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Construction Skills Gap Analysis for the Tees Valley Combined Authority

Final Report



Client: Tees Valley Combined Authority

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Introduction and summary

This report is one step in maintaining an evidence base, to be utilised by the Tees Valley Combined Authority to inform decision making that will help determine the employment and skills opportunities emerging in the construction industry for the Tees Valley 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 Tees Valley Combined Authority 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 Tees Valley Combined Authority is seeking opportunities that can lead to longer term development. In particular the Tees Valley Combined Authority 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 Tees Valley has the right future skills and training pathways in place to deliver demand led solutions.

Tees Valley Combined Authority Area headlines

The Industry

Between 2012/13 and 2016/17 the number of Construction businesses appears to have grown from 1,730 in to 2,130¹. In the same period, Office for National Statistics data indicates that the number of individuals working in construction occupations has declined. If this is true, it indicates a shift to a greater number of smaller businesses that on average employ fewer people. Self-employment is high – 37% of employment compared to 29% of employment across the North East region.

Of Tees Valley construction companies:

- 92.7% are micro (employing fewer than 10 people),
- 6.1% are small (employing between 10 and 49 people),
- 1.2% are medium (employing between 50 and 249 people),
- There are no large employers (those with over 250 people).

While total employment is down (particularly in 2016) self-employment has increased.

¹ The Combined Authority has noted that the methodology used in preparing the estimates was changed in 2015 (leading to a mark-up of around 3% for construction). March 2017 estimates are now available at 2,200

Training and Education

83% of all construction further education training provision in the Tees Valley Combined Authority area is supplied by ten main providers, though there have been 70 training providers active in the area over a four year period.

Although there has been a decrease in unique learner starts, unique apprenticeship starts have increased by 24% over a four year period. The most notable increase has been in Hartlepool with apprenticeships increasing by 107%; Darlington has seen an increase of 48%.

Future Project Pipeline

The analysis assessed 211 construction projects with a total construction value of more than £2.3 billion.

Of these, 62 projects (29% of the number of projects) are of greater value than the average for the total pipeline are worth almost £1.9 billion (or 83% of the total value).

For the year of peak activity, infrastructure is unexpectedly significant, accounting for 52% of the value of new construction. New housing (which is of interest to the Combined Authority) represents 23% of the value of known new projects; public non-residential developments account for 16% of new build spend.

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 21,450.

The occupations with greatest demand are:

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

Risk of shortages

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

1. Architects
2. Non-construction operatives
3. Logistics
4. Civil engineering operatives nec*
5. Surveyors
6. Civil engineers
7. Painters and decorators
8. Glaziers
9. Building envelope specialists
10. Senior, executive, and business process managers
11. Construction Project Managers
12. Wood trades and interior fit-out
13. Other construction process managers
14. Non-construction professional, technical, IT & other office-based

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
2. Painters & decorators
3. Other construction process managers
4. Building envelope specialists
5. Civil engineers
6. Surveyors
7. Civil engineering operatives

Recommendations

The report offers recommendations that include:

1. **Establish a Tees Valley Combined Authority construction skills strategy and action plan.** Review and develop, as appropriate, any existing construction skills strategy.
2. **Develop and strengthen collaborative partnerships.** With a view to building collaborative 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. 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.

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1. Scope

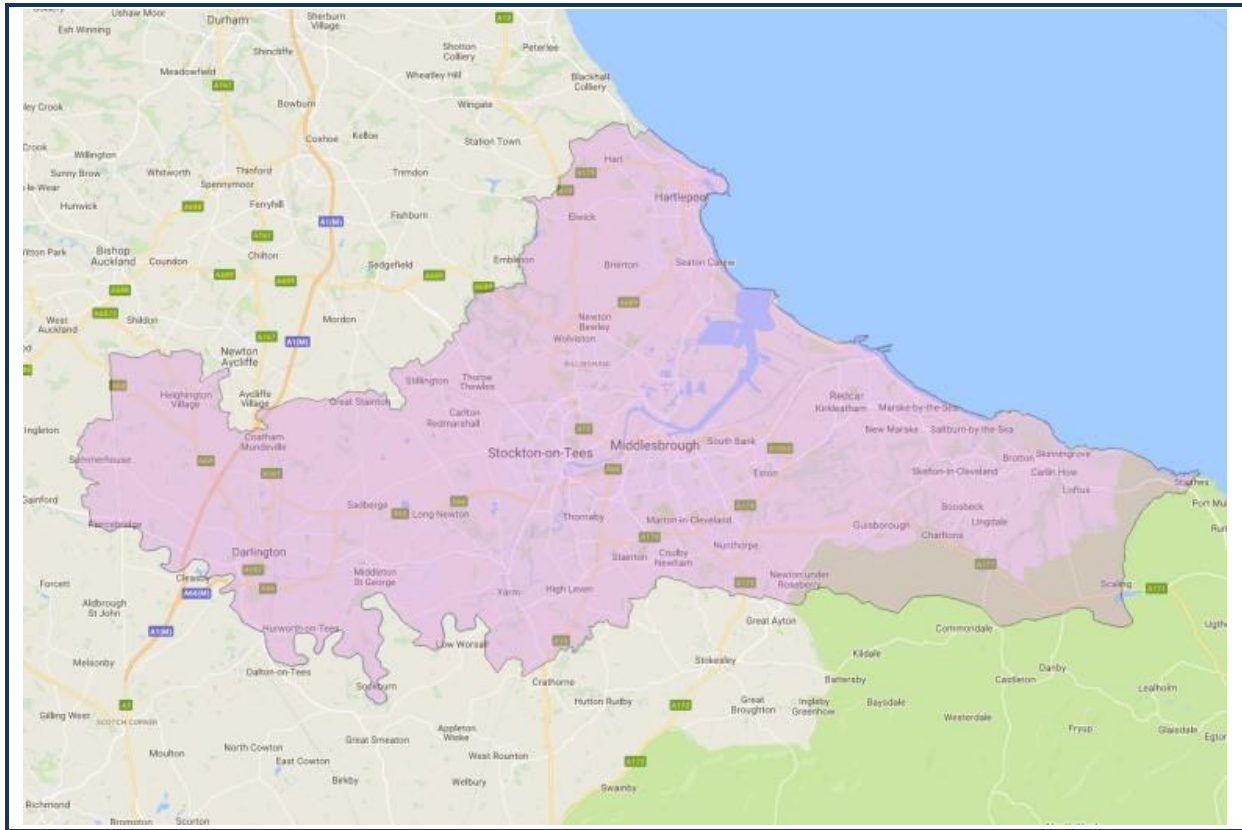


Figure 1: Tees Valley Combined Authority and surrounding areas

The list of local authorities analysed is shown on Table 1

Table 1: Local authorities analysed in the research

	Local Authority
Tees Valley	Darlington
	Hartlepool
	Middlesbrough
	Redcar and Cleveland
	Stockton-on-Tees

2. Tees Valley Combined Authority Labour Demand

2.1. Introduction

The following sections provide an estimate of the labour demand that construction investment will create across the Tees Valley Combined Authority 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.

2.2. Pipeline of denominated projects

2.2.1. Glenigan pipeline analysis

The Glenigan database included 243 projects for the Tees Valley Combined Authority area. Of these a number were removed: 28 due to missing dates and four which were consultancy projects. These omitted projects are listed in Appendix C and their value represented around 16% of the total pipeline. The majority of projects omitted were residential developments typically valued at between £0.5m and £300m. It is possible that this work may take place at an undefined point later in the forecast period and so an assessment of the labour demand is included in the estimates of other work from the additional projects taking place later.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 96 significant projects accounting for just under 76% 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 2 shows the number of significant projects within the Tees Valley Combined Authority 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 2: Key data for significant projects in Glenigan²

	Number of projects	Construction spend (£m – 2017 values)
All Glenigan projects	211	2,309
Significant Glenigan projects	62	1,906
Percentage within significant projects	29%	83%

Appendix D provides a full breakdown of the significant projects and their construction values. The peak year for the spend profile is 2017. The location of the significant projects within the Tees Valley Combined Authority can be seen in Figure 2. The radius of the markers is proportional to the value of the work taking place.

² 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.

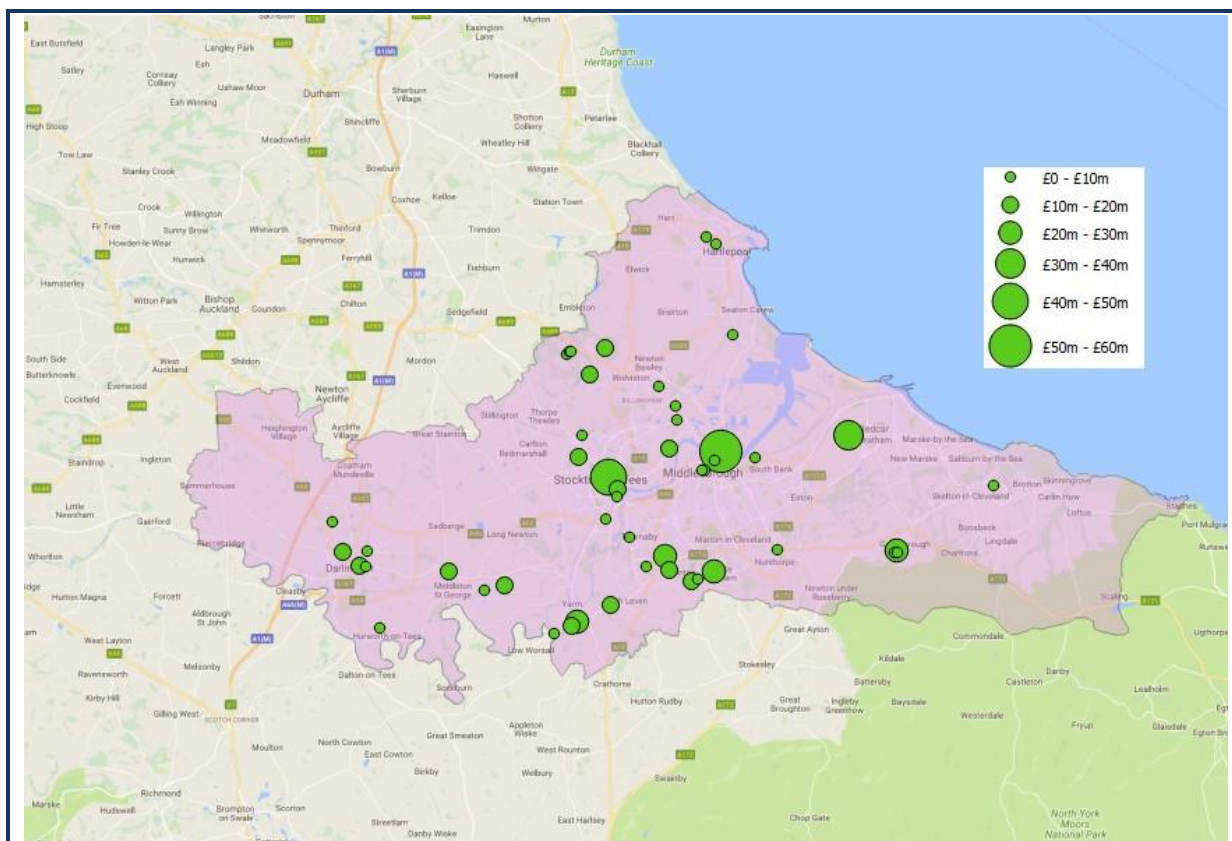


Figure 2: Location of significant projects included in the analysis

2.2.2. Glenigan & NICP spend analysis

Implementing the methodology outlined in Section Appendix A leads to the following findings for the peak year for denominated projects of 2017. 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 3 shows the distribution by sector of new build spend for the total pipeline of denominated projects.

Table 3: New-build construction spend by project type in 2017 (total denominated project pipeline)

Project Type	Construction spend in 2017 (2017 values - £m)	% of total
Infrastructure	418	52%
New Housing	181	23%
Public Non-housing	128	16%
Private Commercial	53	7%
Private Industrial	19	2%
Total	799	100%

Table 4 shows the infrastructure construction spend from both Glenigan and the NICP in 2017 by sub-sector.

