Construction Skills Gap Analysis for the GFirst LEP (the Gloucestershire Local Enterprise Partnership)

Final Report

Client: GFirst LEP

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Executive Summary

The purpose of this report is to present evidence to the Gloucestershire Local Enterprise Partnership (GFirst LEP) on the skills provision and needs required in the construction industry over the next five years (2017-2021). Its aim is to help inform decision makers target resources to employment and skills opportunities, which in turn will enable economic growth.

Construction is one of the key drivers of the UK economy, contributing to around 6% of the UK GDP. According to recent estimates there are currently 2.3 million people working in the construction industry; circa 6.5% of the UK labour market. Despite monthly fluctuations the industry remains above its pre-crisis peak (2008), growing at 2.8% year on year in the most recent quarter (Q3 2017); the fastest growing amongst the main industries. The construction sector acts as a key enabler to other sectors in both the public and private divisions. Its scope is large, ranging from the building of hospitals to the development of new office space; it is essentially a key initiator of the process. As repair and maintenance is a significant part of construction, construction is not only an initiator but also a link between the old and new.

In order focus on skill shortages within the construction sector, this report provides three types of analyses: demand, supply and gap analyses. It begins with the demand analysis, where demand refers to the amount of labour required to fulfil planned infrastructure projects over the forecast horizon. The second section focuses on supply. Supply refers to the number of qualified workers that are expected to be available over the same five year period. The difference between the two is referred to as the gap analysis, which is presented in detail in the final section.

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

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1. Introduction

The Gloucestershire local authorities analysed in this research are:

- Cheltenham
- Cotswold
- Forest of Dean
- Gloucester
- Stroud
- Tewkesbury

Figure 1: GFirst LEP and surrounding areas

2. Demand analysis

2.1. Introduction

This section presents the process of calculating the amount of labour required given the volume of investment in anticipated new construction. Further information on the data sources and methodology are detailed in Appendix A. In order to provide information on the levels of labour demand, the following key assumptions have been made:

1. Workforce demand (2017-2021) is approximately equal to current peak year (2017) demand, based on the premise that construction investment in future years will remain at similar levels.
2. Repair and maintenance (R&M) work is an estimate based on calculations where the proportion of the total output represented by housing and commercial R&M is the same at the LEP level as it is at the regional level in the Construction Skills Network.
3. Projects less than £250,000 have been excluded from the analysis unless stated otherwise; for example repair and maintenance work.

2.2. The Construction Skills Network, The Labour Forecasting Tool and Calculating Labour demand

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. (Gloucestershire sits within the South West Region). To predict construction demand at a sub-regional level, we use our prize-winning Labour Forecasting Tool (LFT) developed on behalf of CITB. Our Labour Forecasting Tool is used to determine the labour demand generated by the construction outputs in the peak year calculated as described in Appendix A. 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).

3. Labour demand in the GFirst LEP area

3.1. Introduction

The following sections provide an estimate of the labour demand that construction investment will create across the GFirst LEP over the period 2017-2021. They report the outputs determined from the analysis described in Section 1 and the labour demand they generate as calculated by the Labour Forecasting Tool.

3.2. Pipeline of denominated projects

3.2.1. Glenigan pipeline analysis

The initial review of the Glenigan database identified 326 projects in the GFirst LEP area. Of these, 38 were removed due to missing dates. Also excluded were two projects which were clearly identified as consultancy projects. A full set of the projects which were omitted from the analysis is provided in Appendix C. Around 2.4% of the total pipeline was removed due to missing dates. The majority of projects omitted were residential developments and public non-housing typically valued at between £0.5 m and £55m. It is possible that this work will take place at some undefined point in the future but as dates are unknown it is most likely that this will be later in the forecast period. Since dates are not known it is not possible to pinpoint when the labour will be required, but an assessment of the labour demand is made in the estimates of other work from the additional projects.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 53 significant projects accounting for just under 89% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 1 shows the number of significant projects within the GFirst LEP 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.

	Number of projects	Construction spend (£m – 2017 values)
All Glenigan projects	286	5,418
Significant Glenigan projects	53	4,802
Percentage within significant projects	**19%**	**89%**

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

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 GFirst LEP can be seen in

Figure 2. The radius of the markers is proportional to the value of the work taking place.

