report and the impact on UK high speed rail (21st August 2015)**

The Almonte Viaduct will be the third largest arch bridge in the world, making it an extremely complex and high-profile project. I was one of just two specialist journalists invited to visit the site to see the work being done first-hand.

The viaduct's contractor, FCC, is bidding to work on HS2 in the UK. As part of the piece I examined how the bridge project would be relevant in their efforts to win that work – essential information for all bidders.


Watch: the Almonte Viaduct in Spain comes together

17 August, 2015 | By Charlie Schouten

The impressive work on the Almonte Viaduct shows off the sort of expertise companies will have to demonstrate if they are to win work on HS2.

Watch the construction process unfold on the imposing structure, based in Cáceres, Spain, some 340 km south-west of Madrid.

Almonte viaduct time-lapse - 2011-2015

Tomorrow on cnplus.co.uk, read the full report and hear more about the challenges faced on the viaduct when *Construction News* went to see the Almonte Viaduct being built by FCC first-hand.

Related Articles

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Machines working overhead
11 August 2015

The feature combines details of a visually and technically awesome project overseas with the lessons that can be learned from it by contractors working in the UK.

We ran the piece with a short but breath-taking video online, making the piece accessible in print, on screen or on mobile. It was the most-viewed article online that week and the video itself has had over 1,100 views on CN's Youtube channel.

2) **Exclusive: HS2 will need 5,000 construction workers a month (21st November 2014)**

Within my first few weeks at Construction News, I attended an event to learn more about HS2, without a specific news brief. There, I met HS2's head of skills, Scott-James Eley, using my initiative to persuade him to give a face-to-face interview and to share HS2's unique skills matrix data exclusively with Construction News.

At a time when questions had been raised over exactly how HS2 planned to complete all the necessary building work for the project, this news piece was extremely timely. It helped inform construction contractors how they could best prepare to address skills shortages and work with HS2 on the UK's biggest project.

This story was one of the most-read on CNplus that week.

3) Exclusive: Construction treads water on predictability – KPIs analysis (14th November 2014)

In this four-page data feature, I analysed a series of KPIs, collated by the Department for Business, Innovation and Skills, CITB and Glenigan, which I arranged to be exclusively shared with Construction News ahead of their official launch.

The KPIs revealed that only 57% of construction projects were completed on time or better, and the same proportion of projects were on budget or better – significantly below the government's target to reduce costs and timings of projects by 33% by 2025.

The data analysis also provided an early indicator of what has become a major theme for construction companies in 2014/15: extreme pressure on profit margins.

As well as the feature, the KPIs were used as the news splash and the cover story – an example of data journalism providing the industry with the hard facts and analysis they need to benchmark their own performance and improve their businesses.

Shape of things to come

The viaduct will be the longest for high-speed rail on earth

Projects such as the Almonte Viaduct show off the skills contractors will have to exhibit if they are to win work on HS2. As more overseas firms show interest in bidding on UK rail projects, competition is set to increase

RAIL
CHARLIE SCHOUTEN

Of all the places to be having a discussion about Sir David Higgins and his plans for High Speed 2, standing 90 m above a river in rural Spain atop a partly built viaduct might not immediately spring to mind.

Yet the Almonte Viaduct, a 996 m-long bridge over the Almonte River 340 km south-west of Madrid, offers a more appropriate backdrop for this conversation than you'd think.

Spanish contractor FCC is tackling the challenge of building the viaduct. At the same time, the company is preparing to bid for work on HS2, in a joint venture with Laing O'Rourke and Murphy, which will be known as LFM.

996m
Total length of the Almonte Viaduct

The viaduct is a highly impressive piece of engineering. It will be the longest for high-speed rail on the planet once finished – as well as the third longest arc bridge in the world behind Krk Bridge in Croatia and Wanxian Bridge in China.

The project exemplifies some of the problems contractors will have to tackle to win work on HS2, the UK's largest planned infrastructure scheme. So how will FCC, Laing O'Rourke and Murphy combine to bring their experience in high-speed rail to the UK market?

Tall order ahead

Being perched on top the part-completed viaduct gives a sense of the immense challenges the FCC team faced when working on the project. Even below deck level, we are more than 90 m from the surface of the Almonte River below, and there are extraordinary sheer drops on both sides of the 384 m-long arch.

The viaduct carries part of the line that was originally intended to link Madrid to Lisbon. The Portuguese section of the railway was cancelled in 2012 due to budget constraints, meaning the Spanish section will now terminate at Badajoz, around 110 km from where we are standing.