Table 4: Construction spend per infrastructure sub-type in 2017 (total denominated project pipeline)

Project Type	Construction spend in 2017 (2017 values - £m)	% of total
Energy	239	58%
Transport	91	22%
Water	68	17%
Flooding	6	1%
General Infrastructure	5	1%
Total	409	100%

2.2.3. Infrastructure spend in the Tees Valley

The infrastructure spend shown above for 2017 (52% of total construction spend is higher than would normally have been expected and higher than has been observed in other areas.

This appears largely to be down to a number of major infrastructure projects listed in the National Infrastructure and Construction Pipeline (NICP), notably:

- Tees Renewable Energy Plant – the biomass power being built at Teesport in Redcar and Cleveland, with total capital funding of £896m between 2016 and 2019.
- Port Clarence CHP biomass power station valued at £160m between 2016 and 2018
- An allocation of several Highways England projects taking place in the North East Region.

The Tees Valley Combined Authority area is geographically, a relatively small area and so a small number of major projects can appear to have a disproportionate impact on the local construction economy.

2.3. Estimate of future total labour demand

As outlined in the Section Appendix A 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 2017 at 21,650.

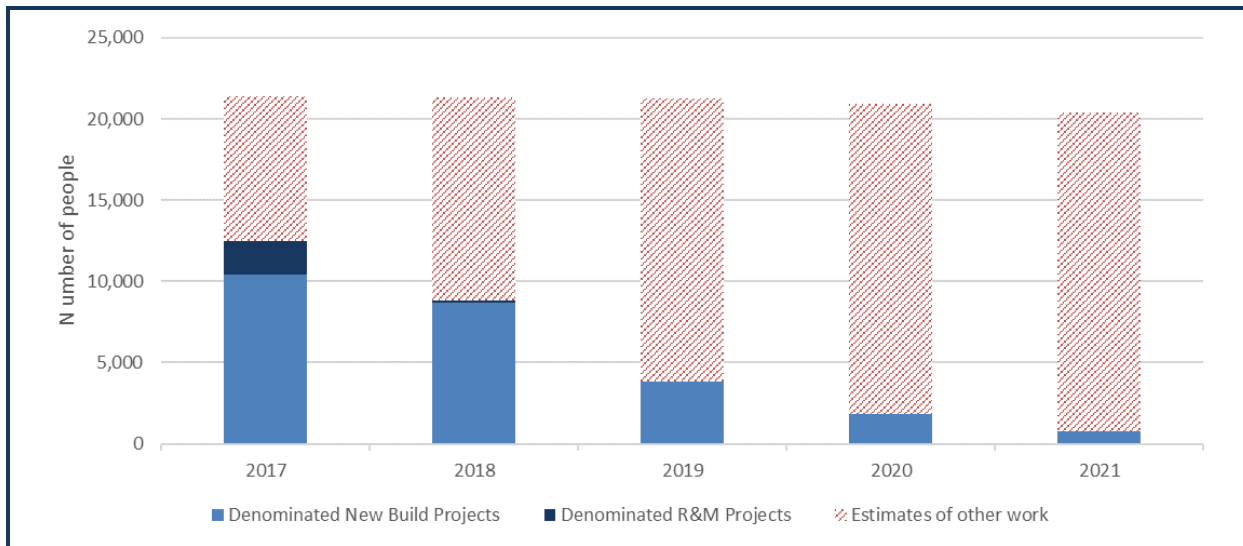


Figure 3: Total construction labour demand including estimates for both R&M and estimates of other work

2.3.1. Breakdown of labour demand by occupation

For the peak year in Glenigan of 2017 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.

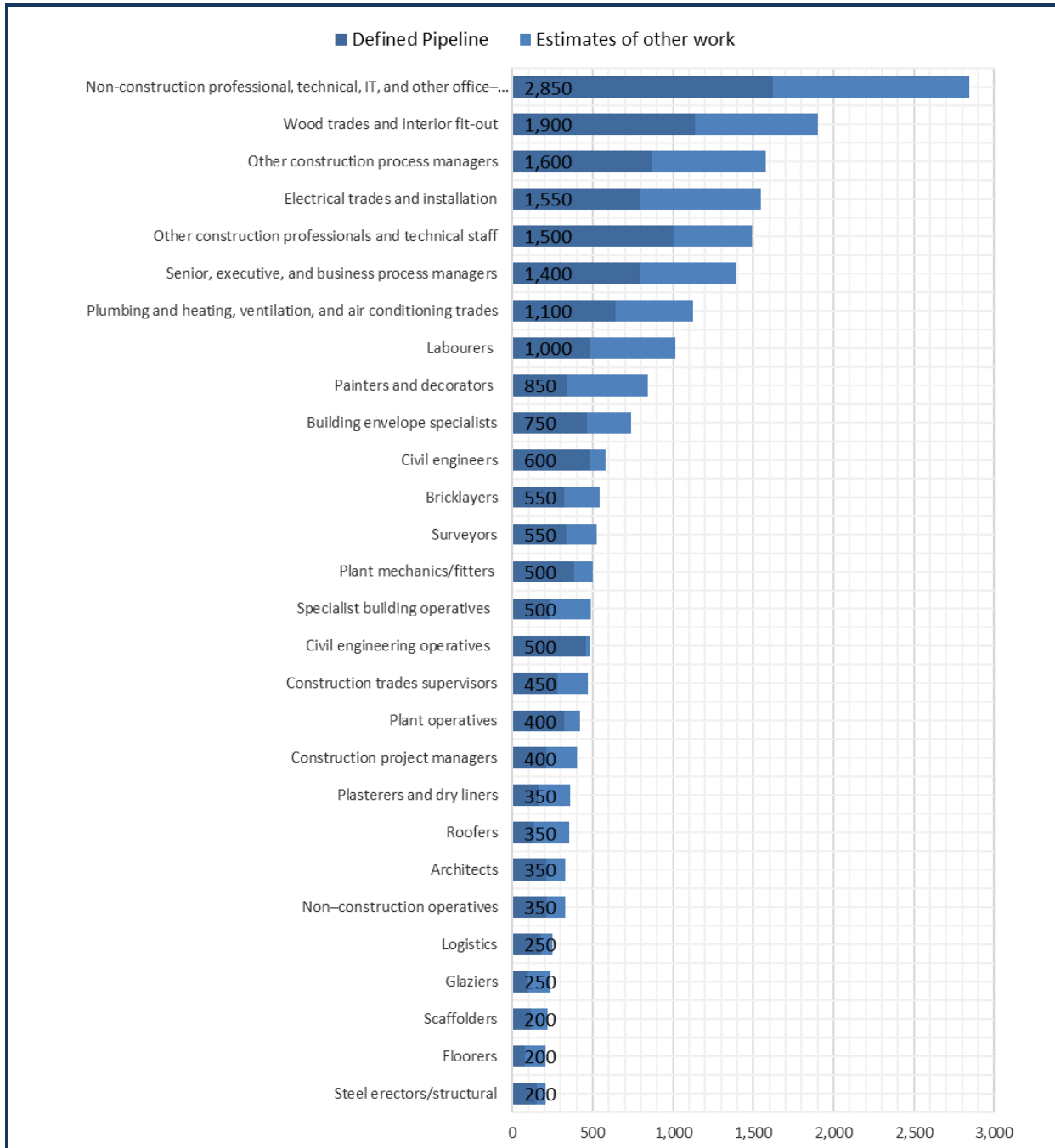


Figure 4: Construction labour demand by occupation in the peak year

2.3.2. Breakdown of labour demand by project type

Table 5 shows the labour demand generated by the denominated projects and the estimates of other work in 2017.

Table 5: Labour demand by work type in 2017

Project Type	Defined Pipeline Labour Demand in 2017 (People)	Estimates of Other Work Labour Demand in 2017 (People)	Total Labour Demand in 2017 (People)	% of total in 2017
Non-housing R&M	0	4900	4,900	23%
Infrastructure	4300	150	4,450	21%
Private Commercial	1000	2900	3,900	18%
New Housing	2400	900	3,300	15%
Public Non-housing	2400	0	2,400	11%
Housing R&M	2050	0	2,050	9%
Private Industrial	350	300	650	3%
Total	12,500	9,150	21,650	100%

2.4. Summary of demand

- The labour demand arising from the construction spend in the Tees Valley Combined Authority area peaks at around 21,650 people in 2017, taking account of estimates of other work including R&M in addition to the pipeline of denominated projects.
- During 2017, the peak year of the Glenigan pipeline demand, the most labour-intensive occupation group is “non-construction professional, technical, IT and other office-based staff” with an annual demand of 2,850 people.
- The estimate of labour demand for the trade occupations for the peak year of 2017 are as follows:
 - The trade occupation for which demand is highest is “Wood trades and interior fit-out” with a requirement for 1,900 people;
 - “Electrical trades and installation” trades follow with 1,550 people.

3. Labour supply in the Tees Valley Combined Authority area

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

The first element of this section takes a view on the current employment levels in the Tees Valley Combined Authority and how this relates to overall employment across the wider North East region and the UK as a whole. The Tees Valley Combined Authority covers Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-On-Tees local authority areas, and the Tees Valley Combined Authority area falls entirely within the larger North East region (which, in addition to those mentioned, also includes Durham, Gateshead, Newcastle upon Tyne, North Tyneside, Northumberland, South Tyneside and Sunderland). All comparisons have therefore been made against the North East region as a whole and, where applicable, the UK. Data from CITB's Construction Skills Network (CSN) is used along with official Government sources. Employment and employers are considered together as they are intrinsically linked, particularly as a large proportion of construction workers are employed within micro businesses or are self-employed, where the business location is also the home location.

For the second section, whilst training occurs at Further Education (FE) and Higher Education (HE) levels, the main 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. Nevertheless, Higher Education in the region is also analysed, but should be considered in the context of the enhanced mobility levels of the learners at this level.

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. Existing workforce

An analysis of the Annual Population Survey shows that the Tees Valley Combined Authority area accounts for around 22% of construction employment in the North East region as a whole – a fall since 2012 when it was around 26%.

This employment is 'workplace' analysis – i.e. it is the number of workers employed by employers within the Tees Valley Combined Authority.

Table 6 applies this percentage share across the CSN occupational breakdown for the North East region as a whole to give an estimate of total employment at occupational and industry level in the Tees Valley Combined Authority area. For comparison, the wider North East region has been included.

Data from the National Office for Statistics indicates that in the Tees Valley Combined Authority area the number of construction workers has decreased by 22% since 2012/13.

Self-employment in the Tees Valley Combined Authority area is 22% higher than it was in 2012/13 at 6,100 workers and 36% higher than it was in 2015/16.

Any trend towards greater self-employment may impact skills supply availability if up-to-date training is more likely to be provided by larger firms.

