

Greater Manchester Chamber of Commerce

# Construction Pipeline Skills Analysis: Heathrow Airport Expansion

Final Report

GMCC Research  
5-1-2016



Greater Manchester  
Chamber of Commerce  
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## 2 GREATER MANCHESTER CHAMBER OF COMMERCE

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### 2.1 ABOUT THE CHAMBER

Greater Manchester Chamber of Commerce (GMCC) is the largest in the UK, representing the views of over 4,700 businesses across all sectors and from the self-employed to global corporations. Collectively its members employ around 400,000 people, one-third of the workforce of the largest area of economic activity in the UK outside London and the South East.

Through a range of membership services GMCC provides first-class business support, international trade and networking opportunities as well as high-quality research and active policy campaigning on behalf of its membership and the wider business and social community of the city-region, supporting the social and economic aims of Greater Manchester and its key partner organisations.

Its pioneering research methodology behind the Construction Pipeline Skills Analysis series of reports has been warmly welcomed by industry, training providers and government. The bringing together of large volumes of data from third-parties and developing a bespoke model through which that data can be easily understood has allowed Greater Manchester Chamber of Commerce to become known as one of the leading bodies for construction sector and skills demand analysis in the UK.

Through innovative partnerships with Barbour ABI, CITB and Whole Life Consultants Ltd, new ways of utilising this methodology are continually being developed, and Greater Manchester Chamber of Commerce is pleased to be able to work with Heathrow Airport on this report. Greater Manchester Chamber of Commerce thanks its key partners in the delivery of the core methodology of this research.

## 3 PARTNERS

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### 3.1 BARBOUR ABI

Barbour ABI is a leading provider of construction intelligence services. With a team of in-house research specialists and a dedicated lead economist, it provides commercially relevant insight and unique analysis of trends and developments within the building and construction industry. Barbour ABI is the chosen provider of industry data and indicators for Government bodies including the Office for National Statistics and the UK Government's Construction and Infrastructure Pipelines, which outline future construction and infrastructure projects where public funding is agreed. Barbour ABI also provides data for independent organisations, such as the Construction Products Association. Providing sales leads and data to many clients that sell their products and services into the built environment, Barbour ABI reports on every planning application in the UK and also tracks 20,000+ projects that do not require planning permission. At each stage, key intelligence is added such as individual contact data, planned or estimated start/end dates, values, materials identified, detailed scheme and status information and also subcontractor information.

### 3.2 CITB

The Construction Industry Training Board is a partner in the Sector Skills Council for the construction industry in England, Scotland and Wales. The CITB works with industry to encourage training, which helps build a safe, professional and fully qualified workforce. The support and funding the CITB provides helps companies to improve skills, increase their competitiveness and respond to challenges such as the low carbon agenda, reducing costs on site and recruiting the best talent for their sector.

"CITB fully endorse how important research is that produces pipeline analysis that will give us a picture of the skills that the construction industry needs, what the education and training system is supplying and where the gaps lie. Planning future skills requirements from a robust evidence base is critical as it helps ensure that investment is correctly targeted in key areas where skills are needed and maximum opportunities for jobs and training can be realised."

### 3.3 WHOLE LIFE CONSULTANTS LTD

Whole Life Consultants Limited is a spin out company of the University of Dundee. Founded in 2004, originally to commercialise the results of a major EPSRC funded programme "A Generic Approach to Whole Life Costing", its activities have subsequently expanded to encompass the commercialisation of all the intellectual property and expertise developed by the Construction Management Research Unit (CMRU). The CMRU is part of the Department of Civil Engineering which achieved the sixth highest score in the UK in the latest Research Assessment Exercise. Supported by the research carried out by the CMRU, the company is ideally positioned to realise the synergies between academic research and practising professionals. The company's multi-disciplinary staff, of whom most are qualified to PhD standard, include Civil, Mechanical and Environmental Engineers, Social, Natural and Computer Scientists.

The Labour Forecasting Tool is an exciting new development commissioned by ConstructionSkills which builds upon our ability to forecast skills needs. The LFT is a web-based application for forecasting labour needs on a whole range of construction projects.

## 4 EXECUTIVE SUMMARY

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The publication by Greater Manchester Chamber of Commerce of its Greater Manchester Construction Pipeline Analysis in November 2013 and updated in July 2014 heralded a new way of understanding the construction industry's future workload and its direct impact on the availability of future skills for the sector. Its positive reception by the construction industry, training providers and the UK government is testament both to the usefulness of this new methodology and the paucity of information that existed in this space prior to the publication of the first edition of the Pipeline Analysis.

Greater Manchester Chamber of Commerce later collaborated with KPMG and London Chamber of Commerce and Industry to publish the LCCI/KPMG Construction Skills Index 2014, which provided a comprehensive analysis of the volume of construction projects and the demand for skilled construction labour in London and the South East of England. In 2015 a report identifying the projected construction demand and its corresponding labour supply requirements for the North West of England was published, which also included the detailed skills gap analysis as in previous publications.

This report, commissioned by Heathrow Airport, seeks to utilise the core methodology from previous publications but goes further in understanding the legacy impact that the Heathrow Expansion project could have on construction sector training in London. Previous reports have highlighted not only the macro-economic scale of construction projects across different parts of the industry and country, but also the mismatch between supply and demand of skilled labour, and of the differing requirements of industry and the output of our educational institutions. They have also identified and laid bare the scale of the recruitment challenge for the industry if it is to successfully respond to the rapid increase in demand from both public and private sector clients.

Continuous changes to the skills system in England over the past few decades have left a system that is, at least in part, unresponsive to businesses' needs. Industry, too, has failed for many years to fully develop its own strategies for bringing forward new people into skilled trades and the volume of apprentices, though rising during the 2000s, is significantly lower than both our own historic levels and those of our primary competitor economies. London, despite being home to large share of construction companies and employees trains few apprentices each year, and the industry has increasingly relied on a migrant workforce to supply its needs.

Government policy in infrastructure development has been notoriously slow in the UK for many decades, but decisions over the past few years have seen a resurgence in demand for improving what is, in many parts of the country, outdated infrastructure with insufficient capacity for today, and a significant shortfall compared to longer-term needs. Road, rail and air capacity is now being addressed, and other critical aspects of the nation's infrastructure such as energy, sewerage, broadband and mobile access are receiving welcome attention.

