Highways skills shortage: the ticking time bomb
**FOREWORD BY PATRICIA HAYES**

I am really pleased that Highways UK has brought together the sector to deliver this important work on skills. The skills survey provides an evidence base and highlights some of the critical areas where we – Government, industry and the education sector – need to make real and rapid progress.

This is both a challenge and a huge opportunity. Investment in the roads sector is set to increase by 20% to nearly £6bn per annum within the next four years, with a near-doubling of investment on the Strategic Road Network (SRN).

We know from previous work that there is a shortfall in our current workforce, and Highways England estimates the need for an additional 12,000 people working across the SRN within the next four years, that is more than a 50% increase on the current workforce of 21,000.

This means opportunities for many more people, not only new entrants to our sector, but also opportunities for our existing workforce to develop their skills further. In an increasingly digital world there will be a demand for new types of skills as, for example, intelligent infrastructure technology becomes part of mainstream delivery solutions.

But in order to make the most of these opportunities we must take the longer term view and invest in skills. Greater investment certainty, and the introduction of the apprenticeship levy in May this year will help. In transport we are already on the front foot as we implement our Transport Infrastructure Skills Strategy, together with Highways England and our other infrastructure client bodies, driving skills through procurement and working towards ambitious targets.

Now, thanks to this survey, the Highways Sector knows where it needs to focus its efforts in detail.

I am particularly struck by the need to tackle the lack of diversity. We have to do this if we are to access the full spectrum of talent that we need. And we need to do this early – promoting the breadth of exciting careers on offer to children in schools from a young age when we know that they begin to make conscious or unconscious choices about their future. But we also need to make sure that when we welcome new entrants, the working environment we offer is as inclusive as possible so that they are encouraged to stay.

This is not quick work and is only something we can achieve by working together.

So I urge you to continue to collaborate. Take this survey as a call to action to make the sector fit for the future - a dynamic and rewarding work environment; highly productive; and equipped to deliver beyond expectation.

**Challenge and opportunity**

“Take this survey as a call to action to make the sector fit for the future”
HIGHWAYS SKILLS: THE TICKING TIME BOMB

**URGENCY**

Urgent action is required to prevent skills shortage delaying delivery of UK's £15bn highways investment programme.

71% are very concerned or concerned that skills shortages within their organisations could impact delivery of client programmes.

**LOST OPPORTUNITY**

The skills crisis will get worse unless action is taken, which is bad for the sector and bad for the wider economy.

61% expect their companies to decline opportunities to tender in the next five years due to insufficient internal resources.

30% say this will be highly likely or likely.

**PINCH POINTS**

In what we think is an industry first, the survey identifies skills pinch-points both now and in ten years' time.

51% consider the lack of availability of core engineering design and ancillary design capability is currently severe or very severe.

73% In the long term (more than ten years) this figure rises to nearly three quarters for core engineering disciplines.

**EXPERIENCE**

Skills shortage most acute at supervisory level

70% believe the skills shortage very severe or severe amongst those with 5-15 years' experience.

57% describe the current skills shortage within the highways sector as very severe or severe.

4% describe the skills shortage as minor or not an issue.

**LONGER TERM**

The skills shortage is forecast to get worse in the longer term, particularly with new skills required to handle the integration of big data on the network.

7% think the sector is equipped with the right technology skills to support the emerging use of connected and autonomous vehicles.

**BREXIT**

Impact of Brexit remains to be seen – but expect further pressure on skills.

69% believe it will put more pressure on skills due to either greater volume of projects (39%) or more ambitious projects (30%) – and this feeling was strongest amongst public sector clients (75%).

11% believe it will result in less pressure on skills due to either consolidation of projects across multiple authorities or more focused regional planning.

**DEVOlUTION**

Regional devolution could amplify the skills shortage

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**THE SOLUTION**

The skills crisis can only be solved with a radical change in mindset, the shortage must be seen as an opportunity. Engineers are problem solvers, we can and must, address this.

- There is so single solution; no silver bullet. A multi-pronged strategy is needed and change must come from within the sector with collaboration from government and the education sector.
- Establishing a national skills academy for highways is considered the initiative that would deliver the greatest benefit.
- Employers must use the clear and stable pipeline of work to increase recruitment and training commitments.
- The industry needs to change its pale, male and stale image. Failure to address diversity will only exacerbate the skills crisis.
- The highways sector needs to present itself as an exciting and rewarding career option and it needs to better communicate what it does to the general public.