Looking at year on year changes on workforce size, both the North East Region and the Tees Valley Combined Authority saw significant contraction in 2015/16 at -9.5% and -21.5% respectively. The North East region has returned to growth in 2016/17 at 1.1%, although the Tees Valley Combined Authority has contracted by 3.5%. Ref: Figure 5

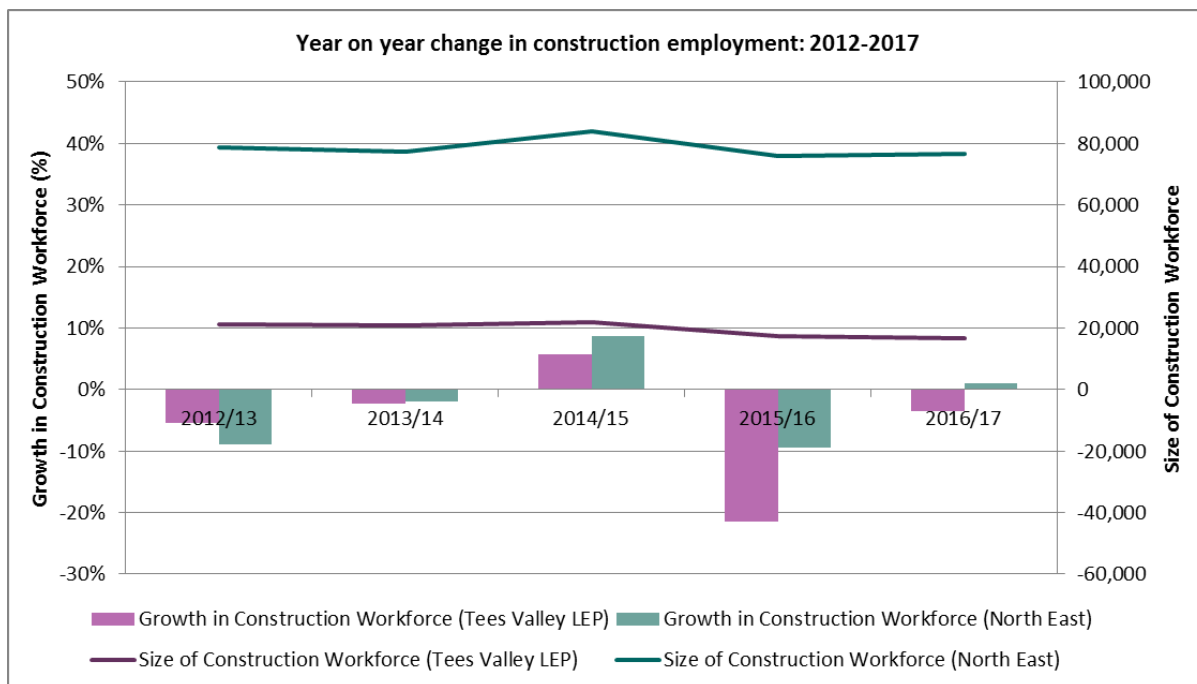


Figure 5: Year on year change in construction employment (Nomis 2017)

2015/16 workforce data

At the time of writing it is not clear what accounts for the reported decline in construction workers in 2015/16. It is possible that it could be the result of an anomaly in the data gathering. The margin of error for ONS data increases for smaller populations such as the Tees Valley Combined Authority area and so small changes in data gathering can skew findings. It is also possible that major construction projects have come to an end or that construction workers living in the Tees Valley area are working just outside the Combined Authority boundaries. The greatest likelihood is several factors combine to skew the data.

In 2016, construction businesses in the Tees Valley Combined Authority area made up a 26% share of the North East Region, this is consistent with the previous four years where it was around 25%. Overall business numbers within the Tees Valley Combined Authority have increased from 1,730 in 2012 to 2,130 in 2016 (an increase of 400). Business numbers within the North East region also increased over the same time period from 6,920 to 8,270. In the rest of the North East region the number of businesses grew by 950 or 18% on 2012 levels. Ref: Figure 6.

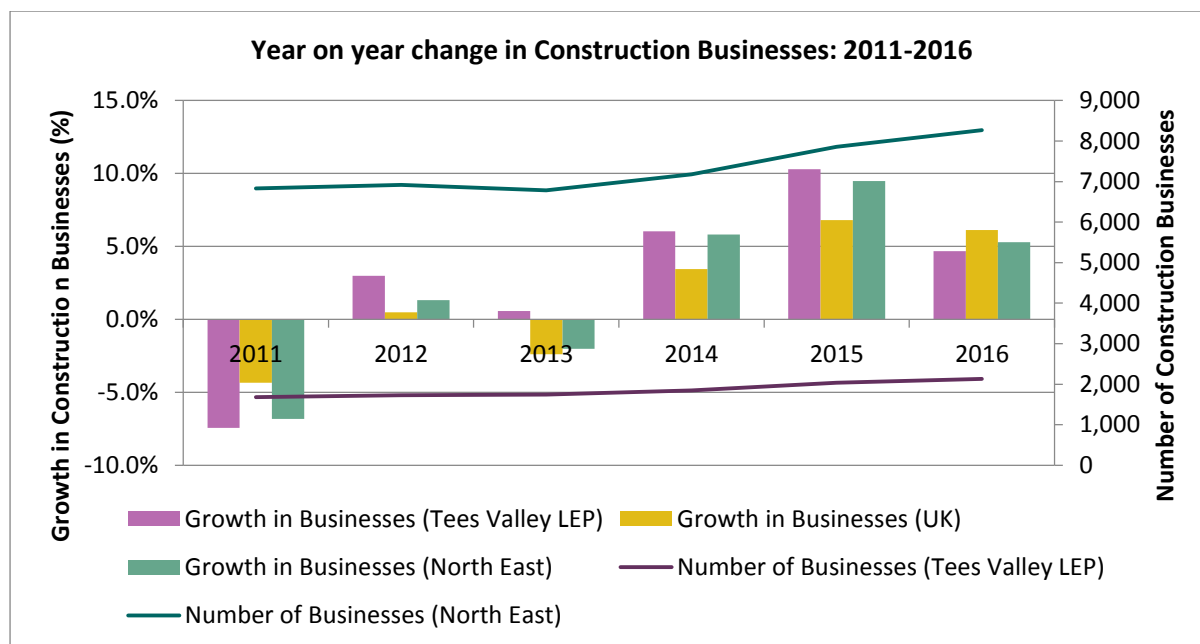


Figure 6: Year on year change in construction businesses (UK Business Count, Nomis 2017)

Figure 7 shows the distribution of construction businesses within the Tees Valley Combined Authority, and Figure 8 shows the distribution of the construction workforce. Interestingly the share of workers almost completely matches the proportions of businesses in each unitary authority area.

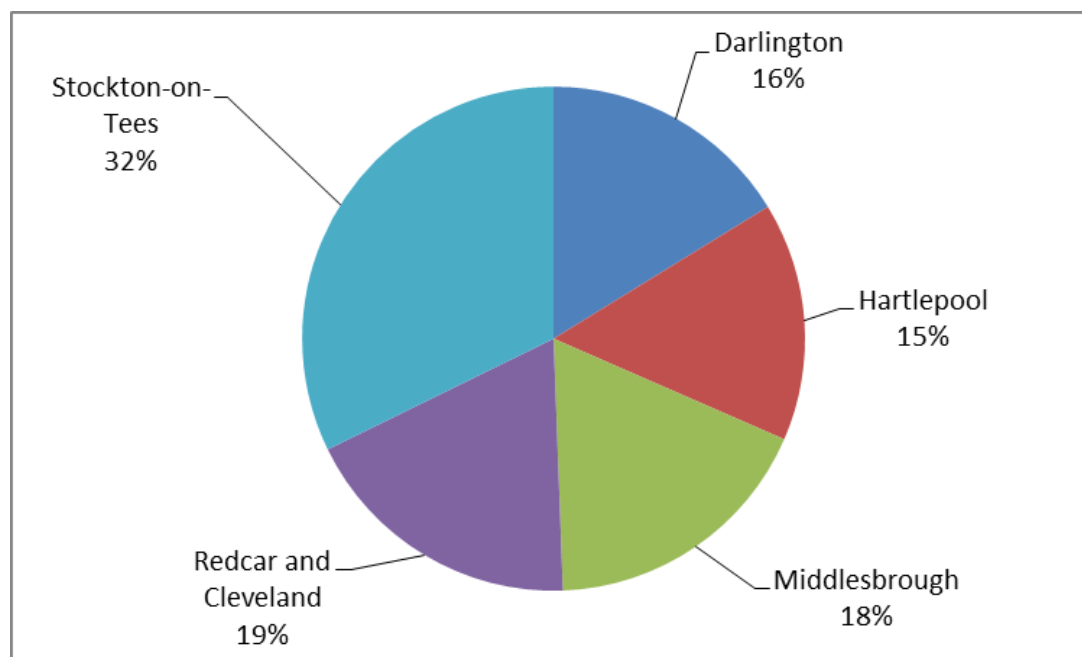


Figure 7: Distribution of **construction businesses** within the Tees Valley Combined Authority (UK Business Count, Nomis 2017)

Between 2012-2016 Stockton-on-Tees experienced the greatest growth in numbers of construction businesses at 31%; Darlington had the least growth at just 11%.

The distribution of construction businesses between the local authorities broadly aligns with the distribution of the local population. Stockton-on-Tees has the largest share of businesses within the Tees Valley Combined Authority area at 32% (slightly above the proportion of the population), Middlesbrough has a slightly smaller proportion of the constructions businesses compared with the

population distribution. Looking at the distribution of firms by business size (excluding Stockton-On-Tees), micro employers are fairly evenly distributed with the second largest proportion residing within Redcar and Cleveland. Small and medium firms are less evenly distributed with 27% of micro firms located in Middlesbrough and the medium firms being split in half between Middlesbrough and Darlington. The distribution of businesses across the local authorities within the Combined Authority has remained much the same in 2016 as it was in 2012.

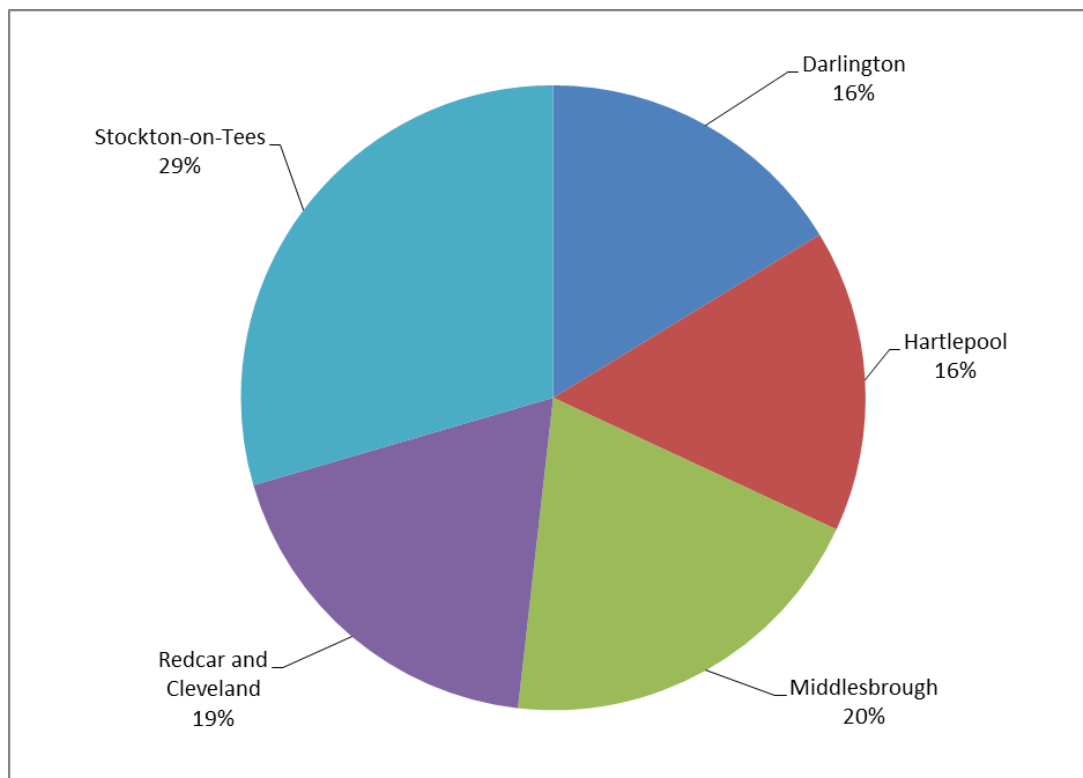


Figure 8: **Construction employment** by area within the Tees Valley Combined Authority area (2017, Nomis)

There are two important factors when looking at the construction sector, these are; direct employment vs. self-employment and size of business.

Overall the construction sector has high levels of self-employment with around 40% of the UK construction workforce being self-employed. The figure is similar in the Tees Valley Combined Authority area, with 37% of those working in construction here classified as self-employed, higher than the levels across the wider North East region (29%). This is perhaps as a consequence of the absence of large companies in the Tees Valley Combined Authority and a slightly higher percentage of micro firms, 92.7% as a percentage of total companies (91.6% in the North East region). Whilst self-employment levels have remained stable across the wider North East region since 2012 at around 28% of the total construction workforce in the region, the Tees Valley Combined Authority has seen this figure substantially increase from a 24% share to a 37% share of their workforce over the same period.