The cost of delivering this particular section, being built by FCC for client ADIF, Spain's state-owned equivalent of Network Rail, is €81.7m (£58.1m), while the viaduct project itself is valued at €45.9m (£32.6m). Work started on site in February 2011 and is due to complete in June 2016.

Project manager Pedro Cavero reveals how technically challenging the project has been – and suggests contractors will have to be innovative in their methods and radical in their thinking in delivering similar work for HS2.

Simply gaining access to the site is a complex procedure. Roads had to be built in a manner similar to the mountain routes, as no slope could climb at more than 10 degrees, otherwise transporting heavy machinery and cranes to the bridge's base would have been unsafe.

The sensitivity of high-speed rail components meant the team was forced to install 15 m abutments under the arch to avoid cable movement due to ground settlement. These were placed in concrete instead of the embankment to ensure their effectiveness.

Other demanding aspects of the project have required SMEs to help larger contractors deliver innovative solutions – something HS2 is also keen to champion.

To construct the main arches, two climbing formwork travellers were used, one on each leg of the bridge. Mr Cavero describes this as the most challenging part of the project. FCC duly sought a partner to carry out the complex works.

From among a number of bids and a wide range of proposals, only one company emerged with a suitable solution: an SME based in the north-east of Spain.

No small jobs

HS2 has already said it will benchmark contractors on their use of SMEs and that it wants at least 60 per cent of contract opportunities in the supply chain for phase one to be fulfilled by smaller firms.

FCC partnered with the University of Toronto to carry out a full aerodynamic study of the bridge's design, while materials used for the project were sourced from within Spain, rather than from abroad.

Technical challenges such as these highlight the importance of innovation within the supply chain – and FCC says it is likely ▶

to take a similar approach in the UK. One area where the company's approach has differed from HS2's expectations is in the method of construction.

HS2 has so far talked up the benefits of offsite manufacturing, and has said contractors' ability to use building information modelling and modular offsite assembly will be among the crucial areas it looks at when appointing contractors and measuring performance.

But at the Almonte Viaduct, the majority of the casting for the decking has been done directly on site, rather than off.

The contract to deliver the viaduct is valued at €45.9m (£32.6m)

Meeting requirements

However, FCC's partnership with Laing O'Rourke is set to address the offsite requirements of HS2. Laing O'Rourke project director of high-speed rail Nadia Savage tells *Construction News* she is particularly keen to show what offsite manufacturing can do on HS2, particularly as so many viaducts and bridges will be required for the project.

She goes on to describe how impressed she's been with FCC's collaboration with its regional supply chain. "The usage of the climbing formwork travellers is a perfect example of how we want to use SMEs on high-speed rail projects in the UK," she says. "We want to use our whole supply chain to tackle problems and improve innovation in exactly the same way."

£32.6m
Total value of the Almonte Viaduct

The LFM JV is just one of several consortia with an international flavour formed in recent months to bid on HS2 work (see page 5).

In May, Bouygues Travaux Publics, Sir Robert McAlpine and VolkerFitzpatrick joined forces to bid for work under the 'Align' joint venture. And in June, Carillion, Eiffage and Kier announced that they would also form a joint venture to target work on high-speed rail in the UK.

Kindred spirits

Ms Savage is confident the LFM partners' similarities and close working relationship, as well as FCC's high-speed rail experience here in Spain, can help the JV win work ahead of its rivals.

"All of the partners in the JV have a similar structure in regards to direct employment – I think we have a very similar philosophy," she says.

"It's all about collaborating to take best practice from each of the JV partners to make it as strong as it can possibly be – not all joint ventures start out like that."

Both Murphy and FCC have expertise in tunnelling for rail, with Murphy having recently completed a £200m contract for the Thames Tunnel as part of Crossrail, in a separate joint venture with Hochtief.

Looking up at the 90 m-high viaduct from beneath its base emphasises just how challenging the technical aspects of HS2 will be for UK contractors.

As preparations for delivering HS2 gather pace, these joint ventures will have plenty to do as they position themselves to win work.

Drawing lessons from international high-speed schemes like Spain's Almonte Viaduct could go a long way to helping them succeed.