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- The highways sector needs to present itself as an exciting and rewarding career option and it needs to better communicate what it does to the general public.
Transport infrastructure is at the heart of the UK’s gradual economic recovery. With an ambitious pipeline of projects lying in wait, the magnitude of which have not been seen for a generation, a key issue for the roads sector will be its ability to deliver the skilled professionals and labour needed to deliver on the ground.

A range of major schemes form an exciting pipeline of vital projects that are likely to apply pressure across the sector for years to come.

And we can’t discuss skills in highways in isolation to other areas of infrastructure and the wider construction industry. The increased investment in roads is to be delivered over the same period as other infrastructure projects (such as the fabled “3 Hs” of Heathrow, HS2, Hinckley Point C) with their own competing resourcing requirements.

The National Infrastructure Plan for Skills, launched in September 2015, goes some way towards mapping expertise against the UK pipeline of projects. Across all forms of infrastructure, the report highlighted an ambitious programme of £411bn of planned public and private investment to 2020 and beyond. [1]

It estimated the expected growth in the project pipeline would create a demand for over 250,000 construction workers and over 150,000 engineering construction workers by 2020 (up from 220,000 and 140,000 respectively from the 2015 baseline).

But the problem is significantly compounded by the fact that the workforce is ageing and more people are retiring from the industry than joining it. Sir Terry Morgan, Chairman of Crossrail, in his foreword to the Transport Infrastructure Skills Strategy (published January 2016) observes “we face the stark reality that in a decade over half the existing workforce will have retired.” This fact underpins the Government’s estimate that we will need to recruit and train nearly 100,000 additional people into the infrastructure and construction workforce by 2020.

But that is the expected demand across the full range of infrastructure activities (ie energy, communications, flood defenses, water and waste etc) and it is difficult to relate such big numbers to the scale of the challenge facing the roads sector.

Drilling down, total investment in the roads sector is set to increase by 20% to nearly £6bn per annum within the next four years. This includes spending across Highways England, local authorities and Transport for London (TfL). By far the most significant increase comes from the implementation of the Department for Transport’s Road Investment Strategy (RIS 1), which will see a near-doubling of investment on the Strategic Road Network (SRN).

In terms of the skills demand, Government has identified the need to increase the workforce in the roads sector from 47,000 in 2015 to 62,000 by 2020. This raises two key points. Firstly, the steep natural attrition of the ageing workforce means the shortfall is significantly more than the apparent gap of 15,000. Secondly workforce numbers have hardly changed in the last two years – little progress has been made since the skills gap was identified so when the problem hits it will do so harder and faster.

[1] Following the Autumn Statement in 2016, Government consolidated and updated its previously separate infrastructure and construction pipelines as the National Infrastructure and Construction Pipeline. This currently contains over 700 projects with a total value of more than £500bn.
Highways England estimates there are currently about 21,000 people working across the SRN but predicts it will need around 31,000 by the end of RIS 1 in 2020/21. Philip Ellis, capacity and capability programme manager at Highways England, speaking at Highways UK, pointed out that factoring in the people who will leave the sector, this equates to bringing in an extra 12,000 to deliver Highways England’s RIS 1 project pipeline. Put bluntly, the challenge is to increase the current workforce by more than 50% within the next four years.

The sector also faces the challenge of gearing up significantly following decades of underinvestment. Arguably this has created a sector characterised by very low margins and a survivalist business model – it is hardly surprising that there has been long-term underinvestment in skills and training.

Furthermore, the sector lost some of its most difficult to replace people in the economic slowdown following the 2008 financial crash. This saw an estimated 10,000 employees leaving the roads sector including large numbers of experienced senior staff, leading to a sharp reduction in the UK’s capacity to manage highways projects and maintenance programmes. And it’s not just about the numbers. In an increasingly digital world there will be a demand for new types of skills as intelligent infrastructure technology becomes part of mainstream delivery solutions.

Brexit adds an extra level of complexity to the issue.

But there is a counterview. Productivity in the construction sector has been almost flat over the last two decades, compared to other sectors such as manufacturing, services, and production that have risen by between 40-70%. Could the promise of more and stable investment provide the impetus for the sector to invest in the people and equipment needed to transform productivity? And if so, to what extent could that alleviate the sector’s apparent skills crisis?

It was against this backdrop that Highways UK set out to undertake a survey of the roads sector to try and drill down into where the problems are most acute and when they might start to bite.