The Airports Commission recommendations for tackling runway capacity in the South East are still awaiting government's final decision, and this report does not seek to either influence or pre-judge that process. It does, however, highlight the positive impact on construction sector training in London that could be delivered, if Heathrow Airport were to implement this report's recommendations.

This report delivers the following key findings:

- Construction output for projects in London in 2016 is expected to be £19.5bn
- Construction output for infrastructure projects in London in 2016 totals £1.85bn
- Demand for construction workers in London in 2016 is 440,000 workers
- Infrastructure projects alone in London in 2016 will require 33,000 workers
- Between 2016 and 2026, the value of infrastructure project starts is £33bn, excluding Heathrow Airport expansion
- By 2020, the demand for construction workers on infrastructure projects with a high degree of certainty of going ahead will have risen to 48,000
- Heathrow Expansion will require an increase in the number of infrastructure construction workers by around 25%, and the overall construction workforce in London by 3%
- Heathrow Expansion should aim to deliver at least 660 apprenticeships over the lifetime of the project
- This would require increasing the number of construction sector apprenticeships achievements delivered in London compared to today by nearly one-fifth
- The careers into which apprentices on the Heathrow expansion project would enter have an average salary in 2015 of £35,000
- The expansion programme could have a peak impact of reducing local borough youth unemployment by around 5%
- Greater London's construction sector training is around 11% under demand in head count, but nearly 70% under demand in competency-based training
- Heathrow Airport's Apprenticeship Levy contributions over the period of expansion will be sufficient to deliver at least 1,000 apprentices, though it is as yet unclear whether government regulation will allow Heathrow to pass this value into its supply chain
- Development of a shared apprenticeship scheme may allow transfer of Heathrow's apprenticeship levy payments into the supply chain, but it may also allow a greater opportunity to support apprenticeships within the smaller companies of the supply chain for the expansion programme
- Heathrow will need to engage early with the supply chain, training providers, schools and other agencies to prepare for the large increase in workforce requirements beyond 2020

## 5 HEATHROW EXPANSION

### 5.1 OVERVIEW

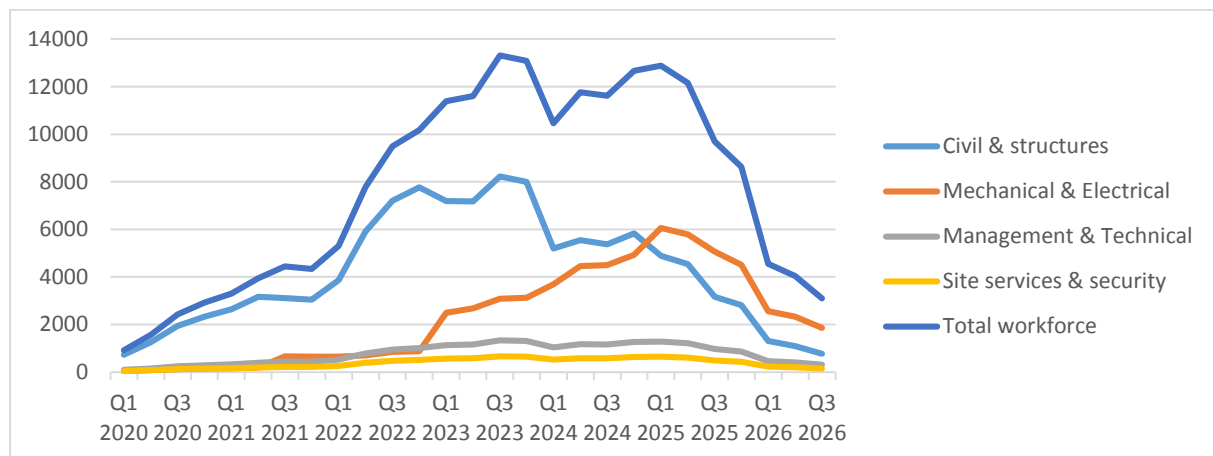
Heathrow, as the UK's only international hub airport, seeks to deliver significant additional capacity through the delivery of a third runway, a sixth passenger terminal and a new freight centre. If granted approval, the project would immediately become one of the single largest construction programmes in the UK.

### 5.2 HEATHROW WORKFORCE MODEL

Developing aggregate workforce models is a challenging task that requires significant historic data to deliver with accuracy. For the purposes of this report, we have utilised two separate models as the core inputs to our working model: the first from Mace, commissioned by Heathrow Airport as part of the core project, and the Construction Industry Training Board's Labour Forecasting Tool, developed by Whole Life Consulting Ltd.

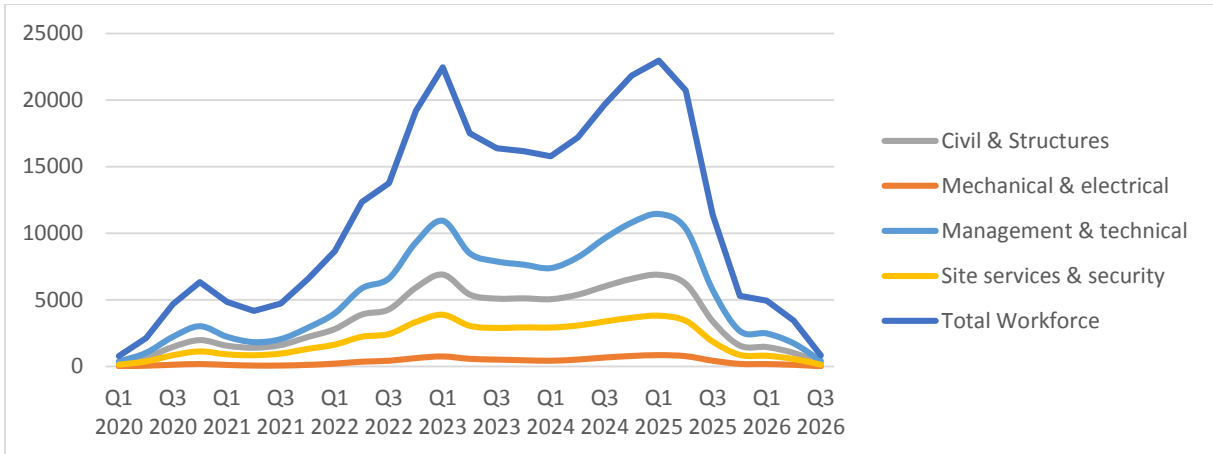
#### 5.2.1 Mace

Using the provisional workforce model supplied by Mace, based upon capital spend values, the project is expected to provide employment for around 13,300 people at peak capacity in 2023.