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

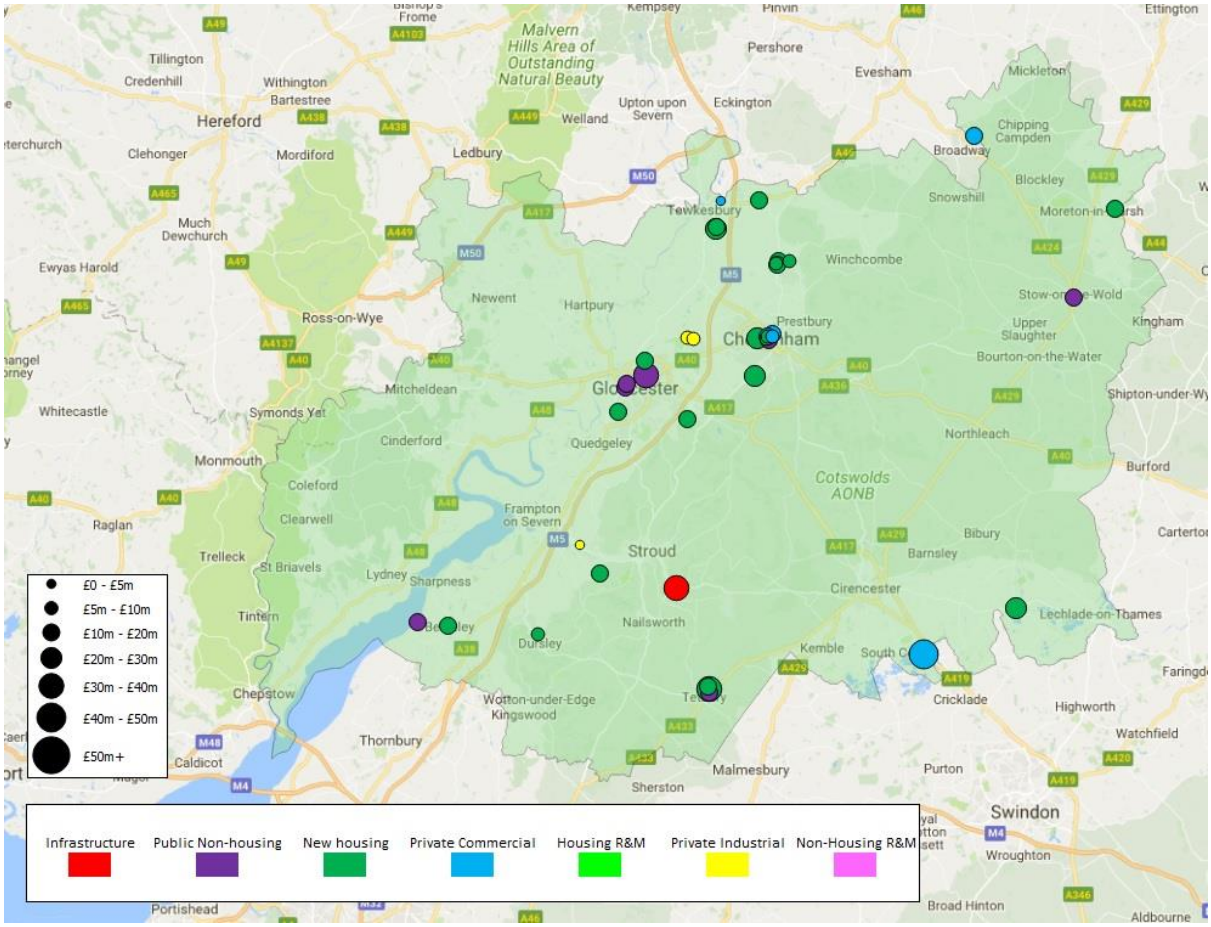

Figure 2: Location of significant projects included in the analysis

3.2.2. Glenigan & National Infrastructure and Construction Pipeline (NICP) spend analysis

Implementing the methodology outlined in 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 2 shows the distribution by sector of new build spend for the total pipeline of denominated projects.

