LIVERPOOL CITY REGION COMBINED AUTHORITY

citb

WLC WHOLE LIFE CONSULTANTS LTD

CITB ANALYSIS

Construction skills gap analysis for the Liverpool City Region Combined Authority area

An analysis of the opportunities presented by the construction landscape in the Liverpool City Region Combined Authority area

April 2018

EXECUTIVE SUMMARY

The Liverpool City Region Combined Authority can expect sustained spending on new construction projects of well over £2 billion per year for at least five years.

That means achieving efficiency savings of just one per cent as a result of better recruitment, training and procurement represents the equivalent of injecting £100million over the five years into Liverpool's construction economy.

To meet anticipated demand, more than 65,000 construction workers are required for the foreseeable future. But with an aging workforce there are risks that Liverpool may not be able to build everything on the wish list. Wood trades; painters & decorators; building envelope specialists; bricklayers; surveyors; specialist building operatives and plasterers top the list of priority roles – where there is a high demand and an apparent shortage.

New housing accounts for 39% of the anticipated new build projects; infrastructure for a quarter and private commercial developments for 18%.

LIVERPOOL CITY REGION'S OPPORTUNITY

The Combined Authority's opportunities are to: support growing businesses; develop a more appropriately and better skilled and flexible workforce; drive higher level skills, match skills and the local economy and encourage job creation. This will, in turn, support the delivery of infrastructure and facilities that the area needs to ensure it is prepared to exploit opportunities as they emerge.

Construction on its own makes up a huge part of the UK economy representing around 7% to 8% of GDP. But crucially it is also an enabler. It will create the new housing that is so desperately needed; will enhance the environment; will create better public spaces and facilities that we depend on; build the facilities for new technologies and manufacturing; and create new infrastructure that enables growth and prosperity. Construction opens up opportunities for major social and economic gains.

"Liverpool will have a huge range of opportunities across a large number of construction trades and professions over the next five years. These are well paid, high skilled jobs that we should be encouraging our children to aspire to. These are the jobs that will shape Liverpool's skyline and house people for generations to come.

CITB will work with employers to attract and train new talent for these rewarding and valuable careers."

Gillian Brewin, CITB Partnership Manager North West

Priority occupations

The report identifies a number of occupations for which there is high demand and a risk of a shortfall – i.e. where action is required to boost workers available in the Liverpool City Region.

1. Wood trades & interior fit out
2. Painters & decorators
3. Building envelope specialists
4. Bricklayers
5. Surveyors
6. Specialist building operatives
7. Plasterers & dryliners

Occupations in context – the challenge

This report sets out a challenge to the Combined Authority, namely to attract, train, recruit and maintain a high skilled construction workforce that meets anticipated demand.

This challenge is set against the backdrop of: relatively high demand for similar skills from other industries; concerns about the future availability of skilled workers and demand from other UK regions and major infrastructure projects.

The Professions

There is high demand for several professional roles, jobs which require a significant length of training before candidates become qualified.

Architects, surveyors and civil engineers require higher level qualifications plus professional accreditation, so the effect of action now will only be felt in five to ten years' time. These are jobs in demand the world over.

However, these roles do not need to be permanently on-site so it is likely that some demand may be met by those working outside the region.

There are also opportunities to modernise construction and for Liverpool to start to encourage and adopt new technologies and new practices like off-site and modular construction to help meet demand.

Recommendations

The report proposes recommendations that include:

1. Establish a Liverpool City Region construction skills strategy and action plan. Review and develop, as appropriate, any existing construction skills strategies.
2. Develop and strengthen collaborative partnerships. With a view to building holistic action plans and encouraging local stakeholders to input to, and take ownership of, the construction skills actions.
3. Develop skills and training pathways. Ensure training is appropriate for local needs and businesses. Develop Combined Authority area construction training so that it is appropriate for the needs of the construction industry and local circumstances, addressing risks of supply shortfalls.
4. Outreach. Build a more positive image of construction locally with young people and those that influence them. Increase recruitment through new entrance points, career changes and reskilling. Emphasise that construction offers high value rewarding careers for all.
5. Use procurement as a lever to enable positive action. Develop smarter approaches to procurement to encourage those bidding for construction and infrastructure contracts or those funding developments to be mandated to include provision for recruitment, training, apprenticeships and outreach.

GoConstruct is one of the construction industry's initiatives, supported by CITB, aimed at helping drawing more young people into construction careers by improve understanding of the careers and rewards available.

CONTENTS

APPENDIX CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

This report is one step in maintaining an evidence base, to be utilised by the Liverpool City Region Combined Authority to inform decision making that will help determine the employment and skills opportunities emerging in the construction industry for the Liverpool City Region area.

Construction is a significant part of the economy and is a major employer. But it is also an enabler of economic growth and job creation and has a significant impact on enhancing the built environment, in creating the facilities required of a modern economy and addresses significant social issues, such as a shortage of housing. It is also an enabler of other sectors' success by building the facilities required for commercial and industrial advances as well as the infrastructure that is, in turn, an enabler of growth. It is, therefore, essential for the Liverpool City Region to invest in supporting the actions proposed in this report as well as referring to the wider evidence base available and involving stakeholders in the development of the associated plans.

This report represents the concluded research, seeking to identify issues so that a practical approach can be taken to realising the opportunities that activity in the construction sector can generate in developing skills, creating jobs and enhancing the local economy, built environment and opportunities.

The Liverpool City Region is seeking opportunities that can lead to longer term development. In particular the Liverpool City Region has expressed an interest in housing and extra demand analysis has been undertaken to provide additional information. However, it should be noted that housing represents just a part (albeit a significant part) of the construction industry and will utilise some of the same skills and workers in demand from other sub sectors.

The analysis starts to determine priorities for interventions to ensure local opportunities are maximised and that The Liverpool City Region has the right future skills and training pathways in place to deliver demand led solutions.

1.1. LIVERPOOL CITY REGION AREA HEADLINES

1.1.1. Future Project Pipeline

The analysis assessed 501 construction projects with a total construction value of more than £10 billion.

Of these, 98 projects (20% of the number of projects) are of greater than the average project value. This 20% of projects is worth almost £8.9 billion (or 86% of the total value), indicating the impact of a relatively small number of very large projects.

For the year of peak activity, used as giving the best indication of the future construction pipeline's impact: New housing accounting for 39% of the value of new construction; infrastructure for 25% and commercial developments 18%.

1.1.2. Future Skills Demands

The total construction labour demand including the volume of R&M imputed from the CSN model peaks for the area in 2017 at 65,900.

The occupations with greatest demand are:

1. Non-construction professional, technical, IT & other office-based
2. Wood trades and interior fit-out
3. Electrical trades and installation
4. Other construction process managers
5. Senior, executive & business process managers
6. Other construction professional & technical
7. Plumbing and HVAC Trades
8. Labourers nec*
9. Painters and decorators
10. Building envelope specialists
11. Bricklayers
12. Surveyors
13. Specialist building operatives nec*
14. Plasterers & dry liners

1.1.3. Risk of shortages

The occupations with the greatest risk of a shortfall between the supply of workers and demand are:

1. Building envelope specialists
2. Architects
3. Glaziers
4. Surveyors
5. Bricklayers
6. Painters and decorators
7. Construction Project Managers
8. Civil engineering operatives nec*
9. Senior, executive, and business process managers
10. Construction Trades Supervisors
11. Specialist building operatives nec*
12. Wood trades and interior fit-out
13. Plasterers & dry liners
14. Civil engineers

1.1.4. Priority occupations

The construction occupations for which there appears to be both high demand and high risk of a shortfall:

1. Wood Trades & interior fit out
1. Painters & decorators
2. Building envelope specialists
3. Bricklayers
4. Surveyors
5. Specialist building operatives
6. Plasterers & dryliners

1.1.5. The Industry

The Liverpool City Region construction workforce is 35% smaller than it was in 2006, having reduced in nine of the last ten years.

Self-employment within construction in the city region remains 16% below 2006 levels at 14,700 workers, representing 41 % of construction employment – very similar to the UK profile (40%) and only slightly above the North West region (38%). There has also been a small increase of 35 firms employing between 10-49 workers.

Between 2012 and 2016 there has been a 13% increase in the number of Micro sized construction businesses – 500 additional firms.

Of Liverpool City Region construction companies:

- 92 % are micro (employing fewer than 10 people),
- 7 % are small (employing between 10 and 49 people),
- 1 % are medium (employing between 50 and 249 people),
- 0.2 % large employers (those with over 250 people).

1.1.6. Training and Education

Of the North West region, the Liverpool City Region Combined Authority accounts for:

- 16% of the construction workforce.
- 17% of the number of construction firms.
- 19% of identified construction related training.

83 % of all construction further education training provision in the Liverpool City Region is provided by ten main providers, *though there have been 70 training providers active in the area over a four year period.*

There is basic FE training available across the full range of construction occupations plus relatively good provision of competence qualifications, which are valued by the construction industry.

However, construction training provision declined by 16% between 2012/13 and 2015/16, with new starters reducing from 5,840 to 4,925 per annum during that time. Liverpool is the only authority that has bucked that trend with an increase in starts.

1.2. SCOPE

The report, reviews the area covered by the six local authorities that make up the Liverpool City Region Combined Authority are analysed in the research: Halton; Knowsley; Liverpool; Sefton; St. Helens and Wirral.

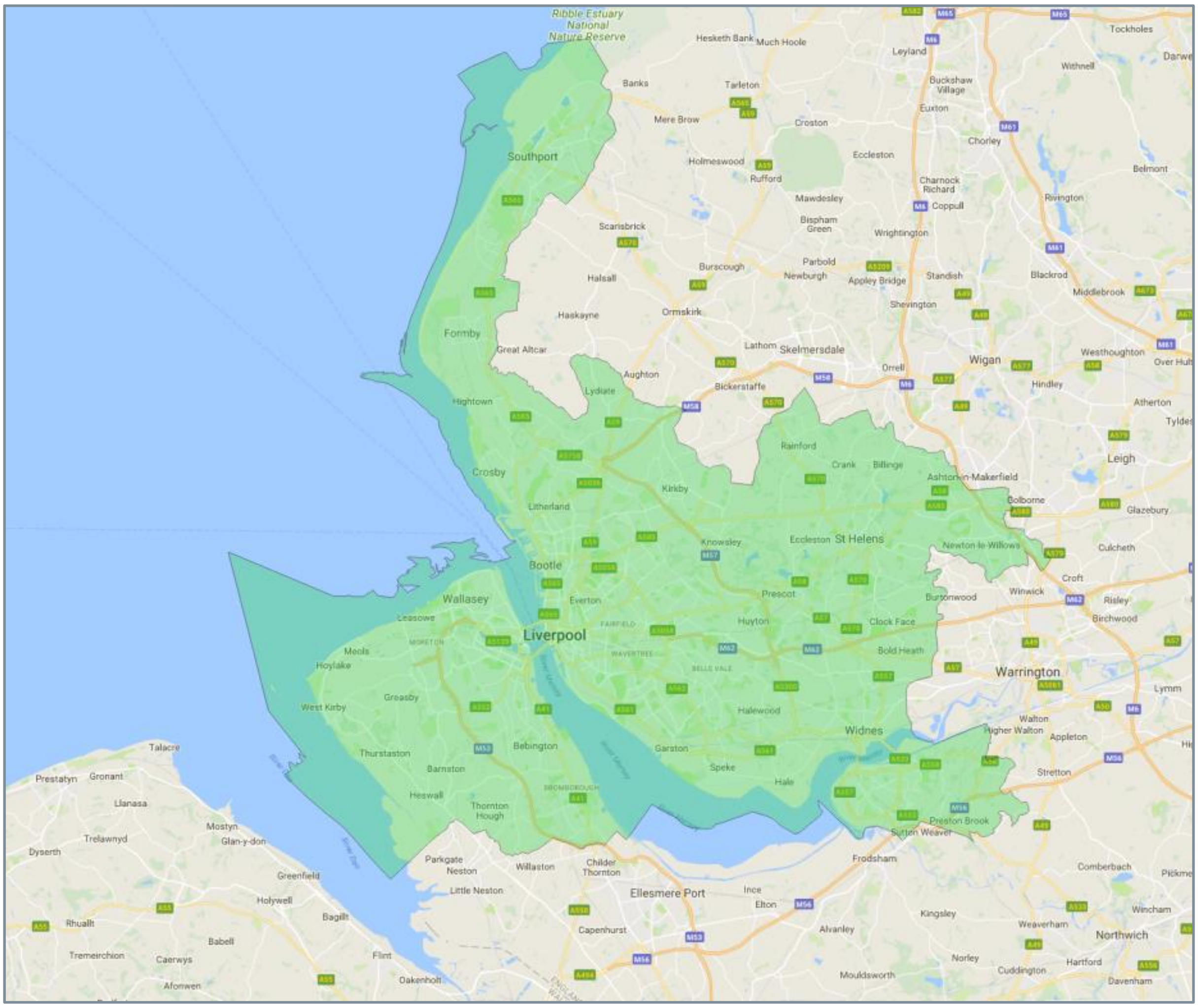

Figure 1: Liverpool City Region and surrounding areas

2. LABOUR DEMAND IN THE LIVERPOOL CITY REGION

The following sections provide an estimate of the labour demand that construction investment will create across the Liverpool City Region over the period 2017-2021. They report the outputs determined from the analysis described in Section 2 and the labour demand they generate as calculated by the Labour Forecasting Tool.

2.1. MAIN POINTS

- The labour demand arising from the construction spend in the Liverpool City Region area peaks at around 65,900 people in 2018, taking account of estimates of other work including R&M in addition to the pipeline of denominated projects.
- During 2018, the peak year of the denominated projects pipeline demand, the most labour-intensive occupation group is non-construction professional, technical, IT and other office–based staff" with an annual demand of 8,800 people.
- The trade occupations with greatest demand for the peak year of 2018 are as follows:
- Wood trades and interior fit-out with a requirement for 6,550 people
- Electrical trades and installation trades follow with 5,000 people;
- Plumbing and heating, ventilation, and air conditioning trades rank third, with a demand of 4,100.

2.2. PIPELINE OF DENOMINATED PROJECTS

2.2.1. Glenigan pipeline analysis

The initial review of the Glenigan database identified 552 projects in the Liverpool City Region area. Of these, 43 projects were removed due to missing dates. Also excluded were 8 projects which were clearly identified as consultancy projects. A full set of the projects which were omitted from the analysis is provided in Appendix C. The spend in projects which were removed because of missing dates is around 2.3% of the total pipeline. The projects omitted were typically valued at between £0.3m and £60m. It is possible that this work will take place at some undefined point in the future but as dates are unknown it is most likely that this will be later in the forecast period. Since dates are not known it is not possible to pinpoint when the labour will be required, but an assessment of the labour demand is made in the estimates of other work from the additional projects as illustrated in Figure 3.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 98 significant projects accounting for 86% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 1 shows the number of significant projects within the Liverpool City Region area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete, duplicate or consultancy projects. Values are shown in 2017 prices, the base price used in the Glenigan database.

Table 1: Key data for significant projects in Glenigan[1]

	Number of projects	Total project lifetime construction spend (£m – 2017 values)
All Glenigan projects	501	10,377
Significant Glenigan projects	98	8,898
Percentage within significant projects	20%	86%

[1] The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the ADJUSTED values of infrastructure projects values to distinguish between construction and engineering construction.

Appendix D provides a full breakdown of the significant projects and their construction values. The peak year for the Glenigan spend profile is 2018. The location of the significant projects within the Liverpool City Region can be seen in Figure 2.

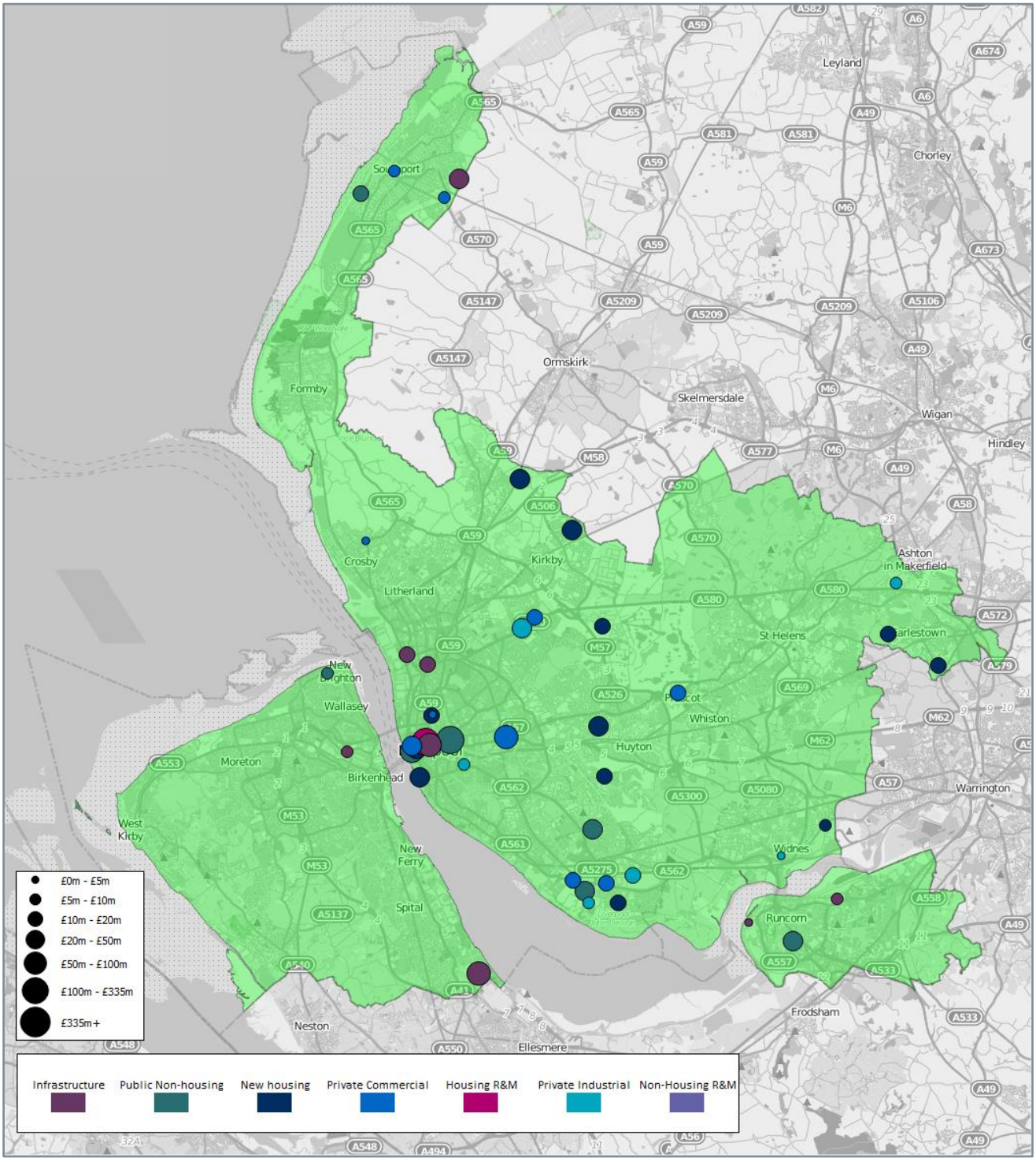

Figure 2: Location of significant projects included in the analysis

2.2.2. Glenigan & NICP spend analysis

Implementing the methodology outlined in Section 0 leads to the following findings for the peak year for denominated projects of 2018. The peak year is used because the tail off in the denominated projects is more likely to be due to a lack of future planning rather than an actual tail off in workload.