When it comes to business size, the distribution of companies across the Tees Valley Combined Authority area is close to the pattern seen across the North East region as a whole, and indeed the United Kingdom, with the majority of construction companies being micro sized, i.e. less than 10 employees. However, as mentioned before the Tees Valley Combined Authority area has no large companies and a slightly higher proportion of small companies (92.7% of businesses in the Tees Valley Combined Authority area) than the average for the wider North East region but lower than the UK average (91.6% and 93.9% respectively), ref Figure 9.

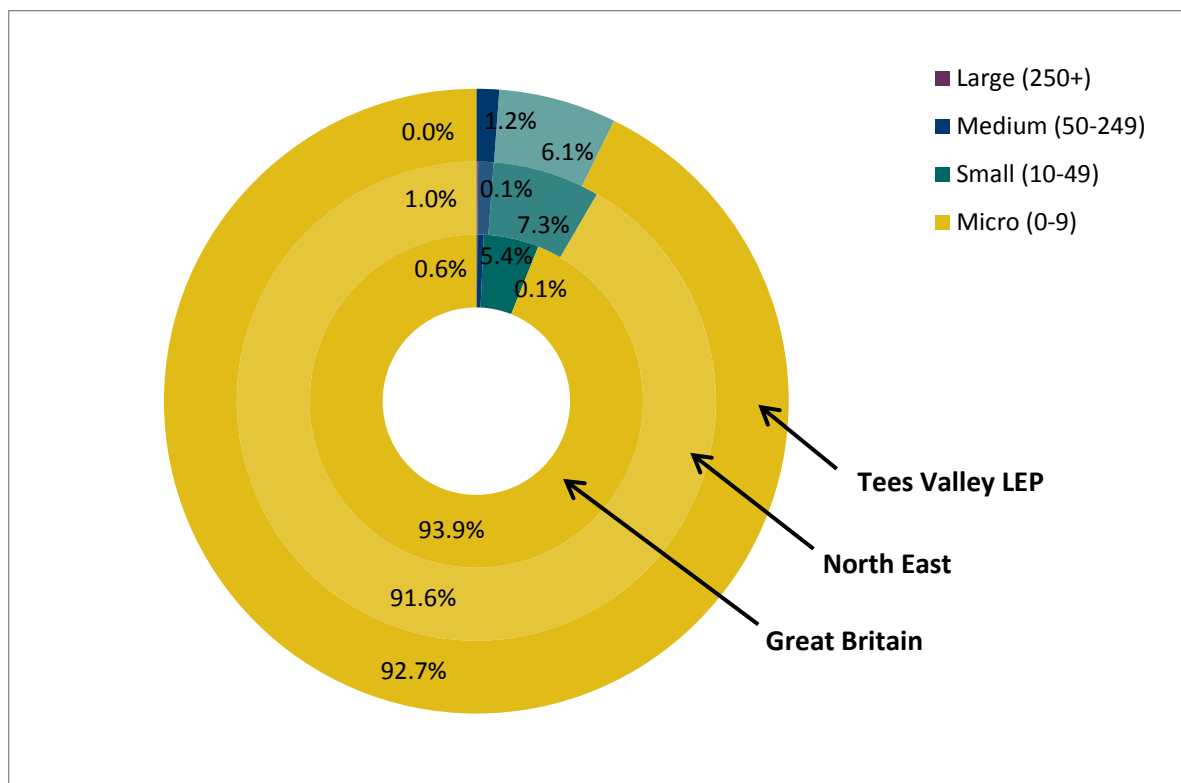


Figure 9: Size of construction businesses (UK Business Count, Nomis 2017)

Over the period from 2012 to 2016 there have been some fluctuations to the composition of businesses by size within the Tees Valley Combined Authority area which generally follow the same trend as the North East region. There are differences that are so small they are probably insignificant:

- The proportion of micro firms has increased by a slightly higher margin, from 90.5% to 92.7% compared to 90.5% and 91.6% in the North East region.
- There has been a slightly higher decrease in the proportion of small businesses dropping from 8.1% to 6.1% versus 8.0% to 7.3% in the North East region.

There are no longer any large employers in the Combined Authority area.

Table 6: Construction occupational breakdown, 2016 (Source Experian & CITB)

Estimated numbers of construction workers in the Tees Valley Combined Authority area by occupation [22% of the CSN data for the North East Region]	Tees Valley Combined Authority	North East Region
Other construction professionals and technical staff	1,760	8,160
Other construction process managers	1,300	6,020
Senior, executive, and business process managers	1,000	4,630
Construction Trades Supervisors	740	3,430
Civil engineers	330	1,510
Construction Project Managers	310	1,440
Surveyors	290	1,330
Architects	80	370
Electrical trades and installation	1,590	7,380
Wood trades and interior fit-out	1,510	7,010
Labourers nec*	1,410	6,530
Plumbing and HVAC Trades	1,340	6,210
Specialist building operatives nec*	750	3,480
Bricklayers	660	3,040
Plant operatives	550	2,520
Plant mechanics/fitters	530	2,470
Plasterers	530	2,450
Painters and decorators	500	2,300
Floorers	500	2,300
Building envelope specialists	490	2,280
Roofers	480	2,230
Steel erectors/structural fabrication	330	1,540
Scaffolders	300	1,410
Civil engineering operatives nec*	260	1,210
Glaziers	160	720
Logistics	110	490
Non-construction professional, technical, IT, and other office-based staff	2,360	10,930
Non-construction operatives	120	560
Total	20,290	93,970

Note: Numbers rounded to the nearest 10

Key

Manager/Professional occupations
Skilled Trades
Office-based Staff

3.2. Main points – workforce:

- The Tees Valley Combined Authority accounts for 22% of the construction employment in the North East region.
- Construction business numbers within the Combined Authority area have grown from 1,730 in 2012 to 2,130 in 2016. Stockton-On-Tees has the highest proportion of firms at 32%.
- Self-employment is higher within the Combined Authority area than the North East region as a whole (37% and 29% respectively).
- There is some evidence to suggest a decline in the construction workforce in the Combined Authority area.

4. Training provision

Overall volumes of training provision have declined within the Tees Valley Combined Authority area dropping by 21% from 2012-13 to 2015-16. This is a larger fall than seen in the North East region as a whole of 17%. Only three authority areas in the North East have seen positive growth; County Durham +2%; Middlesbrough +2% and Northumberland +3%.

CITB analysis of Skills Funding Agency Individualised Learner Records from 2012/13 through to 2015/16 academic years for construction learners shows that:

- The Tees Valley Combined Authority accounts for 23% of identified construction related training across the North East region.
- The Tees Valley Combined Authority has seen a bigger decline in training starts over the period 2012-13 to 2015-16 than the North East region as a whole (-21% and -17% respectively).
- Three of the four districts experiencing the greatest decline in training starts are within the Tees Valley Combined Authority (Darlington -35%, Hartlepool -32% and Redcar and Cleveland -37%), along with Sunderland (outside of the Combined Authority area, which has seen a drop of -34%) these account for the drop seen across the North East region.
- Apprenticeship starts within the Combined Authority area have increased in the period 2012-13 to 2015-16 by 24%, lower than the wider North East region which saw growth of 32% over the same period.

“Knowledge” based qualifications describe those qualifications that typically have a theoretical basis so are more likely to be ‘classroom based’. “Competence” based qualifications, in the main, achieve a recognised NVQ and so a link can be made between the qualification title and the likely occupation that an individual will have. For example someone starting or achieving a Bricklaying qualification is highly likely to be working as a Bricklayer as competence based qualifications are based on an assessment of work based skills.

4.1.1. Qualification achievements

Table 7 looks at qualification achievements over the last four years for the identified competence based qualifications, comparing achievement volumes against the overall pattern with the North East as a whole. From this analysis there looks to be patterns for particular occupations.

[The information shown in Table 7 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 7: **Competence** qualification achievement in the Tees Valley Combined Authority as a % of total competence qualification achievements in North East region as a whole (Source: CITB/SFA)

Construction Occupations	2012-2013	2013-2014	2014-2015	2015-2016	Total Achievements (Learner Aims)	Total
Grand Total	22%	23%	24%	24%	2,860	23%
Main Occupations						
Wood trades & interior fit-out	30%	34%	29%	26%	3,310	29%
Plant operatives	15%	14%	20%	8%	680	15%
Plant mechanics/fitters	22%	33%	21%	36%	650	28%
Specialist building operatives nec*	31%	53%	48%	23%	620	41%
Occupations to monitor						
Plasterers & dry liners	13%	18%	11%	14%	410	14%
Scaffolders	28%	13%	9%	13%	240	17%
Roofers	12%	7%	22%	10%	120	13%
Other construction prof & technical	0%	27%	13%	15%	110	13%
Painters and decorators	22%	18%	15%	16%	100	18%
Occupations with good provision						
Plumbing and HVAC Trades	20%	35%	32%	25%	410	28%
Construction Trades Supervisors	61%	6%	53%	0%	320	53%
Bricklayers	45%	38%	25%	26%	300	32%
Electrical trades & installation	9%	21%	32%	48%	250	32%
Civil engineering operatives nec*	37%	10%	25%	36%	170	27%
Low Overall Learner Volumes						
Building envelope specialists	52%	22%	45%	83%	90	40%
Floorers	17%	14%	27%	4%	80	18%
Glaziers	9%	18%	14%	28%	50	17%
Logistics	0%	0%	0%	100%	30	50%
Construction managers	0%	0%	0%	0%	0	0%
Steel erectors/structural	0%	0%	0%	0%	0	0%

*nec – not elsewhere classified | HVAC: Heating, ventilation and air-conditioning

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

The percentage comparison with the North East region as a whole is used as a device to demonstrate the provision of training in the Tees Valley Combined Authority by occupations relative to one another to gauge where provision is relatively high or low.

Relatively high provision is highlighted in green **Relatively low provision is highlighted in red**

Table 7 shows that there are a group of **occupations that account for the main training volumes**, which are significantly different to the overall training pattern seen for the whole of the North East Region.

(Training volumes within the Combined Authority area appear low compared to that of the North East region as a whole which may account for some of the variation). These are:

- Wood Trades and Interior Fit-Out
- Plant Operatives
- Plant Mechanics/Fitters
- Specialist Building Operatives

Here the qualification achievements are consistent to the overall share of training being achieved in the Combined Authority area or there is a larger volume of training being delivered against them. For occupations such as Wood Trades, the volume of training will be related to their share of employment, while for others such as Plant Operatives, training will be more related to the need to demonstrate competence for these roles through card scheme monitoring, for example the CPCS Card scheme for Plant Mechanics.

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 Plasterers and Dryliners, Scaffolders, Roofers, Painters and Decorators and Other Construction Professionals and Technical Staff, the share of training happening within the Combined Authority is slightly lower than would be expected. It is possible that individuals within the Tees Valley Combined Authority may be travelling outside the area for this type of training.

For the third group – Occupations with good provision: the reverse is the case and there appears to be a higher level of provision for occupations such as Construction Trades Supervisors, Bricklayers and Electrical Trades. It could be that there are providers with particular specialisms in these areas operating within the LEP, or a particular need for this type 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. 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. This group includes notably: Steel erectors and construction managers but also Logistics; Glaziers; Floorers and Building Envelope Specialists.

When looking at training providers over the period 2012-13 to 2015-16 a number of different providers have delivered training for the Tees Valley Combined Authority area. The majority of training (83%) has generally been consistently delivered by a core of 10 providers.