Work started in February 2011 and is due to complete in June 2016

WATCH IT HAPPEN

Watch a time-lapse of the project coming together at ››››cnplus.co.uk/project-report

Construction News visited Almonte Viaduct as a guest of Laing O'Rourke

HS2 needs monthly average of 5,000 construction workers

Data shows £42bn scheme will require 22,672 industry operatives at its peak

EXCLUSIVE
CHARLIE SCHOUTEN
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High Speed 2 will need an average of nearly 5,000 construction workers per month during phase one and two of construction, according to data shared with *Construction News*.

The data, gathered in conjunction with the University of Dundee and with input from the CITB and Experian, shows the project will need a monthly average total workforce of 11,580 workers across six categories of worker during the construction of phase one and two.

An average of 4,980 construction operatives, 1,015 construction designers and 735 construction managers will be required each month, as well as non-construction, rolling stock and railway systems professionals.

SCOTT-JAMES ELEY SKILLS AND EMPLOYMENT STRATEGY MANAGER HS2

"We'll focus on gaps in skills. There isn't existing provision to meet our needs"

The category of labour with the highest workforce on HS2 will be non-construction professional, technical, IT and other office-based staff, of which 1,055 workers will be required on average each month during the first and second phases.

During this time, the peak construction operative workforce will be 22,672.

Crossrail, Europe's largest infrastructure project, had 14,000 workers at its peak.

Speaking to *Construction News*, HS2 skills and employment strategy manager Scott-James Eley said this demand reflected the project's need for "high-level technical skills".

"In terms of forecasting, we've not identified a major shortage in mainstream construction trades – we're not stressing the lack of availabilty of traditional skills," he said. "What HS2 will be focusing on is the gaps in skills like modern construction methodologies, BIM, different approaches to earthwork, and so on. There isn't existing provision to meet our needs."

34,172 Peak total HS2 workforce required

22,672 Peak construction workers required

11,580 Average monthly total workforce required

According to the data, phases one and two will need a monthly average of 781 electricians, 327 plant operatives, 261 bricklayers and 110 scaffolders.

To help meet these employment demands, HS2 announced the opening of a college in Birmingham, with a separate campus in Doncaster, to train staff to fill these skills gaps.

The college, which will be the first new incorporated further education college in more than 20 years, will open in 2017.

Mr Eley was keen to emphasise that it would not just be used for new entrants to the industry. "Fifty per cent of HS2's workforce will need skills at NVQ level 3 or above; at the moment, 80 per cent only have NVQ level 2.

"We will bring in people already in the industry for upskilling – we anticipate this to be a vital area of growth.

"There will be a wide variety of different people studying at the college, both new learners and upskilling, and we will develop relationships with existing facilities to maximise efficiency – we don't want to duplicate work."

Mr Eley said the college wanted to develop the curriculum and training on "collective effort and input from contractors". "The challenge is how to incentivise the supply chain to come and teach at the college, but it's not down to HS2 alone," he said.

"We need a close partnership with the supply chains and other industry bodies so we can all understand where the gaps are and collectively address shortages."

The college will focus on skills that will be beneficial to the whole industry and not just contractors, according to Mr Eley.

The student intake will comprise UK and foreign nationals and Mr Eley said it would be "a measure of the college's success whether foreign students want to come and study there", describing HS2 as a "global business".

When asked whether the skills taught at the college and the job opportunities created by HS2 will be limited to the Birmingham, London and Manchester – HS2's three key hubs – Mr Eley said the demand from the project will create jobs "across the country".

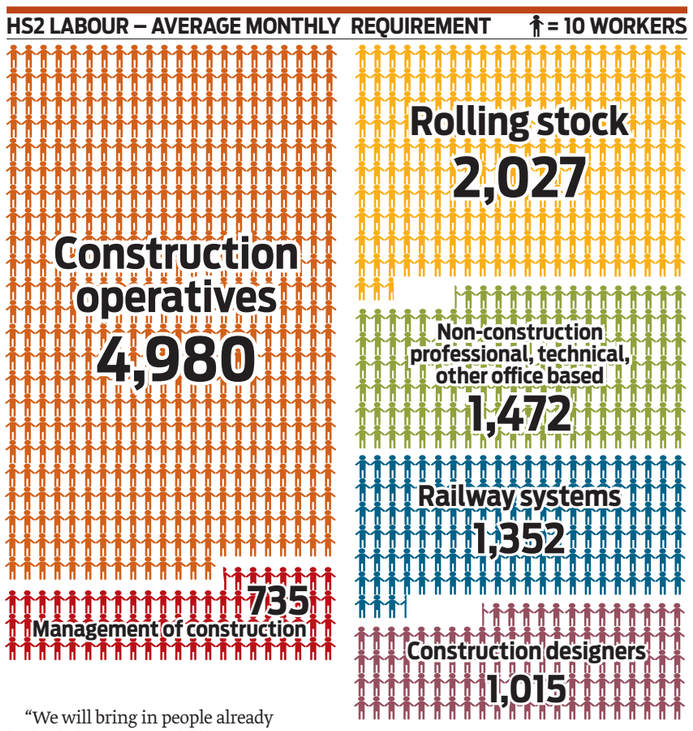
"Work will flow through tier one and tier two contractors down to smaller businesses," he said. "We've seen with Crossrail how the work can help SMEs – HS2 will do that and then some.