Table 2 shows the distribution by sector of new build spend for the total pipeline of denominated projects.

Table 2: New-build construction spend by project type in 2018 (total denominated project pipeline)

Project Type	Construction spend in 2018 (2017 values - £m)	% of total
New Housing	827	39%
Infrastructure	522	25%
Private Commercial	381	18%
Public Non-housing	228	11%
Private Industrial	164	8%
Total	2,122	100%

Table 3 shows the infrastructure construction spend from both Glenigan and the NICP in 2018 by sub-sector.

Table 3: Construction spend per infrastructure sub-type in 2018 (total denominated project pipeline)

Project Type	Construction spend in 2018 (2017 values - £m)	% of total
Transport	338	65%
Water	102	19%
Energy	54	10%
General Infrastructure	27	5%
Flooding	3	1%
Total	522	100%

2.3. ESTIMATE OF FUTURE TOTAL LABOUR DEMAND

As outlined in the Section 0 the denominated project pipeline may not include smaller projects or repair and maintenance work. Figure 3 shows the outcomes of the analysis of future labour demand with an employment growth rate included. The solid blue area shows the labour demand arising from the new build Glenigan and NICP projects. Any R&M included in Glenigan or the NICP is also shown. The red shaded area shows the likely total labour demand arising from estimates of other work. The total construction labour demand including the volume of R&M imputed from the CSN model peaks for the area in 2018 at 65,900 people.

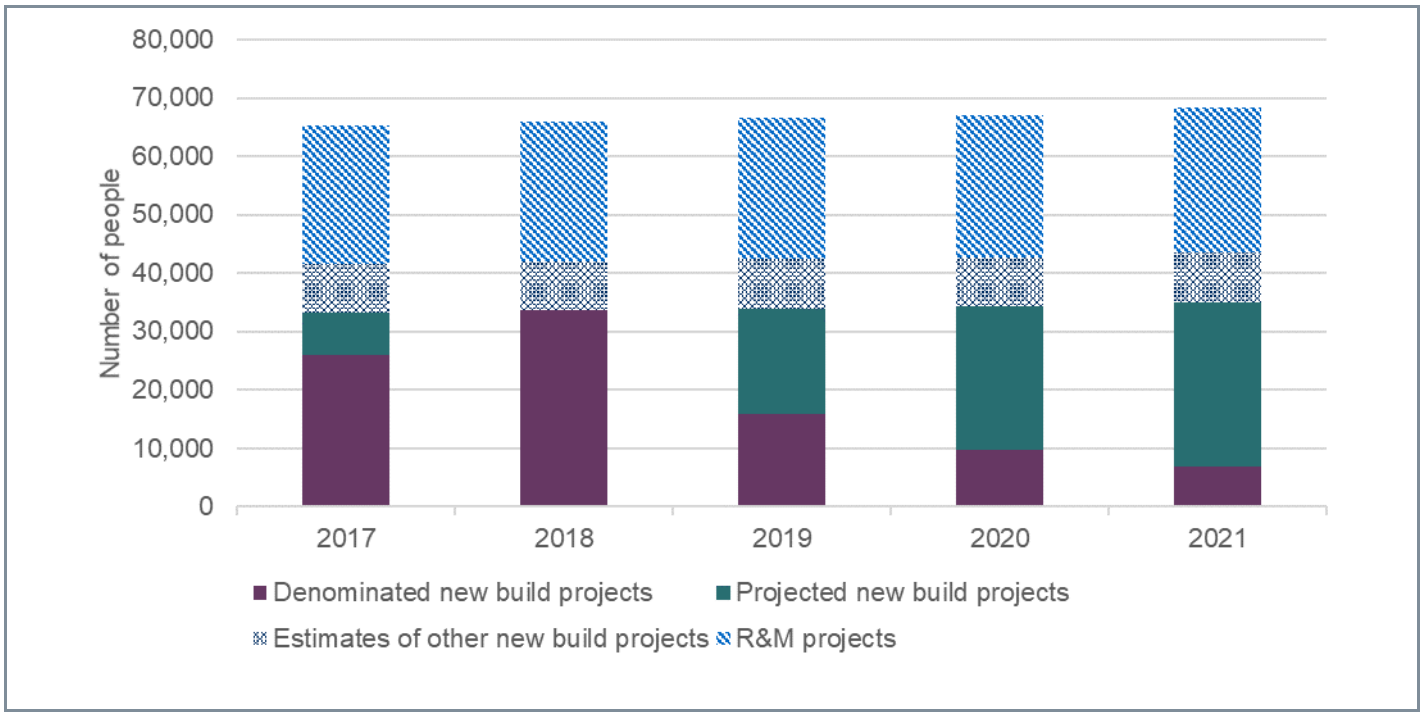

Figure 3: Total construction labour demand including estimates for both R&M and estimates of other work

2.3.1. Breakdown of labour demand by occupation

For the peak year in Glenigan of 2018 the detailed breakdown by each of the 28 occupational groups for the Glenigan and the NICP projects is shown in Figure 4. This shows the breakdown by occupation for both the pipeline of denominated projects and the estimates of other work.

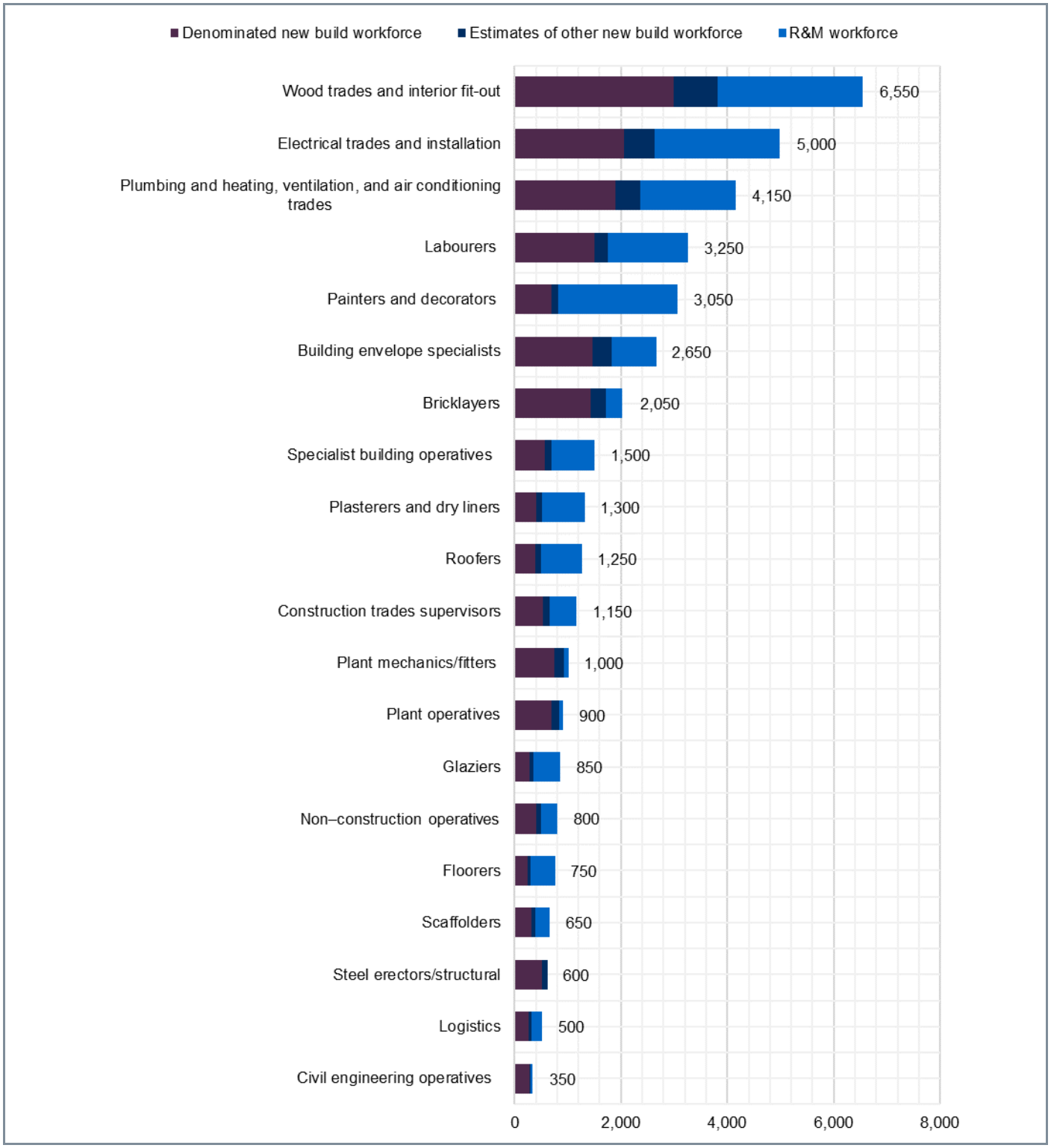

Figure 4: Construction labour demand by occupation in the peak year

Figure 5 shows a breakdown of the occupations which are in the managerial, professional and offices based roles. The chart shows the workforce which will be generated by the pipeline of work taking pace in the area but due to the nature of these roles there is not necessarily a requirement for them to spend all of their time in the area or on site.

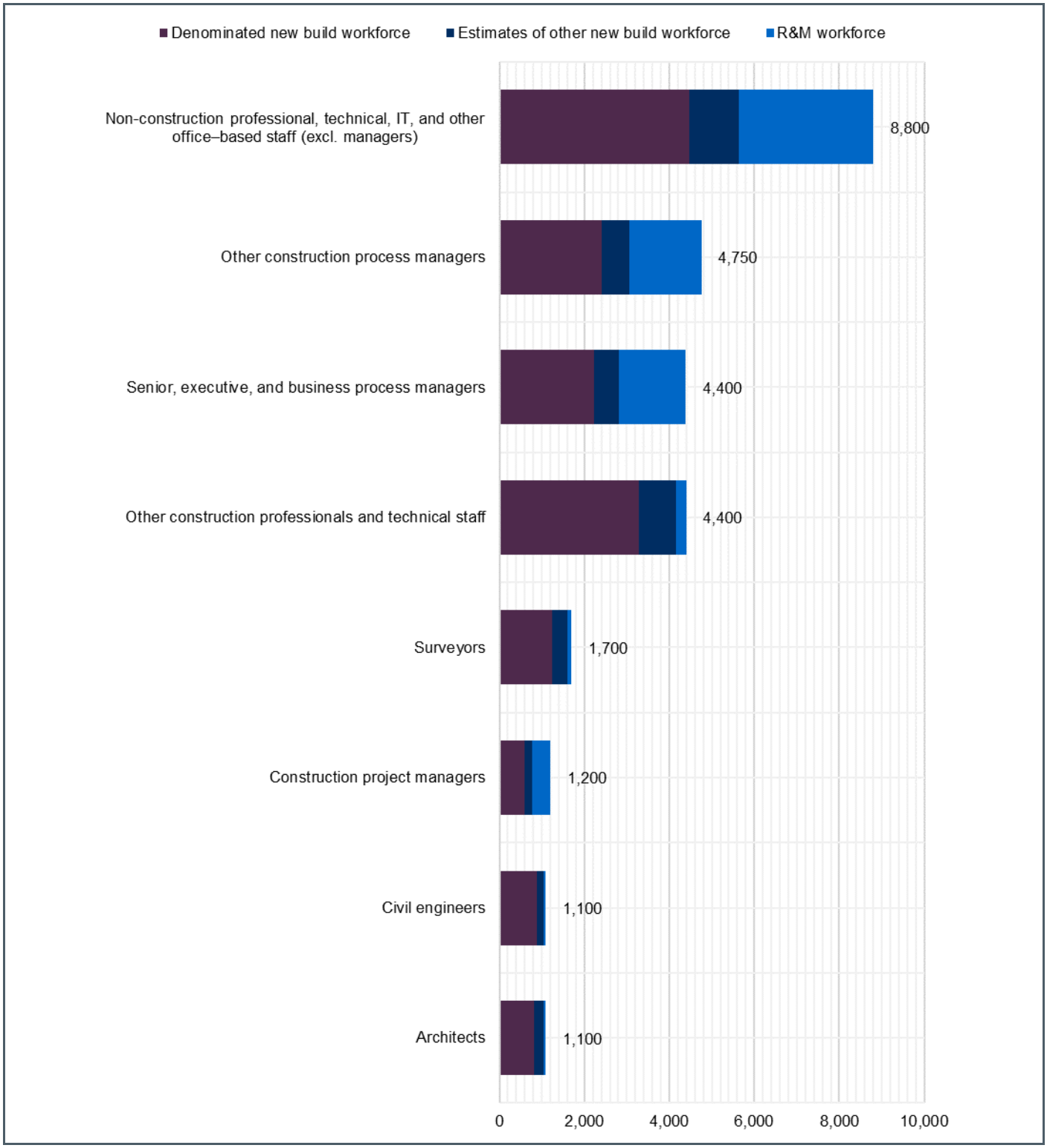

Figure 5: Construction labour demand managerial, professional and office based occupations in the peak year

2.3.2. Breakdown of labour demand by project type

Table 4 shows the labour demand generated by the denominated projects and the estimates of other work in 2018

Table 4: Labour demand by work type in 2018

Project Type	Defined Pipeline Labour Demand in 2018 (People)	Estimates of Other Work Labour Demand in 2018 (People)	Total Labour Demand in 2018 (People)	% of total in 2018
Non-housing R&M	0	17250	17,250	26%
Private Commercial	7100	6750	13,850	21%
New Housing	11200	1600	12,800	19%
Infrastructure	6750	0	6,750	10%
Housing R&M	2800	3850	6,650	10%
Public Non-housing	4850	0	4,850	7%
Private Industrial	3750	0	3,750	6%
Total	36,450	29,450	65,900	100%

3. A PICTURE OF SUPPLY

When looking at the supply of workers there are two main elements to consider: the size of the current workforce and the existing amount of training.

The first element of this section takes a view on the current employment levels in the Liverpool Combined Authority and how this relates to overall employment across the wider North West area and the UK as a whole. Data from CITB's Construction Skills Network (CSN) is used along with official Government sources.

For the second section, although training occurs at Further Education (FE) and Higher Education (HE) levels, the focus of this report is on the FE that takes place. This is because FE tends to be sourced and delivered in a closer proximity to the home and workplace, whereas the length of study time and specialisms for Universities for HE typically give much greater degrees of mobility. The much longer period of time taken to acquire qualifications and experience mean most HE qualified occupations are outside the period that this report can consider.

That does not mean that Liverpool City Region Combined Authority should not have ambitions to move workers through to higher level training and education. There may also be opportunities for more leadership and management, as well as specialist, training and development.

Finally, the demand forecasts are then compared against employment, training and workforce mobility to give an indication of possible gaps and/or occupational pinch points.

3.1. MAIN POINTS

- Forty per cent of the construction workforce in the Liverpool City Region Combined Authority is located within Liverpool, with 21% located in Wirral local authority area
- Current construction workforce within the Combined Authority is estimated at just under 44,000 workers
- The Liverpool City Region Combined Authority accounts for 16% of the North West's total current construction workforce and 17% of its construction firms
- Recent employment trends show a steady decline in construction workforce numbers within the Liverpool City Region Combined Authority over the last five years, against a backdrop of a broadly increasing workforce across the North West as a whole
- 96 training providers have delivered construction-relevant FE courses within the Liverpool City Region Combined Authority over the last four years, with ten main providers delivering 83% of provision.

3.2. EXISTING WORKFORCE

Recent trends: Workforce & Businesses:

- The Liverpool City Region Combined Authority construction workforce has declined in all but one of the last ten years, and is now 35% smaller than it was in 2006 (2013 was the only year to see an increase in the size of the workforce over this timeframe).
- Self-employment within construction in the Combined Authority remains 16% below 2006 levels at 14,700 workers.
- In more recent years (between 2012 and 2016) there has been a 13% increase in the number of Micro sized construction businesses within the Liverpool City Region Combined Authority, accounting for almost all (93%) of the growth in construction businesses in the Combined Authority over this period

An analysis of the Annual Population Survey shows that the Combined Authority accounts for around 16% of construction employment in the North West[2].

[2] ONS/NOMIS (2017) Annual Population Survey workplace analysis by industry April 2016 – March 2017

Table 5 applies this percentage share to the CSN occupational breakdown for the North West area as a whole to give an estimate of total employment at occupational and industry level in the Liverpool City Region. For comparison, the wider North West region has been included.

Construction employment peaked in Liverpool City Region in 2006, and in 2008 for the wider North West. In both areas it didn't return to growth until 2013, although this was short lived in the Combined Authority as employment then fell in each of the following years so that in 2016 it was 35% lower than its 2006 high point. Growth in the wider North West has been weak with falls in construction employment in both 2014 and 2015, although 2016 did see it increase by 2% - still some 18% below its 2008 high. Ref: Figure 6.