Table 8: Top 10 training providers within the Tees Valley Combined Authority by number of starts – excluding apprenticeships (Source: CITB/SFA)

Provider	2012-13	2013-14	2014-15	2015-16	Total (Learner aims)	% Share of total quals	% of quals Ofqual Registered
Middlesbrough College	1,000	1,180	980	960	4,120	18.0%	80.1%
Redcar & Cleveland College	1,220	1,030	620	1,050	3,920	17.1%	26.1%
Hartlepool College of FE	690	640	570	490	2,390	10.5%	56.1%
Darlington College	760	810	280	220	2,070	9.0%	52.4%
Stockton Riverside College	240	600	490	590	1,920	8.4%	44.2%
Manchester College	750	610	190	190	1,740	7.6%	20.3%
Learning Curve (JAA) Limited	320	380	230	220	1,150	5.0%	97.1%
Middlesbrough Council	40	70	240	400	750	3.3%	5.4%
Stockton-on-Tees Council	20	230	180	130	560	2.4%	26.3%
Derwentside College	0	120	290	100	510	2.2%	92.7%

Note: Number of starts has been rounded to the nearest 10

With the exception of Manchester College and Derwentside College the other providers are all within the Tees Valley Combined Authority area.

Manchester College is also the largest provider of training for the wider North East region accounting for 23% of training within this same time period. However the majority of the qualifications delivered by Manchester College are not Ofqual registered. It is believed that the majority of this training is delivered by a subsidiary of The Manchester College to those in HM Prisons.

The biggest providers of Ofqual registered qualifications are Middlesbrough College, Learning Curve Limited and Derwentside College. Overall 54% of qualifications in the North East Region are not Ofqual registered.

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 Tees Valley Combined Authority in Table 9 all local authority areas have seen a decline in learner starts with the exception of Middlesbrough which has seen a marginal increase of 2%. Overall the Tees Valley Combined Authority has seen a higher net decline (-21%) than the North East region as a whole (-17%).

Table 9: Unique Learner starts by area, construction subjects, all levels (Source: CITB/SFA)

Local Authority	2012-13	2013-14	2014-15	2015-16	% Net change	% Quals at Level 2+
Darlington	670	800	520	440	-35%	57%
Hartlepool	960	770	680	650	-32%	53%
Middlesbrough	1,420	1,630	1,500	1,450	2%	45%
Redcar and Cleveland	880	1,140	1,070	550	-37%	55%
Stockton-on-Tees	920	1,080	880	820	-11%	50%
Grand Total	4,850	5,420	4,650	3,910	-21%	51%

Note: Number of starts has been rounded to the nearest 10

In contrast to this the Tees Valley Combined Authority area has seen an overall increase in the number of apprenticeship starts, construction employers tend to have a preference for practical or competence based skills, so it is positive that the Tees Valley Combined Authority has witnessed this increase in apprenticeships over these four years. The college based courses are however still considered to be an important stepping stone or progression route for learners to acquire knowledge.

Roughly half of all qualifications started within the Tees Valley Combined Authority area are Level 2 or above, very similar to that for the North East region as a whole.

4.2. Apprenticeships

Within the Tees Valley Combined Authority area there has been an overall decrease in unique learner starts, however numbers of unique apprenticeship starts buck this trend and have increased by 24% over the same four year period. The most notable change has occurred in Hartlepool in the last year with numbers increasing from 150 in 2014-15 to 330 in 2015-16. Hartlepool has also seen a big increase of 48% over the last four years. Middlesbrough is the only authority which has seen a decline in apprenticeship starts. Ref: Table 10.

Table 10: Unique apprenticeship starts by area (Tees Valley Combined Authority), construction subjects (Source: CITB/SFA)

Local Authority	2012-13	2013-14	2014-15	2015-16	Increase/decrease	% Net Change
Darlington	150	200	220	220	70	48%
Hartlepool	160	150	150	330	170	107%
Middlesbrough	240	230	220	210	-30	-12%
Redcar and Cleveland	130	120	150	140	10	10%
Stockton-on-Tees	150	130	140	150	0	5%
Total	770	760	820	960	190	24%

Note: Number of starts and any increase/decrease have been rounded to the nearest 10

Although the picture for Apprenticeship starts in the Tees Valley Combined Authority area is positive it has not seen as much growth as the North East region as a whole which grew by 32% over the four year period.

When looking at apprenticeship starts by occupation it can be seen that the biggest increases in volume terms apply to building envelope specialists, civil engineering operatives and bricklayers. In contrast to this construction trade supervisors, plumbing and HVAC trades and specialist building operatives saw significant drops in volume over the same period. However, in percentage terms the biggest increases were seen in building envelope specialists, roofers, scaffolders and bricklayers.

Table 11: Unique apprenticeship starts by occupation (Tees Valley Combined Authority), construction subjects
(Source: CITB/SFA)

Occupation	2012-13	2013-14	2014-15	2015-16	Increase/decrease	% Net Change
Bricklayers	80	80	110	230	150	188%
Building envelope specialists	<25	40	70	80	80	2700%
Civil engineering operatives nec*	50	40	50	120	70	146%
Construction managers	<25	<25	<25	<25	<25	N/A
Construction Trades Supervisors	<25	<25	<25	<25	-40	-75%
Electrical trades and installation	70	70	80	70	<25	1%
Floorers	<25	<25	<25	<25	-5	-83%
Glaziers	<25	<25	30	<25	-10	-64%
Other construction profs. and technical staff	<25	<25	<25	<25	<25	56%
Painters and decorators	<25	<25	30	30	<25	38%
Plant mechanics/fitters	<25	<25	<25	<25	<25	50%
Plant operatives	<25	<25	<25	<25	<25	N/A
Plasterers and dry liners	<25	<25	30	30	<25	121%
Plumbing and HVAC Trades	120	110	100	70	-40	-36%
Roofers	<25	<25	<25	<25	<25	200%
Scaffolders	<25	<25	<25	<25	<25	188%
Specialist building operatives nec*	70	90	40	30	-30	-51%
Wood trades and interior fit-out	170	150	150	170	<25	0%

Note: Number of starts and any increase/decrease have been rounded to the nearest 10

4.3. Higher Education

Teesside University is the only higher education provider within the Tees Valley Combined Authority area and within construction it only covers building and civil engineering qualifications. Achievements have decreased over each of the last three academic years and in 2014/15 the University had just 46 civil engineering achievements and 19 in building.

There are five broad Higher Education (HE) qualifications that relate to construction: Architecture, Building, Civil Engineering, Landscape & Garden Design, and Planning. All of these courses are offered in the North East region at the four HE institutions that operate there.

Figure 10 shows the number of education achievements per annum on these courses in the North East region.

The number of training achievements has been declining each year and has fallen from 1,477 in 2012/13 to 1,301 in 2014/15. The biggest fall in numbers is experienced in building qualifications where numbers have fallen by 216 over this period. In percentage terms achievements for building qualifications have fallen by 35% and planning qualifications have fallen by 36% over the same period. In contrast, architecture and civil engineering have grown by 23% and 21% respectively. Landscape and garden design has consistently seen very low numbers, one in 2012/13, five in 2013/14 and none in 2014/15.

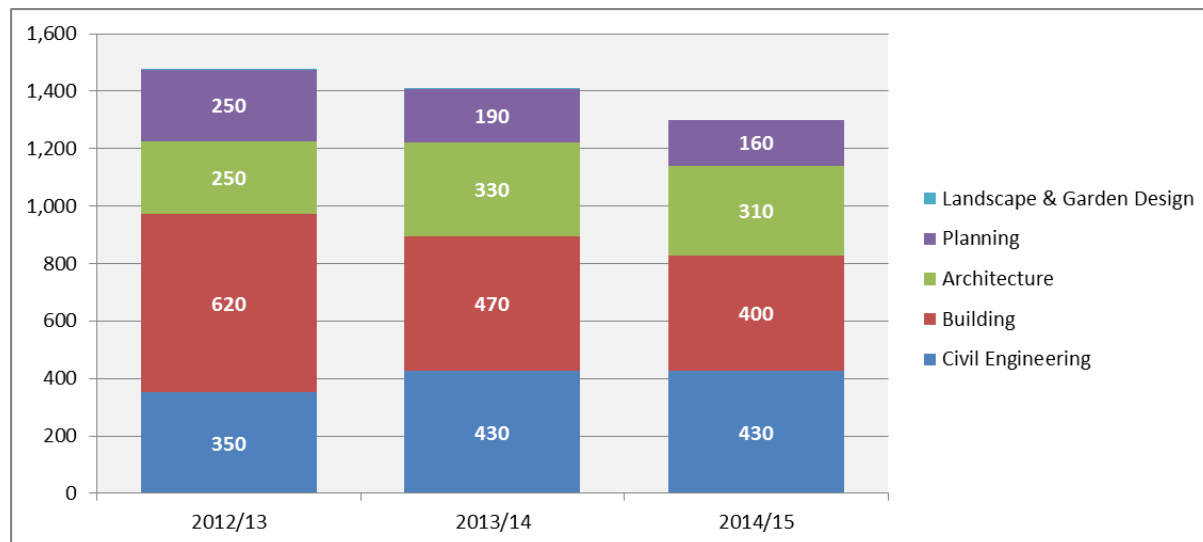


Figure 10: Higher Education achievements per annum in the North East Region (Source: HESA)

Table 12 shows the distribution of construction achievements by qualification across the institutions in the North East region for the 2014/15 academic year. It is clear that the majority of training occurs with institutions outside of the Tees Valley Combined Authority area. The University of Newcastle-Upon-Tyne is the dominant provider in the region with 639 students overall, it also accounts for the majority of all qualifications with the exception of Building. The University of Northumbria is the main provider of Building qualifications accounting for 95%. Civil Engineering is the only subject to be covered by all four institutions.

Table 12: Achievements on construction related degree courses at HE institutions in the North East – 2014/15 academic year (Source: HESA)

Institution	Civil Engineering	Building	Architecture	Planning	Total
University of Durham	20	0	0	0	20
University of Newcastle-upon-Tyne	320	0	185	134	639
University of Northumbria at Newcastle	40	384	126	27	577
Teesside University	46	19	0	0	65
Total - all institutions in the North East	426	403	311	161	1,301
Total - institutions in the Tees Valley Combined Authority only	46	19	0	0	65
% of regional achievements delivered in the Combined Authority area	11%	5%	0%	0%	0

Looking at the achievements within the Tees Valley Combined Authority area for 2014/15 as a proportion of those currently employed in corresponding roles within the Combined Authority area, Civil Engineering achievements are equivalent to 14% of the current number of civil engineers; Building achievements for 2% of the current number of construction project managers and construction trades supervisors; there were no achievements for Architecture or Planning within the Combined Authority area.

If we look at the achievements within the North East region over the same time period as a proportion of those currently employed in corresponding roles within the region the picture is more positive:

- Civil Engineering qualifications account for 28% of the current number of civil engineers
- Building achievements account for 8% of the current number of construction project managers and construction trades supervisors
- Architecture achievements account for 83% of the current number of architects
- Planning achievements account for 12% of the current number of surveyors.

These four areas of achievements together, as a percentage of the existing workforce indicate a very good level of higher education provision in the North East region for construction.

Higher Education in context

However, 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 are more 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 Higher Education. In the UK, this has become normalised. 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.

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 UCAS points entry requirements and 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.

Queens Campus, Thornaby-on-Tees

Durham University is primarily based outside the North East Combined Authority Area but has the Queen's Campus in Thornaby-on-Tees. However, the academic departments are being relocated to Durham and Newcastle University between 2017 and 2020. The Queen's Campus is being established as an International Study Centre, to prepare non-EU students for entry to Durham University.

4.4. Main points – training

Tees Valley Combined Authority area training provision:

- Over the last four years approximately 70 training providers have delivered construction related FE courses within the Tees Valley Combined Authority area.
- Over this time period a core of 10 training providers have delivered 83% of the training.
- Within the Combined Authority area there is only one HE institution accounting for only 5% of construction HE provision in the North East region.
- In relation to vocational qualifications, training providers in the area have delivered large numbers of qualifications for: Wood trades & interior fit-out; Plant operatives; Plant mechanics/fitters; Specialist building operatives.
- In comparison with the North East Region, the area's training providers have delivered a good proportion of vocational training for: Wood trades & interior fit-out; Specialist building operatives; Plumbing and HVAC Trades; Construction Trades Supervisors; Bricklayers; Electrical trades & installation; Civil engineering operatives; Building envelope specialists.
- In comparison with the North East Region, the area's training providers have delivered a low proportion of vocational training for: Plant operatives; Plasterers & dry liners; Scaffolders; Roofers; Other construction prof & technical; Painters and decorators.