Project Type	Construction spend in 2017 (2017 values - £m)	% of total
Infrastructure	334	40%
New Housing	280	34%
Private Commercial	122	15%
Public Non-housing	80	10%
Private Industrial	14	2%
Total	**830**	**100%**

Table 2: New-build construction spend by project type in 2017 (total denominated project pipeline)

Table 3 shows the infrastructure construction spend from both Glenigan and the NICP in 2017 by sub-sector.

Project Type	Construction spend in 2017 (2017 values - £m)	% of total
Energy	167	53%
Transport	100	32%
Water	38	12%
General Infrastructure	5	2%
Flooding	4	1%
Total	**314**	**100%**

Table 3: Construction spend per infrastructure sub-type in 2017 (total denominated project pipeline)

3.3. Estimate of future total labour demand

As outlined in Section 1, the denominated project pipeline may not include smaller projects or repair and maintenance work. **Error! Reference source not found.** 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 2021 at 25,000.

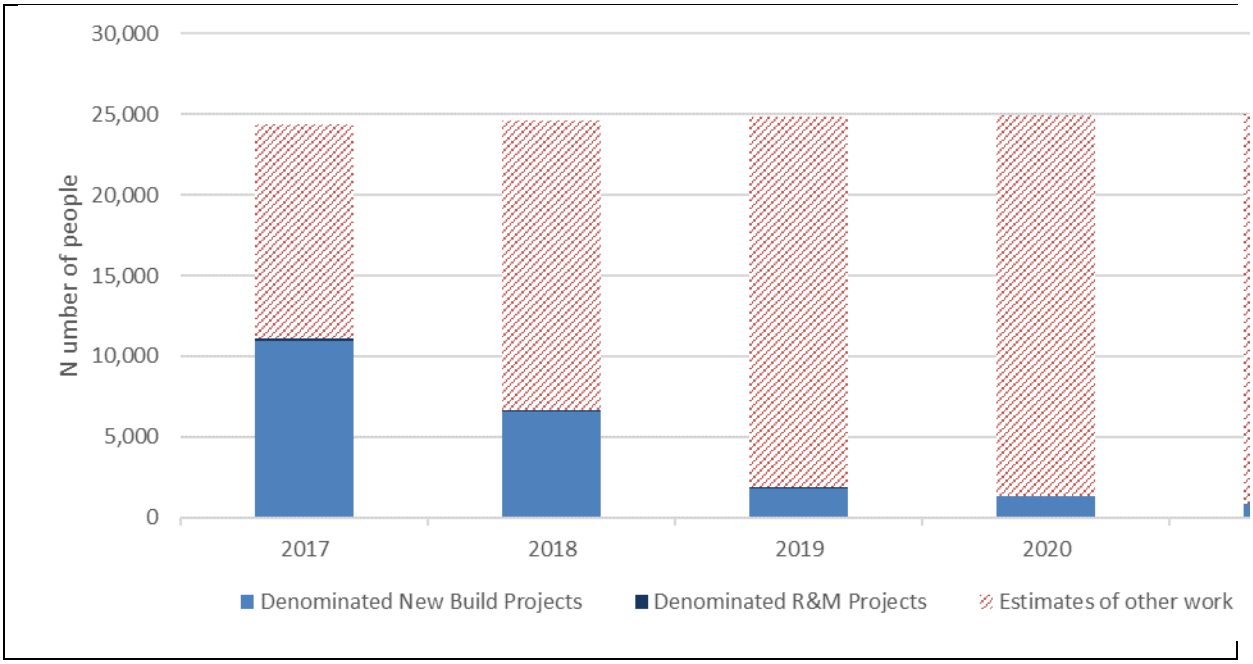

Figure 3: Total construction labour demand including estimates for both R&M and estimates of other work

3.3.1. Breakdown of labour demand by occupation

For the peak year 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.