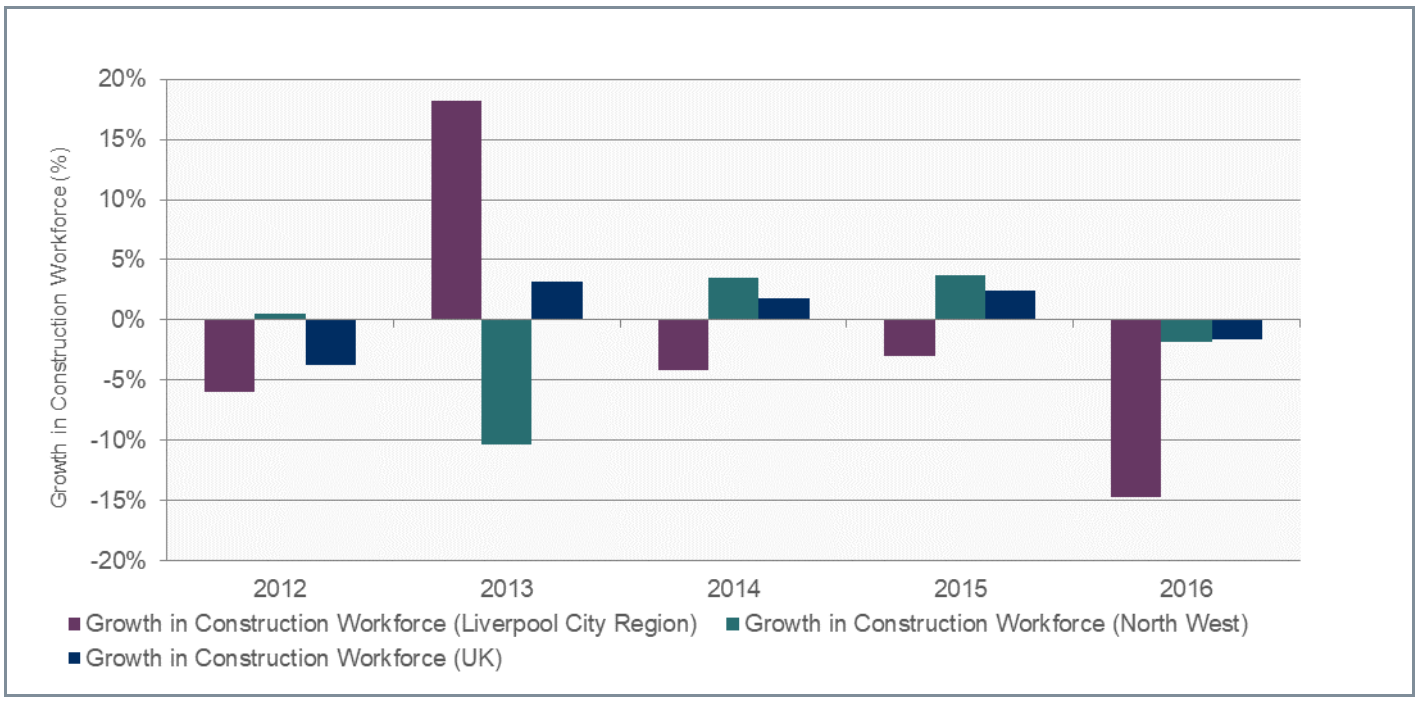

Figure 6: Year on year change in Construction Employment (Experian/CITB & NOMIS 2016)

The number of construction firms within the Liverpool City Region Combined Authority increased by 13% between 2012 and 2016, to just over 4,600 businesses. Much of this increase (500 businesses) was due to growth in the number of micro firms that employ fewer than nine people. This is more or less equal to the rate of growth across the North West, meaning that the Combined Authority accounts for around 17% of construction firms based in the North West.

The number of construction firms in the UK has increased by 14% between 2012 and 2016. Ref: Figure 7.

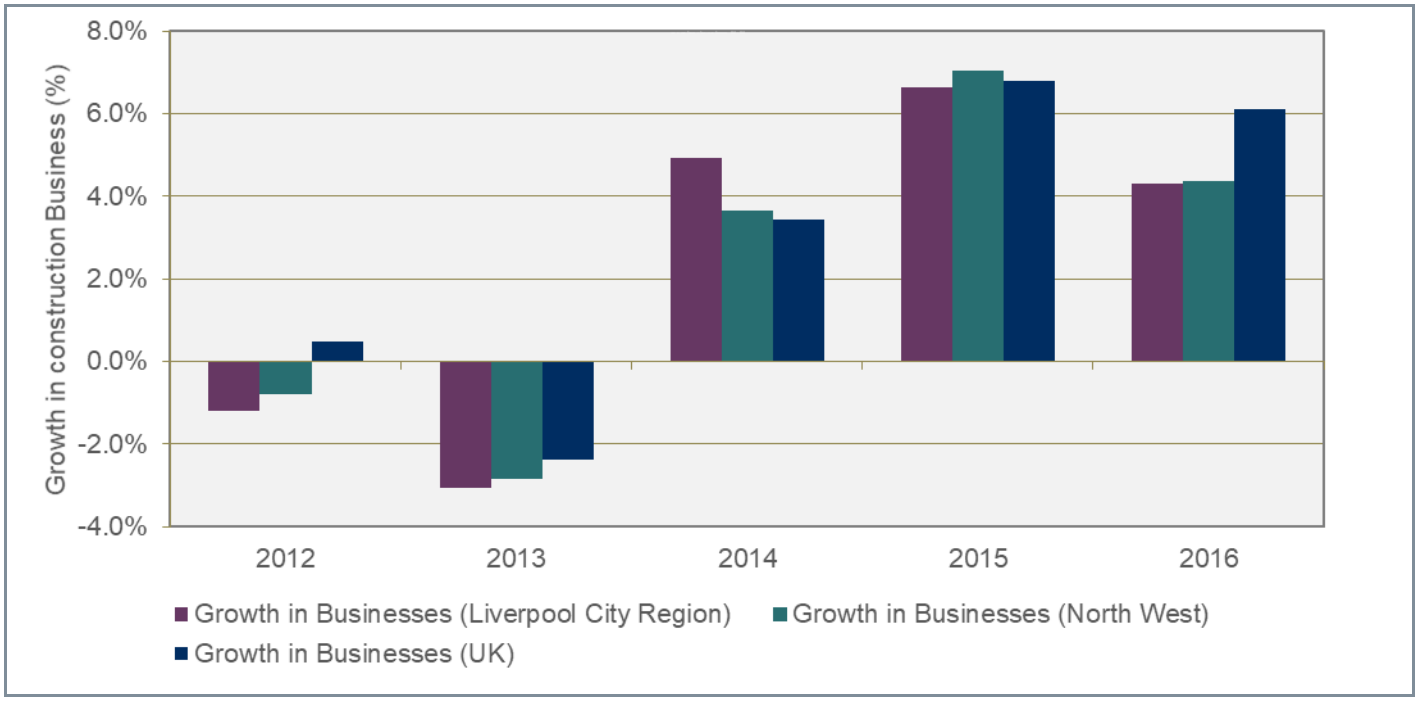

Figure 7: Year on year change in Construction Businesses (UK Business Count, NOMIS 2016)

As would be expected, a contracting construction workforce within the Combined Authority, and a growing number of firms, means that those firms are on average smaller now than five years ago, employing on average 7.8 people in 2016 compared to an average of 9.4 in 2012.

Figure 8 shows the distribution of construction businesses within Liverpool City Region Combined Authority, and Figure 9 shows the distribution of the construction workforce. Interestingly, there are noticeable differences between the two.

Comparing business to workforce distribution indicates that Liverpool has a higher share of employment compared to share of businesses meaning that the firms based there tend to be larger, employing on average 10.9 people. This situation is reversed in both Sefton and Knowlsey where there are higher proportions of businesses to workforce, meaning that smaller firms predominate here with an average business size of 4.1 in Sefton and 3.5 people in Knowlsey.

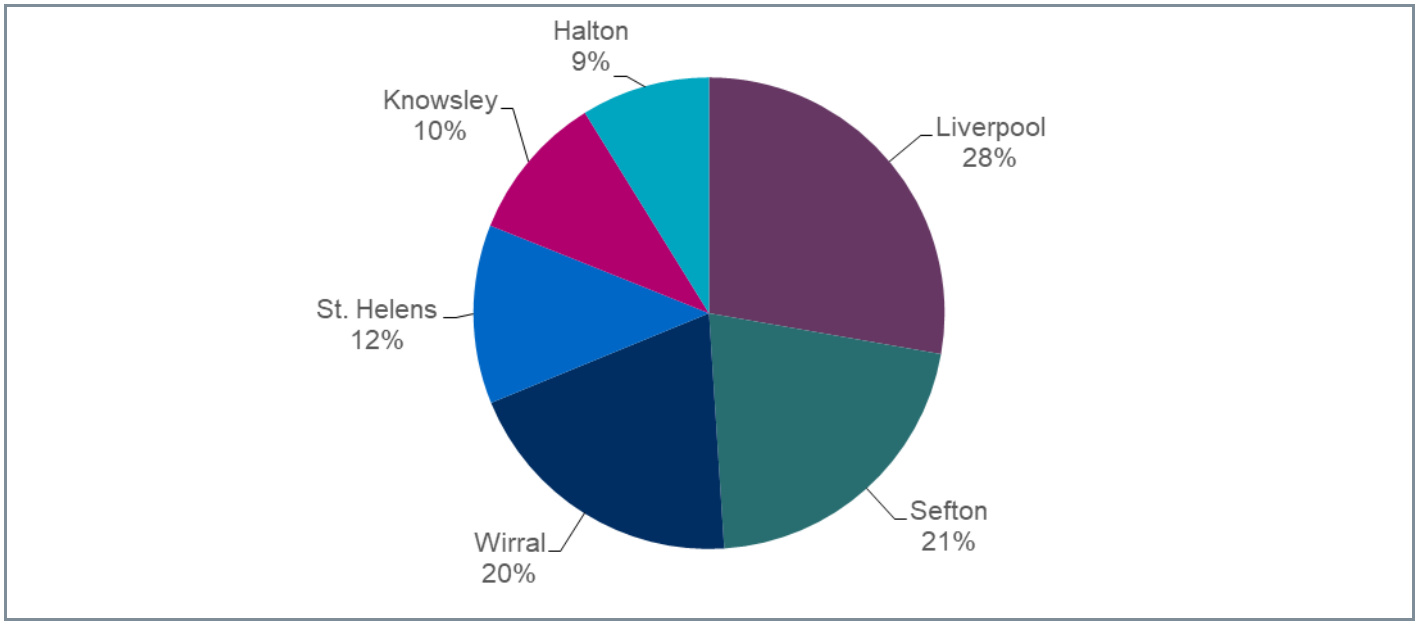

Figure 8: Distribution of construction businesses within the Liverpool City Region (UK Business Count, NOMIS 2017)

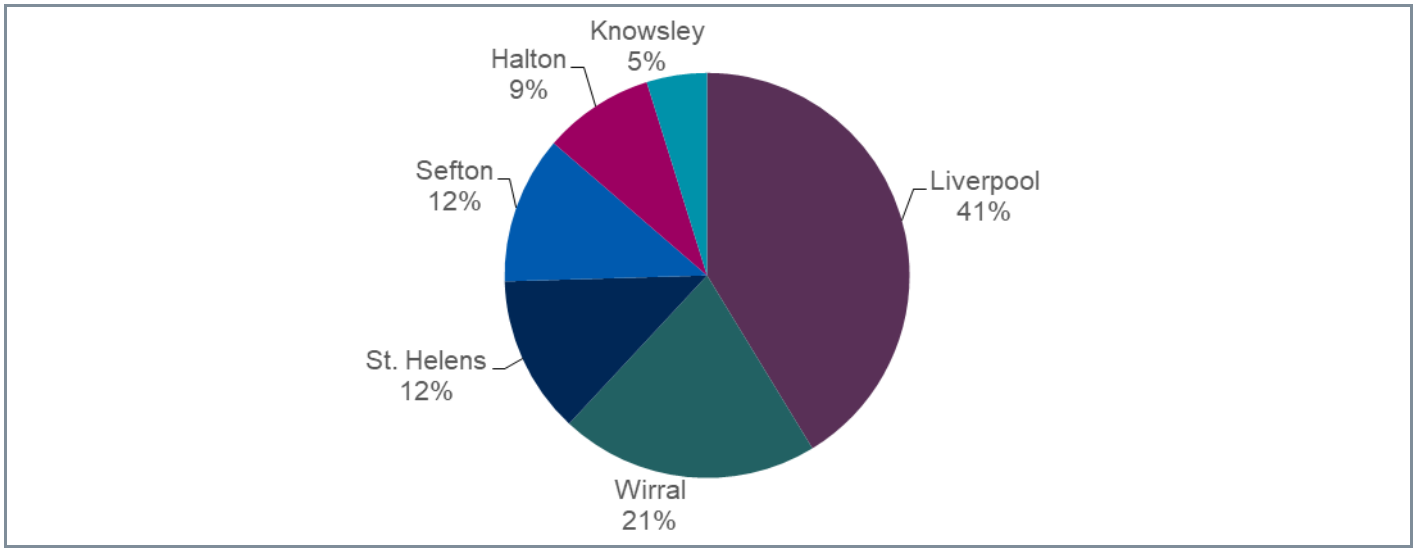

Figure 9: Construction employment by area within Liverpool City Region (2017, NOMIS)

The different pattern between workforce and number of businesses highlights two of the main factors that are important when looking at the construction sector. These are:

- Direct employment vs. self-employment
- Size of businesses.

Overall the construction sector has high levels of self-employment with around 40% of the GB construction workforce being self-employed. This is broadly in line with the level of self-employment in the Liverpool City Region at 41%, and slightly higher than the figure for the North West as a whole at 38%. The level of self-employment in the Combined Authority area has increased steadily over the last ten years, rising from 32% of the total construction workforce in 2006. There has been a similar, but slower, increase in self-employment the North West area, which also stood at 32% in 2006.

When it comes to business size, the distribution of companies across the Combined Authority region is very close to the pattern seen across the North West as a whole, and indeed the United Kingdom, with the majority of construction companies being micro sized, i.e. less than 10 employees, Figure 10.

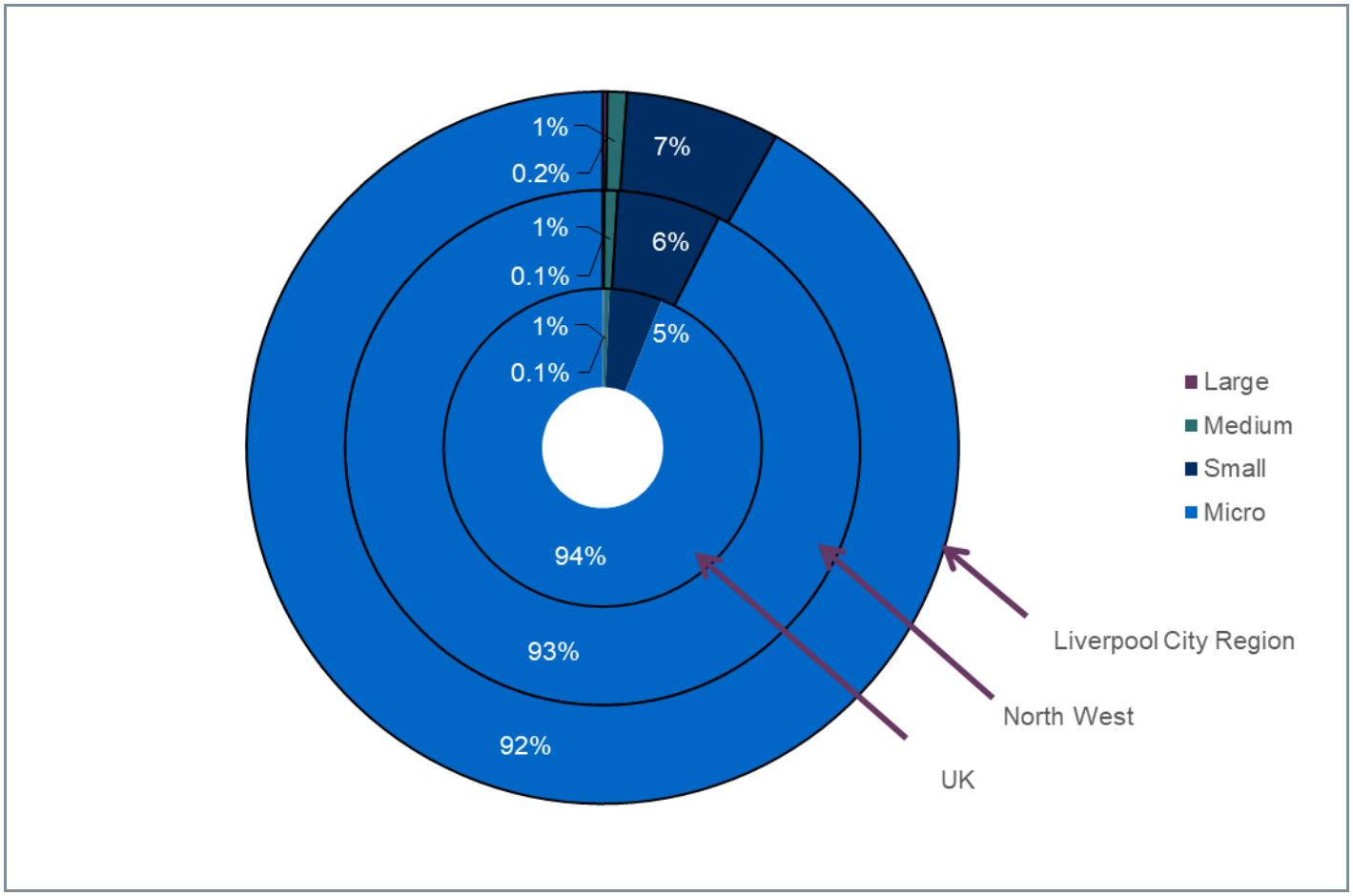

Figure 10: Size of Construction Businesses (UK Business Count, NOMIS 2016)

Nearly all of the net growth in construction businesses between 2012 and 2016 within the Liverpool City Region Combined Authority, a total of 535 additional firms, has come from an increase in the number of Micro sized companies (those employing fewer than ten people). The net increase in these firms amounts to an additional 500 construction firms in the Combined Authority area, with a small net increase of 35 firms employing between 10-49 workers accounting for the overall balance. A net increase of five large firms has led to a corresponding decrease of five medium sized firms in the Combined Authority, meaning no change in the number of firms employing more than 50 people.