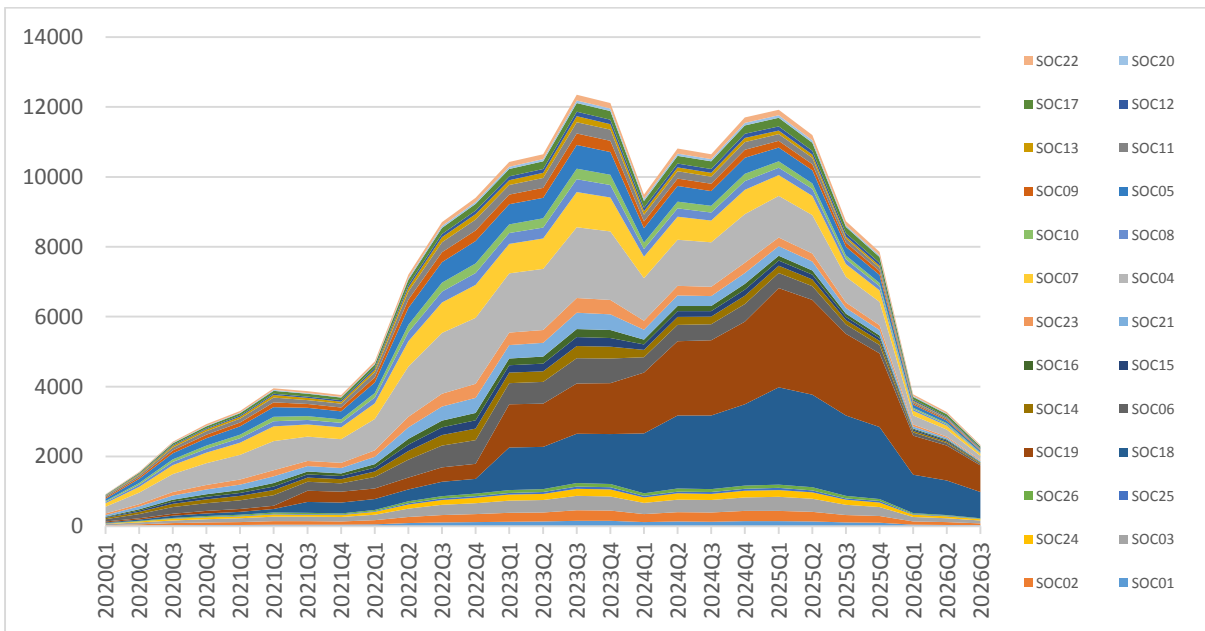
#### 5.2.2 Labour Forecasting Tool

Utilising the Labour Forecasting Tool developed by Whole Life Consultants Ltd in partnership with the Construction Industry Training Board, a similar workforce profile is seen, though it indicates overall a higher requirement for workforce generally, and especially for management and technical personnel. This may be caused by the unusual nature of the Heathrow expansion programme, where a large number of very high value infrastructure projects are each allocated their own individual workforces whereas, in reality, there will be some blending of these workforces across the multiple projects, and particularly so for overall construction and project management.



### 5.2.3 GMCC workforce model

To better understand the detailed breakdown of specialist trades required by Heathrow Expansion, a model has been developed that utilises both of the above workforce models. Using the specialist knowledge from Mace in its provisional workforce model, and deploying the more detailed methodology of the CITB’s Labour Forecasting Tool and utilising the Mace high-level model as a functional constraint, GMCC has developed an estimate of the trade-by-trade breakdown of the individual occupations required to deliver the Heathrow expansion project.



### 5.3 HEATHROW TRAINING REQUIREMENTS

GMCC has previously undertaken extensive consultation with industry over many years which has revealed a minimum training requirement of 5% of the workforce at any one time; this includes both new-entrants to the workforce and up-skilling or professional development of the existing workforce. This means that Heathrow should, therefore, through its supply chain, be aiming to deliver at least 666 apprenticeships over the course of the project, a comparable ratio to the positively-reviewed scheme in place on the Crossrail project.



## 5.4 HEATHROW HIGH-LEVEL TRAINING REQUIREMENTS

Applying this minimum baseline of 5% of the workforce in training reveals a peak training requirements of 412 civil and structures operative apprenticeship, 304 mechanical and electrical operative apprenticeships, 67 management and technical apprenticeships and 34 site services and security apprenticeships. The peak workforce for each of these key areas is at different times, and so care will need to be taken to ensure that apprentices are hired at the optimum part of the project for each of their specialties.

The civil and structures workforce peaks in mid-2023 before falling by around 25% in early 2024, though is broadly stable for the rest of that year, before steadily decreasing towards the end of the programme in 2026. Apprentices in this sector, therefore, should be most actively recruited in early 2022, ready for the higher workforce requirements of the following year, ensuring that there is a volume of work on-site for their specialty over the period of their apprenticeship. Management, technical and site services & security are more stable over the project period, so timing is less important for these areas. For mechanical and electric trades, the peak requirement is naturally later in the project and is less sustained, so recruitment should begin in early 2023 to maximise the benefits for the higher-level apprenticeships in this area.

## 5.5 HEATHROW TRADE-BY-TRADE TRAINING REQUIREMENTS

Applying the minimum standards of 5% of the workforce in training at any one time across all individual occupation groups for the period of the project, it is possible to calculate the average training requirements per year for the duration of the expansion programme. Practically, the volumes will shift subtly over this period for the reasons described above where volumes will need to be matched to the availability of work for each occupation group over the lifetime of the project build. This data should be read as indicative volumes to achieve the 5% target overall as a share of the workforce.