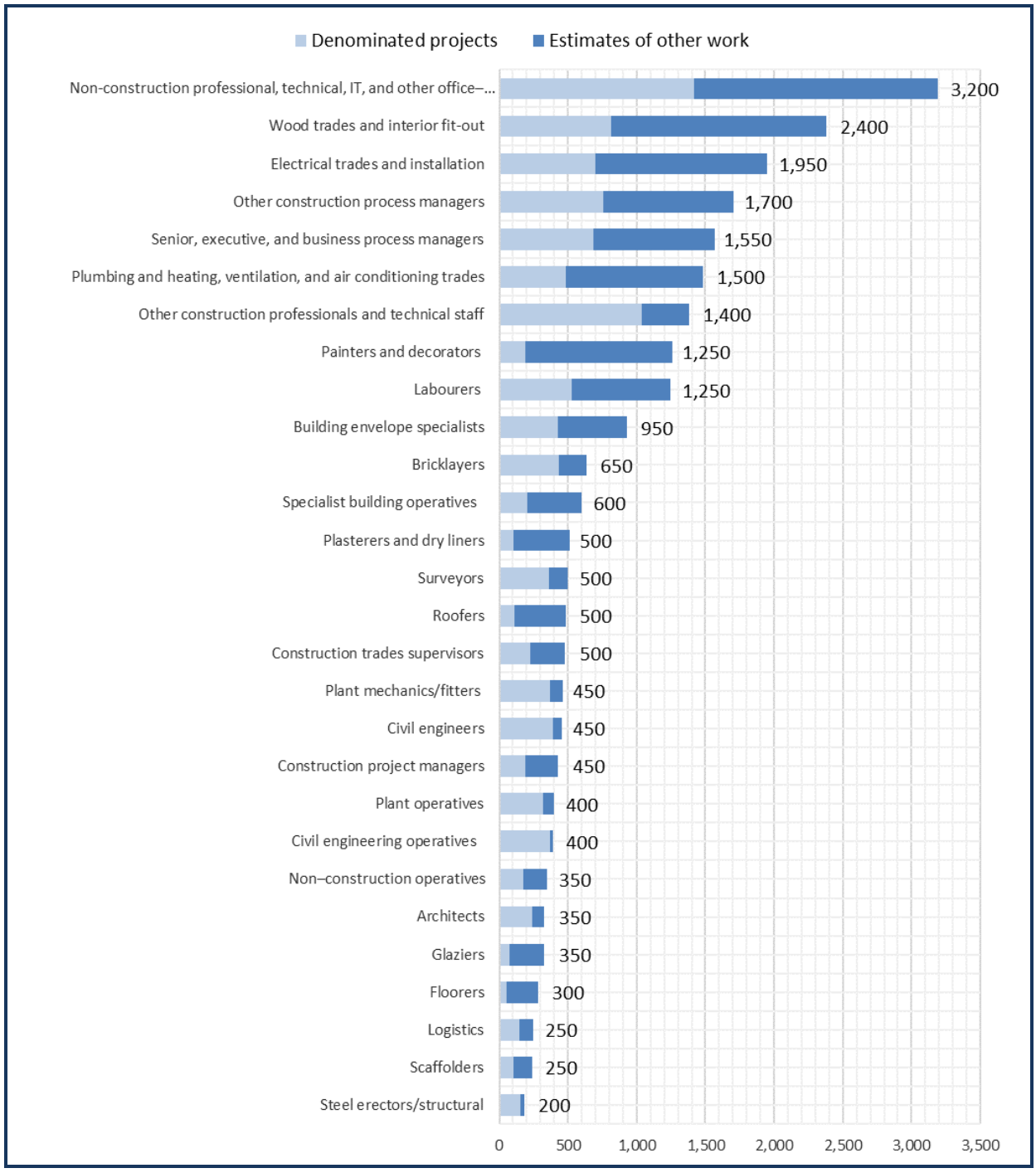

Figure 4: Construction labour demand by occupation in the peak year

3.3.2. Breakdown of labour demand by project type

Table 4 shows the labour demand generated by the denominated projects and the estimates of other work in 2017.