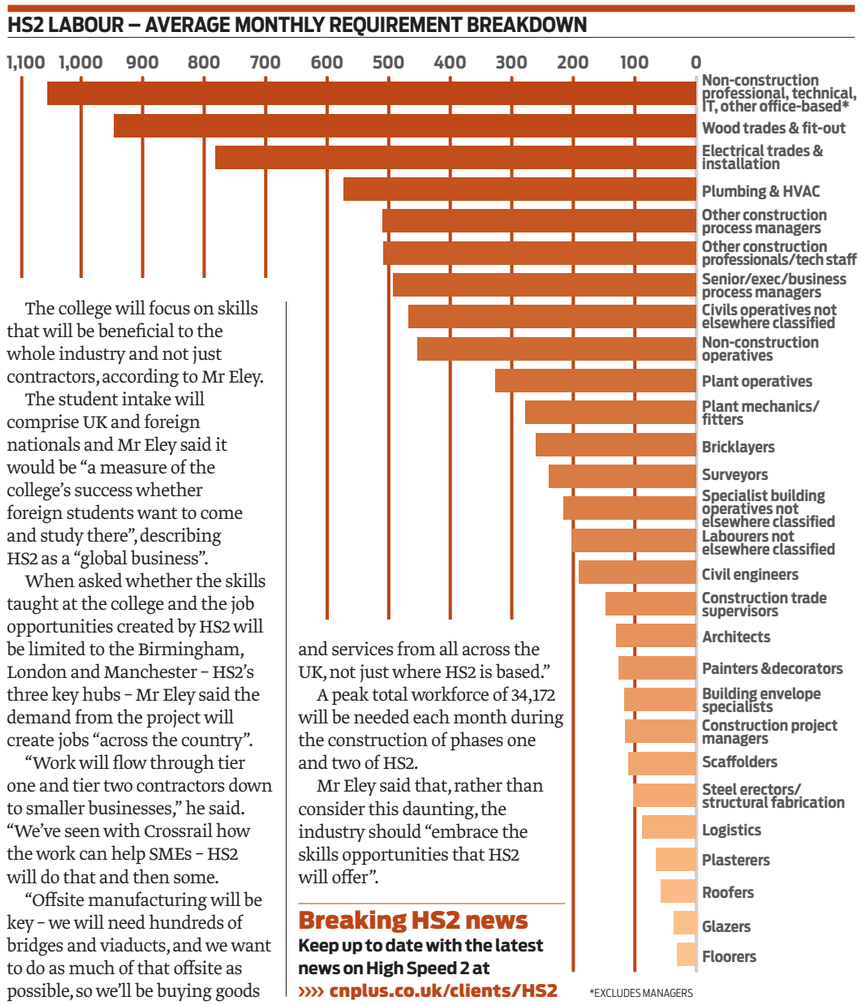
"Offsite manufacturing will be key – we will need hundreds of bridges and viaducts, and we want to do as much of that offsite as possible, so we'll be buying goods and services from all across the UK, not just where HS2 is based."

A peak total workforce of 34,172 will be needed each month during the construction of phases one and two of HS2.

Mr Eley said that, rather than consider this daunting, the industry should "embrace the skills opportunities that HS2 will offer".

