MIND THE GAP – WHAT GAP? OH, THAT GAP!

This paper is based on a talk given at the Chartered Institute of Civil Engineering Surveyors (Chartered ICES) Commercial Conference, held in London on 7 June 2017.

The construction media has often published headlines that refer to a skills gap in the industry. Recently those headlines have been more alarmist; talking about a crisis in construction and serious problems ahead. The purpose of this paper is to review the available data, and to attempt to answer the following questions:

- Is there a gap?
- How big is it?
- What can be done to deal with it?

The focus of the research relates to professional and technical staff, given the involvement of Chartered ICES membership, in both quantity and geospatial surveying.

Available data

There is a great deal of available data to consider. Arguably too much. It has been said that internet research can be akin to wanting a sip of water and being provided with a fire hydrant in full flow. It can be hard to filter the available data, and in this case, there is a lot of conflicting data.

For example, the simple question as to how many people work in the construction industry provides a wide range of opinion. The Office for National Statistics (ONS) suggest that 1,218,900 people were employed in the industry in 2015. This remarkably low figure stems from the data being limited to the 'Private Sector'. This presumably excludes those that do not work in contracting or consulting companies. The Construction Industry Policy paper puts the total number at 2,100,000 people in 2015, yet Cadvantage[1] puts the total at 2,900,000 people. Other sources quote figures between 2,400,000 and 2,700,000. The Royal Institution of Chartered Surveyors (RICS) quote that 8% of the UK construction workforce is an EU citizen, which suggests that they consider the total workforce to be 2,206,250.

From this data it appears implicit that more people work within the public sector on construction, than in private companies. This is hard to accept given that the largest workforce deployed must belong to the contractors and consultants, who actually deliver the projects, rather than the public bodies they work for. These statistics are clearly not based on the same data.

Other issues with the data become apparent from the breakdown, graphically set out by Cadvantage, which provides the statistics in Fig. 1 below to align with their 2,900,000 figure.

[1] http://www.cadvantage.co.uk/who-works-in-uk-construction/

Fig. 1 Cadvantage – Construction worker breakdown by role[1].

Trade	%	Headcount
Executive and Managerial	11	319,000
Painters & Decorators	3	87,000
Civil, mechanical & electrical	5	145,000
Bricklayers, masons, roofers & tilers	3	87,000
Metal, electrical and mechanical	10	290,000
Other occupations	37	1,073,000
Plumbers & HVAC	5	145,000
Plasterers, glaziers & others	5	145,000
Plant & machinery operatives	7	203,000
Carpenters	7	203,000
Architects, town planners, surveyors	6	174,000
	99	2,900,000

Minor discrepancies in the data no doubt relate to rounding, but the key issue appears to be what 'Other occupations' actually are. It may be that this data exists but consists of more than 100 occupations that are too diverse to sensibly show a contribution individually. Or, it may be that the data gathered simply had some gaps. In any event, the reliance on a total number of 2,900,000 rests on almost four in ten people, in the data, having an unknown occupation that may be construction-related.

The RICS has 125,000 members, including trainees; Chartered ICES has 5,121, of which commercial managers amount to 2,915. The RICS is covering a broad church, including valuers and building surveyors who do not directly work in construction, but in property. Even so, the breakdown above is hard to consider as anything other than indicative.

Perhaps the most reliable way to assess the number of people involved in construction, is to take each of the figures provided, and take equal account of each in generating an average estimate. In this way, it is probably the case that the total number of people in the construction industry as of 2015, was in the order of 2.4 million.

I have excluded the ONS data from this calculation, as it only includes private firms. I have then used this data as the source of a trend line, which adjusted over the years to the 2.4 million level, gives an employment profile in construction that looks a bit like Fig.2 below.