Project Type	Labour Demand from denominated projects (People)	Labour Demand from estimates of other work (People)	Total Labour Demand (People)	% of total
Non-housing R&M	0	7350	7,350	**30%**
Private Commercial	2300	2050	4,350	**18%**
New Housing	3650	200	3,850	**16%**
Housing R&M	100	3750	3,850	**16%**
Infrastructure	3250	0	3,250	**13%**
Public Non-housing	1500	0	1,500	**6%**
Private Industrial	300	0	300	**1%**
Total	**11,100**	**13,350**	**24,450**	**100%**

Table 4: Labour demand by work type in 2017

3.4. Summary of demand in 2017 (peak year)

The labour demand arising from the construction spend in the GFirst LEP area peaks at around 24,500 people, taking account of estimates of other work including R&M in addition to the pipeline of denominated projects.

The most labour-intensive occupation group is “non-construction professional, technical, IT and other office–based staff” with an annual demand of 3,200 people.

The estimate of labour demand for the trade occupations are as follows (in descending order of demand):

I. “Wood trades and interior fit-out” with a requirement for 2,400 people;

II. “Electrical trades and installation” trades with 1,950 people.

III. Plumbing and heating, ventilation, and air conditioning trades” rank third, with a demand of 1,500 people.

4. A picture of supply

When looking at the supply of workers there are two main elements to consider; the size of the current workforce and the availability of training courses.

The first section takes a view on the current employment levels in the GFirst LEP and how this relates to overall employment across the wider South West region and the UK as a whole. The GFirst LEP falls entirely with the larger South West region[2], all comparisons have therefore been made against the South West region and, where applicable, the UK. Data from CITB's Construction Skills Network (CSN) is used along with official Government sources.

The second section presents evidence around the number and types of courses provided by institutions. Whilst training occurs at Further Education (FE) and Higher Education (HE) levels, the focus of this report is more often on the FE that takes place. This is because FE tends to be sourced and delivered in close proximity to the home and workplace. HE on the other hand, not only provides much greater mobility, but the duration of study required to qualify tends to be much longer. The much longer period means most HE qualified occupations are outside the period that this report can consider. That does not mean that the GFirst LEP area should not have ambitions to move workers through to higher level training and education. There may also be opportunities for more leadership and management, as well as specialist training and development.

The final section compares the demand forecasts against employment, training and workforce mobility to give an indication of possible gaps and/or occupational pinch points.

4.1. Main points

a) Just over a third of the workforce in the GFirst LEP area are located within the Gloucester city local authority area

b) Current construction workforce in the GFirst LEP area is estimated at just over 29,000

c) Recent employment numbers show that construction employment fell in both the South West as a whole and within the LEP area but the fall in the LEP area was lower

d) Around 52 training providers have delivered construction relevant FE courses within the GFirst LEP area over the last four academic years. There are two main providers delivering 79% of the provision; Gloucestershire College and South Gloucestershire and Stroud College.

[2]Includes Bath and North East Somerset, Bournemouth, Bristol, Christchurch, Cornwall, East Devon, East Dorset, Exeter, Isles of Scilly, Mendip, Mid Devon, North Devon, North Dorset, North Somerset, Plymouth, Poole, Purbeck, Sedgemoor, South Gloucestershire, South Hams South Somerset, Swindon, Taunton Deane, Teignbridge, Torbay, Torridge, West Devon, West Dorset, West Somerset, Weymouth and Portland, Wiltshire in addition to those mentioned for GFirst LEP

4.2. Existing workforce

4.2.1. Recent trends: workforce and businesses

- The GFirst LEP area construction workforce grew by 2% between 2012 and 2016, slightly above the South West rate of 1%.
- There has been a 9% increase in the number of micro sized construction businesses from 2012 to 2016 within the GFirst LEP area accounting for almost all (96%) of the growth in construction businesses in the LEP area over this period.
- Self-employment fell to 35% in 2016 from 51% in 2012.

An analysis of the Annual Population Survey shows that the LEP area accounts for around 13% of construction employment in the South West[3]. Table 5 applies this percentage share across the CSN occupation breakdown for the South West region as a whole to give an estimate of total employment at occupational and industry level in the GFirst LEP. For comparison the wider South West region has been included in Table 5.