### 5.5.1 Average annual training requirement by occupation

		2020	2021	2022	2023	2024	2025	2026
SOC01	Senior, executive and business process managers	2	3	6	8	7	7	3
SOC02	Construction managers	3	5	10	15	14	13	5
SOC03	Non-construction professional, technical, IT, and other office-based staff (excl. managers)	4	7	14	19	18	17	6
SOC24	Other construction professionals and technical staff	2	4	7	10	9	9	3
SOC25	Architects	1	1	2	3	3	3	1
SOC26	Surveyors	1	2	4	5	5	4	2
	<b>Total Management &amp; Technical</b>	<b>13</b>	<b>22</b>	<b>43</b>	<b>60</b>	<b>56</b>	<b>53</b>	<b>20</b>
SOC18	Electrical trades and installation	3	11	19	66	106	124	50
SOC19	Plumbing and heating, ventilation, and air conditioning trades	3	11	19	67	107	127	51
	<b>Total Mechanical &amp; Electrical</b>	<b>6</b>	<b>22</b>	<b>38</b>	<b>133</b>	<b>213</b>	<b>251</b>	<b>101</b>
SOC06	Building envelope specialists	8	13	29	34	24	17	4
SOC14	Plant operatives	4	7	14	17	12	8	2
SOC15	Plant mechanics/fitters	3	5	10	12	9	6	2
SOC16	Steel erectors/structural	3	4	10	11	8	6	2
SOC21	Civil engineering operatives nec*	5	8	19	22	15	11	3
SOC23	Civil engineers	5	8	17	20	14	10	3
SOC04	Wood trades and interior fit-out	22	36	80	93	65	46	11
SOC07	Painters and decorators	11	18	40	47	33	23	6
SOC08	Plasterers and dry liners	4	7	15	17	12	9	2
SOC10	Floorers	4	6	12	14	10	7	2
SOC05	Bricklayers	8	12	27	32	22	16	4
SOC09	Roofers	4	6	13	15	11	8	2
SOC11	Glaziers	4	6	13	15	11	8	2
SOC13	Scaffolders	2	3	7	8	6	4	1
	<b>Total Civil &amp; Structures</b>	<b>87</b>	<b>139</b>	<b>306</b>	<b>357</b>	<b>252</b>	<b>179</b>	<b>46</b>
SOC12	Specialist building operatives nec*	2	2	5	6	6	6	2
SOC17	Labourers nec*	3	4	9	12	12	11	4
SOC20	Logistics	1	2	3	4	4	3	2
SOC22	Non-construction operatives	2	3	6	8	8	7	3
	<b>Total Site Services &amp; Security</b>	<b>8</b>	<b>11</b>	<b>23</b>	<b>30</b>	<b>30</b>	<b>27</b>	<b>11</b>
	<b>Overall Total</b>	<b>114</b>	<b>194</b>	<b>410</b>	<b>580</b>	<b>551</b>	<b>510</b>	<b>178</b>

## 5.6 AVERAGE EARNINGS BY OCCUPATION

Despite popular conception, construction is a well-paid industry. Overall across the UK, construction is similarly paid to the manufacturing sector and these two industries are second only to finance and insurance in terms of average salary. All other sectors of the economy show average salaries below these three, with construction and manufacturing regularly vying for second place on the salaries league table.

With demand for construction generally strong over the medium to long-term across the UK, and particularly so in London, there are opportunities for well-paid, sustainable career paths within construction and even more so within specialist fields. The following table summarises the average salaries in London in 2015 for the various occupations analysed (source: Office for National Statistics Annual Survey of Hours & Earnings, with GMCC calculations; some occupation-level data is not available).

SOC01	Senior, executive and business process managers	£74,034
SOC02	Construction managers	£60,201
SOC03	Non-construction professional, technical, IT, and other office-based staff (excl. managers)	£36,609
SOC24	Other construction professionals and technical staff	£40,782
SOC25	Architects	£46,305
SOC26	Surveyors	£43,838
	<b>Average Management &amp; Technical</b>	<b>£50,295</b>
SOC18	Electrical trades and installation	£31,673
SOC19	Plumbing and heating, ventilation, and air conditioning trades	£32,541
	<b>Average Mechanical &amp; Electrical</b>	<b>£32,107</b>
SOC06	Building envelope specialists	£32,456
SOC14	Plant operatives	£34,116
SOC15	Plant mechanics/fitters	£26,631
SOC16	Steel erectors/structural	£28,584
SOC21	Civil engineering operatives nec*	£28,454
SOC23	Civil engineers	£40,013
SOC04	Wood trades and interior fit-out	£30,406
SOC07	Painters and decorators	£32,456
SOC08	Plasterers and dry liners	N/A
SOC10	Floorers	N/A
SOC05	Bricklayers	£29,262
SOC09	Roofers	N/A
SOC11	Glaziers	£32,456
SOC13	Scaffolders	£33,404
	<b>Average Civil &amp; Structures</b>	<b>£31,658</b>
SOC12	Specialist building operatives nec*	£28,121
SOC17	Labourers nec*	N/A
SOC20	Logistics	£26,307
SOC22	Non-construction operatives	£23,146
	<b>Average Site Services &amp; Security</b>	<b>£25,858</b>
	<b>Overall Average</b>	<b>£34,979</b>

## 5.7 POTENTIAL FOR RECRUITMENT FROM LOCAL POPULATION

The Office for National Statistics issues population projections by local authority. By analysing the forecasts for the 18-25-year-olds resident in Heathrow's key five local authority areas (Ealing, Hillingdon, Hounslow, Slough and Spelthorne), it is possible to estimate the impact that additional new recruitment into construction apprenticeships on the Heathrow expansion programme may have on the local young population.

The population of 18-25-year-olds in these key areas is projected to average around 122,000 over the period of the proposed expansion programme. Whilst it is difficult to estimate youth unemployment levels over a ten-year period into the future, analysis with upper and lower limits allows us to estimate the potential impact.