Fig. 2. Total number of people employed in the Construction Industry

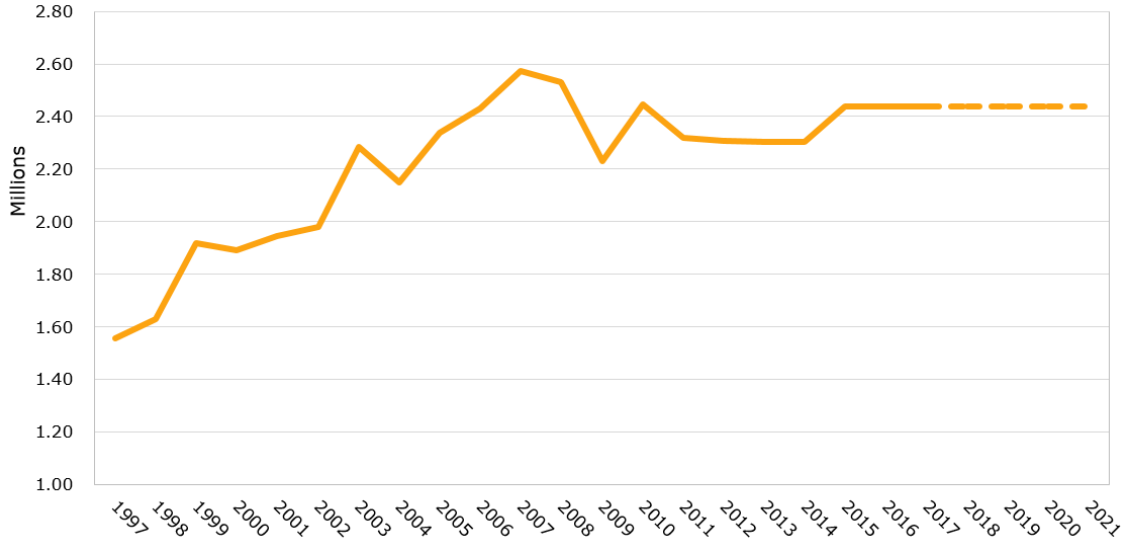


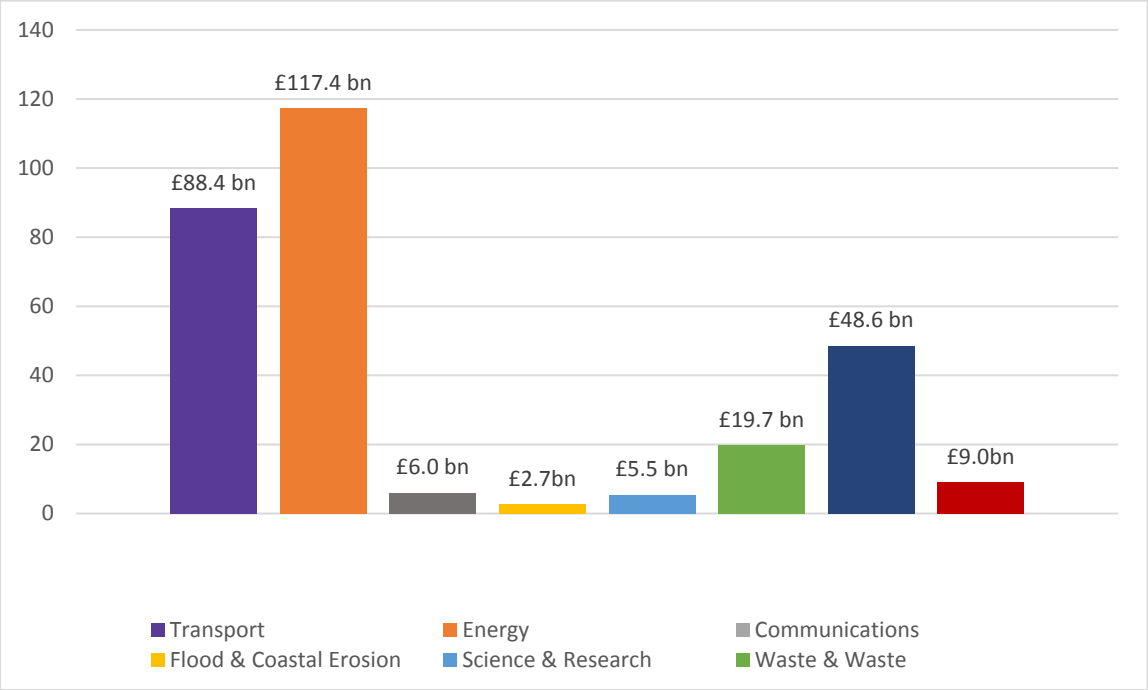
Fig. 2 clearly assumes, incorrectly, that the workforce will be static from 2015 to 2021. At this stage, a flat line can be used as the baseline from which to predict the increase in people needed, when the increase in work to be delivered is predicted.