[3] ONS/NOMIS (2016) Annual Population Survey Workplace Analysis Jan 2016 – Dec 2017

Occupation	GFirst LEP	South West
Other construction professionals and technical staff	1,970	15,120
Senior, executive, and business process managers	1,940	14,930
Other construction process managers	1,520	11,650
Surveyors	850	6,510
Construction trades supervisors	420	3,260
Architects	360	2,800
Civil engineers	350	2,660
Construction project managers	340	2,620
Wood trades and interior fit-out	3,590	27,610
Plumbing and HVAC Trades	2,400	18,470
Electrical trades and installation	2,080	15,960
Building envelope specialists	1,580	12,170
Painters and decorators	1,450	11,120
Labourers nec*	1,120	8,610
Bricklayers	1,000	7,680
Plasterers	650	4,980
Roofers	580	4,490
Specialist building operatives nec*	520	4,000
Plant operatives	500	3,870
Scaffolders	480	3,700
Glaziers	360	2,760
Steel erectors/structural fabrication	320	2,430
Civil engineering operatives nec*	310	2,350
Plant mechanics/fitters	280	2,170
Floorers	170	1,290
Logistics	120	940
Non-construction professional, technical, IT, and other office-based staff	3,990	30,690
Non–construction operatives	240	1,850
Total	29,490	226,690

Table 5: Construction occupational breakdown, 2016 (Source: Experian and CITB)
**nec – not elsewhere classified*

Key

Manager/Professional Occupation
Skilled Trades
Office-based Staff

In 2016, the GFirst LEP construction employment was approximately eight times smaller in size than the South West, sitting at around 23,800 people. On the whole the construction workforce in the GFirst LEP area has mirrored changes in the size of the construction workforce, however in a number of years the changes have been more volatile than the overall UK and South West workforce. Between 2012 and 2016 the construction workforce in the GFirst LEP area grew by 2%. However this growth was not seen each year with declines year on year in 2012, 2014 and 2016. This follows the same pattern in the South West region as a whole, with an overall growth of 1% but with declines also in 2012, 2014 and 2016. The changes in construction workforce at LEP, region and UK wide are detailed in Figure 5 below.