Breaking HS2 news
Keep up to date with the latest news on High Speed 2 at
»»» cnplus.co.uk/clients/HS2





Construction treads water on predictability

The percentages of projects being finished on time and to budget remain far from the government's 2025 targets, but figures for skills, training and diversity offer some encouragement

PERFORMANCE
CHARLIE SCHOUTEN

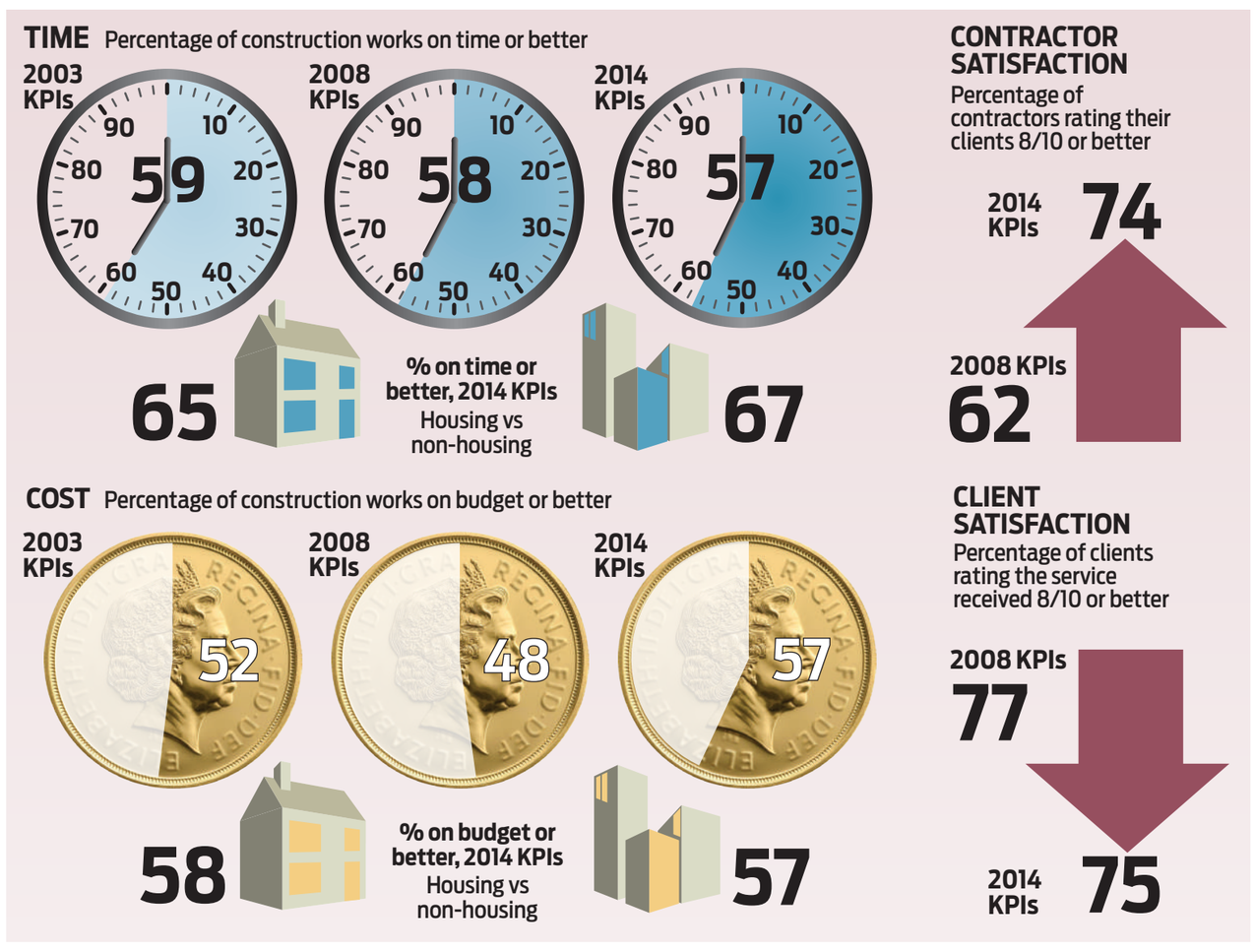
As the construction industry looks forward to improving market prospects over the next few years, a new series of key performance indicators, compiled by Glenigan, BIS, CITB and Constructing Excellence, provide an in-depth assessment of how the protracted downturn in workloads has hit the industry and its performance.

The KPIs, which are based on a survey of thousands of projects completed in 2012 and 2013 (there was no report last year) highlight the challenges industry now faces if it is to seize the opportunities over the coming years.

The data shows that staying on cost and on time is still a challenge for the majority of projects. Less than half of all housing projects are delivered on cost, and even fewer are completed on time or better.

In contrast, non-housing projects are generally performing better, with three-quarters of all projects completed on cost or better, but similarly to housing, completing on time remains a major issue.

"The performance of social housing has dragged results for the housing sector down"
ALLAN WILÉN, GLENIGAN



Clients and contractors are still cost-focused, even as the situation improves post-recession.