“Could the promise of more and stable investment provide the impetus for the sector to invest in the people and equipment needed to transform productivity?”

This report presents the results. The primary aim was to identify the main skills challenges in the roads sector and gauge opinions on the severity and consequences of the skills shortage. The report focuses attention on the problem and points to some of the solutions currently in play. Significantly we’ve looked at it the issue from both supply and demand side perspectives, demand being how we make better use of resources, and supply being how we bring more resources in.

Inevitably it raises as many questions as it answers but it does, we hope, provide a road-sector focused look at the issues and forms an important part of the evidence base from which we hope we can all contribute to developing effective solutions.

SKILLS NEEDS IN THE ROADS SECTOR

<table>
<thead>
<tr>
<th>Year</th>
<th>Client and project leadership</th>
<th>Engineering and technical</th>
<th>Construction management</th>
<th>Skilled trade and labour</th>
<th>TOTAL (people)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 (baseline)</td>
<td>2,700</td>
<td>14,000</td>
<td>8,700</td>
<td>21,600</td>
<td>47,000</td>
</tr>
<tr>
<td>2020</td>
<td>3,500</td>
<td>18,500</td>
<td>11,500</td>
<td>28,600</td>
<td>62,000</td>
</tr>
</tbody>
</table>

(source National Infrastructure Plan for Skills)
The survey shows urgent action is required to prevent the skills shortage delaying delivery of UK’s “once in a generation” highways investment programme.

- The road sector is facing a skills time bomb that could impact delivery – nearly three-quarters (71%) are very concerned or concerned that skills shortages within their organisations could impact delivery of client programmes.
- Over half (57%) describe the current skills shortage within the highways sector as very severe or severe. Just 4% describe the skills shortage as ‘minor’ or ‘not an issue’.

Furthermore the skills crisis will get far worse unless action is taken, restricting business growth. This is bad for the sector – and businesses within it – and for the wider economy, given the strategic importance of the UK’s road network.

- Nearly two-thirds (61%) expect their companies to decline opportunities to tender in the next five years due to insufficient internal resources.
- Nearly one third (30%) say this will be highly likely or likely.
- Nearly half (41%) say staff churn in the highways sector is having a very severe or severe impact on delivery.

The skills crisis can only be solved with a radical change in mindset – the shortage must be seen as an opportunity. Engineers are problem solvers – we can – and must – address this.

"Nearly three-quarters are very concerned or concerned that skills shortages within their organisations could impact delivery of client programmes"
We are looking at the skills challenge in entirely the wrong way and it should be viewed as a massive skills opportunity for the country, says Richard Robinson, AECOM’s European and Middle East chief executive for civil and infrastructure.

Speaking at Highways UK he set out why the scale of the problem is not that massive when you look at the various routes through which it could be tackled. There are, he said, around 46,000 engineering graduates a year and tens of thousands of apprenticeships in the construction sector. There is also an “enormous untapped resource that we have shamefully overlooked so far as an industry – women.”

And if you could improve the sector’s relatively low productivity, he said, we could cover the perceived gap in skills. “My view is we face not a problem but an opportunity to bring a lot of people into the industry and to train them up in new skills that will be saleable around the world.”

The productivity problem

The British Government released figures in April 2016 suggesting productivity in construction had improved by only 1.4% since 1997. The following month the Chartered Institute of Building (CIOB) published a report Productivity in Construction: Creating a Framework for the Industry to Thrive. The report identifies a wide consensus within industry on how to boost construction productivity and makes a number of practical recommendations – such as tying public investment to training and job creation; developing new business models and financial models with incentives directed more towards productivity; and creating construction innovation and excellence hubs.
Where the problems are most acute

The survey identifies where the shortages are in terms of both different areas of service provision and also different skills levels, both now and in 10 years’ time.

In terms of skills levels, nearly three-quarters (70%) believe the skills shortage is very severe or severe amongst those with 5-15 years’ experience. The next greatest category of concern is management (15+ years’ experience) where 57% describe the shortage as very severe or severe. The implication is you can’t turn on experience – apprentices and graduates cannot plug the skills gap in the short or even mid-term. Urgent lateral thinking is required.

In terms of service provision, respondents identify the main blockages to be in core engineering design and ancillary design (eg environment, BIM, data management, ITS) with just over half responding “severe” or “very severe” in both cases.

The problem is expected to get worse. In the long-term (more than ten years) the severe/very severe response rises to nearly three quarters (73%) for core engineering disciplines.