Show me the work…

The National Infrastructure Delivery Plan 2016 (NIDP)[2] is an extremely useful document, with much detail in it. It sets out £483 billion of investment in over 600 infrastructure projects and programmes, across the UK, up to 2021 and into the future. This document is detailed, and is the source of the £500 billion figure often quoted elsewhere. Sometimes the sum of £300 billion is used instead, this refers to the pipeline of work set out in the NIDP that is to be delivered during the next five years to 2021.

Infrastructure covers a wide range of projects, and includes social infrastructure such as schools, hospitals and prisons, together with the roll out of broadband. Fig. 3 shows a useful graphic from the NIDP that splits up the projects by sector.

Fig 3. Infrastructure investment, by sector, spend from 2016-17 to 2020-21



[2] https://www.gov.uk/government/publications/national-infrastructure-delivery-plan-2016-to-2021

Major project pressures

There are some major projects, with which most people in construction are familiar with these include:

HIGH SPEED 2

- Start: 2017
- Duration: 17 years
- Budget: £56 bn
- Headcount: 7,174

HEATHROW EXPANSION

- Start: 2019
- Duration: 7 years
- Budget: £16 bn
- Headcount: 4,978

CROSS RAIL 2

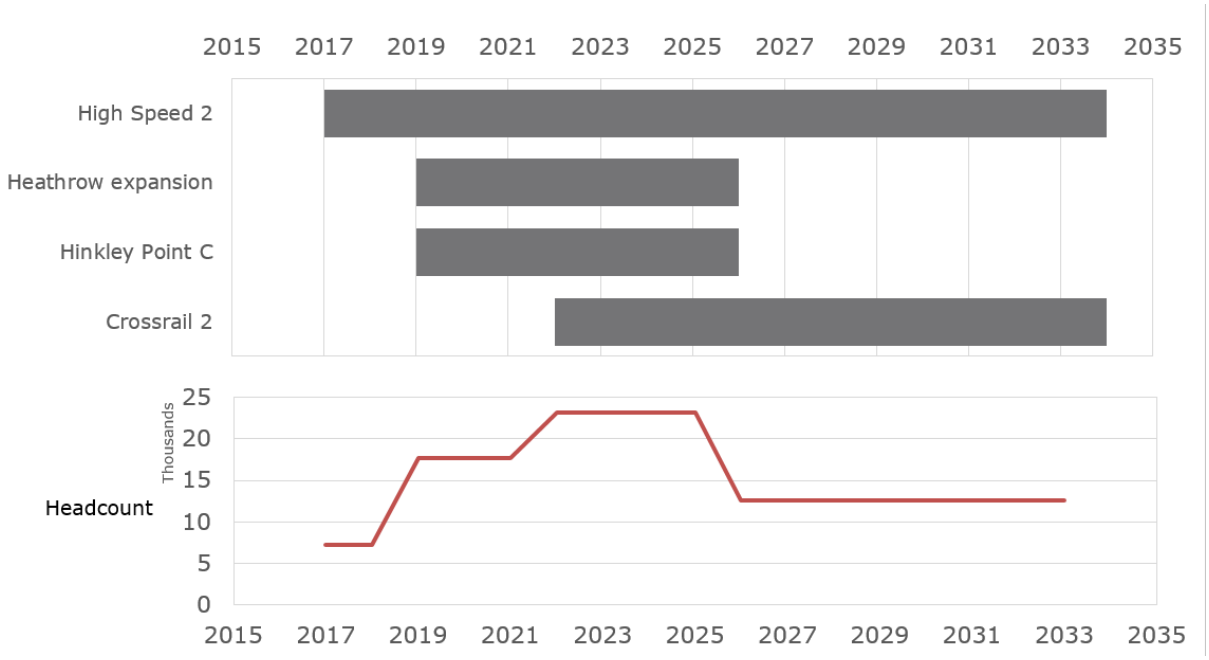
- Start: 2022
- Duration: 12 years
- Budget: £30 bn
- Headcount: 5,444

HINKLEY POINT C

- Start: 2019
- Duration: 7 years
- Budget: £18 bn
- Headcount: 5,600

Although the major projects are by no means the lion share of the work, it is interesting to see how they stack up based on planned time of delivery and headcount as per Fig 4.