Last year, the government introduced its Construction 2025 strategy, which aims to reduce overall costs by 33 per cent, project time by 50 per cent from inception to completion, and greenhouse gas emissions in the built environment by 50 per cent.

But the *UK Industry Performance Report 2014* shows that some areas are still lagging behind, in spite – or perhaps because – of the recent recovery.

33%
Government target for reduction in project costs

Housing costs worsen

The KPIs reveal data for overall projects and are also broken down by design and construction phases. For housing schemes completed in 2012 and 2013:

- 46 per cent of overall projects were completed on or below budget.
- 41 per cent of overall projects completed on time or better.
- 58 per cent of construction works completed on or below budget;
- 65 per cent of construction works completed on time or better.

Housing as a sector has seen little improvement in on-time and on-cost delivery over the past five years, despite bouncing back from recession-driven lows over the past three years.

From a design-and-build perspective, housing saw a significant decline in cost predictability – less than half of clients (46 per cent) reported that their project had been completed on or below budget over the past year, compared with 62 per cent in 2011.

This is a decline in performance during the downturn – when the percentage of projects completed on or below budget was 56 per cent in 2009 and 59 per cent in 2010.

"The poor performance of social housing projects has dragged the results for the housing sector down," Glenigan chief economist Allan Wilén says.

"Following the government's new funding regime, there's been a lot of rejigging of planned projects to make sure that they stack up financially – this has obviously had a big impact on the performance of the sector."

In terms of design phases, 71 per cent of housing schemes came in on budget or better, down from a survey high of 81 per cent in the previous year.

While a 10 percentage point decline is concerning, it is worth noting that the figure of 71 per cent is still the third-highest percentage of this measure in the past 10 years – suggesting design cost efficiency is gradually improving.

One positive was the construction phase KPIs for housing: the proportion of clients reporting that construction costs were on budget or better rose to 58 per cent in 2013/14 from 55 per cent in 2012, just below the survey high of 59 per cent in 2011.

Housing timings improve

In terms of time predictability, the results for housing also improved year on year. The percentage of overall projects completed on time or better over 2013/14 increased to 41 per cent, up from an all-time low of 25 per cent in the previous year.

The large increase was from a very low base, and looking at projects over the past 10 years, there has actually been little improvement in housing projects being completed on time.

"You might as well toss a coin to see whether you get your project on time or not"
DON WARD, CONSTRUCTING EXCELLENCE

"Time predictability is a huge issue – you might as well toss a coin to see whether you get your project on time or not," Constructing Excellence chief executive Don Ward says.

"The slow progress of change for time predictability is a real challenge. Most clients want no surprises – they want projects to be ready when they need it.

"I'd say that as an industry, we need to be more professional and honest on the timing of projects."

74%
Housing clients satisifed with end-product

Between 2004 and 2008, an average of 45 per cent of housing projects were completed on time or better, while between 2009 and 2014 only 36 per cent of projects did so.

While the prolonged downturn was a major factor, the high proportion of housing projects missing their timing targets is not encouraging.

"Coming out of the recession, we've seen a lot of clients focusing on cost – timing can often be of secondary importance and, to some extent, there's a trade-off," Mr Wilén says.

"This could also be a reflection of project timings shortening and the industry setting itself more challenging targets to meet."

Although the overall proportion of projects completing on time remains low, the construction phase of housing schemes has improved.

This year, 65 per cent of construction phases for housing projects completed on time or better – a survey high and a marked improvement over the 30 per cent figure reported in 2012.

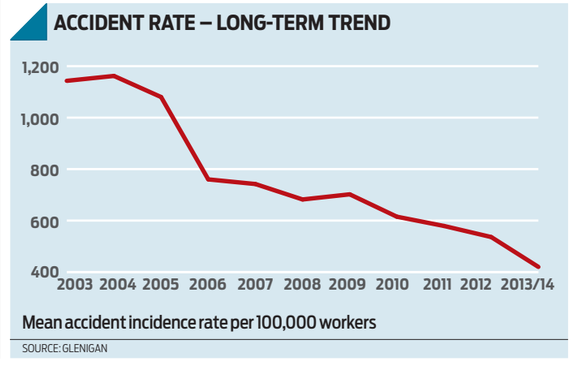
Timing in the design phase also improved, with 52 per cent of projects having their design completed on time or better.

However, this is still lower than average – between 2004 and 2008, 55 per cent of design phases were completed on time.