Table 5: Construction occupational breakdown, 2016 (Source Experian & CITB)

Occupation	Liverpool City Region	North West
MANAGERIAL, PROFESSIONAL & OFFICE BASED ROLES		
Senior, executive, and business process managers	2,700	16,790
Construction Project Managers	720	4,480
Other construction process managers	3,420	21,290
Construction Trades Supervisors	710	4,420
Civil engineers	720	4,450
Other construction professionals and technical staff	3,370	20,930
Surveyors	950	5,900
Architects	590	3,690
Non-construction professional, technical, IT, and other office-based staff	5,780	35,960
SKILLED TRADES		
Wood trades and interior fit-out	4,210	26,180
Bricklayers	1,170	7,260
Building envelope specialists	1,370	8,550
Painters and decorators	1,800	11,190
Plasterers	850	5,290
Roofers	950	5,910
Floorers	520	3,230
Glaziers	470	2940
Specialist building operatives nec*	940	5,830
Scaffolders	500	3,140
Plant operatives	760	4,740
Plant mechanics/fitters	830	5,140
Steel erectors/structural fabrication	420	2,590
Labourers nec*	2,340	14,540
Electrical trades and installation	3,400	21,150
Plumbing and HVAC Trades	3,040	18,900
Logistics	400	2,480
Civil engineering operatives nec*	210	1,300
Non–construction operatives	680	4220
Total	**43,820**	**272,490**

*nec = not elsewhere classified

4. TRAINING PROVISION

4.1. MAIN POINTS

Liverpool City Region Combined Authority region has:

- 83% of learner volumes covered by ten main providers
- Training across the full range of construction occupations
- Good levels of competence qualifications achievements across many construction occupations, most notably Wood Trades and Interior Fit Out, Plumbing and HVAC, and Building Envelope Specialists.

Construction training provision has fallen by 16% in the Liverpool City Region over the four academic years from 2012/13 to 2015/16, with the number of new starters dropping from 5,840 to 4,925 during that time. All Local Authorities within the Combined Authority have witnessed declines in construction starts, with the exception of Liverpool where starts increased by 19%.

.

CITB analysis of Education and Skills Funding Agency (ESFA) Individualised Leaner Records from 2012/13 through to 2015/16 academic years for construction learners shows that:

- The Liverpool City Region Combined Authority accounts for 19% of identified construction related training across the North West region – a proportion that has changed little over the last four years.
- The fall in the total number of learners starting all construction across the Combined Authority (16%), has been slightly more pronounced than the 14% reduction in learners starting across the wider North West area as a whole.
- The number of construction apprenticeship starts in the Combined Authority area has increased by 10% between 2012/13 and 2015/16 thanks to large increases in Sefton and St Helens (all other areas fell). Apprenticeship starts across the wider North West region have increased by 34% over the same time.
- There has been a large drop in other Education and Training leaner starts (down by 21%) across both the Combined Authority and the North West as a whole
- Overall there has been a shift in Liverpool City Region Combined Authority towards offering more construction apprentice training (generally favoured by employers) and away from full time training (where some trainees can find it harder to enter employment after leaving college). This move is not consistent across the whole Combined Authority, however, with Halton, Knowsley, and Liverpool all increasing the number and proportion of full-time learners compared to apprentices.

The information shown in Table 6: Competence qualification Learner Aims in Liverpool City Region Combined Authority as a % of total Learner Aims in North West as a whole (all qualification levels) has been produced by mapping qualification reference numbers and titles to the most appropriate Construction Skills Network occupations. This has been built up over a number of years by CITB with over 1,800 qualifications reviewed and linked where possible. Note: there are some qualifications that have broad or generic titles that cannot be linked to distinct occupations.

Table 6: Competence qualification Learner Aims in Liverpool City Region Combined Authority as a % of total Learner Aims in North West as a whole (all qualification levels) (Source: CITB/ESFA)

Construction Occupations	12-13	13-14	14-15	15-16	Total Achievements	Total
Total	19%	23%	20%	21%	4,900	21%
Occupations with good provision						
Other construction professionals & technical staff	14%	25%	70%	43%	700	46%
Building envelope specialists	44%	60%	23%	51%	540	42%
Plasterers and dry liners	35%	33%	20%	30%	210	31%
Roofers	21%	16%	41%	39%	170	31%
Glaziers	18%	17%	30%	44%	190	28%
Floorers	33%	26%	17%	44%	130	28%
Specialist building operatives nec*	22%	25%	34%	24%	410	27%
Plumbing and HVAC Trades	23%	28%	19%	19%	670	23%
Wood trades and interior fit-out	22%	24%	18%	19%	700	21%
Bricklayers	20%	25%	16%	22%	320	21%
Civil engineering operatives nec*	19%	20%	14%	19%	150	18%
Painters and decorators	14%	17%	11%	24%	170	16%
Occupations to Monitor						
Construction Trades Supervisors	17%	31%	0%	2%	60	16%
Electrical trades and installation	14%	17%	19%	12%	360	15%
Plant operatives	11%	18%	6%	23%	570	13%
Scaffolders	12%	12%	18%	12%	120	13%
Low Overall Learner Volumes						
Steel erectors/structural	25%	3%	5%	21%	<25	11%
Construction managers	13%	0%	0%	0%	<25	9%
Plant mechanics/fitters	33%	6%	5%	1%	30	8%
Logistics	0%	6%	0%	0%	<25	1%

**nec – not elsewhere classified*

Note: Total learner aims are across the period 2012-2013 to 2015-16 have been rounded to the nearest 10

Nearly two-thirds of the achievements in the Combined Authority are at Level 2 or above (64%).

The percentage comparison with the North West as a whole, over the last four years, is used as a device to demonstrate the provision of training in the Liverpool City Region Combined Authority. It takes into account that roughly 16% of regional employment is based in the Combined Authority area from which it can be inferred whether provision is higher or lower than would be expected. Low provision may indicate that trainees have to travel outside the Combined Authority area to find appropriate training courses or, as in the case of plant operatives and mechanics, that an urban centre is not an appropriate location for such training.

Relatively high provision is highlighted in green and relatively low provision is highlighted in red.

Many of the occupations with **Good Provision** have good levels of training in comparison with relative levels of employment in the Combined Authority which reflects the fact that many training providers offering FE courses are located in the Combined Authority. As would be expected for a major metropolitan area Liverpool City Region attracts people from outside the Combined Authority area to receive training.

The second group – Occupations to monitor: identifies a small number where we would expect higher levels of training, again linked to either the occupational size and/or demonstrating competence. For this cluster, which covers Construction Trade Supervisors, Electrical trades and installation, Plant Operatives, and Scaffolders, the share of training within the Combined Authority is lower than would be expected, although in the case of Plant Operatives which requires a large open space for training, this is almost certainly due to a lack of appropriate facilities. It is possible that individuals within the Liverpool City Region are travelling outside the area for these types of training.

Lastly there is a group of **occupations where the low level of learner volumes** makes it difficult to judge patterns across the years. For several of the courses in this group, notably courses for plant mechanics and fitters and construction managers, training has declined sharply from a high level which may indicate a loss of local training facilities. Whilst the training provider network can adjust to cover changes in demand, there will be a requirement for a certain volume of training to make it viable for a provider to deliver it. These occupations could suffer from this intermittent demand or learners could be travelling further afield to more specialist training providers.

In terms of training providers, from 2012/13 through to 2015/16 96 different providers have delivered training in the Liverpool City Region Combined Authority area. However, there is a consistent pattern with over 83% of construction training being delivered by the ten largest providers. Ref: Table 7: Top ten providers within the Liverpool City Region Combined Authority (Source: CITB/EFSA).

Table 7: Top ten providers within the Liverpool City Region Combined Authority (Source: CITB/EFSA)

Provider	12-13	13-14	14-15	15-16	Total	% Share of Total Quals	% Ofqual Regulated
The City Of Liverpool College	1,387	1,278	765	857	**4,287**	16.5%	73.0%
Wirral Metropolitan College	1,050	1,341	886	479	**3,756**	14.5%	75.4%
Manchester College, The	699	1,052	1,006	454	**3,211**	12.4%	32.9%
Southport College	718	627	547	559	**2,451**	9.5%	52.7%
St Helens College	429	480	715	523	**2,147**	8.3%	81.4%
Hugh Baird College	569	632	778	128	**2,107**	8.1%	82.3%
St Helens Chamber Limited	307	300	400	147	**1,154**	4.5%	98.1%
Riverside College	196	216	260	280	**952**	3.7%	88.9%
South West Regional Assessment Centre Limited		52	177	608	**837**	3.2%	93.8%
Preston College	175	338	99	34	**646**	2.5%	95.4%

Six of the top 10 providers are located within Liverpool City Region. Manchester College is one of the largest providers of training across the North of England, yet it is notable that the vast majority of these qualifications are not Ofqual registered; Southport College also provides a below average proportion of qualifications that are Ofqual registered (average for all training providers in the Liverpool City Region is 72.3%).

This profile is typical of many geographic areas in that there is a relatively small group of FE colleges delivering the majority of construction training. A smaller proportion of additional training is then delivered by a larger number of other providers. Sometimes these smaller specialist providers can operate far from the normal base of those for whom they provide training. In total this training covers the majority of the main occupations involved in the construction workforce.

When looking at training provision across individual local authorities within the Liverpool City Region Combined Authority, large decreases in learner starts in most local authority areas are not compensated for by an increase in construction training in Liverpool, illustrated by the detail in Table 8 below.

Table 8: Unique Learner starts by area, construction subjects, all levels (Source: CITB/EFSA)

Local Authority	**12-13**	**13-14**	**14-15**	**15-16**	**Change 2012-2015**	**% Net change**
Halton	379	318	344	372	-7	-2%
Knowsley	207	218	186	139	-68	-33%
Liverpool	1,748	1,722	1,626	2,080	332	19%
Sefton	1,392	1,374	1,266	1,019	-373	-27%
St. Helens	1,125	1,019	944	804	-321	-29%
Wirral	1,152	1,102	867	663	-489	-42%
Total	**5,840**	**5,612**	**5,109**	**4,925**	**-915**	**-16%**

Almost two thirds of this training is at Level 2 or above, slightly higher in Knowsley at 77% and slightly lower in St Helens at 55%.

Overall, the Liverpool City Region Combined Authority has experienced a slightly larger drop in construction training between, 2012/13 and 2015/16 than the wider North West (-16% and -14% respectively).

Looking within the main programmes of learning being undertaken, the reason for the declines in both the Combined Authority and the region is down to a fall in the amount of college based training. Whilst these courses are an important stepping stone or progression route for learners to acquire knowledge, construction employers tend to have a preference for practical or competence based skills, so it is reassuring therefore, despite the falls in overall training, that the number of construction apprentices in both the Combined Authority and the region increased by 10% and 34% respectively.

4.2. HIGHER EDUCATION

This report has not assessed in detail the higher level provision delivered within the Liverpool City Region.

There are five broad HE qualifications that relate to construction: Architecture, Building, Landscape & garden design, Planning, Civil Engineering, and a small number of other courses linked to architecture, building & planning. All these courses are offered in the North West region at the ten HE institutions that are either based or operate there.

Of these construction related courses, the three that are most relevant to delivering the projects discussed in this report are Civil Engineering, Architecture, and Building. Table 9 compares the number of first year undergraduate students on these courses at HE institutions in the North West Region.

Table 9: First year students of UK origin on Construction related degree courses at universities in the North West region and Liverpool City Region. 2014/15 academic year. (Source CITB and HESA)

Course	Liverpool John Moores University	University of Liverpool	North West region
Civil engineering (H2)	138	41	349
Architecture (K1)	109	84	384
Building (K2)	219	0	494
Planning (urban, rural & regional) (K4)	0	15	58
Others in in architecture, building & planning (K9)	0	0	9
Total	466	140	1294

There are a number of significant challenges to address in understanding Higher Education's place in UK construction. Most significantly, those starting and completing HE level qualifications tend to be willing to travel significant distances to study and then find employment. For many students the opportunity to leave home and move to a new town or city is one motivation for entering HE. In the UK, this has become normalised. University students are more likely to move into a region to study and then, once graduated, out of a region to find employment.

A 2014 study undertaken by *Education Phase* on behalf of TV Licensing indicated that the average distance from home to place of HE study was around 90 miles. This also indicated that of the sample, only around 5% of HE students were studying within 20 miles of home but that 78% moved 60 or more miles or were from overseas.

However, when questioned, different institutions respond differently – with some universities indicating that they believe they attract students from closer to home while others have a more national and often international focus. This is, in part, down to the course type and its availability elsewhere. But there appears to be a rough correlation between the UCAS points required for entry to some universities and the distance students travel. Typically the most demanding universities draw students from a greater average distance.

Once a student has finished their course there is limited centrally available data on their destination – both in terms of career type and location. In a significant proportion of cases those completing higher education move into careers unrelated to their course. Data available from: HESA 2014-15 Industry of full-time first degree graduates, indicated that students graduating in Architecture and Building and Planning were subsequently employed in:

- 51% Professional, scientific and technical activities
- 23% Other sectors
- 20% Construction
- 6% Real estate activities

For graduates working in the construction industry, the subject in which they graduated was recorded as being:

- 24% Architecture, Building; Planning
- 30% Engineering
- 46% Other subject areas

4.2.1. Degree level apprenticeships

Some provision for higher level training for professional roles is available as degree apprenticeship programmes that attract government subsidy and are available to potential students as debt free education.

This is an attractive opportunity that could be highlighted to applicants and employers but that also requires support from employers to recruit at age 18 rather than 21 (graduate). This may help fill some higher level skills gaps earlier as the apprentice can start to make a contribution in their professional roles after one year of study.

5. MOBILITY OF THE WORKFORCE

Construction workforces are fluid by nature and this section of the report will look at findings from the CITB survey into Workforce Mobility and Skills in the UK Construction Sector 2015 to give a picture of mobility within the workforce. Data specific to the North West will be analysed in order to understand how this might impact on future training interventions and the supply of job opportunities for local people.[3]

5.1. MAIN POINTS

- Two fifths of North West construction workers have worked in the construction industry for over 20 years (40%). Two-thirds have worked in the industry for at least 10 years (66%).
- The majority of construction workers in the North West (91%) started their construction career there. Workers in the North West are among the most likely to have remained in the same region/nation in which they were based for their first construction job.
- Within the North West, the average (mean) distance from workers' current residence (taking into account temporary residences) to their current site was 20.5 miles (22 miles is the UK average).
- More than three quarters of all construction workers in the North West are confident that when they finish their current job they will get a job that allows them to travel from their permanent home to work on a daily basis (79%).
- Overall around two fifths of all construction workers have only worked on one type of project (43%)

Around half of construction workers in the region aged under 60 say they definitely will be working in the industry in five years' time (52%) and a further third think it is very or quite likely (33%).

5.2. WORK HISTORY

Two-thirds of construction workers in the North West have worked in the construction industry for at least 10 years (66%), and two-fifths (40%) have worked in it for over 20 years. The fact that they grew up in the region, or have always lived there, is the most likely reasons why construction workers are based within the North West (69%) which is higher than the UK average (55%). Over nine in ten (91%) construction workers in the region have remained in the North West for all or most of their career, compared to the UK average of 80%.

Further evidence of the stability of the construction workforce in the North West comes from the finding that in most cases (89%) workers reported their last site was also in the North West.

In terms of the regions/nations in which workers' current employer operates in, the majority (93%) of workers in the North West reported that their employer operated within the region they were currently working in, while 6% operated in the West Midlands and 4% operated in both Yorkshire and the Humber and London, as shown in Table 10: Region/nation employer operates in, compared with region/nation working in currently.

[3] CITB (2015) Workforce Mobility and Skills in the UK Construction Sector – North West

Table 10: Region/nation employer operates in, compared with region/nation working in currently

Region or nation employer operates in	Region/nation currently working in											
	EM %	EE %	GL %	NE %	NW %	NI %	SC %	SE %	SW %	WA %	WM %	YH %
East Midlands	83	16	8	13	3	2	4	12	8	7	24	11
East of England	12	67	15	11	2	1	4	19	8	7	9	6
London	10	27	84	13	4	1	5	27	12	7	9	6
North East	9	9	8	93	3	1	4	6	7	7	8	15
NORTH WEST	11	9	8	14	93	1	4	6	7	11	11	10
Northern Ireland	3	3	3	2	1	99	3	2	1	3	2	1
Scotland	6	4	6	9	1	2	97	2	4	4	5	4
South East	13	23	27	12	3	*	4	65	21	7	11	6
South West	9	5	7	10	3	*	4	18	83	10	15	5
Wales	6	5	5	8	3	*	4	3	10	96	14	4
West Midlands	21	9	8	12	6	*	4	7	12	9	92	8
Yorkshire & the Humber	15	10	7	19	4	1	5	6	8	8	8	88
Republic of Ireland	1	2	3	*	*	2	1	1	1	2	2	*
Other parts of Europe	*	*	*	1	0	0	0	0	*	0	1	0
Outside Europe	*	1	0	*	0	0	0	0	*	0	*	0
Other / Unsure	1	3	2	3	2	*	1	3	1	*	1	3
Unweighted bases	410	366	452	427	435	274	463	439	494	290	352	369

Source: Workforce Mobility and Skills in the UK Construction Sector 2015 Report. BMG Research on behalf of CITB.
Base: All respondents. *denotes less than 0.5%

5.3. WORKER ORIGINS

Workers were asked which region/nation they were living in just before they got their first job in construction in the UK. Overall 9 in 10 construction workers in the North West were living in the region when they started their construction career (91%). Workers currently based in the North West are amongst those most likely to have remained in the same region/nation in which they were based for their first construction job. Furthermore construction workers in the North West are among the most likely to have stayed in the region where they studied for their first qualification (90%), with Scotland, Northern Ireland, and the North West being the only three regions/nations with a higher percentage. At the lower end of the range, only around half of construction workers in the East of England (50%), South East (55%) and London (58%) are based in the same region/nation as where their first qualification was achieved.