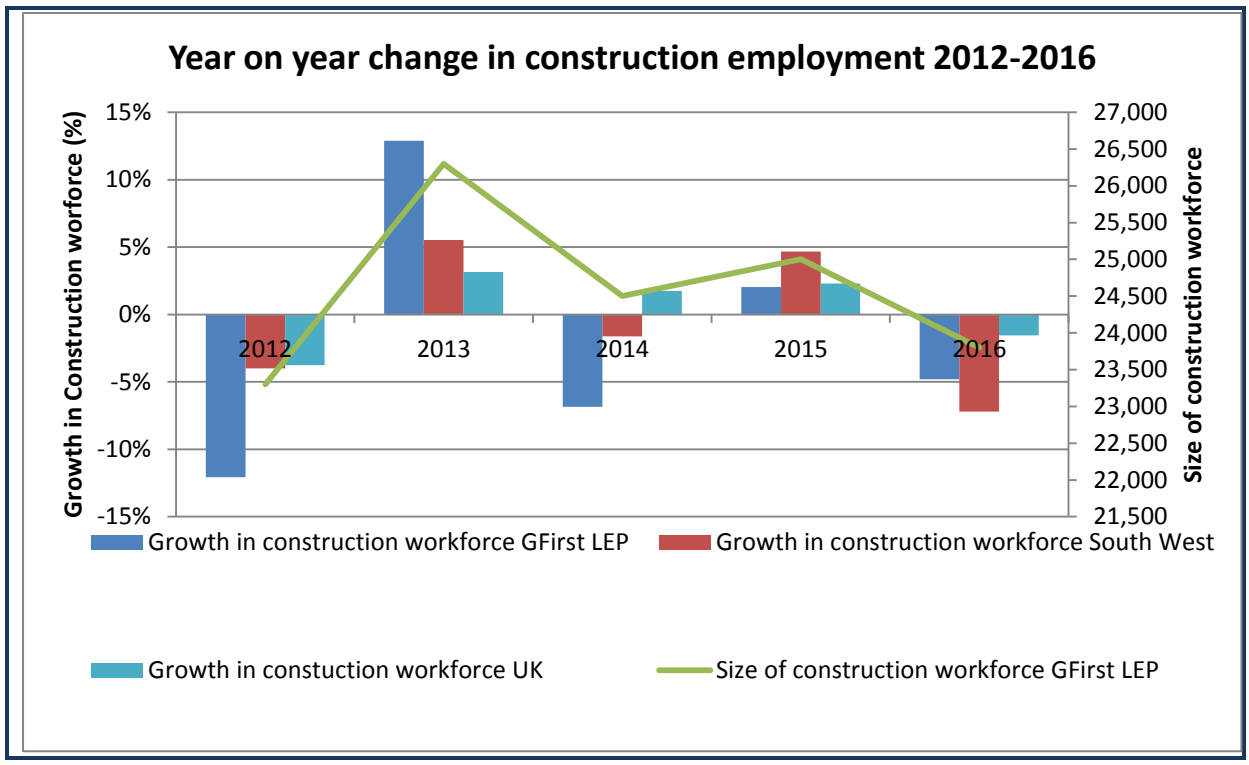

Figure 5: Year on year change in construction employment (NOMIS –annual population survey workplace analysis August 2017)

In the South West as a whole the number of construction businesses increased by 10% over the last five years (2012-2016). This is slightly above the GFirst LEP area which saw an 8% increase over the same time period. This means that the share of South West construction businesses in the GFirst LEP area has slightly fallen from 12% in 2012 to 11% in 2016. Figure 6 shows the year on year change in construction businesses across the GFirst LEP, the South West region and the UK as a whole.

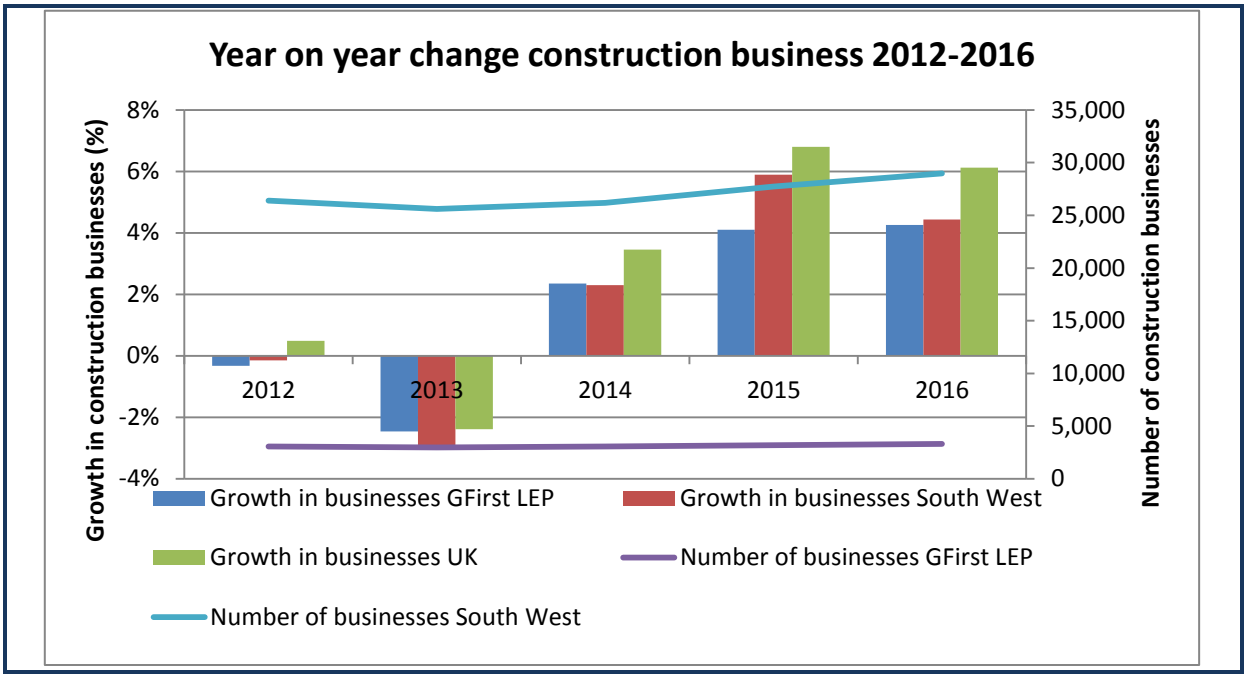

Figure 6: Year on year change in construction businesses (UK Business Count, NOMIS 2017)