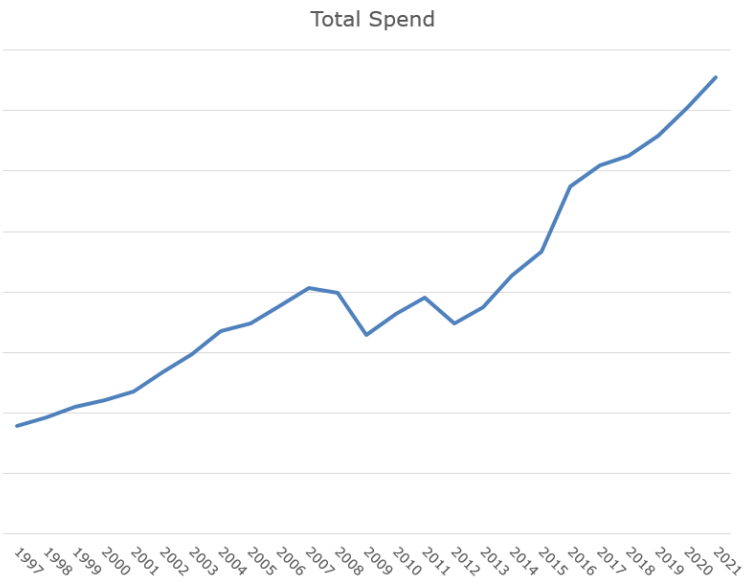
Fig. 4. Major Projects



Now we can start to see, that if the major projects are a barometer of the industry overall, and it seems that they might be, there is a bit of a pinch in the period 2019 to 2025 to say the least.

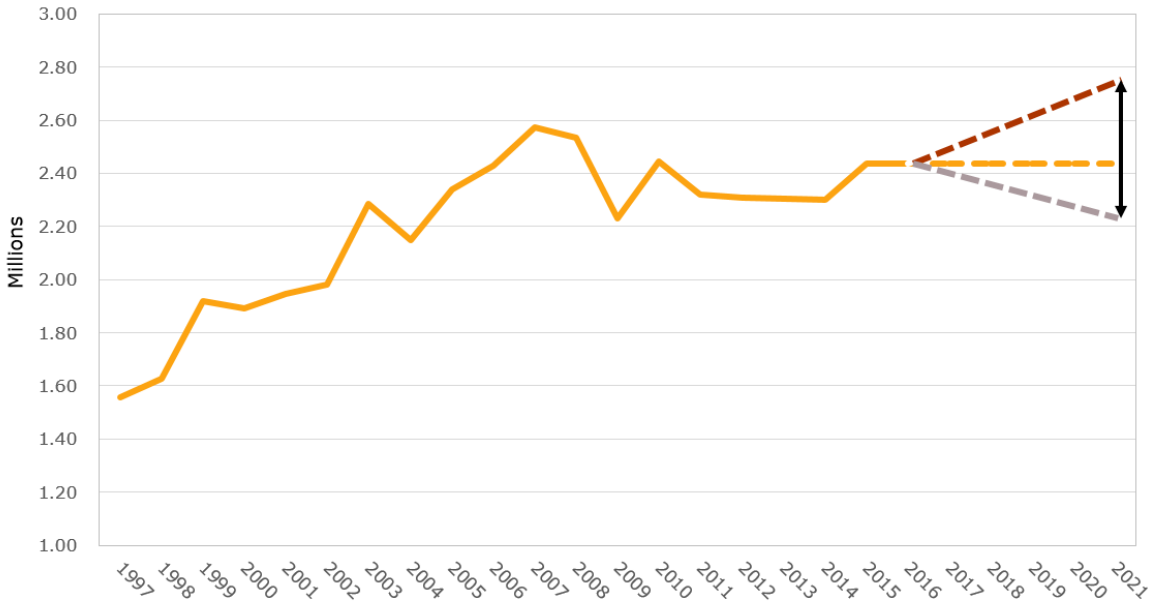
Turning a review of the NIDP and the major projects into a projected spend for the construction industry is not easy, or entirely accurate. One challenging factor is abating the numbers by the value of existing jobs finishing, like Crossrail. Making some basic assumptions about those projects, and adding in the new workload, does produce an extension of the workload graph, which actually closely follows the trend of recent years in terms of rate of growth as per Fig. 5.