	2020	2021	2022	2023	2024	2025	2026
18-25 population projections	121,045	120,591	120,275	120,546	121,498	123,165	125,495
Youth unemployment (10%)	12,105	12,059	12,028	12,055	12,150	12,317	12,549
Youth unemployment (15%)	18,157	18,089	18,041	18,082	18,225	18,475	18,824
Youth unemployment (20%)	24,209	24,118	24,055	24,109	24,300	24,633	25,099
Heathrow training requirement	114	194	410	580	551	510	178
Net impact (10%)	0.9%	1.6%	3.4%	4.8%	4.5%	4.1%	1.4%
Net impact (15%)	0.6%	1.1%	2.3%	3.2%	3.0%	2.8%	0.9%
Net impact (20%)	0.5%	0.8%	1.7%	2.4%	2.3%	2.1%	0.7%

## 5.8 SKILLS GAP ANALYSIS

A key part of the GMCC methodology to understand skills gaps in the future workforce is to analyse data on all publically funded qualifications delivered in an area for the construction sector. By undertaking this analysis, it is possible to understand two key components about supply-side constraints to developing a trained workforce. Firstly, to differentiate between the volume of non-competency based training (i.e. where there is no workplace-based training as part of the qualification, e.g. certificates and diplomas) and competency-based training (where a joint classroom-based and workplace-based learning provision is in place), such as NVQs and apprenticeships. Secondly is the difference between projected demand (5% of overall workforce requirements for a geography) and the volume of training being delivered by training providers in that area. This latter part allows the understanding of critical under- and over-supply of various qualifications in relation to projected industry demand.

The table below presents data on the average number of *individuals* resident in London who have completed a publically-funded FE or equivalent construction qualification in the last two years. This is then broken down into the volume of learners who achieved non-competency and competency-based qualifications. This is then compared to the training requirement to deliver the work expected in 2016 (the most reliable year for understanding volume of likely projects), and the share of under or over-training is calculated. It should be noted that for the management and technical section, most people entering these fields continue to do so through traditional degrees in the HE sector and these are not presented here; the number are published as a guide to show how recent uptake of vocational qualifications for these traditionally degree-led subjects are evolving.

		All qualifications	Non-Competency	Competency	2016 Requirement	Surplus(+) or Deficit(-) - All	Surplus (+) or Deficit(-) Competency
<b>Management &amp; Technical</b>							
SOC01	Senior, executive and business process managers	2	0	2	869	-100%	-100%
SOC02	Construction managers	536	473	63	1673	-68%	-96%
SOC03	Non-construction professional, technical, IT, and other office-based staff (excl. managers)	688	152	536	2235	-69%	-76%
SOC24	Other construction professionals and technical staff	31	23	8	1104	-97%	-99%
SOC25	Architects	1	1	0	337	-100%	-100%
SOC26	Surveyors	30	0	30	535	-94%	-94%
<b>Civil &amp; Structures</b>							
SOC06	Building envelope specialists	405	0	405	803	-50%	-50%
SOC14	Plant operatives	566	28	538	379	49%	42%
SOC15	Plant mechanics/fitters	299	149	150	269	11%	-44%
SOC16	Steel erectors/structural	190	0	190	245	-22%	-22%
SOC21	Civil engineering operatives nec*	95	34	61	485	-80%	-87%
SOC23	Civil engineers	880	339	541	459	92%	18%
SOC04	Wood trades and interior fit-out	2226	1485	741	2184	2%	-66%
SOC07	Painters and decorators	1418	913	505	1030	38%	-51%
SOC08	Plasterers and dry liners	1426	487	939	389	267%	141%
SOC10	Floorers	299	129	170	302	-1%	-44%
SOC05	Bricklayers	1140	846	294	732	56%	-60%
SOC09	Roofers	14	4	10	369	-96%	-97%
SOC11	Glaziers	141	0	141	354	-60%	-60%
SOC13	Scaffolders	63	63	0	186	-66%	-100%
<b>Mechanical &amp; Electrical</b>							
SOC18	Electrical trades and installation	3263	3099	164	1346	142%	-88%
SOC19	Plumbing and heating, ventilation, and air conditioning trades	3619	3031	588	1385	161%	-58%
<b>Site Services &amp; Security</b>							
SOC12	Specialist building operatives nec*	173	0	173	471	-63%	-63%
SOC17	Labourers nec*	1	1	0	955	-100%	-100%
SOC20	Logistics	310	228	82	267	16%	-69%
SOC22	Non-construction operatives	23	23	0	600	-96%	-100%
<b>Total</b>		<b>17839</b>	<b>11508</b>	<b>6331</b>	<b>19963</b>	<b>-11%</b>	<b>-68%</b>

Perhaps the key message from this data is that Greater London comes very close to attracting enough people into construction industry qualifications – just 11% short of demand – but that gap opens up to 68% when looking at competency-based qualifications. This is critical as previous research with a wide range of construction companies shows that these qualifications, with work-based experience, are critical for employers to consider recruiting. This means that only around one-third of learners who undertake construction sector qualifications complete them with the level of experience that companies value.

Using the same metrics, it is possible to see large variations across different trades. Ignoring management and technical for the reasons set out above, some trades with initially perceived surpluses of training (e.g. SOC07 painters & decorators) become in deficit when assessed for competency. Also, these broader occupation codes can conflate different issues, for example, SOC08 (plasterers and dry-liners) appears in surplus even when competency is taken into account, but current training provision is heavily biased to the wet trades, with little dry-lining provision available.

Provision remains heavily biased towards the “traditional” construction trades with plant, painting & decorating, bricklayers, electrical and plumbing all showing over-training overall, even though all fall into deficit when on-site competence is considered. The newer emerging trades, some yet without clear career paths such as building envelope, remain in deficit, and training providers should seek to work with industry to develop accredited training provision to meet this new demand. Whilst it is all too easy to blame training providers for this mismatch, employers, too, must understand that work-based training cannot be delivered by a training provider without a company working in partnership.

As part of its apprentice and labour strategy, Heathrow should, therefore, work closely with both training providers and its supply chain to ensure that there are sufficient competency-based qualifications and training routes available to support its expansion plans. The data suggests that there are enough young people interested in training for a career in the sector, but they are not being guided down the right paths, potentially because of a lack of training provider and employer collaboration to ensure the right industry-led provision is available.

## 6 CONSTRUCTION IN THE UK

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### 6.1 LONDON CONSTRUCTION PIPELINE

GMCC's methodology for identifying the future pipeline of work in the construction sector identifies output of £19.5 billion pounds in 2016 alone for Greater London with infrastructure delivering £1.85 billion of this total and public non-residential projects, of which infrastructure may form a part, totalling a further £2.1 billion. Utilising the Labour Forecasting Tool, it is estimated that this pipeline of work will require approximately 440,000 workers (40% higher than London's own domestic construction labour force) to deliver at its current peak in January 2017, with 30,000 of those required solely for infrastructure projects.