5.4. TRAVEL TO SITE

The majority of construction workers (88%) in the North West also had their permanent home in the region, meaning that 12% travelled into the region for work from another region or country in which their current residence is based. The main regions from which people travelled to work in the North West were the West Midlands (8% of all workers in the NW at the time of the survey) and Wales (3%). This means that after the North East, construction workers in the North West are the most likely within England to currently be living in the same region as the site they work on.

Workers in the North West were asked to indicate the furthest distance they have worked from their permanent or current home in the last 12 months. Figure 10 shows that 1 in 8 construction workers have worked no more than 20 miles away (12%) and a further third have worked between 21 and 50 miles away (35%). This leaves half that have worked more than 50 miles away from their permanent home (51%), with a quarter that have worked between 51 and 100 miles away (23%) and more than a quarter that have worked more than 100 miles away (28%). In the UK workers based in the North West were the most likely to have travelled more than 100 miles from their permanent home to work in the last 12 months (UK average: 21%).

However, the average (mean) distance from workers' current residence (taking into account temporary residences) to their current site was 20.5 miles for the North West, slightly less than the UK average of 22 miles. This indicates that although workers can travel some distance to work, it is likely to be intermittent.

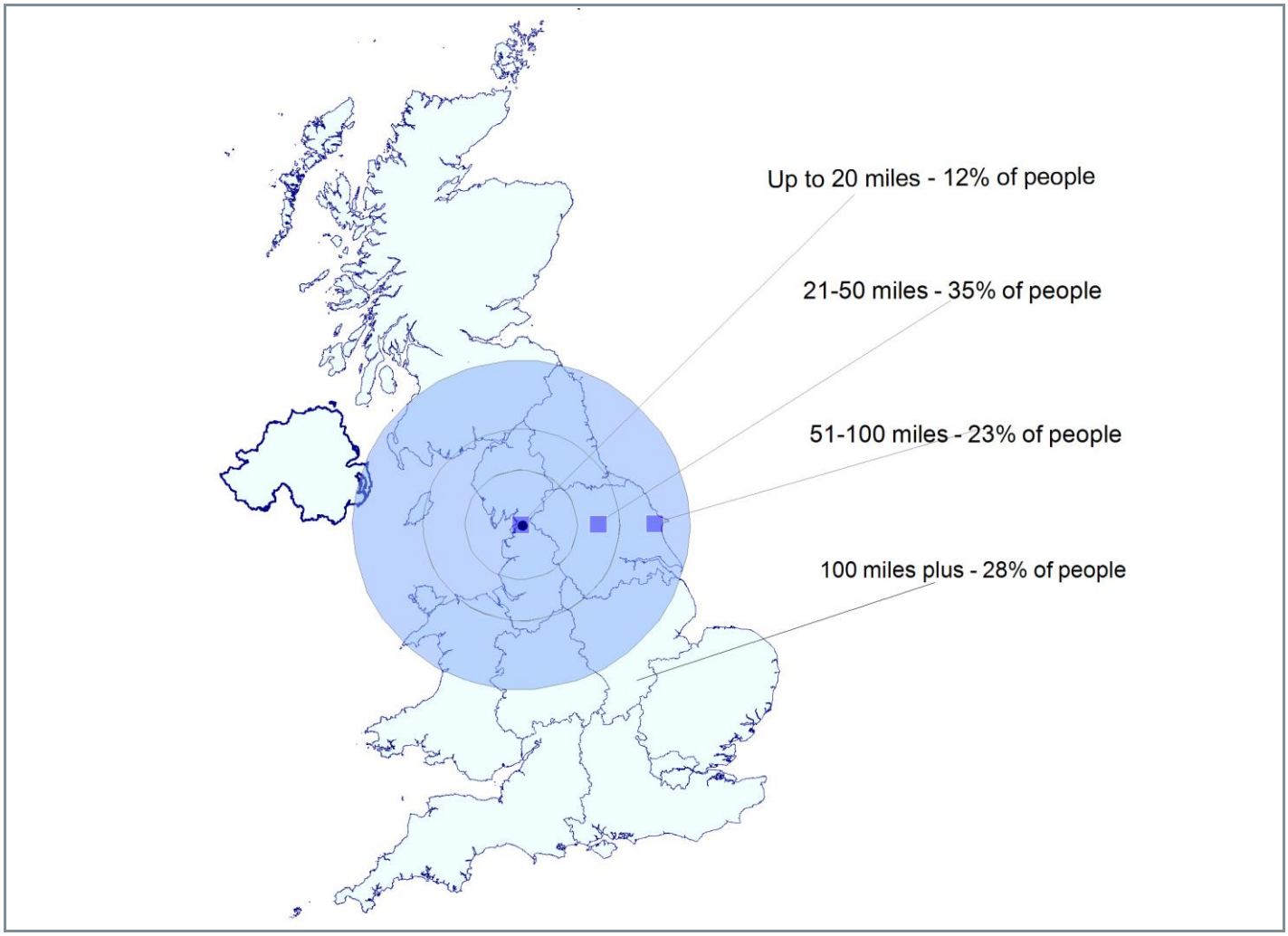

Figure 11: Furthest distance worked in past 12 months (CITB, 2015)

5.5. SITE DURATION AND CHANGE

In order to get a measure of workplace stability, workers were asked to indicate how long in total they expect to work at their current site. Around a fifth of all construction workers in the North West (21% cf. 33% in 2012) do not expect to work on that site for more than a month, including 5% that only expect to be there for about a week or less. Almost a quarter (23%) expect to stay on that site for a year or longer, a notable increase compared with 2012 (6%), suggesting more stable employment in the North West than in 2012. However a comparable proportion (27%) of workers did not know how much longer they could expect to be on site, indicating that a significant minority of temporary workers are living with some uncertainty and insecurity.

More than three quarters of all construction workers in the North West are confident that when they finish this job they will get a job that allows them to travel from their permanent home to work on a daily basis (79%). Compared with workers in other regions/nations, those in the North West are amongst the most confident in this respect; second only to those in Scotland (81%).

5.6. SUB-SECTOR AND SECTOR MOBILITY

All workers were asked which of types of construction work they have spent periods of at least 3 months at a time working in.

Compared with 2012 there has been a significant increase in the proportion of construction workers that have been working on new housing within the North West; up from 72% to 93%. For all other types of projects the proportion of construction workers that have worked on them has fallen since 2012.

Overall around two fifths of all construction workers have only worked on one project type (43%), compared with a fifth in 2012 (21%), which again suggests a pattern of increased stability in the sector.

5.7. LEAVING THE SECTOR

In order to assess the potential outflow from the sector in the next five years (led by worker preference), all workers were asked how likely it is that in five years' time they will still want to be working in construction. Within the North West, half the construction workers say they definitely will be (51%) and a further third think it is very or quite likely (33%). Just 2% say they definitely won't be and a further 5% hope to be retired by then, while 5% don't know.

Excluding those aged 60 and over (as those over 60 may be assumed to be considering retirement in the next 5 years) 52% believe they will definitely want to be working in the construction sector and a further 33% believe it is very likely or quite likely they will want to be working in the construction sector. Only 7% think on any level that they will not want to be working in the construction sector in 5 years' time which is less than in 2012 (15%).

Overall the findings from the Mobility survey indicate a stable, well established workforce across the North West. There is some evidence of movement between neighbouring regions, especially the West Midlands and Wales, but on the whole the workforce have grown up in the region, undertaken their initial construction training in the region and have stayed there for the majority of their working life. Additionally, optimism across the workforce is high with a majority expecting to still be in the construction industry in five years' time.

Setting the Mobility survey research against the overall workforce and business patterns noted earlier indicates that whilst the North West region as a whole has a stable workforce, workers within the Liverpool City Region Combined Authority area will not be limited to working only within the Combined Authority area – they may travel to work in other areas of the North West outside of the Combined Authority. Likewise, workers in other areas of the North West will also be travelling to work within Liverpool City Region Combined Authority.

6. DEMAND AGAINST SUPPLY

6.1. MAIN POINTS

Before looking at demand against supply, it should be noted that the Glenigan dataset used to produce the demand view is based on projects that are picked up at various stages of the planning process. As such there will be projects in the pipeline that may not go ahead or be subject to delay; additionally there will be newer projects that will be added to the list. In this respect the view is essentially a snapshot of what potential work could look like.

When looking forward, there will be less visibility on future projects for work that requires shorter planning times. Research carried out by CITB on behalf of UKCG showed that the lead time from planning to work starting on site varied by the type of work and value. Large scale infrastructure and commercial projects took the longest time whereas lower value work in general, along with work in the industrial sector, was able to get on site quickest.

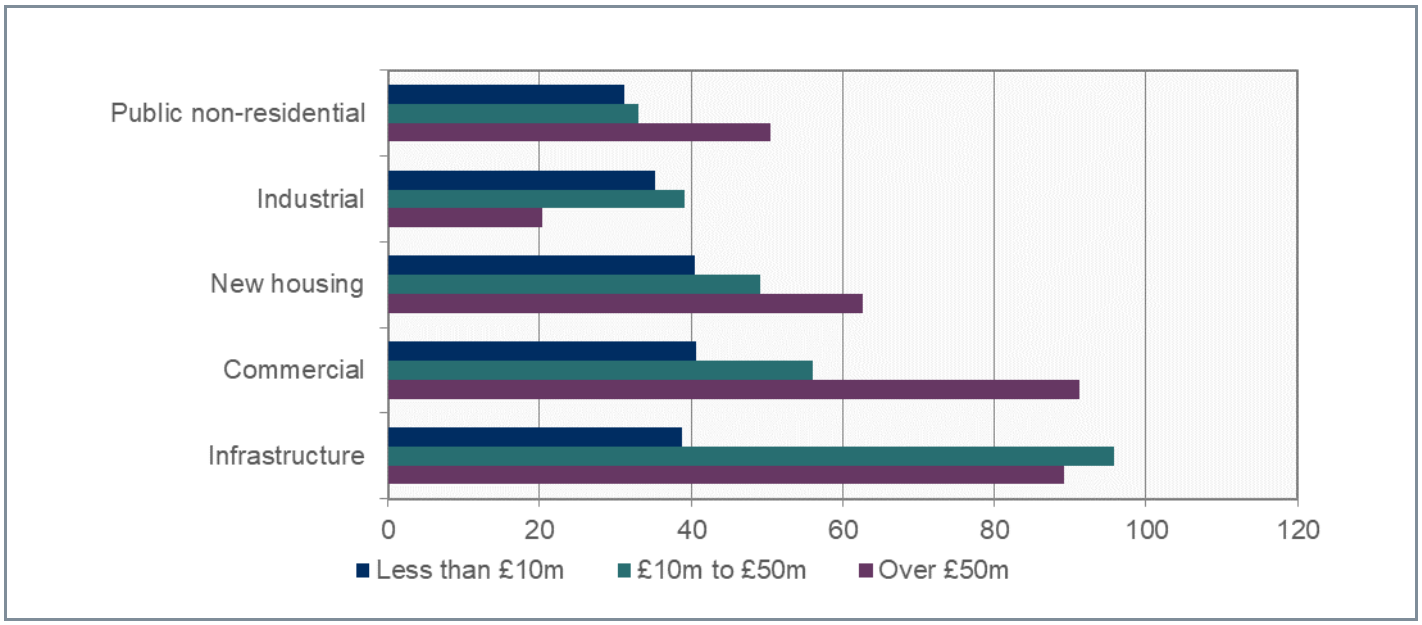

Figure 12: Average number of weeks from planning to work on site, UK 2010-2013 (Source: UKCG/Glenigan)

There will also be work carried out that does not require planning permission, for example household repair and maintenance (R&M) work, and this can account for a significant share of work in the construction sector. Current estimates for R&M work in the North West indicate that it accounts for 34% of yearly construction output.[4]

Also, whilst different types of projects can be categorised by their type of build, such as housing, commercial or industrial, the workforce skills required are less easy to categorise in the same way as some occupations will be able to apply their skills across a number of sectors. For example, evidence from the 2015 Mobility research shows that occupations such as general operatives, bankspersons, roofers and bricklayers are most likely to have only worked on one project type, while painters and decorators, carpenters and joiners, and site managers are more likely to have worked on a wide range of projects.[5]

[4] CITB(2016) Construction Skills Network – North West

[5] CITB(2015) Workforce Mobility and Skills in the UK Construction Sector – North West

6.2. GAP ANALYSIS

With current construction employment in the Liverpool City Region Combined Authority estimated at just under 44,000, the identified demand forecast from projects in Glenigan plus estimates of repair and maintenance of more than 65,000 workers suggests a significant shortfall in local provision. See Table 11.

Table 11: Occupational breakdown of demand for Liverpool City Region Combined Authority against current employment (Source CITB/WLC)

Occupation	Liverpool City Region current employment	Relative risk of shortfall
SKILLED TRADES		
Building envelope specialists	1,370	1.93
Glaziers	470	1.81
Bricklayers	1,170	1.75
Painters and decorators	1,800	1.69
Civil engineering operatives nec*	210	1.67
Specialist building operatives nec*	940	1.60
Wood trades and interior fit-out	4,210	1.58
Plasterers	850	1.53
Electrical trades and installation	3,400	1.47
Floorers	520	1.44
Steel erectors/structural fabrication	420	1.43
Labourers nec*	2,340	1.39
Plumbing and HVAC Trades	3,040	1.37
Roofers	950	1.32
Scaffolders	500	1.30
Logistics	400	1.25
Plant mechanics/fitters	830	1.20
Plant operatives	760	1.18
Non–construction operatives	680	1.18
PROFESSIONAL, MANAGERIAL & OFFICE BASED		
Architects	590	1.86
Surveyors	950	1.79
Construction Project Managers	720	1.67
Senior, executive, and business process managers	2,700	1.63
Construction Trades Supervisors	710	1.62
Civil engineers	720	1.53
Non-construction professional, technical, IT, and other office-based staff	5,780	1.52
Other construction process managers	3,420	1.39
Other construction professionals and technical staff	3,370	1.31
	43,820	**1.51**

Note: nec*: not elsewhere classified; HVAC: Heating, ventilation and air-conditioning.

Table 11 shows that there are some possible disparities where demand is expected to outstrip the current estimates for employment available locally. These occupations show high relative gap in comparison with other occupations.

In Table 11 those occupations highlighted:

- RED – [Top quartile] are at high risk of an immediate shortfall of workers and are worthy of urgent consideration for action to increase numbers of skilled workers.
- AMBER RED – [Second quartile] appear to be at risk of a shortfall and should be reviewed to determine where opportunities for further training and development exist
- AMBER – [Third quartile] still demonstrate a risk of a shortfall but should be monitored and tested to compare with local qualitative opinions.
- BLUE – [Bottom quartile] appear to be at relatively low risk compared with other occupations. This does not mean changes in construction demand, training provision or the movement of workers will not change this status and so monitoring is recommended.

Those roles appearing to be at greatest risk of a shortfall compared with local supply are:

Among skilled trades:

- Building envelope specialists
- Glaziers
- Bricklayers
- Painters and decorators
- Civil engineering operatives nec*
- Specialist building operatives nec*
- Wood trades and interior fit-out
- Plasterers

The majority of these roles require on-site activity for the majority of working time.

Among professional and managerial roles:

- Architects
- Surveyors
- Construction Project Managers
- Senior, executive, and business process managers
- Construction Trades Supervisors
- Civil engineers

These roles are more likely to office based, be relatively mobile or require less regular attendance on site. There is some anecdotal evidence available to suggest that some provision is likely to be met from outside the region.

For roles requiring high level qualifications and professional experience lead times can be very significant and so although a requirement may be urgent, meeting demand from within the City Region area may not be a short term option.

Bricklayers are in demand regionally and nationally as a result of the increase in house building since the end of the recession, as mentioned in the preceding section with a significant increase in the proportion of construction workers that have been working on new housing within the North West; up from 72% to 93%. Bricklaying and trowel occupation qualifications are widely offered at most FE colleges that run construction courses, but the number of people qualifying in this occupation is erratic, with almost 100 achievements in 2015/16, but less than 60 achievements in the 2014/15 academic year. These numbers suggest that much of the demand in both the short and long terms will need to be met by migration from outside the Combined Authority area, and possibly from outside the wider North West region.

Building Envelope Specialists install the elements of the outer shell of a building. Demand for people skilled in this role will be high based on planned projects. The number of achievements in the qualification are currently running at nearly 100 a year in each of the last two years, although this is down from nearly 180 between 2012 and 2014. This means that there is a realistic probability that all those qualifying in this qualification will find employment in the Combined Authority area, although there will still be a need to attract workers from outside the Combined Authority to meet demand.

Similarly, **Steel Erectors and Structural Fabricators** will be much in demand. Achievements in FE training have been very low over recent years with just over ten qualifiers in total since 2012/13. Given the timescales involved it is likely that in the short term some of this demand will be met by migration from outside the Combined Authority area and possibly from outside the North West region.

Demand for **civil engineers**, **architects** and **surveyors** is a reflection of the wider UK shortage[6]. Additionally as professionally qualified occupations, which tend to require degree qualifications, there will be at least three years of education followed by additional training before becoming qualified plus years more to gain experience. If new candidates are to be encouraged to join these professions, it is likely that encouragement is required some years before they start training.

It is therefore highly likely that the short-term demand identified would require workers to be drawn into the Liverpool City Region from the wider region and beyond.

It should also be noted that for some professions workers often have an office location away from the site location and travel between them. And for some, there is some anecdotal evidence to suggest that demand is met by provision based in other centres of population.

See: 264.2.1 Degree level apprenticeships in Higher Education.

6.2.1. Plant operatives

Plant operatives are crucial to the progress and productivity of the construction industry but the risk of shortages highlighted in this report appear less extreme than the experiences of individual local expert witnesses suggest. This is a complex situation and there are a number of factors that may help explain this disparity that include:

- Plant operatives may work across sectors. Although the analysis is specific to the construction sector, the plant equipment and services providers will often work across multiple sectors and many skills for some equipment types will be transferable. So workers may move between sectors. Around 21% of UK plant operatives work within construction.
- Plant supply firms and therefore the plant operatives are relatively mobile and so are thought more likely than some occupations to travel over a larger area to undertake work. This may also skew research findings where supply may be met from outside a project's region and demand may draw operatives away from a region.
- Training provision appears often to exceed expectations. Within the construction sector there are two main causes for this:
    a. Plant operatives will often be required to work with multiple types of machinery and require certification for each significant equipment type – so may hold multiple certifications.
    b. Other professions – notably site based roles, such as bricklayers and labourers – may be required to use plant on-site for which they have gained certification.
- In addition, the implication in relation to training provision for a group of occupations that are mobile is that while training provision may be delivered in one location, the benefits of that training may be felt in different regions and more likely on a national level.
- Shortages may be for specific equipment types while overall the statistics may indicate good levels of provision. This is particularly the case with complex infrastructure works, where unusual specialist machinery is required but for which there is a shortage of appropriately qualified workers. This may go some way to explain shortages highlighted by individual commentators.
- Plant operative employers also operate with different business models and this can complicate the picture:
  - some employ their own operatives and own the plant,
  - some will employ operatives and hire the plant,
  - some will provide the plant for hire while agencies provide the operatives.