Fig. 5. Total Construction Spend



If you use a rule of thumb to allocate headcount per billion, from the data already described above, you get a required increase of 400,000 people in order to fill the total gap. However, that is not quite the full story:

Fig. 6: UK Construction Industry



It is important to note that the increase of 400,00 people to meet increased demand, is based on the current EU based workers staying in the UK. Over 200,000 EU workers are predicted to leave the UK, giving a total risk of up to 600,000 people as a shortfall, as shown in Fig. 6.

This all sounds pretty serious. Because it is. Already the effects are coming through, with recruitment specialist Hays, reporting an average increase in construction professional's pay of 10% per year. This is said to relate to rising UK activity levels, with competition for the best people caused by the need to have the numbers to credibly bid for bigger and better contracts.

A shortage in skilled people can create all kinds of risks.

Complex projects require qualified and experienced technical staff at all levels. Innovation can be the key to making the projects work, or resolving the big problems that sometimes arise. Completion on time is a function of headcount or manpower but also of quality of staff. The ability to mitigate delays and get back on track requires experienced hands on the wheel. Late delivery and increased costs is going to mean more disputes and legal fees incurred, along with the uncertainty that brings.

Increasing costs, through wage hikes and no easy way to replace those retiring, will also affect the supply chain. The more specialist the supplier, the more acute the effect may be, given the difficulty in recruiting. Hays have reported salary growth in some sectors of construction at 10% per annum since 2014. Other reports suggest some firms are targeting whole teams from competitors. Staff retention is becoming an issue, with companies starting to look at lock-in strategies to protect their businesses.

The RICS have suggested a SAFE strategy (Stabilising Attracting Future-proofing Enterprising) approach. This involves adding construction to the list of key skills for immigration, and allowing students to stay on post qualification for a period. These steps are well intended, but I am not sure they grip the scope and scale of the problem, particularly in the medium term.

Construction has not always appealed to children at school as a career path. Often those coming through know someone in the industry. It has to be said that a lot of great PR for the industry has come from Crossrail, and I know the professional institutions have programmes to visit schools and explain how great a career in construction can be.

If you were to recruit new people in school today, and convinced a group of fourteen-year olds that this was the career for them, they would not be Chartered until September 2029:

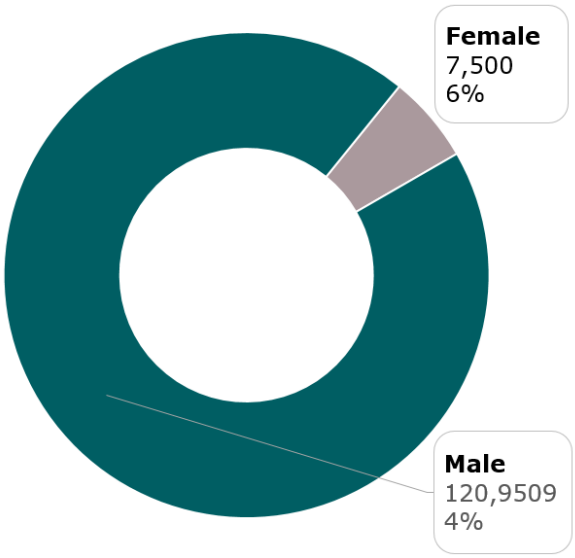
	GCSEs	A-levels	Degree (Apprenticeships?)	On the job training	Chartered
Years:	2	2	3	2	3

While we should be doing this in any event; it will not fill the gap during the next few years.