5. Mobility of the workforce

Construction workforces are fluid by nature and this section of the report considers 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 East Region is used to understand how this might impact future training interventions and the supply of job opportunities for local people.³

Appendix Table 16 shows the Region/nation an employer operates in, compared with region/nation working in currently. This is taken from the CITB survey into Workforce Mobility and Skills and gives an indication of the inter-regional movement of workers. In comparison with other English regions this indicates that a relatively large proportion of workers spend some or all of their time in the North East region to work.

As some respondents would have indicated that they had worked in more than one region, the totals for percentage figures in the table exceed 100%.

5.1. Work history

Just under two thirds of construction workers have worked in the industry for at least 10 years (61%), with just over a third working in the construction industry for over 20 years (36%) and. The most likely reason for working in the region is because they grew up there/have always lived there (80%), much higher than the UK average of 55%. Nearly nine in ten (88%) construction workers in the region have remained in the North East for all or most of their career, compared to the UK average of 80%.

Further proof of the stability of the construction workforce in the North East is emphasised by the finding that in the majority of cases (86%) workers reported their last site was also in the North East. In terms of the regions/nations in which workers' current employer operates in, the majority (93%) of workers in the North East reported that their employer operated within the region they were currently working in, while 19% operated in Yorkshire and the Humber, 14% in the North West, and 13% in both the East Midlands and London, as shown in Appendix Table 18: Region/nation employer operates in, compared with region/nation working in currently.

5.2. 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 nearly all construction workers in the North East (96%) were interviewed in the same region in which they were living in when they started their construction career. Workers currently based in the North East are among the most likely to have remained in the same region in which they were based when they started their construction careers, on a par with Scotland (96%) and Northern Ireland (97%) in this respect.

Furthermore construction workers in the North East are again most likely to have stayed in the region where they studied for their first qualification (92%), with Scotland and Northern Ireland again being the only two with a higher percentage. Additionally, there is a higher than average mention by workers in Yorkshire and the Humber (8%) of construction workers achieving their qualification in the North East.

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

5.3. Travel to site

The majority of construction workers were interviewed on a site that was located within the same region/nation as their permanent home, with just 3% of all construction workers in the North East travelling into the region for work from another region in which their current residence is based (which includes those travelling to/from work from a neighbouring region).

Workers in the North East were asked to indicate the furthest distance they have worked from their permanent or current home in the last 12 months. Figure 11 shows that nearly two fifths have worked more than 50 miles away from their permanent home (39%), with 13% that have worked between 51 and 100 miles away and a quarter that have worked more than 100 miles away (26%). Workers based in North East were amongst those most likely to have travelled more than 100 miles from their permanent home to work in the last 12 months.

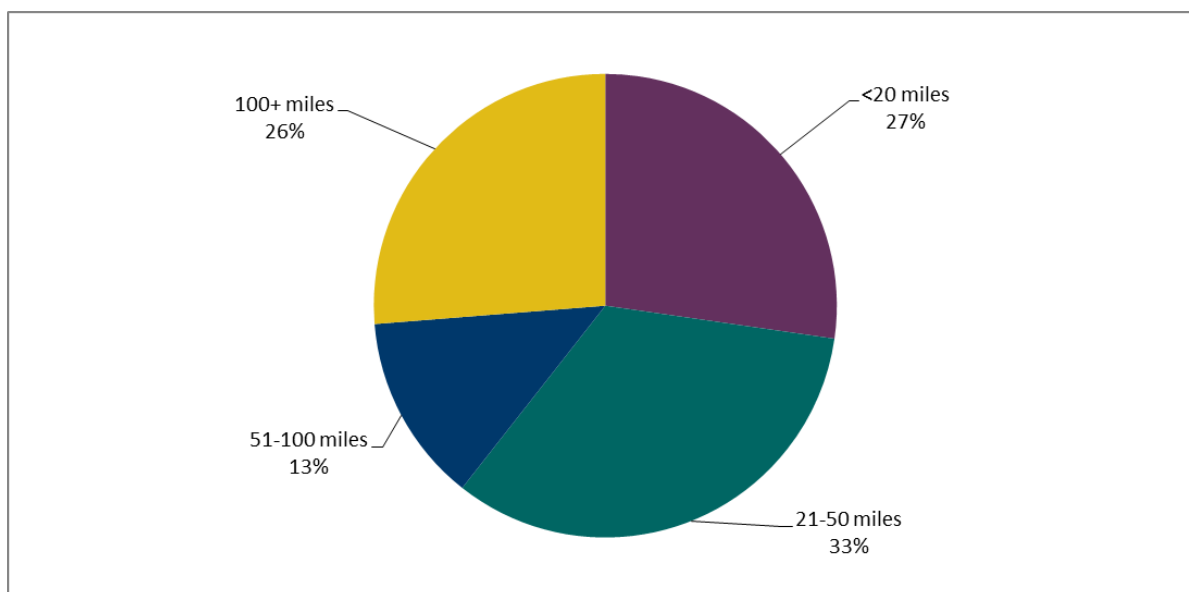


Figure 11: Furthest distance worked in past 12 months (CITB, 2015)

However, the average (mean) distance from workers' current residence (taking into account temporary residences) to their current site was 14 miles for the North East, 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.

5.4. 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 that specific site during this phase.

One in six of all construction workers in the North East (16%) do not expect to work on that site for more than a month, including 7% that only expect to be there for about a week or less. A third expect to stay on that site for a year or longer (32%), a notable increase compared with 2012 (21%), suggesting more stable employment in the North East than in 2012. However a comparable proportion (30%) 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.

Three quarters of all construction workers in the North East 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 (76%).

5.5. 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 East, up from 69% to 86%. For all other types of projects the proportion of construction workers that have worked on them has fallen since 2012.

Overall one half of all construction workers have only worked on one project type (49%), a large increase compared with 1% in 2012, which again suggests a pattern of increased stability in the sector.

5.6. 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 5 years' time they will still want to be working in construction. Within the North East, half the construction workers say they definitely will be (48%) and a further third think it is very or quite likely (35%). Just 1% say they definitely won't be and a further 7% 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) 50% believe they will definitely want to be working in the construction sector and a further 36% believe it is very likely or quite likely they will want to be working in the construction sector. Only 4% think on any level that they will not want to be working in the construction sector in five years' time which is less than in 2012 (11%).

5.7. Main points – mobility

Overall the findings from the Mobility survey indicate a relatively stable, well established workforce across the North East Region. There is some evidence of movement between neighbouring regions, specifically Yorkshire and Humber, 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 East as a whole region has a stable workforce, workers within the Tees Valley Combined Authority will not be limited to working only within the Combined Authority – they may travel to work in other areas of the North East Region and outside of the Region. Likewise, workers in other areas of the North East will also be travelling to work within the Tees Valley Combined Authority.

- More than a third of all construction workers in the North East have worked in the industry for at least 20 years (36%). Just under two thirds have done so for 10+ years (61%).
- Nearly all construction workers in the North East (96%) were interviewed in the same region in which they were living in when they started their construction career. Workers in the North East are among the most likely to have remained in the same region/nation in which they were based for their first construction job.
- Just 3% of all construction workers interviewed in the North East travelled into the region from another region in which their current residence is based.
- Within the North East, the average (mean) distance from workers' current residence (taking into account temporary residences) to their current site was 14 miles (22 miles is the UK average).
- Three quarters of all construction workers in the North East are confident that when they finish their current job their next job will allow them to travel to work from their permanent home on a daily basis (76%).
- Overall about half of all construction workers in the North East have only worked on one project type (49%).
- Since 2012 in the North East Region, there has been an increase in the proportion of construction workers working on new housing, up from 69% to 86%.
- Around half of construction workers say they definitely will be working in the industry in five years' time (48%) and a further third think it is very or quite likely (35%).

6. Demand against supply

Before looking at demand for construction compared with supply of construction workers, 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.

It is also important to note that the demand calculations are based on data covering the Tees Valley Combined Authority area, whereas the supply figures are an extrapolation of data for the North East Region.

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.

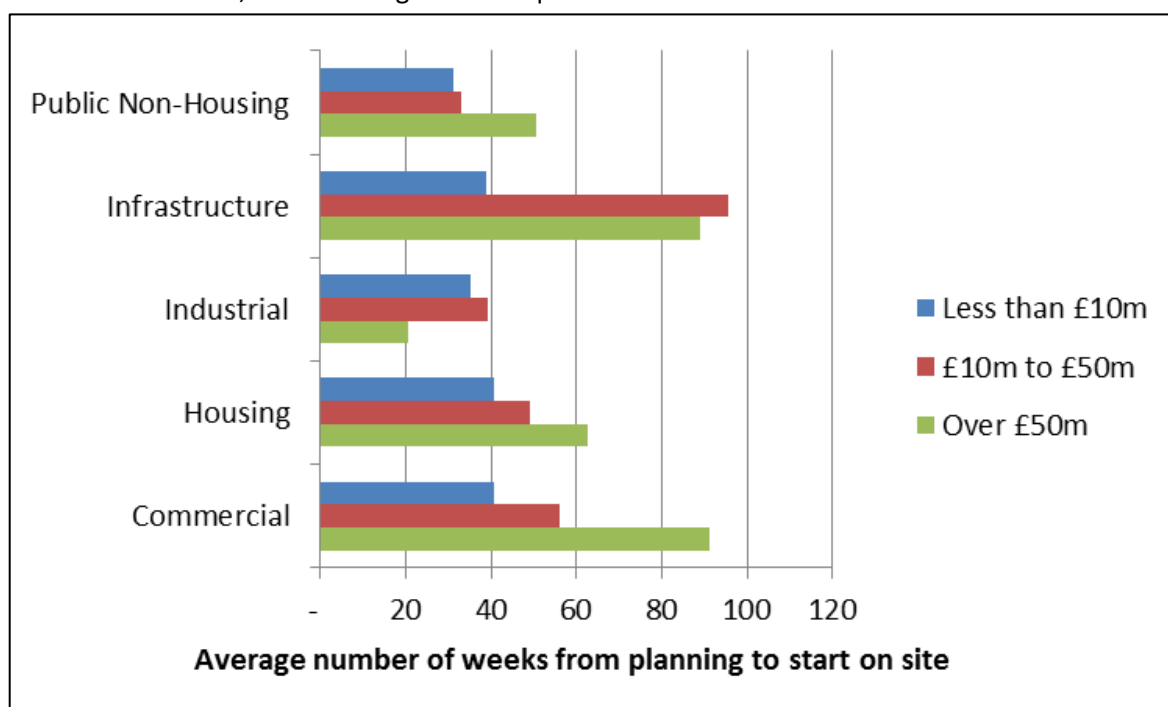


Figure 12: Average number of weeks from planning to work on site, UK 2010-2013 (Source: UKCG/Glenigan)

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. Estimates for R&M work in the North East indicate that it accounts for 24% of annual construction output.

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 plasterers and banksmen/bankpersons are most likely to have only worked on one project type, while bricklayers, site managers, dryliners, and scaffolders are more likely to have worked on a wide range of projects.

6.1. Gap analysis

Construction employment demand in 2017 within the Tees Valley Combined Authority is estimated at just over 21,390, the identified demand forecast from projects in Glenigan is outstripping supply; accounting for 105% of current employment in 2017 before reducing, as the identified projects visibility decreases. Ref: Table 13.