The figure also marks a significant decline from 2010, when 69 per cent of design was completed on time or better.

In terms of client satisfaction, the figures for housing will again cause concern.

The proportion of projects receiving a satisfaction rating of eight out of 10 or higher for in terms of end-product fell to a record 10-year low of 74 per cent, ▶



down from 82 per cent in 2012 and 88 per cent in 2011.

Similarly, the proportion of projects rated eight out of 10 or higher for service fell sharply to 62 per cent, down from 76 per cent in the previous year – again, a record 10-year low.

The housing KPIs tend to reflect social housing, where there is a clearer client-contractor procurement model, rather than the private sector, and show performance is in need of improvement. The report indicates the performance may reflect reduced government spending on social housing, with clients taking the strain.

The disparity between growth in private housing and social housing is set to continue through to 2017, according to forecasts from the Construction Products Association and Experian, which show that output in social housing will remain flat while private output will continue to grow. Improving these KPIs should be an urgent focus for social housebuilders.

"On the whole the number of non-housing projects completed on time is low"
ALLAN WILÉN, GLENIGAN

Non-housing costs peak

The KPIs for non-housing for 2013/14 show that:

- 75 per cent of overall projects completed on or below budget.
- 46 per cent of overall projects completed on time or better.
- 57 per cent of construction completed on or below budget.
- 67 per cent of construction completed on time or better.

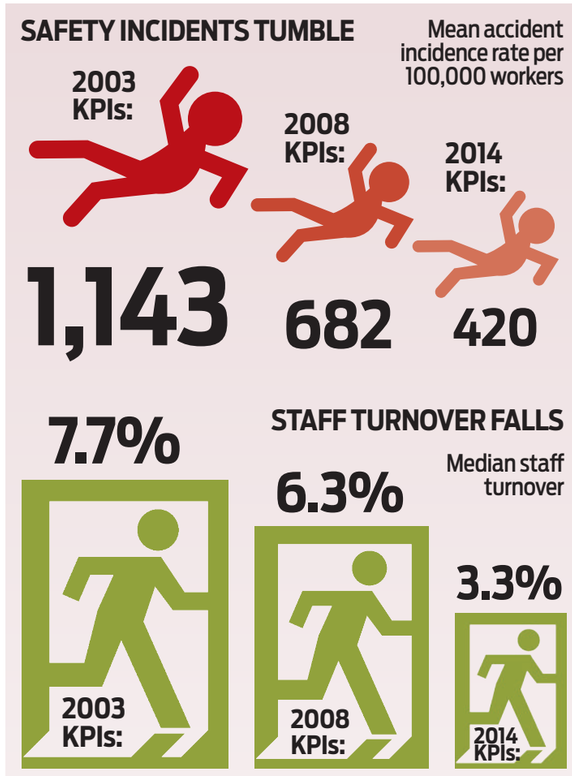
In contrast to the housing market, non-housing has shown marked improvement in line with economic recovery. Non-housing projects improved in six of the nine main KPIs, with only one showing a decline.

Project cost predictability reached a new survey high, with 75 per cent of projects coming in on cost or better – an improvement from 65 per cent in 2012 and 47 per cent in 2009.

Cost prediction for design phases reached a survey peak of 81 per cent of design coming in on cost or better, growing from 79 per cent in 2012.

Only construction phases registered a decline in coming in on cost or better – this fell to 57 per cent in 2013, down from 60 per cent the previous year.

Nevertheless, an average of 58 per cent of construction for non-housing projects came in on cost or better between 2010 and 2013/14, compared with 46 per cent for the previous four years – suggesting that, on the whole, cost-effectiveness and efficiency are continuing to improve.



Non-housing similar on timing

In terms of time predictability, there is not a great deal of difference between housing and non-housing: 46 per cent of non-housing projects in the latest KPIs came in on time or better, compared to 41 per cent for housing projects.