Women

The construction industry has long been regarded as a male dominated area. The statistics show this in very clear terms.

- Only 9% of the engineering workforce is female. And only 6% of registered engineers and technicians (i.e. CEng, IEng, EngTech) are women.



- The UK has the lowest percentage of female engineering professionals in Europe, at less than 10%, while Latvia, Bulgaria, and Cyprus lead with nearly 30%.
- In 2013/14, women accounted for 3.8% of engineering apprenticeships starts and 1.7% of construction skills starts.
- In 2015, 17% of STEM (Science, Technology, Engineering, Mathematics) teachers think that a career in engineering is undesirable for their students. This rises to 19% for STEM teachers aged 25-44 years old.
- Girls do very well in physics with 33.9% of female entrants gaining an A or A*, compared to 29.5% of male entrants.
- In 2014/15, 53% of apprenticeships starts were by women and 47% by men. On the other hand, female apprenticeship 2013/14 starts in the following frameworks are: engineering – 3.8%, construction skills – 1.7%, compared to children's care learning and development – 94.2%.

Enabling women to meet their full potential in the workforce is estimated to potentially add as much as $28 trillion to annual GDP in 2025.

WHAT CAN WE DO ABOUT THIS?

Having done some research, it seems very clear that the industry is approaching a serious problem. Rather than just make this statement, I list below some of the things that are being done by professional bodies and a few new ideas:

- **Flexible part time working** – May encourage more female staff, or retain existing staff, who need more flexible arrangements.
- **Periodic working** – By this, I mean people who wish to work for a few months, then take a break. This can be much more practical than requiring someone to work a four-day week etc.
- **Training roles** – These need to increase, in order to upskill the existing workforce and to train new entrants.

- **Mentoring roles** – The best way to develop talent quickly, that I have seen, is to have people mentored as well as educated. A great deal can be learnt quickly, by working with someone with many years of experience.
- **Ambassadors** – Before retiring, or even afterwards, an increase in the number of people who can visit schools, and also at other careers events, relating to female candidates and transfers from other sectors.

Can skills be transferred from other sectors?

In my view, this needs a closer look. In some professions, for example the legal profession, it is possible to undertake almost any degree, then do a 12-month transfer course to gain a qualifying law degree. Surely this approach could apply to other industries?

Research shows that a number of professions also use Primavera software, not just construction. Perhaps some of those professions have comparable roles to construction projects. Some examples that come to mind are:

Existing Profession	Potential Construction Profession
Banking	Quantity Surveying
Mechanical Engineer	Structural Engineer
Accountancy	Quantity Surveying
Oil & Gas	Building Services
Managerial	New roles?

Is there any reason that an accountant could not carry out quantity surveying, given a 12-month intensive construction course? Bringing people in from other industry sectors may have other advantages, importing best practice ideas from across the spectrum.

Managerial roles are something that construction has often shied away from in the pure sense. Many professionals will tell you that, in a consultancy, it is common to promote the best engineers, for example, into management positions. The professional bodies need to look at a career transfer course from parallel professions to make this work.

A promotion based on engineering skill, then leads to a new role managing people, work flow, finance, IT, and the myriad of other functions needed to run a business. This does not happen in other industries. In the NHS for example, the best doctors are not promoted into trust managers or executives. Others are hired in to do this. Perhaps we can learn from this to free up core skills.

CONCLUSIONS

A shortage in skills and people is no illusion on any analysis of the data, however fragmented. It is a clear and present danger to the delivery of the planned infrastructure and construction sector projects needed by industry and by the country as a whole. As this shortage takes more effect, commercial risks for businesses will come to the fore and require new thinking to mitigate.

Training is great and needs to happen but too little, too late still appears to be the case. The use of skills from other industries, combined with a higher take up of female applicants, could be the real answer.

So, in terms of the gap, and in answer to my original question, of “What gap?”, my conclusion is – “Oh, that gap!”. Challenges lie ahead and there is a need for thorough planning and immediate action to avoid serious consequences.