Interestingly the responses do not support an increasingly held C-suite view that because many large consultancies now offer a significant global/offshore design capability, core engineering services are a non-exhaustible resource. The argument runs that if you don’t have the capacity to design a project in the UK, it could be picked up by (less expensive) colleagues in other parts of the world. But that is clearly not yet a reality among our respondents.

A key point is that while some areas are more acute than others, the responses point to concern across all areas. Assuming investment materialises as envisaged stress will be put on all elements of service provision.

A critical issue is how quickly the gap can be filled when skills shortages arise. There is a common presumption that it is easier and quicker to find lower skilled people.

WHERE THE PROBLEMS ARE MOST ACUTE

KEY POINTS

- Our survey identifies the availability of people with supervisory and management experience as the area of most concern
- Board/executive level experience is considered to be in least short supply
- In terms of service provision, respondents identify the main blockages to be in core engineering design and ancillary design
- There is concern across all areas of service provision. If investment materialises as envisaged, stress will be put on all elements of delivery
- A critical issue is how quickly gaps can be filled when skills shortages arise
- Different activities face different pressures. Generally lower skills areas are easier and quicker to replace. And while you can design a road remotely, you cannot build it without people on the ground

“Most acute is the lack of core engineering and ancillary design services”
At what level is the skills shortage most acute?

<table>
<thead>
<tr>
<th>Level</th>
<th>Public sector</th>
<th>Consultant</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisory (5-15 Years Experience)</td>
<td>2</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Management (Over 15 Years Experience)</td>
<td>0</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Apprentice/Technician</td>
<td>7</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>Graduate</td>
<td>5</td>
<td>18</td>
<td>39</td>
</tr>
<tr>
<td>Board/Executive Level</td>
<td>16</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

Now: To what extent do you believe the following areas of service provision are impacted by the current skills shortage?

<table>
<thead>
<tr>
<th>Area</th>
<th>Public sector</th>
<th>Consultant</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design (Core Engineering Disciplines)</td>
<td>2</td>
<td>11</td>
<td>36</td>
</tr>
<tr>
<td>Design (Ancillary Disciplines)</td>
<td>0</td>
<td>12</td>
<td>34</td>
</tr>
<tr>
<td>Construction Services</td>
<td>3</td>
<td>15</td>
<td>39</td>
</tr>
<tr>
<td>Skilled Trade</td>
<td>4</td>
<td>16</td>
<td>36</td>
</tr>
<tr>
<td>Asset Management</td>
<td>5</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>Manual Labour</td>
<td>0</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>Specialist</td>
<td>0</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>Tier 2/3 Supply Chain</td>
<td>0</td>
<td>7</td>
<td>23</td>
</tr>
</tbody>
</table>

70% considered the lack of availability of supervisory people to be “severe” or “very severe.”

Core engineering and ancillary design disciplines are considered to be in most short supply. Skilled trades are more of a concern than manual labour.

That does not allow for the potential impact of Brexit (which is more likely to restrict lower skilled non-UK workers) or that the UK is currently close to full employment.

While it remains a reasonable assumption that it should be easier to find, say, additional labour or haulage drivers than a BIM technician or experienced project manager, blockages in project delivery are likely to be more critical on site than in the design office. You can design a road remotely, but you cannot build it without people on the ground.

“You can’t turn on experience... the skills shortage is most severe amongst those with 5-15 years’ experience”
Highways England has developed a model that maps out when and where skills are required for project delivery. Philip Ellis, HE’s capacity and capability programme manager says: “We can talk about £15bn investment plan, but do we understand how many project managers that is or how many highways engineers we will need? “We need to present the investment programme in a way that will help the supply chain to respond,” he said, because “unless we can talk in terms that are meaningful to them, it will be difficult to optimise resources and get to the solutions quickly.”

In essence the Highways England model looks at the £15bn spend over the remainder of RIS 1 and breaks it down into around 120 different people resources. The model, reports Ellis, is being developed further to identify both plant and materials availability needs.

WHERE THE PROBLEMS ARE MOST ACUTE

The results, broken down into the sector’s constituent parts, reveal interesting variations. Contractors, for instance, worry more about the availability of manual labour and skilled trades, consultants worry about ancillary design services, while clients are most concerned about core design and construction services. Respondents were asked to predict how the skills shortage would pan out in the long term, defined at ten years and more. Across all areas of service provision respondents uniformly expect the problem to get worse by some 10% to 20%.