The number of workers to deliver infrastructure projects rises over our analysed period with projects already visible for 2020 in Greater London requiring around 48,000 workers; this will rise further as more projects gain approval for development over the coming years.

The pipeline currently indicates a total of £33.3 billion of infrastructure projects scheduled to start between 2016 and 2026 inclusive and Heathrow Airport expansion would increase this volume by approximately one-third. High Speed 2 and Crossrail 2 (though the latter has not yet received final approval, though it is expected) make together make up £29 billion, a clear indication of the scale of infrastructure investment in London over the coming decade. Heathrow expansion would become the third largest infrastructure project in London during this period.

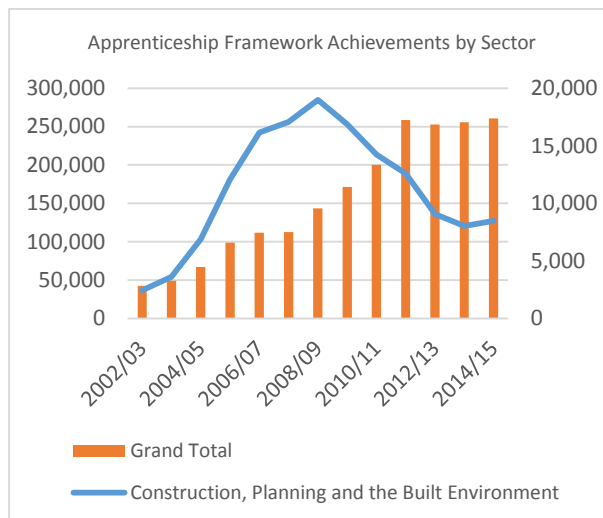
### 6.2 IMPACT OF HEATHROW EXPANSION ON LONDON CONSTRUCTION

With a peak workforce requirement of around 13,300 people in 2023, Heathrow Airport expansion will increase the number of workers required on infrastructure projects in London by at least one-quarter, and across all construction in London by 3%, assuming construction output is steady over the subsequent decade. In reality, growth of around 2.5% per year is expected, increasing this share still further.

With other large-scale infrastructure projects scheduled for the either the same, or an overlapping, timeframe with Heathrow, there is likely to be significant competition for skilled labour. High Speed 2, Crossrail 2 and Thames Tideway Tunnel will each require significant volumes of skilled construction labour in London. Other projects further afield such as the yet to be confirmed High Speed North plans of the National Infrastructure Commission, alongside potential new nuclear power stations, will also increase the demand for labour far above its current supply.

## 7 CONSTRUCTION APPRENTICESHIPS IN THE UK

Reforms by the Labour administration in the early-2000s saw significant increases in the number of apprenticeships nationally, with completions increasing from 42,400 in 2002/3 to 260,900 in 2014/15. Apprenticeships within the construction, planning and the built environment also grew rapidly in the pre-recession period to a peak of 18,980 in 2008/9, but that number has fallen to just 8,470 in the latest data. Though employment in the sector overall has declined since the onset of the recession in 2008, the overall reduction in headcount is only 15% compared to 55% in the volume of apprenticeships.



A similar picture is seen in London as in the UK as a whole. With only 500 apprenticeship completions in the most recent data, London trains fewer construction apprentices (just 6% of the national total, even though it has 16% of all construction businesses) than any other region in England, and only one-third of the region with the highest volume, the North West.



With just 8,470 construction, planning and the built environment apprenticeships completed in 2013/14, the sector across the country as a whole is failing to train enough apprentices for the industry's future. This is a fundamental problem, but far from new.

With over 300,000 workers in the construction sector in Greater London, industry research would expect to see around 15,000 apprentices in training each year across the conurbation; the reality is around one-thirtieth of that. London performs particularly poorly in terms of volume of apprentices, but even at the national level the 1.8 million workers in construction should, to ensure sustainability of the future workforce, be supported with around 90,000 apprenticeships rather than just under 9,000 in the latest data.





## 8 APPRENTICESHIP LEVY

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### 8.1 GOVERNMENT POLICY

At Budget 2015 the Chancellor of the Exchequer announced the introduction of an apprenticeship levy, requiring a contribution of 0.5% of a company's total wage bill into a ring-fenced pot that can be spent only on apprenticeship training. Coming into force on 6 April 2017, this will raise around £3 billion annually, and a company-level allowance of £15,000 means that only companies with a wage bill of £3 million or more are liable for this levy, which will be collected at source through PAYE.

Funds will be stored in a digital account from which companies will be able to allocate funds to individual training providers to pay for apprenticeship funding. Government will top-up companies' contributions to their digital apprenticeship voucher account by 10% each month, at the same time as companies file their monthly PAYE returns. Funds must be used within 18 months of their payment into the account, after which they will be lost; this applies also to the government top-up. The payments will operate on a first-in, first-out basis, meaning that when allocating a payment to a training provider, the funds that entered the account first will be used to pay for the training.

### 8.2 HEATHROW AIRPORT CONTRIBUTIONS

Heathrow Airport's own estimate of its Apprenticeship Levy payments is between £1.5 million and £2 million per year. The cost (of training only, excluding salaries) of an apprenticeship in the construction, planning and built environment sector varies from £4,000 to £15,000 depending on level, duration and specialism. Assuming that all apprenticeships delivered are of the highest level, this will deliver on its own funding for a minimum of 133 apprentices per year.

Heathrow's Apprenticeship Levy pot will accumulate a maximum of around £15 million over the lifetime of the expansion project (six and three-quarter years of £2 million pounds per year from the annual contributions from Heathrow Airport plus the 10% government funded 'top-up'), enough to deliver a minimum of 1,000 apprentices. This is, in itself, sufficient for the 5% minimum for the expansion programme at its peak, and would also deliver a surplus that could be used to deliver additional apprentices beyond the expansion project. Assuming the industry expectation of 5% of workers in training, there is a natural opportunity for 666 apprentices. This may leave at least £5 million unspent from the voucher pool which can be deployed to other parts of Heathrow's business.