[6] Migration Advisory Committee (MAC) Shortage Occupation List 2015

6.3. GAP ANALYSIS – LONG TERM

When looking at the longer term past 2018, the amount of known work in the Combined Authority area decreases. To give a view on the gap analysis across the wider range of work and over the longer term, the annual Average Recruitment Requirement (ARR) details within the North West CSN 2017-2021 report can be used if it is weighted to reflect the fact that Liverpool City Region Combined Authority accounts for about 16% of the construction workforce in the North West.

The short term demand and long term demand for skilled workers in an area can be quite different. A greater or lesser proportion of the short term demand will be met by workers from outside the area, who will stay for only as long as the demand exists. This is especially true for highly skilled or niche jobs where it wouldn't be viable to train people to meet a temporary spike in demand.

Where the demand for specific skills becomes a long term need, then reliance on a migratory workforce is not feasible, and this then becomes an annual recruitment requirement to be met by recruiting new workers to the industry. As would be expected, the relative requirement for occupations in the longer term is lower than the short term spike in demand created by the scale of some of the know projects discussed in this report.

It is also worth noting that some of the professional occupations, notably architects, give a slightly misleading picture in terms of supply and demand as they can be based almost anywhere in the world, and don't necessarily need to visit the construction site. Others, such as Surveyors, will travel widely to construction projects, so a high demand in one area need not be met by employees from that area over the long term.

There are several occupations where the overall long term demand creates a need for workers that is not reflected in the short term pipeline of known projects, e.g. plasterers, logistics operatives, and civil engineers nec. This allows slightly longer to plan for how to match supply with demand, and should also afford more time to meet more of this demand via local training.

With these points in mind, the long term forecast for Liverpool City Region Combined Authority identifies a range of occupations with a high occupational requirement, either as a proportion of employment or as a percentage of overall demand. These occupations are:

- Wood trades and interior fit-out
- Bricklayers
- Plasterers
- Electrical trades
- Plumbing & HVAC trades
- Logistics
- Civil Engineering Operatives nec
- Non construction professional, technical, IT, and other office based jobs (% of demand)

Several other occupations have a moderately high demand figure which would require monitoring – shown in Table 12 below:

Table 12: Occupational breakdown of ARR for North West region as a whole (Source CITB)

Occupation	Liverpool City Region	ARR 2017-2021 (Combined Authority)	ARR as % of 2016 Employment Forecast
MANAGERIAL, PROFESSIONAL & OFFICE BASED			
Senior, executive, and business process managers	2,700	<10	-
Construction Project Managers	720	<10	-
Other construction process managers	3,420	30	0.90%
Construction Trades Supervisors	710	20	2.70%
Civil engineers	720	<10	-
Other construction professionals and technical staff	3,370	10	0.30%
Surveyors	950	<10	-
Architects	590	20	2.90%
Non-construction professional, technical, IT, and other office-based staff	5,780	90	1.50%
SKILLED TRADES			
Wood trades and interior fit-out	4,210	110	2.60%
Bricklayers	1,170	60	5.20%
Building envelope specialists	1,370	20	1.30%
Painters and decorators	1,800	30	1.60%
Plasterers	850	40	4.80%
Roofers	950	10	1.50%
Floorers	520	<10	-
Glaziers	470	10	2.70%
Specialist building operatives nec*	940	<10	-
Scaffolders	500	<10	-
Plant operatives	760	30	3.90%
Plant mechanics/fitters	830	20	2.10%
Steel erectors/structural fabrication	420	10	2.30%
Labourers nec	2,340	70	2.80%
Electrical trades and installation	3,400	100	3.00%
Plumbing and HVAC Trades	3,040	90	2.90%
Logistics	400	20	5.60%
Civil engineering operatives nec	210	10	5.30%
Non-construction operatives			
Total	**43,140**	**805**	**1.87%**

Note – Annual average recruitment requirements excludes non-construction operatives

6.4. GAP ANALYSIS – TRAINING NEEDS

Looking at the future demand against current competence based training, there are two aspects:

- Is there training in the areas of potential demand?
- Is there the volume of training required across the spread of occupations?

Taking the first of these, ***'is there the training in the areas of potential demand?'***

The demand analysis and CSN identify bricklayers, logistics and civil engineering operatives as being in demand. The demand analysis also identifies architects, surveyors, civil engineers, building envelope specialists, and steel erector/structural fabrication as being significant.

Logistics is not a construction specific occupation; therefore supply and demand are more influenced by demand from other sectors including: retail, warehousing and transport.

For **architects**, **surveyors**, and **civil engineers** demand would typically be met from graduate level recruitment, which would not be restricted to supply from within the Liverpool City Region Combined Authority.

Training for manual occupations, as measured by learner aims, has declined in the Liverpool City Region and the wider North West, meaning that there is likely to be a need, in the short-term at least, to rely on workers from outside the area to meet demand.

The second question ***"is there the volume of training required across the spread of occupations?"*** is possibly mixed in response. There would appear to be:

- Provision for training across the range of occupations
- A core of providers who deliver the majority of training
- Good provision of competence qualifications for certain occupations, most notably Wood trades and interior fit-out, plumbing and HVAC trades, and electrical trades and installation. However:
- There are occupations, such as construction trades supervisors, plant mechanics/fitters, Plant operatives and roofers where the levels of competence based training appears to be slightly low.

6.5. GAP ANALYSIS – PEAK DEMAND COMPARED WITH RECENT TRAINING PROVISION

The report establishes for the Liverpool City Region both:

- A hierarchy of occupations by peak demand (shown in Figure 4) and also provides
- Details of recent competence qualifications (shown in Table 6: Competence qualification Learner Aims in Liverpool City Region Combined Authority as a % of total Learner Aims in North West as a whole (all qualification levels)

Comparing the two may be helpful in identifying where there appears to be relatively good or relatively poor provision between occupations.

Table 13: Liverpool City Region peak demand compared with competence training provision

Occupation	Peak demand	Average annual competence training over four years – 2012/13 to 2015/16	Average annual competence training provision (four years – 2012/13 to 2015/16) compared with demand
Other construction professionals & technical staff	4400	17.50	0.40%
Construction project managers	1200	6.25	0.52%
Plant mechanics/fitters	1000	7.50	0.75%
Steel erectors/structural fabrication	600	6.25	1.04%
Logistics	500	6.25	1.25%
Construction trades supervisors	1150	15.00	1.30%
Painters and decorators	3050	42.50	1.39%
Electrical trades and installation	5000	90.00	1.80%
Wood trades and interior fit-out	6650	175.00	2.63%
Roofers	1250	42.50	3.40%
Bricklayers	2050	80.00	3.90%
Plumbing and HVAC Trades	4150	167.50	4.04%
Plasterers & dry liners	1300	52.50	4.04%
Floorers	750	32.50	4.33%
Scaffolders	650	30.00	4.62%
Building envelope specialists	2650	135.00	5.09%
Glaziers	850	47.50	5.59%
Specialist building operatives nec*	1500	102.50	6.83%
Civil engineering operatives nec*	350	37.50	10.71%
Plant operatives (see section 6.2.1)	900	142.50	15.83%

It is, however important to note that in some cases training provision may be delivered outside the Combined Authority area. This is particularly likely for more specialised training and the relatively small geographic area of the Combined Authority, close to other centres of population increase this likelihood .

In Table 13 those occupations highlighted:

- RED – [Bottom quartile] indicate VERY LOW LEVELS of competence training provision in comparison for the anticipated demand for skilled workers.
- AMBER – [Third quartile] indicate RELATIVELY LOW LEVELS of competence training provision in comparison for the anticipated demand for skilled workers.
- BLUE – [Second quartile] indicate ACCEPTABLE levels of competence training provision in comparison for the anticipated demand for skilled workers.
- GREEN – [Top quartile] indicate RELATIVELY GOOD levels of competence training provision in comparison for the anticipated demand for skilled workers.

Plant operatives – training levels are difficult to provide a direct comparison. (See section 6.2.1 for explanation.)

7. CONCLUSIONS AND RECOMMENDATIONS

The aim of the Liverpool City Region should be to achieve progress in addressing the long term and immediate challenges that the construction industry faces in the area. However, balancing the supply of construction workers and skills against future demand and ensuring that a well-qualified workforce is in place is likely to be assisted by the Combined Authority encouraging collaboration between influential local stakeholders. Positive progress is likely to be the result of a succession of incremental and interlinked actions undertaken by organisations working towards common goals.

There is strong evidence to suggest that the Liverpool City Region area will suffer a shortage for some critical construction occupations. While these may be drawn in from others areas, the risk of inadequate local skills is that construction may be delayed or increase in price, inhibiting the achievement of local social and economic goals.

There are six recommendations.

7.1. COLLABORATIVE PARTNERSHIPS

Conclusion

It will be essential to ensure that those interested in construction and with an influence over outputs and construction skills in the Liverpool City Region area work together. It is clear that training provision does not always align with demand and does not appear to address the requirements of construction employers. (E.g. much training delivered at lower levels; much is knowledge rather than competency based. [Anecdotally, employers report a preference for competency training and a concern that too often knowledge based training does not produce site-ready workers.]

Recommendation

a) The Combined Authority should ensure that relevant stakeholders and influencers are engaged. Share available evidence with them with a view to building collaborative holistic action plans. Points of common interest should be established to encourage these stakeholders to input to, and take ownership of, the construction skills actions. This will maintain a sense of shared ownership of the challenges, priorities and solutions. Those stakeholders include: local construction businesses; major employers; local authorities; developers (especially those interested in housing); housing associations; those responsible for managing infrastructure (transport and utilities); construction training providers, local influencers and universities. This may, in particular, include establishing immediately, closer working relationships with the largest projects taking place across the region (that will have disproportionate significance) in developing and supporting the skills and employment strategic framework.

b) An early action may be to establish a construction working group comprising those with a remit to, or influential in, developing the built environment in the Liverpool City Region and neighbouring areas and task it with delivering outputs that achieve the Combined Authorities desired outcomes.

7.2. SKILLS STRATEGY: PIPELINE IDENTIFICATION, PLANNING AND EXPLOITATION

Review and develop, as appropriate, existing construction skills strategy. Establish a Liverpool City Region construction skills strategy and action plan

Conclusions

An ambition of the developing construction skills and training pathways should be to match training and development with the needs of employers and the local economy. In the Combined Authority area 83% of FE training is provided by ten providers; 63% by just the biggest five so the greatest potential impact is through mediated collaboration, between the FE colleges.

A common complaint of construction employers is that new starters are not often enough *site ready* so pathways might include working with employers to enhance new starters' site readiness and behaviours. It appears that the majority of training provision is at low levels that are a necessary step in an individual's development but insufficiently often meet the needs of employers.

Some anecdotal evidence received by CITB suggests that in many cases, construction FE courses are completed but do not lead to a career in the occupation for which they are trained. Although this cannot be quantified at the moment, this is supported by an apparent mismatch between training achievements and occupational supply. This suggests a need to work with colleges, employers and graduating students to help ensure that a greater proportion move into appropriate additional and vocational training and the career for which they have a qualification.

Recommendations

a) Develop the Liverpool City Region construction action plan to ensure that priority is given to trades and professions highlighted in this report as being:
    1. In high demand AND at high risk of a shortfall.
    2. In high demand
    3. At high risk of a shortfall

b) Longer term projections and the development of scenarios may enable an assessment of the potential impacts of major initiatives that may skew demand. [For example, the Liverpool City Region area appears to have an aspiration to increase the provision of new housing. However, the immediate pipeline suggests significant investment in other sub sectors, notably infrastructure.] An action for the Combined Authority is to establish whether this trend is likely to continue and if so ensure that training provision addresses future demand for occupations of relevance, in particular to house builders.

c) An early action plan should assess if employers are facing specific skills shortages or skills wage inflation and what short-term interventions can be activated to address them. If issues are identified, consideration should be given to pursuing funding that can be utilised to support delivery of new training interventions.

d) Early consideration should be given to those occupations that need to be site-based, for which demand cannot be met by office based roles that could be located outside the Liverpool City Region area.

e) Identify demographic data available and associate, as far as possible, actions with opportunities for those where the greatest potential social and economic impact can be gained by addressing occupational shortfalls or other priorities.

7.3. DEVELOP FUTURE SKILLS AND TRAINING PATHWAYS

Conclusions

It is clear there is high demand for several construction occupations and so there will be continuing demand to train people in essential skills. There are also some apparent gaps between supply and demand where immediate action would help address shortfalls in the near future.

However employers often report that introductory training delivered at levels 1 and 2 does not give them site ready proficient workers. And there is evidence to suggest that many who complete construction training at levels 1 and 2 do not then move into construction careers. However there is also anecdotal evidence that colleges would like to support the provision of more apprenticeships but that employers are not always providing the opportunities.

There will also be a developing need for new skills to address new construction methods (e.g. offsite and modular build and the need for BIM applications.)

The CITB report – 'Faster, Smarter, More Efficient: Building Skills for Offsite Construction' – provides an assessment of how the adoption of offsite is changing the skills and training landscape for construction.

Recommendations

a) By working together the major colleges can avoid duplication of effort or share resources, enhance specialisations and explore innovative ways of delivering the curriculum that meets employers' and students' needs.

b) The aims of this should be to: reduce the provision of under-subscribed courses; add provision for over-subscribed courses; add additional or enhance specialist courses to reflect the potential need for new construction skills and balance the provision of training with anticipated demand from the construction contractors locally.

c) A starting point may be to consider those occupations where there appears to be high demand and a high relative gap. An option is to pilot a range of solutions to test validity and effectiveness and achieve the most expedient solutions.

d) Action to address future skills needs should be incremental and take into consideration the delivery of training that supports construction industry needs – i.e. establish site ready proficient workers. Emphasis should be on ensuring that training shifts towards or leads to the provision of more competency based training and high quality sustainable apprenticeships.

e) One potential opportunity may be to identify and facilitate how FE colleges and employers can engage with specialist training providers as well as with major projects, to establish greater provision to address:

- A common complaint of construction employers. That is – new starters are not often enough 'site ready' so a curriculum might including working with employers to enhance new starters' site readiness and behaviours.
- Address any anticipated specific local needs and ensure that training delivers what employers need as part of a complete package of training initiatives.

f) This may involve establishing training pathways through which students can complete initial knowledge based training before progressing into vocational training and apprenticeships and gaining site experience (while finishing their training).

g) In the longer term there may also be opportunities for the Combined Authority to work with those colleges that offer Higher Education qualifications and Universities to consider how they can attract, train and retain the higher level, advanced and 'future' skills for which there appears to be demand and inadequate provision (across the UK). For example that may be in high demand for the many significant projects that are expected to proceed in the Liverpool City Region area and further afield and that will increasingly need to utilise developing technology (e.g. BIM).

h) Consideration should also be given to building an understanding of the economic and transport inhibitors that may prevent people accessing training and apprenticeships. Are there options for ensuring that training is provided where it is accessible; that those with limited financial support can receive support with the provision of appropriate clothing and equipment or that there is assistance with transport to remote worksites.

7.4. OUTREACH: BUILD A MORE POSITIVE IMAGE OF CONSTRUCTION WITH YOUNG PEOPLE. AND INCREASE RECRUITMENT THROUGH NEW ENTRANCE POINTS, CAREER CHANGES AND RESKILLING.

Conclusion

Construction is sometimes associated with negative and inaccurate stereotypes that deter potential recruits, with education choices and career decisions often influenced in school and sometimes at a very early age.

It is increasingly clear that influences and preferences are established early in childhood and so it may be appropriate to build a positive profile of construction with children before the age of 11 as well as during secondary education.

Recommendation

a) With an anticipated long term demand for some skills, the potential exists for an outreach programme that goes out to schools to build a positive perception of construction for the future as offering high value rewarding careers for all. And subsequently encourages applications for construction skills courses and apprenticeships from a broader spectrum of young people – in particular ethnic minorities and women.

b) There are further opportunities for outreach with those aged 16 and above, in particular those studying relevant *STE(A)M* subjects but who have not considered that they lead into interesting and rewarding carers in construction or supporting construction.

c) CITB has supported employers across the construction and built environment to come together working with a number of stakeholders to develop an industry led initiative called Go Construct (www.goconstruct.org). This initiative inspires individuals to find out more about the sector, to access an experience with employers from school engagement via the Construction Ambassador scheme and find work experience placements.

d) There may also be more mature audiences that can be encouraged to move into construction careers. This may include people with relevant transferable skills (e.g. from manufacturing or ex-military) or those where there is a significant social gain by ensuring they are in valuable employment, in particular the unemployed but also ex-offenders and so contact should be made with DWP and HM Prison Service. Targeted intervention should be included within the construction action plan.

e) There is an opportunity to maximise Go Construct and introduce other similar employer and local authority led initiatives to raise engagement between the local employers, educators and individuals from all backgrounds. (E.g. Careers and Enterprise Company.)

7.5. USE PROCUREMENT AS A LEVER TO ENABLE SKILLS DEVELOPMENT

Conclusion

Construction is delivered through construction suppliers, often funded by private developers as well as by local authorities and regulated by local planning authorities. These organisations are better placed to prepare for the future if they have certainty on which to base their plans. The proportions that are small and micro companies are high and these companies have limited ability to maintain the processes and people to search for local opportunities or that enable collaboration to support larger projects.

The Combined Authority has indicated an aspiration to influence clients to achieve wider social and economic benefits as well as achieving value for money. There is a desire to explore ways to make sure that corporate social responsibility obligations are monitored, with contractors required to demonstrate that they achieve quantifiable benefits in relation to commitments made. This may require ensuring that best practice and details of commitments are shared between local authorities and other stakeholders.