Breaking down the skills challenge

Highways England has developed a model that maps out when and where skills are required for project delivery. Philip Ellis, HE’s capacity and capability programme manager says: “We can talk about £15bn investment plan, but do we understand how many project managers that is or how many highways engineers we will need? “We need to present the investment programme in a way that will help the supply chain to respond,” he said, because “unless we can talk in terms that are meaningful to them, it will be difficult to optimise resources and get to the solutions quickly.”

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**Viewpoint: Philip Ellis, Highways England**

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### Long term: to what extent do you believe the following areas of service provision will be impacted by a skills shortage in the long term, i.e. 10+ years’ time?

#### 1) Design (Core Engineering Disciplines)

- **All responses**
  - Ten years: 73%
  - Now: 23%

#### 2) Design (Ancillary Disciplines)

- **All responses**
  - Ten years: 54%
  - Now: 18%

#### 3) Construction Services

- **All responses**
  - Ten years: 54%
  - Now: 16%

#### 4) Skilled Trade

- **All responses**
  - Ten years: 48%
  - Now: 18%

#### 5) Asset Management

- **All responses**
  - Ten years: 42%
  - Now: 10%

#### 6) Manual Labour

- **All responses**
  - Ten years: 40%
  - Now: 12%

#### 7) Specialist

- **All responses**
  - Ten years: 35%
  - Now: 8%

#### 8) Tier 2 Supply Chain

- **All responses**
  - Ten years: 34%
  - Now: 9%
Attracting and retaining talent

The most significant perceived barriers to attracting people into the sector are competition from careers in other industries, the low relative appeal of highways and low remuneration.

Contractors are much more concerned about work/life balance and the lack of clarity about career paths but much less put off by qualifications being too onerous. Consultants are more concerned about remuneration and less so about insufficient diversity. Public sector respondents highlighted the attractiveness of other industries and the sector’s lack of diversity.

Low remuneration takes top slot when it comes to retaining talent. Other significant barriers are non-highways construction and infrastructure projects attracting talent, lack of respect for the profession and fear of job insecurity associated with the historic stop-start approach to investment.

Consultants want more pay and bemoan the lack of variety in the work, but are happier than contractors and public sector clients about the status of the profession. Contractors struggle with the work/life balance, consider the route to management to be unclear, but don’t worry too much about the lack of variety in the work or the lack of diversity.

A recurring theme within the survey’s open-field responses is how the sector values technical skills. The overriding message is people enter the engineering sector because they want to be party to delivering huge, complex, exciting infrastructure. But once they get into the sector they see the accelerated career path is through a non-technical route, particularly operational management and that causes great frustration for the technical experts. As one respondent put it, “the issue is possibly exacerbated by the expectation from clients that the whole supply chain is technically competent. If clients expect all suppliers to do the basics to a high standard, that inevitably pushes the focus more on non-technical aspects of delivery and the supply chain responds accordingly.”

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talks up roads and infrastructure as being at the heart of the national economy and a catalyst for economic growth, yet that isn’t acknowledged in the kudos around the industry and it’s not acknowledged in the rewards given to the individuals who work within it. A sobering conclusion is the responses highlight many significant barriers to attracting talent to the industry, it is not simply a matter of addressing one or two. It should be a no brainer that a sector facing a major skills challenge needs to broaden its talent pool. RICS’ Building Inclusivity report (published June 2016) identified the UK’s construction and built environment sector to be 13% female and 1.2% BAME (Black, Asian, and Minority Ethnic).

A three-point plan

Speaking at Highways UK, Sue Stevens, CIHT’s director of education and membership put forward a three-point plan for the sector. As an industry, she said, we must promote careers in highways in a way that shows them to be exciting to young people. That needs to happen in schools, it’s great to talk to graduates but engaging with schools is where the process starts.

The sector must widen the talent pool. If we keep going back to the same sources of recruits used in the past we’re not going to get the numbers we need. Once you’ve got them you’ve got to keep them and the environment in which they work is very important to that. If young employees don’t feel comfortable, if they don’t feel respected and valued they will look elsewhere. It is easy to talk about creating an inclusive culture, but less easy to implement. But if you don’t do it, you’ll find you are losing your best people to other sectors that have more appeal and look more welcoming.
But our survey revealed respondents rated the sector’s lack of diversity to be the least significant factor to attracting new talent. Perhaps that is simply a reflection of the fact the sector is largely aging, male and predominantly white.