### 8.3 DIGITAL VOUCHERS IN THE SUPPLY CHAIN

However, the ability for companies to pass their Apprenticeship Levy funding to other companies, whether within their supply chain or not, is not yet clear. In its initial consultation over the core design of the Apprenticeship Levy, government asked about businesses' willingness to retain an option over distributing a companies' contributions to other companies. In its latest guidance published in April 2016, government has indicated that, in the first year of the levy's operation, levy funds will only be able to be spent on the company's own employees. Government has, however, also acknowledged that a number of the responses to the original Apprenticeship Levy consultation indicated a desire to pass their own Apprenticeship Levy contributions into their supply chain. Government has not yet taken a position on this, and expects to provide further information in June 2016, after making an assessment of the possible approaches to delivering this option.

Without this option, this would mean that Heathrow Airport's own Apprenticeship Levy fund would not be able to be used to support wider apprenticeships within the supply chain of companies

contracted to deliver the expansion project. In this case, Heathrow Airport would need to develop an internal apprenticeship programme for its own staff to be able to make use of the funds that will accumulate in its employer pot. If government decides to allow at least some use of employers' contributions to the levy for spending by other companies within their supply chain, then Heathrow Airport may be able to pass its digital apprenticeship vouchers to companies who are contracted to delivery of the expansion programme. However, each of those companies are likely to also be contributing to the levy in their own right, and will also be seeking ways of maximising their own returns from this funding. Heathrow should, therefore, develop a strategy for apprenticeship funding delivery across its supply chain to maximise the benefits not only of its own apprenticeship vouchers, but those of all companies working on the expansion project.

#### **8.4 A SHARED APPRENTICESHIP SCHEME FOR HEATHROW?**

In the event of government choosing to disallow the use of apprenticeship levy funds for distribution within the supply chain, an option for Heathrow Airport may be the development of a shared apprenticeship scheme. Whilst not yet very widely used, these vehicles have become more prominent over the past few years, seeking as they do to mitigate some of the problems and remove the natural barriers for smaller companies taking on apprentices. In this model, one company becomes the employer for a number of apprentices, fulfilling not only the usual legal requirements of an employer, but also the management of apprenticeship programmes for those employees. The apprenticeship operates in the normal way with a relationship between employer, training provider and apprentice, but the apprentice is then rotated round a number of "host" employers, each of whom support the apprentice through one or more aspects of their training.

This method can increase uptake of apprentices amongst smaller employers, as it removes a number of the risks of a small company taking on an apprentice for a number of years despite perhaps working on contracts of much shorter duration. Whilst it is not yet clear how the detailed regulations of the Apprenticeship Levy will be designed, a scheme similar to this, with Heathrow Airport as employer and the supply chain as "host" employers, may allow Heathrow Airport to employ apprentices directly and pay for their training through its own Apprenticeship Levy contributions, whilst managing and facilitating their work-based training with its supply chain on the Expansion Project.

The larger companies engaged in the expansion project will also be contributing to the Apprenticeship Levy as part of their own legal obligations, and will therefore be seeking to realise a volume of apprenticeships themselves to maximise their benefits from the levy. This means that, if Heathrow were to develop a shared apprenticeship scheme, it should target its efforts at the smaller companies in the supply chain, supporting the apprentices to work with contractors who themselves are not liable for the levy, or only have minimal contributions.

## 9 CHALLENGES

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### 9.1 THE CHALLENGE FOR INDUSTRY

The construction sector has a notoriously “long-tail” of SMEs, with micro-businesses making up a disproportionately large share of the supply-chain. Small companies are less likely to employ apprentices, though they will often perform a disproportionately large share of the on-the-ground delivery of many projects. Challenges arise when clients and prime contractors agree to a large volume of apprenticeships at the start of a project and merely expect the supply chain to deliver their ambitions. Lack of capacity, of human, administrative and financial, can all serve to dent the ambitions of clients in the delivery of these targets.

Experience with clients commissioning large-scale projects has shown the critical importance of ensuring that the client’s desire for social value impacts from the project require significant buy-in from the supply chain as a whole. Clients must ensure that not only are the key messages around apprenticeship delivery critical for its definition of success of the project, but that strategic management, guidance and support of the delivery of apprenticeships throughout the whole supply chain is vital for delivery of the key aims.

Increasingly popular amongst clients who have successfully managed and delivered social value schemes within their projects is the creation of a single-pot of funding to support apprenticeships at the project level. A common challenge for companies within the supply chain and particularly at the lower levels is that clients will often mandate apprenticeship volume requirements with the prime contractor but the funding to deliver those apprenticeships does not often or easily pass down the supply chain. Good practice has highlighted the benefits of this single-pot approach, where funding for apprenticeships can be passed directly from the client or the prime contractor to the companies within the supply chain that are employing apprentices directly on the delivery of the project. This can avoid either the funds not reaching the lower tiers of the supply chain at all, or becoming delayed through slow payment processes between the layers of the supply chain. It is a similar approach to the project bank account concept, where funds are held centrally and paid to individual contractors directly from a client-prime contractor held account to mitigate cash-flow issues to smaller companies within the project.

### 9.2 THE CHALLENGE FOR TRAINING PROVIDERS

The construction industry is rapidly evolving, with the development of relatively new trades that do not yet have established career paths and in the increasing use of modern methods of construction and off-site manufacture. The training and education system, as well as parts of the industry itself, has not yet fully responded to these changes. The further education system, through its funding model, is more responsive to supply-side signals from young people and careers advice than it is to demand-side inputs from industry. This means that the UK as a whole is over-training in a number of trades and significantly under-training in others. Previous research by Greater Manchester Chamber of Commerce highlights a large under-supply in trades such as steel fixing, building envelope trades including glazing and cladding and others including formwork joinery and dry-lining. Access to accredited training programmes in these trades, amongst others, remains difficult, and this is contributing to a lack of skilled labour entering the workforce.

Through its work on the Employer Ownership of Skills pilot, Greater Manchester Chamber of Commerce highlighted how, by bringing clusters of employers within the industry together and

identifying common needs, it was able to place a strong market-led offer to training providers to design, commission and deliver new training courses to respond to industry demand. It also worked with companies that were delivering qualifications to their own employees to open their offer to other companies within the industry to the benefit of wider sector. As the most successful pilot scheme in the country for this programme, it led the way in showing how, but using an intermediary body to aggregate industry demand and use that weight of information to work with training providers to evolve their training offer, a better use of both public and private funding could be delivered to support the growth in the construction sector.