Recommendations

a) The potential exists through smarter approaches to procurement (including co-ordinated approaches to Section 106 agreements) to encourage those bidding for construction and infrastructure contracts or those funding developments to be mandated to include provision for recruitment, training, apprenticeships and outreach that is co-ordinated across the Combined Authority area.

b) Provision could be required to hold contractors to account for commitments made. Such an approach could be co-ordinated through the Liverpool City Region and local authorities and be a requirement of planning applications and local authority and public sector contracts.

c) Early engagement with employers to discuss any such approach is recommended to find ways of ensuring that such requirements take into consideration the industry's needs and circumstances.

d) Procurement of major contracts, or conditions of planning consent could mandate the sharing of supply and sub-contracting through a locally managed portal available to businesses based within the region.

7.6. MAINTAINING & ENHANCING THE EVIDENCE BASE

Utilise local qualitative knowledge and experience to inform the findings of this report. And use other sources of data available to help inform decision making. CITB publishes a range of research of relevance to the construction industry but other relevant information is also regularly published.

Utilise the licence to use the CITB Labour Forecasting Tool to regularly update the evidence base that supports decision making as circumstances change and to demonstrate construction pipeline opportunities. Ensuring that pipeline visibility assists the local industry in reducing risks such as economic instability or maintaining sustainable employment. The demand forecasts produced using data from Glenigan are the result of a snapshot at a moment in time and so it is wise to update demand at regular intervals according to the need and capability.

END

AUTHORS

Mohamed El-Haram
Martin Turner
Marcus Bennett

Version	Date	Details of modifications
First draft	November 2017	Collated demand and supply data
Draft v4	December 2017	First draft to share with client only
Draft v 5	April 2018	Incorporating feedback & new content

CITB, Bircham Newton, Norfolk, PE31 6RH
+44 (0)344 994 4400
www.citb.co.uk

CITB is registered in England and Wales Charity No 264289 and in Scotland Charity No SC044875

Whole Life Consultants Limited, Dundee University Incubator, James Lindsay Place, Dundee, DD1 5JJ
+44 (0)1382 224 304
enquiries@wlcuk.com

Whole Life Consultants Ltd is registered in Scotland as SC259987, VAT number 852809506 Registered office c/o 14 City Quay, Dundee DD1 3JA

WHOLE LIFE CONSULTANTS LTD

APPENDICES

Construction skills gap analysis for the Liverpool City Region Combined Authority area

Appendices to the Construction skills gap analysis for the Liverpool City Region Combined Authority area

April 2018

APPENDIX CONTENTS

APPENDIX A. DEMAND ANALYSIS METHODOLOGY

Introduction

The Construction Skills Network (CSN) provides labour market intelligence for the construction industry. Developed by Experian on behalf of CITB it forecasts labour demand in each of 12 UK regions and provides forecasts of how the industry will change year on year. It is not designed however to predict labour demand at a sub-regional level. For this purpose, we use our prize-winning Labour Forecasting Tool (LFT) developed on behalf of CITB. Labour demand is calculated by converting the volume of construction activity forecast to take place in any geographical region into forecast labour demand using labour coefficients (the number of person years required to produce £1m of output). For the sake of consistency with ONS terminology the 'volume of activity' is referred to as 'output' throughout this report. The following sections describe:

- the sources of data we use;
- how the output is calculated;
- how we deal with the absence of comprehensive data that is the typical situation beyond the first year or two of our analysis;
- how we reconcile any differences between the results produced by the LFT and those produced by the CSN;
- the steps we take to take account of any shortcomings in the sources of data;
- and how the LFT converts output into labour demand.

Calculating construction output

A.1.1.1. Data sources

There are two principal sources of data: the Glenigan database and the National Infrastructure and Construction Pipeline (NICP). Once we have elicited the appropriate data, the results are sent to the Liverpool City Region to supplement and/or confirm.

A.1.1.2. Glenigan

The original purpose of the Glenigan database is to allow contractors to identify leads and to carry out construction market analysis. It is updated every quarter to provide details of planning applications from local authorities supplemented with additional project-specific data. Of particular relevance to this report, it provides a description of each project, its name, location, value, and in most cases, projected start and end dates. It contains many tens of thousands of projects. The Glenigan pipeline does not identify every single project in an area: projects which are small (typically but not exclusively those less than £250,000 in value), and most that involve repair and maintenance are not included.

We have used the latest available cut of Glenigan data (2017Q2) including all the relevant projects which started before 2017 but excluding those which are already complete. We have included in our analysis only those projects shown to be at the following planning stages because there is a reasonable probability that these projects will be realised in practice:

- Planning not required
- Detail plans granted
- Reserved matters granted
- Application for reserved matters
- Plans approved on appeal
- Listed building consent

The values of some infrastructure projects given in the Glenigan database are the total value of construction and engineering works. In these cases, since the scope of this study is limited to the construction sector, an estimate of the engineering value has been calculated and subtracted from the total value. This provides what we have termed the construction value. The percentages applied to the total value of each infrastructure project type to derive the construction value are shown in Table 14. The construction/engineering proportions have been validated through work we have undertaken for other clients and have been used in the production of Infrastructure UK's National Infrastructure Plan for Skills and the Construction Skills Network forecasts.

An initial review of the projects in the pipeline is carried out to ensure that only projects which have (a) a defined value and (b) defined start and end dates, are considered in the analysis, and that no projects are duplicated. For example “major leads” and “frameworks” may include smaller projects that are separately identified in the database.

Because of the size of the database, it is impossible to review the details of every project. Instead, we identify the small number of projects that represent the greatest value, the so-called significant projects. To do this, we use the Mean Value Theorem developed at the University of Dundee which states that maximum information from any set of data is obtained simply by considering the data whose value is greater than the average. This is a version of the Pareto rule which suggests that 80% of the value in a data set is contained within the 20% of items whose value is the greatest. The significant projects are then thoroughly inspected to make sure that the information reported in the Glenigan database is consistent and accurate as far as can be ascertained. Any anomalies are resolved, if necessary by returning to the source of the data. Since this process typically picks up the projects whose value represents 80% of the total, the scope for any errors in the remaining data to have a significant impact is severely limited.

Table 14: Proportion of total value related to construction

Infrastructure type	Sub-type	Construction value as a proportion of total value
Flooding	Flooding	90%
Transport	Bridges	100%
	Road Tunnel	100%
	Roads	100%
	Air Traffic Control	100%
	Airports	100%
	Ports	90%
	Stations (Underground/Network rail)	80%
	Mixed Rail	55%
	Electrification	35%
	Underground/DLR (not incl. Stations)	35%
	Rail maintenance	10%
	Trams	55%
	Contactless Ticketing	20%
Water	Water/Wastewater Treatment Works	90%
Communications	Broadband/Digital infrastructure	20%
Energy	Photovoltaics	80%
	Generation (Biomass)	50%
	Generation (Energy from Waste)	50%
	Generation (Nuclear)	50%
	Undefined Electricity Generation	40%
	Generation (Fossil fuel)	25%
	Generation (Renewables - Offshore)	20%
	Generation (Renewables - Onshore)	10%
	Gas Transmission/distribution	30%
	Electricity transmission/distribution	25%
	Interconnectors	20%
	Nuclear Decommissioning	60%
	Smart Meters	0%
	Oil and Gas	10%
Mining	Mining	80%
General infrastructure	General infrastructure	100%

For the significant projects, the project descriptions in the database are assigned the most appropriate project type to be used when the data is input to the LFT (each type is driven by a different underlying model). Cases where a project consists of more than one type are broken down into multiple forecasts which are assigned specific project types to more closely predict the labour demand. This takes account of the different types of work which may exist within a single project, e.g. mixed developments comprising residential, commercial and industrial building. For the non-significant projects, the default project type defined in the Glenigan pipeline is applied.

In order to maintain consistency with the CSN, whose forecasts extend only as far as 2020/21, we have limited our analysis of the Glenigan data to the annual spends up to and including 2020/21.

A.1.1.3. NICP data

The Infrastructure and Projects Authority (formerly Infrastructure UK and Major Projects Authority) compile a pipeline of UK infrastructure and construction projects and the associated annual public and private investment. For this report we have used the Autumn 2016 NICP which includes details of around 720 projects valued at some £500bn.

The NICP data is examined to identify infrastructure projects or programmes of work taking place in the Liverpool City Region that are not included in the Glenigan database. The construction cost is calculated from the total cost reported in the NICP using the percentages in Table 14. Projects in the Glenigan dataset and the NICP are combined (ensuring that there is no double counting) to create a pipeline of 'denominated' projects for the area. We have only considered those projects which are specifically allocated to the Liverpool City Region in the NICP (i.e. projects at a national level have not been considered).

The Autumn 2016 pipeline includes both construction and infrastructure projects but for the purposes of this analysis we have included only projects which are clearly defined specific projects rather than regional programmes of work. This reduces the risk of double counting with data in Glenigan.

A.1.1.4. CSN data

The CSN model produced by Experian also uses Glenigan as a major source of data relating to the volume of construction activity in the UK. Experian supplement the Glenigan data with market intelligence collected by a variety of means including a series of 'Observatories' held every six months in each region, at which representatives of the industry are invited to comment on the validity of Experian's data and findings. In Experian's annual CSN report, their estimate of the output in each of the following sectors is published:

- Public housing
- Private housing
- Infrastructure
- Public non-housing
- Industrial
- Commercial
- Housing repair and maintenance
- Non-housing repair and maintenance

Aligning the Glenigan pipeline with CSN output

The following process is undertaken to ensure that the value of work in the Glenigan pipeline is aligned with output as measured by the CSN.

7. Considering the government region within which the Liverpool City Region lies (in this case, the North West), identify only the new build in the denominated projects by removing all repair and maintenance projects.
8. Compare the output identified in the denominated projects as new build at the regional level with the CSN new build at the regional level sector by sector e.g. residential, non-residential, infrastructure etc.
9. If in any sector the denominated new-build regional output for the peak year is more or less than that forecast by the CSN for the same year then the value of each new build denominated project is factored by the following ratio:

$$\frac{Value\ of\ CSN\ new\ build\ at\ regional\ level\ for\ given\ sector}{Value\ of\ denominated\ new\ build\ projects\ at\ regional\ level\ for\ given\ sector}$$

The outputs calculated in this way are referred to as 'factored new build outputs'

This process takes account of both projects (typically less than £250k in value) not included in the denominated projects and those whose value or probability of realisation is over-optimistic.

10. To take account of housing repair and maintenance (R&M) at the Combined Authority level, it is assumed that the proportion of the total output represented by housing R&M is the same at the Combined Authority level as it is at the regional level in the CSN. The Glenigan new build factored housing output is therefore multiplied by the following ratio:

$$\frac{Value\ of\ CSN\ housing\ R\&M\ at\ regional\ level}{Value\ of\ CSN\ new\ build\ housing\ at\ regional\ level}$$

to derive the output in housing R&M to be added to the factored new build output

11. The non-housing R&M to be added to the factored new build non-housing output is calculated in a similar way.

Dealing with the 'cliff edge'

As the time horizon extends there is less clarity on what is planned. As a result, the number of denominated projects declines the further into the future we look. This apparently declining workload is highly unlikely to reflect the total amount of work that will take place in the future. It is almost certain that there will be additional projects that come on stream which are yet to be identified. To overcome this 'cliff edge' effect we assume, based on an analysis of historical data, that the future workforce is approximately equal to the peak. It should be noted that the peak labour demand refers to the current "snapshot" of the scheduled construction spend. It is prudent to expect that, should the investment in future years follow the same pattern, the peak labour demand figures are likely to be roughly similar assuming the mix of projects remains consistent. The peak has, therefore, been projected forwards and backcast to create a more likely scenario of the ongoing workforce. The employment growth rate is based on the CSN employment forecast for the whole region under consideration.

A consequence of this approach is the implicit assumption that the proportion of people in each occupation in the additional projects remain unchanged year on year.

Calculating total labour demand

Our Labour Forecasting Tool is used to determine the labour demand generated by the construction outputs in the peak year calculated as described in Sections 2.2, and 2.4. The LFT can determine the labour demand generated by a pipeline of construction projects given only the project types, their start and end dates and their locations. It quantifies the month-by-month demand in each of the 28 occupational groups shown in Appendix A. To do this, it uses labour coefficients (person years to produce £1m of output) derived from historical ONS data. The labour coefficients are updated annually as new data becomes available, and indexed to take account of changes in prices.

There are different labour coefficients for each occupation and for each of the following project types:

- residential
- non-residential
- infrastructure
- residential R&M
- non-residential R&M

Infrastructure projects can be broken down into the types shown in Table 14.

APPENDIX B. OCCUPATIONAL DEFINITIONS

Reference is made in this report to a range of occupational aggregates for construction occupations. This appendix contains details of the 166 individual occupations which are aggregated into 28 occupational aggregates.

Occupations included within construction occupational aggregates (Four-digit codes refer to Office for National Statistics Standard Occupational Classification Codes).	
1 Senior, executive, and business process managers	
(1115) Chief executives and senior officials	(1162) Managers and directors in storage and warehousing
(1131) Financial managers and directors	(1259) Managers and proprietors in other services nec
(1132) Marketing and sales directors	(1139) Functional managers and directors nec
(1133) Purchasing managers and directors	(2133) IT specialist managers
(1135) Human resource managers and directors	(2134) IT project and programme managers
(1251) Property, housing and estate managers	(3538) Financial accounts managers
(1136) Information technology and telecommunications directors	(3545) Sales accounts and business development managers
(2150) Research and development managers	
2 Construction project managers	
(2436) Construction project managers and related professionals	
3 Other construction process managers	
(1121) Production managers and directors in manufacturing	(3567) Health and safety officers
(1122) Production managers and directors in construction	(3550) Conservation and environmental associate professionals
(1161) Managers and directors in transport and distribution	
(1255) Waste disposal and environmental services managers	
4 Non-construction professional, technical, IT, and other office–based staff (excl. managers)	
(3131) IT operations technicians	(3541) Buyers and procurement officers
(3132) IT user support technicians	(3562) Human resources and industrial relations officers
(3534) Finance and investment analysts and advisers	(4121) Credit controllers
(3535) Taxation experts	(4214) Company secretaries
(3537) Financial and accounting technicians	(7129) Sales related occupations nec
(3563) Vocational and industrial trainers and instructors	(7211) Call and contact centre occupations
(3539) Business and related associate professionals nec	(7219) Customer service occupations nec
(3520) Legal associate professionals	(9219) Elementary administration occupations nec
(3565) Inspectors of standards and regulations	(2111) Chemical scientists
(2136) Programmers and software development professionals	(2112) Biological scientists and biochemists
(2139) Information technology and telecommunications professionals nec	(2113) Physical scientists
(3544) Estate agents and auctioneers	(3111) Laboratory technicians
(2413) Solicitors	(3421) Graphic designers
(2419) Legal professionals nec	(2463) Environmental health professionals
(2421) Chartered and certified accountants	(2135) IT business analysts, architects and systems designers
(2424) Business and financial project management professionals	(2141) Conservation professionals
(2423) Management consultants and business analysts	(2142) Environment professionals
(4216) Receptionists	(2425) Actuaries, economists and statisticians
(4217) Typists and related keyboard occupations	(2426) Business and related research professionals
(3542) Business sales executives	(4124) Finance officers
(4122) Book-keepers, payroll managers and wages clerks	(4129) Financial administrative occupations nec
(4131) Records clerks and assistants	(4138) Human resources administrative occupations
(4133) Stock control clerks and assistants	(4151) Sales administrators
(7213) Telephonists	(4159) Other administrative occupations nec
(7214) Communication operators	(4162) Office supervisors
(4215) Personal assistants and other secretaries	(7130) Sales supervisors
(7111) Sales and retail assistants	(7220) Customer service managers and supervisors
(7113) Telephone salespersons	(4161) Office managers

5 Construction trades supervisors	
(5250) Skilled metal, electrical and electronic trades supervisors (5330) Construction and building trades supervisors	
6 Wood trades and interior fit-out	
(5315) Carpenters and joiners (8121) Paper and wood machine operatives	(5442) Furniture makers and other craft woodworkers (5319) Construction and building trades nec (25%)
7 Bricklayers	
(5312) Bricklayers and masons	
8 Building envelope specialists	
(5319) Construction and building trades nec (50%)	
9 Painters and decorators	
(5323) Painters and decorators	(5319) Construction and building trades nec (5%)
10 Plasterers	
(5321) Plasterers	
11 Roofers	
(5313) Roofers, roof tilers and slaters	
12 Floorers	
(5322) Floorers and wall tillers	
13 Glaziers	
(5316) Glaziers, window fabricators and fitters	(5319) Construction and building trades nec (5%)
14 Specialist building operatives not elsewhere classified (nec)	
(8149) Construction operatives nec (100%) (5319) Construction and building trades nec (5%)	(9132) Industrial cleaning process occupations (5449) Other skilled trades nec
15 Scaffolders	
(8141) Scaffolders, stagers and riggers	
16 Plant operatives	
(8221) Crane drivers (8129) Plant and machine operatives nec	(8222) Fork-lift truck drivers (8229) Mobile machine drivers and operatives nec
17 Plant mechanics/fitters	
(5223) Metal working production and maintenance fitters (5224) Precision instrument makers and repairers (5231) Vehicle technicians, mechanics and electricians	(9139) Elementary process plant occupations nec (5222) Tool makers, tool fitters and markers-out (5232) Vehicle body builders and repairers
18 Steel erectors/structural fabrication	
(5311) Steel erectors (5215) Welding trades (5214) Metal plate workers, and riveters	(5319) Construction and building trades nec (5%) (5211) Smiths and forge workers (5221) Metal machining setters and setter-operators
19 Labourers nec	
(9120) Elementary construction occupations (100%)	
20 Electrical trades and installation	
(5241) Electricians and electrical fitters (5249) Electrical and electronic trades nec	(5242) Telecommunications engineers
21 Plumbing and heating, ventilation, and air conditioning trades	
(5314) Plumbers and heating and ventilating engineers (5216) Pipe fitters	(5319) Construction and building trades nec (5%) (5225) Air-conditioning and refrigeration engineers
22 Logistics	
(8211) Large goods vehicle drivers (8212) Van drivers (9260) Elementary storage occupations	(3541) Buyers and purchasing officers (50%) (4134) Transport and distribution clerks and assistants

23 Civil engineering operatives not elsewhere classified (nec)	
(8142) Road construction operatives (8143) Rail construction and maintenance operatives	(8123) Quarry workers and related operatives
24 Non–construction operatives	
(8117) Metal making and treating process operatives (8119) Process operatives nec (8125) Metal working machine operatives (8126) Water and sewerage plant operatives (8132) Assemblers (vehicles and metal goods) (8133) Routine inspectors and testers (8139) Assemblers and routine operatives nec	(9249) Elementary security occupations nec (9233) Cleaners and domestics (9232) Street cleaners (5113) Gardeners and landscape gardeners (6232) Caretakers (9241) Security guards and related occupations (3319) Protective service associate professionals nec
25 Civil engineers	
(2121) Civil engineers	
26 Other construction professionals and technical staff	
(2122) Mechanical engineers (2123) Electrical engineers (2126) Design and development engineers (2127) Production and process engineers (2461) Quality control and planning engineers (2129) Engineering professionals nec (3112) Electrical and electronics technicians (3113) Engineering technicians (3114) Building and civil engineering technicians	(3119) Science, engineering and production technicians nec (3121) Architectural and town planning technicians (3122) Draughtspersons (3115) Quality assurance technicians (2432) Town planning officers (2124) Electronics engineers (2435) Chartered architectural technologists (3531) Estimators, valuers and assessors (3116) Planning, process and production technicians
27 Architects	
(2431) Architects	
28 Surveyors	
(2433) Quantity surveyors (2434) Chartered surveyors	

APPENDIX C. GLENIGAN PROJECTS REMOVED FROM THE LIVERPOOL CITY REGION

This section contains a list of all the Glenigan projects removed from the analysis, stating the reason for their exclusion.