It nevertheless raises a critical question. If we do manage to attract a more diverse intake, how do we make entrants feel they are in a welcome and inclusive environment and it is worth investing their future within the sector?

Sue Percy, chief executive of CIHT believes the solutions are both structural and behavioural. If we don’t tackle both,” she says “we won’t get very far. We need to invest in upskilling both the new and existing workforce. That means training, that means qualifications, that means really supporting the workforce.”

And there should be more accountability on skills investment, she says, with more transparency on the percentage of turnover that is going on skills investment.

But it’s got to go beyond numbers, she says “inclusive behaviours and leadership has to go hand in hand with the diversity discussion. We need to seek diversity, create inclusion and drive accountability in our sector.”

When it comes to retaining people within the sector, consultants want more pay and bemoan the lack of variety in the work, but are happier than contractors and public sector clients about the status of the profession. Contractors struggle with the work/life balance, consider the route to management is unclear, but don’t worry too much about the lack of variety in the work or the lack of diversity.
You have to start somewhere

The story for Crossrail could be the same story for Highways England, says Sir Terry Morgan

When Sir Terry Morgan took over the reigns as chair of Crossrail seven years ago, he soon came across the inconvenient truth that the skills to deliver the project simply didn’t exist.

Crossrail, he told the Highways UK conference, needed just over a 1000 people of a certain skill to work underground but there were just 700 people in total in the whole of the UK with those skills and their average age was 55.

And when Sir Terry spoke to the supply chain and told them that collectively they had to do something about it, he reports they said: “why bother, you’ll have finished your project in five or six years’ time.”

“Well ask yourself the question,” Sir Terry told the HUK audience “if you didn’t start five or six years ago, where would we be today in terms of trying to develop the skills agenda? You have to start somewhere.”

And with Highways England the new kid on the block as a major infrastructure client concerned over its ability to deliver on an ambitious investment programme, Sir Terry suggests the story for Crossrail could be the same story for Highways England.

Sir Terry believes investing in infrastructure should be more than “just the transport system that you create”. If you do it well “you create a much bigger story in terms of benefits to the UK economy as a whole”.

While welcoming “the very positive agenda” that exists at the moment about the importance and the criticality that government is placing on infrastructure investment, “we have to make absolutely certain that we do not give politicians the excuse to change priorities.

“There has to be a continuity and there has to be planning about what to do with the investment. There has to be an agenda that keeps moving things forward beyond the next five years.”

Crossrail’s response to its looming skills shortfall was to set up the Tunnelling and Underground Construction Academy in east London with the aim of training people in underground construction over the lifetime of the project. Targets were set for an annual intake to reach 400 by 2018.

Hand in hand, adds Sir Terry, we said to the supply chain, “if you want a contract with Crossrail not only do you deliver on time and cost but you will employ an apprentice for every £3m worth of contract value.”

As chairman I was the conscience, there was the commitment, an obligation beyond delivering on time and on cost, which was to make a contribution to the skills agenda.

The result is that against the target of 400 people by 2018, the intake is currently 602 and by 2018 Sir Terry expects it to be 800.

It’s also been notable at attracting women into the sector. The industry as a whole “is about 10% female”, but last year Crossrail’s female apprentice intake was 27%. In a similar vein, nationally across all apprenticeship programmes, one in five come from a NEETS (Not in Education, Employment or Training) background. On Crossrail 40% of the apprentice intake is from a NEETS background. The Transport Minister Andrew Jones, Sir Terry reports, “just takes fantastic delight in that Crossrail is a social programme as well as an infrastructure investment and that for me is critically important.”

As part of the skills agenda Sir Terry, on behalf of DfT, has lead a review group comprising all the major transport client groups namely Network Rail, Crossrail, HS2, Highways England and Transport for London.

“We think, but we don’t really know, that we are currently training about 7500 apprentices. We committed to increasing this to 30,000 by 2020. We’ve also said that by that time, 20% of our apprentice intake should be female. HS2’s ambition goes significantly further, its gender mix target is 50/50.

“There has to be that scale of ambition. At the end of the day it gives Government the confidence that when they promote infrastructure investment, we as a client and those in the supply chain can demonstrate through performance that infrastructure investment is a phenomenally good way of encouraging inward investment and creating an economy that we can all be proud of.”