There may be a role for Heathrow Airport in bringing together at an early stage the contractors for the expansion programme to identify any common gaps in training and skilled labour requirements, aggregating those needs to gain greater purchasing power in the marketplace of training provision.

## 10 SUCCESS AT CROSSRAIL

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Crossrail has delivered 450 apprenticeships on a project of similar spend value with a total headcount of 10,000 people.

In partnership with its principal contractors, the Crossrail project has delivered the most significant injection of new skills into UK tunnelling and underground construction in over a generation. The project has now created over 550 apprentices, going far beyond the original target of 400 that was reached in January 2015. Around 44% of the apprenticeships have been filled by people who were previously unemployed, doubling the UK average. The apprentices are being trained in a wide range of professions from construction and quantity surveying, to accountancy and business administration.

Outside of apprenticeships, more than 800 new jobs have gone to those out of work. Working with contractors, Crossrail requires all new positions to be advertised externally and through Jobcentre Plus. School and local borough visits are also conducted to promote the diverse career opportunities on offer, and meet the contractor days allow trainees to get a feel for the industry and hear about all the latest jobs. Crossrail also set up a Tunnelling and Underground Construction Academy with SFA funding, which trains more than 1,600 unemployed jobseekers. The highly effective recruitment and training approach should stand as a template to be replicated across the construction industry and other sectors in order to address skills shortages and growing youth unemployment.

With tunnellers earning up to £80,000 a year, and other projects such as HS2, HS3, the Northern Line extension and Crossrail 2 in the pipeline, the scheme could provide a very bright future indeed at a time when demand for these skills is only going up. The scheme has proven to be a valuable step for young people, giving them the chance to learn a trade working on a unique project and become part of the Crossrail legacy. The skilled workforce built by the project will go on to support the UK construction and engineering for decades to come.

## 11 OPPORTUNITIES FOR IMPACT

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Full delivery of 5% of the expansion workforce into apprenticeships in the construction sector has the potential to, at peak, increase annual construction apprenticeships in London by 19% single-handedly. Whilst not all apprenticeships for the Heathrow expansion project will be delivered locally (as a share of the work will be completed off-site), there remains significant opportunities to develop local legacies from the enlargement of training provision within the capital.

Development of the Heathrow Academy to deliver at least some aspects of the apprenticeships for the expansion programme could deliver significant additional capacity within the academy to deliver provision for other employers in the future. With only 500 apprenticeship completions in the latest data for Greater London, there is a requirement for significantly greater capacity within the construction sector to deliver apprenticeship training. Partnerships between Heathrow Academy and other local training providers could deliver training opportunities directly for the local labour force, supporting the community to upskill its residents. The increased volume of apprenticeships in west London generated by Heathrow expansion could be partially ring-fenced for local candidates, and with large volumes of major infrastructure projects due for delivery in London over the coming decade and beyond, there will be a requirement for volumes of training over and above that which will be delivered by contractors working on the Heathrow project.

Heathrow Airport and Heathrow Academy should investigate how they can scale up not only to deliver the Heathrow expansions, but also how it can become a core part of supporting construction (and other sector) apprenticeships beyond the life of the project itself. Expertise gained in working closely with local communities to engage young people in the apprenticeship opportunities at Heathrow will be valuable to other clients across London, and Heathrow should seek to maximise its community impact more widely by promoting its knowledge and embedding its learning as a model of best practice for other large schemes.

## 12 RECOMMENDATIONS

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### **Early engagement with supply chain**

There will be a significant recruitment challenge for skilled labour in London and across the UK for large infrastructure projects, and competition will be high. Heathrow should engage as early as possible with its expected supply chain and work with it to support recruitment and develop new apprenticeship routes. For some specialised skills, accredited training is not available, and new qualifications may need to be designed and commissioned.

### **Develop a joint apprenticeship programme with the supply chain**

Employers within the supply chain may desire to recruit apprentices but not have access to the training provision that they require for the skills they are seeking. By developing a joint apprenticeship programme, Heathrow could aggregate the whole industry requirements to deliver the expansion programme and utilise its combined purchasing power to commission new programmes where needed and to procure delivery from suitable partners to support the wider project.

### **Support work to grow competency-based learning provision**

With an 11% shortfall in headcount entering training for the sector compared to demand but a 68% shortfall in competency-based training, there is, in common with the rest of the UK, a large need to ensure that young people who are interested in entering the construction sector are placed on the correct training provision to ensure employability at the end of the course. Heathrow should work closely with all schools training providers in the area, and with their supply chain, to ensure that young people are directed to the appropriate routes for this form of training, of which full apprenticeships are the most recommended path.

### **Investigate opportunities from a Shared Apprenticeship Scheme**

Regardless of whether the government allows apprenticeship levy vouchers to be shared by supply chains, there is an opportunity to support smaller businesses looking to engage with Heathrow by the development of a Shared Apprenticeship Scheme. By the establishment of such a scheme, Heathrow would be able to de-risk the delivery of apprenticeships by smaller companies that may feel that they cannot commit to an apprentice whose period of study may be longer than the contract on which they are engaged. Depending upon government regulations of the apprenticeship levy, it may also be an opportunity to invest Heathrow's own apprenticeship vouchers into the smaller companies in the supply chain.

### **Ensure single-pot of apprenticeship funding**

If Heathrow chooses to mandate volumes of apprenticeships in its procurement contracts it should establish a single-pot of funding to support the delivery of these programmes into the supply chain. Examples from other clients have shown that by ring-fencing the funding for apprenticeship training and passing it directly to the company that is employing the apprentice (or directly to the training provider if through a wider programme), it further de-risks the project for the smaller companies.

### **Train on behalf of wider construction sector**

Through the additional training capacity that will need to be set-up to support the expansion project, Heathrow has an opportunity to support the training of apprentices beyond the core programme

itself. Investment into facilities whether at Heathrow Academy or at or with other institutions, and the co-design of new apprenticeship frameworks could have benefits more widely than just for Heathrow and its supply chain. Heathrow should seek to maximise the impact of this capacity as widely as possible.