21.6% Reduction in mean accident rate, 2012–2013/14

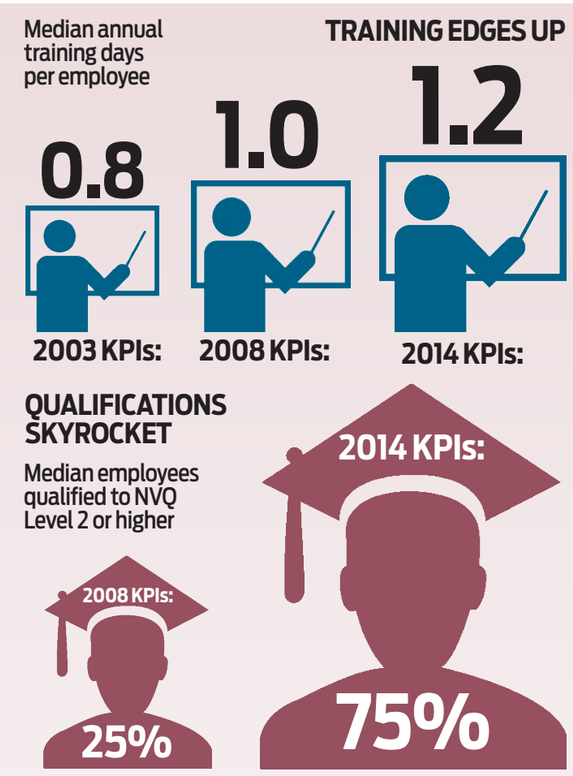
"Retail is the only real exception in terms of time focus – they often make sure projects are completed on time so that they are open to customers, regardless of cost increases – but on the whole the number of non-housing projects completed on time is low," Mr Wilén says.

Time predictability for both housing and non-housing design also followed a similar pattern, with 52 per cent of design for housing and non-housing coming in on time or better.

More positively, 67 per cent of construction for non-housing projects was completed on time or better – an increase on the previous year's figure of 46 per cent and a new high.

From a client satisfaction perspective, non-housing again performed better than housing. Client satisfaction was flat between the 2012 and 2014 KPIs, with 81 per cent of projects receiving a satisfaction rating of 8/10 or higher – by comparison, only 74 per cent of housing projects did so.

The KPIs suggest non-housing construction is in a better state than housing – particularly in terms of on-cost project delivery. That both housing and non-housing are experiencing similar trends in on-time delivery is a concern that needs addressing.



"The figures suggest companies didn't compromise on safety, even in the recession"
DON WARD, CONSTRUCTING EXCELLENCE

Skills, safety and diversity up

The KPIs show that:

- Mean accident rate fell to 420 in 2013/14, down from 536 in 2012.
- Median percentage of employees trained to NVQ level 2 or higher grew to 71 per cent.
- Median percentage of women employed rose to 19 per cent.

A clear positive to take from the KPIs is the state of diversity, training and safety. All three KPIs have shown marked improvement since the onset of the recession and, in the case of safety, year-on-year declines in the number of accidents since 2009.

The mean accident incidence rate fell to 420 in 2013/14, down from 536 in 2012 and a high of 1,217 in 2002, meaning accidents have been cut by nearly two-thirds in just over 10 years.

"The figures suggest companies didn't compromise on safety, even during the recession," Mr Ward says. "The industry came a long way during the 2000s – we need to make sure we remain committed to safety."

There is similarly positive news for training and skills. The median percentage of employees trained to NVQ level 2 or higher has more than doubled in the past two years, rising from 31 per cent in 2011 to 66 per cent in 2012 and 71 per cent in 2013/14. This is a sharp and rapid increase, considering that the median percentage reached a record low in 2010, when it stood at 21 per cent.

However, Mr Ward warns that the numbers might not entirely be reflective of improved training across the board. "While positive, the figures could suggest many unskilled workers dropped out of the industry during the recession, with only those with better qualifications kept on," he says.

"It would be great if the industry could maintain this growth in training without sucking underqualified workers back into construction."

Nevertheless, the latest figure represents a record high. In addition, 61 per cent of direct employees held a Construction Skills Certification Card, up from 56 per cent in the previous year.

Diversity is also improving: the median percentage of women employed stood at 19 per cent for 2014, up from 15 per cent in 2012.

19% Median percentage of women in the industry

Meeting targets?

As construction emerges from recession, the recovery has brought its own set of challenges the industry will have to address.

The KPIs show staying on cost and on time is still a challenge for the majority of projects – and efficiency and cost targets are only frequently met in smaller projects valued under £1m.

The poorly performing (predominantly social) housing market needs the most focus and investment – less than half of all housing projects are on cost, and even fewer are completed on time.

Non-housing projects are on the whole performing much better – three quarters of all projects completed on cost or better, but similarly to housing, completing on time remains a major issue.

The main positive is that skills and training have reached some of their highest levels – and with more skilled workers in the industry and more investment into training, there is potential for efficiency and cost-effectiveness to improve.

Despite positive trends, the KPIs clearly show the strides industry must take to meet the government's vision for Construction 2025.

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