Sir Terry Morgan, Chairman, Crossrail
Skills fit for the future

Most of the workforce in the highways sector has historically drawn on traditional construction skills, but with the introduction of new technologies and intelligent infrastructure there is a trend toward a broader range of engineering and technical skills required to deliver the future investment plans.

That means the skills challenge is not just about numbers, it’s about capability. The skills we’ve got at the moment are not going to equip us with the infrastructure that we need to deliver in the future.

The consequences of not being prepared for the future are huge and we have a responsibility to prepare for these changes and adapt accordingly. Speaking at Highways UK, Rachel Skinner, Vice President at the Institution of Civil Engineers with a lead on Public Voice said: “We have to recognise that the world of the future is absolutely not a roll forward of the world of the now. We also need to think much more closely about the paths from now to that future.”

For instance, it is widely expected that the world is going to become ever more connected, ever more reliant on digital technologies of different types.

“A danger here is we throw around shorthand”, says Skinner. “We talk about driverless cars, we talk about smart roads and smart cities, we talk very loosely and very easily as if we know exactly what we mean and we’re all talking about the same thing. But when you have a detailed conversation it becomes really obvious incredibly quickly that there are all kinds of different perspectives at play.

“It worries me that we are missing a lot of tricks by not being sufficiently collaborative and not thinking in that bigger sense how it might actually happen. The potential on offer is ours to shape. We mustn’t underestimate our ability as professionals in the infrastructure and built environment space to engage with and shape the changes driven by digital.

We need to stop thinking about it as something that is happening somewhere else, by others. We need to think about how we can take ownership and think about that integrated and creative process and how we go from concept right through to delivery and operations and maintenance and make sure that is a strong strand as we go forward.

“There is huge untapped potential and if we can get to grips with it, it will genuinely help us to be much more fit for the future and also overcome a lot of the challenges we face at the moment to do with industry relevance and our visibility around innovation and the understanding generally in society about what we actually do.”

Do you believe the highways sector currently has the technology skills required to support the emerging use of autonomous vehicles on the network?

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There is a lack of confidence that the sector has the technology skills to support the emergence of increasingly autonomous vehicles.
Do you believe the highways sector currently exhibits the skills and mindset needed to make collaborative working successful?

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Collaboration has been the watchword for the sector over the last couple of years but only 28% say the sector exhibits the right skills and mindset to make collaborative working successful and 27% say it doesn’t.

Building inclusivity

The RICS report *Building inclusivity: Laying the foundations for the future* published in June 2016 is a benchmarking report that enables companies across the construction, property and land sectors to see how they measure up against their peers and to track their progress.

The report is based on data provided by firms signed up to the RICS’s Inclusive Employer Quality Mark. It is a voluntary and self-assessed process that uses the National Equality Standard criteria, developed by EY, as a framework by which companies can assess their equality, diversity and inclusion criteria.

It looks across six key areas of leadership and vision, recruitment, staff retention, staff development, staff engagement and continuous improvement.

RICS says responses show some good practice in the sector and what appears to be a strong commitment to the diversity and inclusion agenda. However, concludes the report “many of the organisations that responded are clearly at an early stage of their journey. While there is ambition and senior support, there is also a lack of planning, implementation and monitoring that is required to see real change happen.”
Solutions

When asked to rank which of seven given skills initiatives would deliver the greatest benefit there is no stand out initiative, with options polling between 11% and 19%.

In descending order, the top three initiatives are a national skills academy, greater standardization in baseline qualifications and a national competency assessment.

Within a free-form response field, respondents typically reiterate a number of the themes that have emerged in other parts of the survey. There is a particular focus on the status of chartered civil engineers/professional engineers and the lack of an incentive to develop and retain a technical skill.

A number talk of the need for a collaborative, positive attitude from clients and that clients should take some level of risk and trust partners. There is also a view that client bodies can lack knowledge and expertise with too few of them directly employing professional engineers.

A recurring comment is don’t set up initiatives for the sake of it. More important, respondents said, is a clear and stable pipeline of work that allows recruitment and training commitments to be made over longer periods.

As one says, what the sector needs is “a determined and guaranteed workflow across a number of years to demonstrate the opportunities and establish well-proven career paths”. Another describes the lack of visibility of the work pipeline as “the biggest blocker to skills initiatives”.

No doubt Highways England and DfT would argue that establishing a stable and guaranteed workflow is exactly what the Road Investment Strategy does.