Table 13: Occupational breakdown of demand for Tees Valley Combined Authority area against current employment (Source CITB/WLC)

Occupation	Tees Valley Combined Authority demand	Risk of shortfall: 2017 demand compared with 2016 employment
Architects	350	4.11
Surveyors	550	1.83
Civil engineers	600	1.78
Other construction process managers	1,600	1.21
Construction project managers	400	1.30
Other construction professionals and technical staff	1,500	0.85
Construction trades supervisors	450	0.63
Logistics	250	2.36
Building envelope specialists	750	1.50
Painters and decorators	845	1.70
Glaziers	250	1.51
Wood trades and interior fit-out	1,900	1.26
Bricklayers	550	0.83
Plumbing and HVAC Trades	1,100	0.84
Electrical trades and installation	1,550	0.97
Plasterers	350	0.68
Labourers nec*	1,000	0.72
Roofers	350	0.73
Plant operatives	400	0.77
Steel erectors/structural fabrication	200	0.62
Specialist building operatives nec*	500	0.65
Civil engineering operatives nec*	500	1.84
Scaffolders	200	0.73
Plant mechanics/fitters	500	0.94
Floorers	200	0.42
Non-construction operatives	350	2.69
Senior, executive, and business process managers	1,400	1.39
Non-construction professional, technical, IT& office-based staff	2,850	1.21
Total	21,650	Base point: 1.05

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

Table 13 shows that there are some possible disparities where demand either outstrips or matches the current employment estimates for a number of occupations. These occupations show high relative gap in comparison with other occupations.

In Table 13, 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** – [Second quartile] are at some risk of a shortfall and should be reviewed to determine where opportunities for further training and development exist
- **AMBER GREEN** – [Third quartile] are at low risk of a shortfall but should be monitored and tested to compare with local qualitative opinions.
- **GREEN** – [Bottom quartile] appear to be at relatively low risk. 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.

The gap analysis compares the number of workers calculated as being required to meet the peak construction demand (as described in the demand section of this report) with the number of workers estimated as being available in the Tees Valley Combined Authority area (as described in the supply section of the report). This gives an indication as to the comparative risk of a shortfall between construction occupations. Those risks appear most likely to be in the following occupations:

- Architects
- Surveyors
- Civil engineers
- Construction project managers
- Logistics
- Building envelope specialists
- Painters and decorators
- Wood trades and interior fit-out
- Glaziers
- Civil engineering operatives nec
- Senior , executive, and business managers
- Non-construction operatives

While some of these occupations are construction specific, others have cross-sector implications.

6.1.1. Construction specific occupations

Demand for **Civil engineers, Architects and Surveyors** is a reflection of the wider UK shortage. (Migration Advisory Committee (MAC) Shortage Occupation List 2015)

Additionally as professionally qualified occupations, which tend to require degree qualifications, there will be at least three years of education and training before becoming qualified plus years more to gain experience. And 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 increase identified would require workers to be drawn into the Tees Valley Combined Authority area from the wider North East 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 anecdotal evidence to suggest that demand is met by provision based in other centres of population.

6.1.2. Cross-sector occupations

As skills in these occupations can be used in other sectors, the degree to which demand can be met will be influenced by factors other than construction demand.

Non-construction operatives move between construction and other sectors such as manufacturing and wholesale/distribution. It is possible that experienced workers could be required by other sectors as well as across the broader North East region.

Logistics skills also have an element of cross over, particularly with retail and transport sectors, which could mitigate potential demand. When compared to other occupational groups it is also lower in actual numbers which magnifies percentage changes.

In addition to the major projects identified in the Glenigan Pipeline, there will also be other work carried out in the Tees Valley Combined Authority area that is captured within the demand analysis where additional workers will be required. This additional work includes projects that are less than £250,000, as well as repair and maintenance work that does not require planning consent, and as noted earlier, this is expected to mean a total workforce demand of 21,650 between 2017 and 2019.

6.2. Gap Analysis – Long Term

When looking at the longer term past 2017, 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 wider North East CSN 2017-2021 report can be used, bearing in mind that Tees Valley Combined Authority has consistently related to around 22% of regional employment in recent years.

[The ARR is a gross requirement that takes into account workforce flows into and out of construction, due to such factors as movements between industries, migration, sickness and retirement. However, these flows do not include movements into the industry from training. The ARR provides an indication of the number of new employees that would need to be recruited into construction each year in order to realise forecast output.]

Table 144: Occupational breakdown of ARR for North East region as a whole (Source CITB)

Occupation	2016 Employment Forecast (North East)	ARR 2017-2021 (North East)	ARR as % of 2016 Employment Forecast
Non-construction prof, technical, IT, other office-based staff	10,929	200	1.8%
Construction trades supervisors	3,430	150	4.4%
Other construction professionals and technical staff	8,158	110	1.3%
Senior, executive, and business process managers	4,632	110	2.4%
Specialist building operatives nec*	3,479	110	3.2%
Labourers nec*	6,528	90	1.4%
Wood trades and interior fit-out	7,012	70	1.0%
Roofers	2,228	70	3.1%
Floorers	2,303	60	2.6%
Plant operatives	2,524	50	2.0%
Painters and decorators	2,304	50	2.2%
Steel erectors/structural fabrication	1,543	50	3.2%
Scaffolders	1,410	50	3.5%
Civil engineers	1,510	30	2.0%
Civil engineering operatives nec*	1,213	30	2.5%
Electrical trades and installation	7,381	20	0.3%
Construction project managers	1,441	20	1.4%
Plumbing and HVAC Trades	6,205	-	0.0%
Other construction process managers	6,024	-	0.0%
Bricklayers	3,036	-	0.0%
Plant mechanics/fitters	2,469	-	0.0%
Plasterers	2,451	-	0.0%
Building envelope specialists	2,284	-	0.0%
Surveyors	1,332	-	0.0%
Glaziers	721	-	0.0%
Non-construction operatives	561	-	0.0%
Logistics	492	-	0.0%
Architects	374	-	0.0%
Total	93,974	1,270	1.3%

Key

Manager/Professional occupations
Skilled Trades
Office-based Staff

The CSN 2017-2021 ARR is consistent with the earlier analysis in identifying a requirement for:

- Senior, Executive and Business Process Managers
- Non-Construction Office Based Staff

The CSN 2017-2021 ARR also identifies some other occupations with an occupational requirement, either as actual volumes or as a percentage of current employment. These occupations are:

- Construction Trade Supervisors (volume and % of employment)
- Specialist Building Operatives nec (volume and % of employment)
- Other Construction Professionals and Technical Staff (volume)
- Scaffolders (% of employment)
- Steel Erectors/Structural Fabrication (% employment)
- Roofers (% of employment)

The **Non-Construction Office Based Staff** are likely to have skills that can be transferred over a range of industries so there will exist a wider pool of potential recruitment to draw from in this instance.

Construction Trade Supervisors and **Specialist Building Operatives nec** have been identified due to a combination of comparatively high ARR by volume and an ARR as a percentage of current employment notably above the regional average.

Other Construction Professionals have been identified solely in volume terms because of their comparatively high ARR by volume and high overall employment levels, accounting for 8.7% of all regional construction employment.

For **Scaffolders**, **Steel Erectors/Structural Fabrication**, and **Roofers**, the ARR as a percentage of current employment is notably above the regional average at 3.5%, 3.2% and 3.1% respectively, which indicates potential occupational pressure to meet forecasted demand.

6.3. 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 civil engineering skills as being in demand, with the demand analysis also identifying Architects and Surveyors.

As covered earlier, Logistics and Non-Construction Operatives are not construction specific; therefore we would anticipate supply and demand to be more influenced by retail/warehouse/transport demands. For Civil Engineers, this would typically be met from graduate level recruitment, which would not be restricted to supply from within the Tees Valley Combined Authority area. With the wider impacts on these occupations, a training needs analysis specific to the Tees Valley Combined Authority area is unlikely to give credible views.

Although training levels within the Tees Valley Combined Authority area are low for all occupations, the wider North East region already delivers a significant volume of Plant Operative training and there is also good training provision for the likes of Plasterers and Dry Liners, Glaziers and Roofers. For Plant Operatives, one of the factors will be the exact type of training required, i.e. is an operative trained to use a particular type of machine or perform a niche task? Further work would have to be carried out to determine the extent to which specialist skills in these areas would match future demand, however at the moment the view would be that there is capability 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 (albeit at low levels)
- A core of providers who deliver the majority of training
- Low levels of training provision across all occupations within the Tees Valley Combined Authority area (none above 53%) but higher levels across the North East region as a whole, in particular for plant operatives, glaziers, roofers and plasterers (all over 80%).

6.4. Main points gap analysis

There will be replacement demand for all occupations.

The occupations with greatest demand are:

- Non-construction professional, technical, IT & other office-based
- Wood trades & interior fit-out
- Other construction process managers
- Electrical trades and installation
- Other construction professionals & technical staff
- Senior, executive & business process managers
- Plumbing & HVAC Trades
- Labourers nec*
- Painters and decorators
- Building envelope specialists
- Civil engineers
- Surveyors
- Bricklayers
- Civil engineering operatives

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

- Wood trades & interior fit out
- Painters & decorators
- Other construction process managers
- Building envelope specialists
- Civil engineers
- Surveyors
- Civil engineering operatives

7. Conclusions and recommendations

The aim of the Tees Valley Combined Authority 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 Tees Valley 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 Tees Valley Combined Authority 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 Tees Valley 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 Tees valley Combined Authority 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 Tees Valley Combined Authority 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 Tees Valley 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 Tees Valley 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. 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.)

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 Tees Valley 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 careers 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.

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 Tees Valley Combined Authority 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

APPENDICES

Appendix A. Demand analysis methodology

A.1.1. 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 details on 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.

A.1.2. Calculating construction output

A.1.2.1. 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 date, the results are sent to the Tees Valley Combined Authority to supplement and/or confirm.

A.1.2.2. 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 (2016Q4) 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 15. 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 15: 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 thoroughly inspected and 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 housing, commercial and industrial. 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.1.2.3. 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 Tees Valley Combined Authority 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 15. 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 Tees Valley Combined Authority 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.1.2.4. 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

A.1.2.5. Validation by the Tees Valley Combined Authority

Finally, the resulting pipeline of work is forwarded to the Tees Valley Combined Authority who check its validity and identify any omissions or other issues.

A.1.3. 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.

1. Considering the government region within which the Tees Valley Combined Authority lies (in this case, the North East), identify only the new build in the denominated projects by removing all repair and maintenance projects.
2. 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.
3. 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:

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

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.

4. To take account of housing repair and maintenance (R&M) in the denominated projects 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 output is therefore multiplied by the following ratio:

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

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

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

A.1.4. 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.

A.1.5. 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 A1.2, and A1.4. 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 B. 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 15Table 15.