	Heading	Local Authority	Value (£m)	Start Date	End Date	Reason for omission
1	200 Flats	Liverpool	8.500			Missing Values
2	27 Flats (New/Conversion)	Liverpool	1.850			Missing Values
3	448 Flats (Conversion)	Halton	20.000			Missing Values
4	22 Flats & 1 Shop	Knowsley	1.150			Missing Values
5	8 Flats/Shop/Restaurant/Cafe & Takeaway Units	Liverpool	0.472			Missing Values
6	13 Flats (Conversion/Extension)	Sefton	0.650			Missing Values
7	26 Flats & 1 Commercial Unit (Conversion/Extension)	Liverpool	1.350			Missing Values
8	Multiple Occupancy (Conversion/Extension)	Wirral	1.000			Missing Values
9	60 Flats	St. Helens	3.000			Missing Values
10	168 Flats	Liverpool	37.000			Missing Values
11	Cinema & Bar (Extension/Refurb)	Liverpool	10.000			Missing Values
12	Demolition	Wirral	0.300			Missing Values
13	Enabling Works	Liverpool	2.000			Missing Values
14	Hospital Operating Theatre (Extension)	Liverpool	0.640			Missing Values
15	Hospital Operation Theatre (Extension)	Wirral	0.500			Missing Values
16	Health Inpatient Facility	Sefton	60.000			Missing Values
17	Hospital (Extension)	Liverpool	3.064			Missing Values
18	Hospital (Refurbishment)	Liverpool	0.750			Missing Values
19	Apartment/Hotel & Restaurant (Conversion)	Liverpool	5.300			Missing Values
20	11 Hotel/Office/Micro Brewery/Restaurant/Bar	Sefton	1.090			Missing Values
21	Hotel (Extension/Alterations)	Liverpool	1.200			Missing Values
22	Hotel (Conversion)	Wirral	1.800			Missing Values
23	10 Houses	Wirral	0.750			Missing Values
24	Street Lighting Works Framework	Liverpool	1.000			Missing Values
25	5 Non Food Retail Units (New/Conversion)	Liverpool	2.515			Missing Values
26	Nursing Home (Extension)	Wirral	0.580			Missing Values
27	Care Home (Extension)	Liverpool	1.000			Missing Values
28	Care Home (Extension)	Sefton	0.603			Missing Values
29	Nursing Home	Liverpool	1.000			Missing Values
30	Care Home (Extension)	St. Helens	0.803			Missing Values
31	Nursing Home (Extension)	Wirral	1.724			Missing Values
32	Commercial & Hotel Development	Liverpool	30.000			Missing Values
33	Reserve Power Generating Facility	Knowsley	1.000			Missing Values
34	Strategic Energy Services Partner	Knowsley	5.000			Missing Values
35	Solar Photovoltaic Farm	Halton	4.000			Missing Values
36	Restaurant/Cafe	Liverpool	3.267			Missing Values
37	2 Retail Units	Liverpool	0.465			Missing Values
38	New Showroom	Sefton	0.464			Missing Values
39	6 Student Flats	Liverpool	1.000			Missing Values
40	Warehouse Buildings	Knowsley	9.000			Missing Values
41	Warehouse (Extension)	Knowsley	1.350			Missing Values
42	Workshop	Halton	2.500			Missing Values
43	Care Home	Sefton	11.000			Missing Values
44	Consultancy Services	Halton	0.500	02/03/2015	05/03/2018	Missing dates

	Heading	Local Authority	Value (£m)	Start Date	End Date	Reason for omission
45	Consultancy Services (Framework)	Liverpool	1.500	03/04/2014	29/03/2018	Missing dates
46	Consultancy Services	Sefton	19.000	10/08/2010	10/11/2018	Missing dates
47	Consultancy Framework	Liverpool	20.000	07/09/2015	09/09/2019	Missing dates
48	Civil Engineering Consultancy Services	St. Helens	30.000	01/10/2017	01/04/2021	Missing dates
49	Consultancy Services Framework	Knowsley	90.000	05/06/2018	05/06/2022	Missing dates
50	Consultancy Framework Agreement	Liverpool	250.000	01/07/2015	03/07/2019	Missing dates
51	Project Management & Full Design Team Services Framework Agreement	Liverpool	2900.000	01/05/2017	01/05/2019	Missing dates

APPENDIX D. SIGNIFICANT GLENIGAN PROJECTS IN THE LIVERPOOL CITY REGION

This appendix provides a list of all the significant projects analysed. The projects appear in the following as they were put into the LFT.

	Description	Local Authority	Construction Value (£m)	Start Date	End Date	Project Type
1	Capital Works (Framework)	Liverpool	2.3	28/09/2015	23/09/2019	Public Non-housing, New housing, Infrastructure
2	Housing (Refurbishment)	Liverpool	4.7	23/05/2016	23/05/2018	Infrastructure
3	Housing/Commercial (Heating Maintenance)	Knowsley	4.7	01/04/2016	01/04/2020	Housing R&M
4	Social Housing Framework	Liverpool	3.4	01/08/2016	03/08/2020	New housing
5	Fusion21 Lifts Framework	Knowsley	1.6	01/08/2016	01/08/2020	Housing R&M
6	927 Houses & Flats	Liverpool	14.3	06/11/2017	09/11/2020	New housing, Private Commercial
7	284 Flats & 4 Commercial Units	Liverpool	14.1	11/09/2017	08/10/2018	Infrastructure
8	286 Flats/Student Flats & 4 Offices	Liverpool	32.3	21/08/2017	24/08/2020	Housing R&M
9	50 Flats & 1 Hotel	Liverpool	49.1	28/08/2017	29/09/2018	New housing, Public Non-housing, Private Commercial
10	2 Commercial/Industrial Buildings	St. Helens	130.8	09/10/2017	09/10/2021	Private Industrial
11	790 Student Flats & 1 Retail/Office Unit	Liverpool	20.7	10/08/2015	28/07/2017	New housing, Private Commercial, Public Non-housing
12	312 Flats & Commercial Units	Liverpool	38.9	07/07/2017	05/07/2019	New housing, Private Commercial
13	157 Apartments/4 Workshops	Liverpool	27.3	11/09/2017	06/05/2019	Public Non-housing
14	224 Student Flats & 12 Offices	Liverpool	35.5	09/04/2018	20/05/2019	Private Commercial, Private Industrial
15	Residential/Commercial Development	Liverpool	104.9	11/06/2018	12/06/2023	New housing, Private Commercial, Private Industrial, Public Non-housing
16	440 Flats/Tower Block & Hotel	Liverpool	157.1	02/10/2017	13/10/2025	Private Commercial, Private Industrial
17	100 Flats & 4 Commercial Units	Liverpool	22.0	20/11/2017	17/12/2018	New housing, Private Commercial, Public Non-housing
18	3 Office/Light Industry/Storage	Liverpool	116.6	18/12/2017	17/09/2018	Private Commercial
19	Homes & Commercial Units	Liverpool	118.6	07/03/2016	11/03/2019	Infrastructure
20	Student Accommodation & Commercial Units	Liverpool	51.0	14/08/2017	12/08/2019	New housing
21	65 Student Accommodation/Hotel/Commercial/Retail Units	Liverpool	20.5	12/12/2016	31/07/2018	Infrastructure
22	447 Flats & Commercial Units (New/Conversion)	Liverpool	39.3	03/10/2016	26/03/2018	New housing
23	538 Flats & 1 Office/1 Exhibition	Liverpool	26.5	24/10/2016	20/11/2017	Public Non-housing, Private Commercial
24	850 Residential/Hotel/Commercial Units	Liverpool	161.3	18/04/2016	29/07/2019	Infrastructure
25	1002 Flats/2 Commercial Units	Liverpool	243.1	09/10/2017	09/10/2022	New housing, Private Commercial
26	668 Homes & 126 Sheltered Housing	Sefton	180.9	07/09/2015	07/09/2025	Public Non-housing
27	200 Flats & 1 Office/Shop	Liverpool	20.4	16/10/2017	16/04/2019	Public Non-housing

	Description	Local Authority	Construction Value (£m)	Start Date	End Date	Project Type
28	Education, Science & Medical Hub	Liverpool	1339.9	11/09/2017	11/09/2022	Public Non-housing
29	Hotel/Restaurant/Training Centre & Leisure	Liverpool	5.6	04/06/2018	14/01/2019	Public Non-housing
30	138 Houses/51 Flats/6 Bungalows & 1 Foodstore	Liverpool	13.2	13/06/2018	11/07/2019	New housing, Private Commercial
31	High Rise Refurbishment Framework	Knowsley	300.0	17/03/2015	19/03/2019	New housing, Private Commercial
32	Residential Development (New)	Liverpool	25.0	14/09/2017	09/03/2018	New housing
33	304 Flats	Liverpool	79.0	05/02/2018	11/05/2020	Public Non-housing, New housing
34	257 Flats	Liverpool	28.9	16/10/2017	12/11/2018	New housing, Public Non-housing, Private Commercial
35	277 Flats	Liverpool	13.3	27/01/2018	24/02/2019	Public Non-housing
36	Bridge	Halton	331.8	07/05/2014	07/10/2017	New housing
37	Liverpool International College	Liverpool	12.8	02/10/2017	27/09/2019	New housing, Private Industrial
38	Distribution Centre	Liverpool	22.3	07/05/2018	07/05/2019	New housing
39	Distribution Warehouse	St. Helens	6.9	15/01/2018	23/07/2018	New housing, Private Commercial
40	Food Industry/Warehouse (New/Extension)	Liverpool	6.7	18/09/2017	26/03/2018	New housing
41	Hospital (Extension/Refurbishment)	Liverpool	153.0	03/02/2014	03/03/2018	Infrastructure
42	Comprehensive Cancer Care Centre	Liverpool	48.4	09/01/2017	09/01/2020	New housing
43	Hospital (Extension)	Liverpool	11.1	07/12/2015	14/07/2017	Private Commercial
44	Hotel/Apart Hotel (Extension/Alterations)	Liverpool	21.2	27/11/2017	06/08/2018	Private Commercial
45	Aparthotel	Liverpool	20.0	24/10/2017	23/10/2018	Private Industrial
46	Hotel (Conversion)	Liverpool	22.7	09/05/2016	15/12/2017	Infrastructure
47	Hotel & Shopping Centre (New/Alterations)	Sefton	7.4	23/10/2017	04/06/2018	New housing, Private Commercial
48	Energy Efficiency Delivery Framework	Liverpool	250.0	01/04/2014	01/04/2018	Private Commercial
49	Strategic Housing Delivery Partner	Liverpool	288.9	06/06/2014	07/06/2019	Public Non-housing, Private Commercial
50	Housing Repairs	Liverpool	200.0	04/05/2015	04/05/2019	New housing
51	370 Houses	Sefton	26.7	04/09/2017	01/10/2018	Private Commercial, Public Non-housing, Infrastructure
52	358 Houses	Knowsley	25.9	14/05/2018	10/06/2019	New housing, Private Commercial
53	600 Homes	Knowsley	57.8	07/03/2016	04/03/2019	Private Commercial
54	286 Houses	Knowsley	20.7	20/11/2017	17/12/2018	Private Commercial
55	110 Houses	Liverpool	14.9	22/05/2017	18/06/2018	Private Commercial
56	Civil Engineering Works	Liverpool	50.9	07/11/2016	07/08/2017	Private Commercial
57	Manufacturing/Storage Building	Knowsley	13.5	05/09/2016	05/09/2017	Public Non-housing
58	Dual Carriageway	Liverpool	13.8	24/04/2017	20/07/2018	New housing
59	Highway (Maintenance)	Liverpool	83.3	01/07/2013	01/10/2021	New housing
60	2 Care Homes	Wirral	4.5	03/10/2016	03/07/2017	New housing, Private Commercial
61	Office Building	Liverpool	12.3	10/07/2017	06/04/2018	Infrastructure

	Description	Local Authority	Construction Value (£m)	Start Date	End Date	Project Type
62	Command Centre	Liverpool	16.4	11/04/2016	24/12/2017	Private Industrial
63	Modular Buildings Framework	Knowsley	167.4	01/06/2017	03/06/2021	New housing
64	Electricity Generation Plant	Halton	3.7	08/01/2018	09/07/2018	New housing, Private Commercial
65	Railway Station (Upgrade)	Liverpool	200.6	04/09/2017	08/10/2018	Public Non-housing
66	131 Houses	Halton	8.0	05/12/2016	11/08/2017	Private Commercial
67	School Building	Liverpool	9.3	04/04/2016	15/09/2017	Public Non-housing
68	Shopping Centre (Redevelopment)	Liverpool	18.0	30/01/2017	16/03/2018	Public Non-housing
69	Retail & Commercial Units	Liverpool	19.8	20/11/2017	18/06/2018	New housing
70	41 Retail & Leisure Units	Liverpool	100.0	02/05/2016	30/12/2019	New housing
71	Discount Store (Fit Out)	Liverpool	2.9	10/07/2017	10/09/2017	New housing
72	Student Accommodation	Liverpool	32.0	13/09/2017	13/09/2019	Private Commercial
73	Student & Key-worker Accommodation	Liverpool	45.7	17/04/2017	20/04/2020	Public Non-housing
74	192 Student Flats	Liverpool	11.0	06/06/2016	06/09/2017	New housing
75	Supermarket	Sefton	10.0	02/10/2017	02/04/2018	New housing
76	Theatre & Film Screenings	Knowsley	19.0	15/01/2018	21/01/2019	Public Non-housing
77	Film Studios (Conversion)	Liverpool	25.0	18/08/2017	17/08/2018	Infrastructure
78	University	Liverpool	45.7	07/05/2018	07/05/2020	Infrastructure
79	University	Liverpool	39.4	11/11/2015	06/11/2019	New housing
80	Waste Recovery Plant	Wirral	66.4	05/06/2018	05/06/2020	Private Commercial
81	Energy Recovery Park	Sefton	22.1	07/08/2017	05/08/2019	Private Industrial
82	Highway (Improvements/Maintenance)	Halton	25.8	03/06/2013	03/06/2019	Private Industrial
83	8 Storage Sheds	Liverpool	4.2	13/03/2017	18/09/2017	Infrastructure
84	30 Care Flats	Sefton	5.0	04/12/2017	04/12/2018	Private Commercial, Public Non-housing
85	Train Depot (New/Refurbishment)	Liverpool	8.0	03/07/2017	03/07/2018	Private Industrial
86	Food Hub	Liverpool	5.3	20/03/2017	27/11/2017	Infrastructure
87	Electricity Generation Plant	Halton	5.9	07/07/2017	13/04/2018	Public Non-housing
88	150 Houses	Knowsley	10.8	03/05/2018	31/05/2019	Housing R&M
89	147 Houses	Liverpool	10.6	30/10/2017	26/11/2018	Housing R&M
90	Warehouse/Office/Laboratory Fit Out	Halton	3.7	04/09/2017	04/03/2018	Public Non-housing
91	Apartments (Extension)	Liverpool	9.6	09/04/2018	09/04/2019	Private Commercial
92	142 Houses	St. Helens	10.3	20/11/2017	17/12/2018	Private Industrial
93	School	Halton	9.7	15/08/2016	25/09/2018	Private Industrial
94	Infrastructure/Public Realm	Liverpool	8.8	31/07/2017	31/10/2018	Infrastructure
95	New Build Housing and Site Preparation Framework	St. Helens	36.1	01/06/2016	03/06/2020	New housing
96	Wirral Dock Bridges Replacement	Wirral	5.1	06/03/2017	01/12/2017	Private Commercial
97	134 Houses	St. Helens	9.7	29/08/2017	29/09/2018	Public Non-housing
98	Retail Development (New/Alterations)	Sefton	4.5	03/07/2017	25/12/2017	Housing R&M

AUTHORS

Mohamed El-Haram
Martin Turner
Marcus Bennett

Version	Date	Details of modifications
First draft	November 2017	Collated demand and supply data
Draft v4	December 2017	First draft to share with client only
Draft v 5	April 2018	Incorporating feedback & new content

CITB, Bircham Newton, Norfolk, PE31 6RH
+44 (0)344 994 4400
www.citb.co.uk

CITB is registered in England and Wales Charity No 264289 and in Scotland Charity No SC044875

Whole Life Consultants Limited, Dundee University Incubator, James Lindsay Place, Dundee, DD1 5JJ
+44 (0)1382 224 304
enquiries@wlcuk.com

Whole Life Consultants Ltd is registered in Scotland as SC259987, VAT number 852809506 Registered office c/o 14 City Quay, Dundee DD1 3JA