“The next few years are shaping up to be a critical window”

Furthermore the Apprenticeship Levy comes in on 6 April 2017. It requires all employers operating in the UK, with a pay bill over £3 million each year, to invest in apprenticeships at a rate of 0.5% of their annual pay bill. It should have a significant positive impact.

The next few years are shaping up to be a critical window in which to demonstrate that the stop start approach has gone, and for the industry to seize all the benefits, not least those associated with making sure the sector attracts and retains the skills needed to deliver effectively in the future.
With the details of the Government’s approach to Brexit still unknown, it is impossible to speculate in detail on its impact within the highways sector.

Amanda Clack, head of infrastructure at EY and President of the RICS is also chair of the industry-convened Brexit Infrastructure Group formed to establish and ensure that Government is well-briefed and informed on the key issues and how they affect the infrastructure sector.

Speaking at Highways UK she said Brexit is coming and will impact the infrastructure sector particularly. However, she urged, we should see it as “just an additional layer of complexity to the problem.”

ONS, the Office of National Statistics, she reports, estimates that 9% of construction workers in the UK are non-UK EU nationals. But, says Clack, the situation is very regionalized and in London the figure rises to 54%. That is consistent with the observation from Crossrail chairman Sir Terry Morgan “that 40% of people working on Crossrail are non-British, for the simple reason that we don’t have the skills we need to actually undertake the work.”

In a similar vein, Sue Percy, CIHT chief executive, identifies a reliance on migrant labour especially on big projects. “Historically look at where labour has come from and a lot of it has been outside the

“By increasing pressure on skills, Brexit could force the cultural change that has been alluding the sector for so long”

UK,” she said. With Brexit, she added “we will potentially struggle to replicate the model of migrant labour additionality that we have really relied upon until now.”

While that seemingly adds up to bad news, Clack says Brexit could be a catalyst to think differently. “We are great innovators and we need to ask ourselves how do we do things differently to make significant step changes in how the sector works and operates. How do we become more productive, how do we use the supply chain better, how do clients become more intelligent clients, and how do we drive the industry to innovate so that we are using resources in a smarter and more effective way?”

Might it be that by increasing pressure on the problem, the consequences of Brexit could drive innovation and achieve the step change that has been alluding the sector for so long? Both DfT and Highways England are currently undertaking detailed research to establish where the impacts of Brexit may materialize. Clearly different tiers will be affected to differing degrees. For instance, the percentage of non-UK EU workers might be a small percentage of a company’s workforce, but when you go down the supply chain to lower skill levels you are generally seeing a higher percentage.

How concerned are you about the impact of a future Brexit on highway sector skills?

At the time of questioning (October/November 2016) under half (40%) were very concerned or concerned about the impact of Brexit on skills resources in the highways sector. However expect additional pressures and an additional layer of complexity.
FUTURE PRESSURES

Will devolution put more pressure on skills?

With the prospect of regional devolution giving greater fiscal autonomy to devolved bodies, is that going to influence where companies put their market capacity? Might devolution challenge the principle that the sector is broadly national in outlook and the supply chain simply follows the money?

The prospect of significant work packages from the emerging Sub-national Transport Bodies (STBs) such as Transport for the North, Midlands Connect and England’s Economic Heartland certainly creates a possibility of more major clients.

At present Highways England controls the big packages and close to 200 local authorities offer much smaller scale opportunities.

The implementation of the Major Roads Network concept through the STBs could make the smooth coordination and scheduling of major works more complicated, particularly with respect to resourcing site operations.

From the responses, 69% thought devolution would result in more pressure on skills resulting from either a greater volume of projects or more ambitious projects, 14% thought it would make no difference and 11% said there would be less pressure on skills through consolidation of projects and more focused regional planning.

However it pans out, planning and coordination of work programmes between the STBs is vital.

With regional devolution increasing the likelihood of more localised decision making and greater investment autonomy, what impact do you foresee on skills in the highways sector?

More pressure on skills due to greater volume of projects
More pressure on skills due to more ambitious projects
Less pressure on skills due to consolidation of projects across multiple authorities
Less pressure on skills due to more focused regional planning
Devolution will make no difference to the demand for skills
Don’t know

More than two thirds (69%) think devolution would put more pressure on skills resulting from either a greater volume of work or more ambitious projects.

The Highways UK skills survey – who responded

Thanks to the efforts of our supporters the Highways UK skills survey was circulated widely to the memberships of ICE and CIHT and promoted extensively through the social media channels of Highways England and matchtech. Analysis within this report is based on 405 fully completed responses.

SUPPORTERS