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
- (1131) Financial managers and directors
- (1132) Marketing and sales directors
- (1133) Purchasing managers and directors
- (1135) Human resource managers and directors
- (1251) Property, housing and estate managers
- (1136) Information technology and telecommunications directors
- (2150) Research and development managers
- (1162) Managers and directors in storage and warehousing
- (1259) Managers and proprietors in other services nec
- (1139) Functional managers and directors nec
- (2133) IT specialist managers
- (2134) IT project and programme managers
- (3538) Financial accounts managers
- (3545) Sales accounts and business 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
- (1122) Production managers and directors in construction
- (1161) Managers and directors in transport and distribution
- (1255) Waste disposal and environmental services managers
- (3567) Health and safety officers
- (3550) Conservation and environmental associate professionals

4 Non-construction professional, technical, IT, and other office-based staff (excl. managers)

- (3131) IT operations technicians
- (3132) IT user support technicians
- (3534) Finance and investment analysts and advisers
- (3535) Taxation experts
- (3537) Financial and accounting technicians
- (3563) Vocational and industrial trainers and instructors
- (3539) Business and related associate professionals nec
- (3520) Legal associate professionals
- (3565) Inspectors of standards and regulations
- (2136) Programmers and software development professionals
- (2139) Information technology and telecommunications professionals nec
- (3544) Estate agents and auctioneers
- (2413) Solicitors
- (2419) Legal professionals nec
- (2421) Chartered and certified accountants
- (2424) Business and financial project management professionals
- (2423) Management consultants and business analysts
- (4216) Receptionists
- (4217) Typists and related keyboard occupations

	<p>(3542) Business sales executives (4122) Book-keepers, payroll managers and wages clerks (4131) Records clerks and assistants (4133) Stock control clerks and assistants (7213) Telephonists (7214) Communication operators (4215) Personal assistants and other secretaries (7111) Sales and retail assistants (7113) Telephone salespersons (3541) Buyers and procurement officers (3562) Human resources and industrial relations officers (4121) Credit controllers (4214) Company secretaries (7129) Sales related occupations nec (7211) Call and contact centre occupations (7219) Customer service occupations nec (9219) Elementary administration occupations nec (2111) Chemical scientists (2112) Biological scientists and biochemists (2113) Physical scientists (3111) Laboratory technicians (3421) Graphic designers (2463) Environmental health professionals (2135) IT business analysts, architects and systems designers (2141) Conservation professionals (2142) Environment professionals (2425) Actuaries, economists and statisticians (2426) Business and related research professionals (4124) Finance officers (4129) Financial administrative occupations nec (4138) Human resources administrative occupations (4151) Sales administrators (4159) Other administrative occupations nec (4162) Office supervisors (7130) Sales supervisors (7220) Customer service managers and supervisors (4161) Office managers</p>
5 Construction trades supervisors	
	<p>(5250) Skilled metal, electrical and electronic trades supervisors (5330) Construction and building trades supervisors</p>
6 Wood trades and interior fit-out	
	<p>(5315) Carpenters and joiners (8121) Paper and wood machine operatives (5442) Furniture makers and other craft woodworkers (5319) Construction and building trades nec (25%)</p>
7 Bricklayers	
	<p>(5312) Bricklayers and masons</p>

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, staggers 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 Tees Valley Combined Authority**

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

Number	Heading	Local Authority	Value (£m)	Start Date	End Date	Reason for omission
1	Sports Hall	Darlington	0.3			Missing dates
2	6 Tourist Accommodation Units (Conversion/Extension)	Redcar & Cleveland	0.5			Missing dates
3	10 Flats (Conversion)	Redcar & Cleveland	0.5			Missing dates
4	Community Building & Event Space	Hartlepool	0.5			Missing dates
5	Training & Industrial Storage Building	Stockton-On-Tees	0.5			Missing dates
6	16 Sheltered Housing Units (Conversion)	Stockton-On-Tees	0.6			Missing dates
7	Farm Shop	Darlington	0.7			Missing dates
8	Student Accommodation (Conversion/Extension)	Middlesbrough	0.7			Missing dates
9	Office Building	Redcar & Cleveland	0.8			Missing dates
10	12 Student Flats (Conversion/Alterations)	Middlesbrough	0.9			Missing dates
11	Gas Fuelled Generation Plant	Stockton-On-Tees	0.9			Missing dates
12	14 Houses	Hartlepool	1.0			Missing dates
13	Peaking Power Generation Plant	Stockton-On-Tees	1.0			Missing dates
14	Concrete Batching Plant	Redcar & Cleveland	1.0			Missing dates
15	Shop/Restaurant/Takeaway/Leisure Units	Redcar & Cleveland	1.1			Missing dates
16	21 Flats & 3 Office/Retail Units	Middlesbrough	1.2			Missing dates
17	Visitor Centre	Redcar & Cleveland	1.3			Missing dates

Number	Heading	Local Authority	Value (£m)	Start Date	End Date	Reason for omission
18	Recycling Facility (Extension)	Redcar & Cleveland	1.5			Missing dates
19	18 Elderly Flats, 11 Bungalows, 5 Town Houses & 4 Flats (New/Conversion)	Hartlepool	2.1			Missing dates
20	77 Flats (Conversion)	Middlesbrough	2.6			Missing dates
21	45 Houses	Stockton-On-Tees	3.4			Missing dates
22	Care Home Development	Middlesbrough	3.8			Missing dates
23	Car Showroom & Workshop	Stockton-On-Tees	4.5			Missing dates
24	Energy From Waste Facility	Middlesbrough	6.3			Missing dates
25	110 Residential Units	Hartlepool	8.3			Missing dates
26	Agricultural Market	Darlington	9.0			Missing dates
27	4 Office/Pilot Plant/Warehouse Buildings (Extension)	Stockton-On-Tees	14.8			Missing dates
28	Deep Sea Container Terminal	Redcar & Cleveland	300.0			Missing dates
29	Consultancy Framework	Stockton-on-Tees	2.6	4/30/2014	4/25/2018	Consultancy
30	Design Consultants Framework	Stockton-on-Tees	7.0	10/17/2016	10/19/2020	Consultancy
31	Consultancy Services Framework	Stockton-on-Tees	1.0	7/24/2018	7/24/2023	Consultancy
32	Design Team & Technical Advisor Services Framework	Hartlepool	0.5	4/1/2014	3/27/2018	Consultancy

Appendix D. **Significant Glenigan projects in the Tees Valley**

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	Energy Efficiency Measures Framework	Middlesbrough	500.0	1/2/2014	1/2/2018	Housing R&M
2	1230 Houses/Flats	Middlesbrough	175.0	4/3/2017	1/23/2032	New housing
3	Minor Works Framework Contract	Stockton-on-Tees	122.1	6/27/2016	6/27/2020	Public Non-housing
4	Residential Development Framework	Darlington	100.0	7/26/2018	7/26/2022	New housing
5	Contractors Framework	Stockton-on-Tees	75.0	6/23/2016	6/25/2020	New housing
6	Biomass Power Station	Stockton-On-Tees	60.0	1/11/2016	4/16/2018	Infrastructure
7	Biomass Power Plant	Middlesbrough	60.0	8/21/2017	8/17/2020	Infrastructure
8	School	Hartlepool	48.9	4/22/2014	4/22/2018	Public Non-housing
9	Building Construction Framework	Stockton-On-Tees	34.2	4/1/2014	4/1/2018	Public Non-housing
10	Materials Handling Facility	Redcar & Cleveland	32.0	5/29/2019	5/29/2022	Infrastructure
11	Civil Engineering Framework	Stockton-on-Tees	29.0	11/30/2013	11/30/2017	Infrastructure
12	114 Houses	Redcar & Cleveland	26.7	3/20/2017	3/23/2020	New housing
13	341 Houses	Stockton-On-Tees	25.6	4/4/2016	4/1/2019	New housing
14	Highways Surfacing Framework	Darlington	24.4	10/1/2016	10/3/2020	Infrastructure
15	299 Houses	Middlesbrough	22.4	7/19/2017	8/19/2018	New housing
16	375 Residential Units	Middlesbrough	22.2	1/17/2018	2/17/2019	New housing
17	Biomass Power Station	Stockton-On-Tees	20.0	8/11/2017	8/9/2019	Infrastructure
18	240 Houses	Stockton-On-Tees	18.0	6/1/2015	6/1/2018	New housing
19	4 Fire Stations & 2 Fire Authority Buildings Framework	Hartlepool	17.9	8/30/2013	8/30/2017	Public Non-housing
20	232 Houses	Darlington	17.4	12/19/2016	1/22/2018	New housing
21	Police Headquarters	Middlesbrough	16.3	3/20/2017	9/18/2017	Public Non-housing
22	Hospital (Refurbishment/Extension)	Darlington	16.3	11/23/2015	3/18/2018	Public Non-housing
23	350 Retirement Village Units	Stockton-On-Tees	15.2	1/15/2018	2/18/2019	New housing
24	Business Park	Stockton-On-Tees	13.5	9/4/2017	10/1/2018	Infrastructure

	Description	Local Authority	Construction Value (£m)	Start Date	End Date	Project Type
25	Theatre (Extension/Alterations)	Darlington	13.0	6/20/2016	10/29/2017	Private Commercial
26	Golf Resort Development (New/Alteration)	Stockton-On-Tees	12.9	1/7/2019	4/6/2020	Private Commercial
27	172 Houses	Middlesbrough	12.9	4/3/2017	1/7/2019	New housing
28	Hotel	Stockton-On-Tees	12.8	9/11/2017	12/3/2018	Private Commercial
29	Hospital Energy Centre (Extension)	Stockton-On-Tees	11.4	5/18/2017	11/15/2018	Public Non-housing
30	148 Houses	Stockton-On-Tees	11.1	3/21/2016	9/18/2017	New housing
31	145 Houses & 1 Sports Facilities	Stockton-On-Tees	10.3	10/12/2015	10/13/2017	New housing, Private Commercial, Public Non-housing
32	Airport (Alterations)	Darlington	10.0	7/11/2017	7/11/2018	Infrastructure
33	128 Houses	Redcar & Cleveland	9.6	10/3/2016	10/30/2017	New housing
34	Office Building	Middlesbrough	9.4	2/8/2018	11/8/2018	Private Commercial
35	138 Houses	Stockton-On-Tees	9.1	9/4/2017	10/1/2018	New housing
36	138 Houses	Hartlepool	9.1	7/13/2018	8/10/2019	New housing
37	Bridge Works	Middlesbrough	9.0	6/30/2017	6/29/2018	Infrastructure
38	Residential Development	Stockton-On-Tees	8.0	7/25/2016	9/25/2017	New housing
39	78 Student Flats (Conversion/Alterations)	Stockton-On-Tees	7.9	10/9/2017	11/19/2018	Public Non-housing
40	Bio-Incubator Building	Darlington	7.3	8/3/2017	5/3/2018	Public Non-housing, New housing, Private Commercial, Infrastructure
41	46 Houses/15 Flats & 12 Bungalows	Darlington	7.2	2/6/2017	6/15/2018	New housing
42	Anaerobic Biogas Production	Hartlepool	7.2	8/22/2016	11/22/2017	Infrastructure
43	Food Industry	Stockton-On-Tees	6.9	10/16/2017	5/7/2018	Private Industrial
44	95 Houses	Darlington	6.3	6/17/2018	7/17/2019	New housing
45	80 Houses & 1 Supermarket	Stockton-On-Tees	6.1	12/14/2017	1/11/2019	New housing, Private

	Description	Local Authority	Construction Value (£m)	Start Date	End Date	Project Type
						Commercial
46	36 Bungalows & 28 Houses	Hartlepool	6.0	4/24/2017	8/31/2017	Private Commercial
47	10 Industrial Workshop Units & 3 Retail Units	Redcar & Cleveland	5.7	1/9/2017	8/4/2017	Private Commercial, Private Industrial
48	Office Building	Middlesbrough	5.7	2/8/2018	11/15/2018	Private Commercial
49	Concert Venue (Refurbishment)	Middlesbrough	5.7	12/12/2016	2/5/2018	Public Non-housing
50	Community Safety Hub	Middlesbrough	5.3	3/16/2017	12/28/2017	Public Non-housing
51	Fire Station	Stockton-On-Tees	5.1	12/12/2016	12/11/2017	Public Non-housing
52	Waste Transfer Station	Redcar & Cleveland	5.0	4/23/2018	1/30/2019	Infrastructure
53	Offices	Stockton-On-Tees	4.6	3/6/2017	12/4/2017	Private Commercial
54	Distribution Centre/Warehouse/Offices (Extension)	Darlington	4.0	2/8/2018	8/16/2018	Private Industrial, Infrastructure
55	Business Park	Redcar & Cleveland	4.0	1/30/2017	10/30/2017	Private Commercial
56	School & Nursery	Hartlepool	3.9	8/25/2017	6/1/2018	Public Non-housing
57	Supermarket	Hartlepool	3.3	11/6/2017	6/4/2018	Private Commercial
58	7 Industrial Units	Stockton-On-Tees	3.2	11/6/2017	5/14/2018	Private Industrial
59	Flood Defence	Hartlepool	3.2	10/9/2017	4/9/2018	Infrastructure
60	Supermarket	Redcar & Cleveland	3.0	4/3/2017	9/29/2017	Private Commercial
61	Storage & Distribution Facility	Stockton-On-Tees	2.8	7/17/2017	1/22/2018	Private Industrial
62	Housing (Refurbishment)	Stockton-on-Tees	2.8	1/16/2017	7/28/2017	Housing R&M

Appendix E. Region employer operates in, compared with working in

Appendix Table 16: Region/nation employer operates in, compared with region/nation working in currently

Region/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 and 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%