Figure 7 shows the distribution of construction businesses by local authority within the GFirst LEP area and Figure 8 shows the distribution of the construction workforce. The distribution of businesses to workforce is quite different within most of the local authorities. The only exception is Cheltenham where 16% of both the businesses and workforce are based. The Cotswolds local authority has a 19% share of the businesses but only a 9% share of the workforce. The Forest of Dean and Tewkesbury also have a higher share of businesses than workforce with 14% versus 9% and 15% versus 6% respectively. However in both Gloucester and Stroud there are a lower percentage of businesses when compared to the workforce with 16% versus 34% and 21% versus 26% respectively.

This difference in share of businesses and workforce could mean that where the percentage of businesses is higher than the workforce there are more medium and larger employers. Where it is lower, then there could either be a higher number of micro and small businesses or that the workforce consists of a greater number of people from outside of the district.

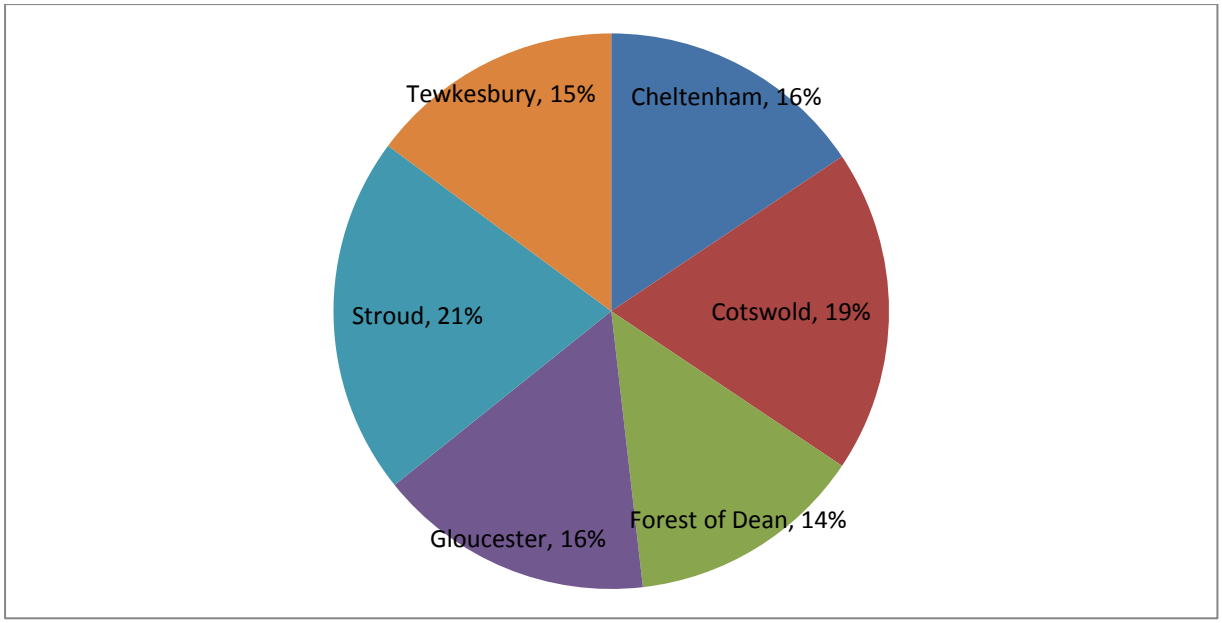

Figure 7: Distribution of construction businesses within the GFirst LEP (UK Business Counts NOMIS 2016)

Between 2012 and 2016 the distribution of the workforce has changed quite significantly in some of the local authority areas. For example 72% more of the construction workforce is now located in Stroud but in the Cotswold local authority the construction workforce has decreased by 50%. However despite these changes, Gloucester has the highest proportion of the workforce both in 2012 and 2016 and Tewkesbury has the lowest.

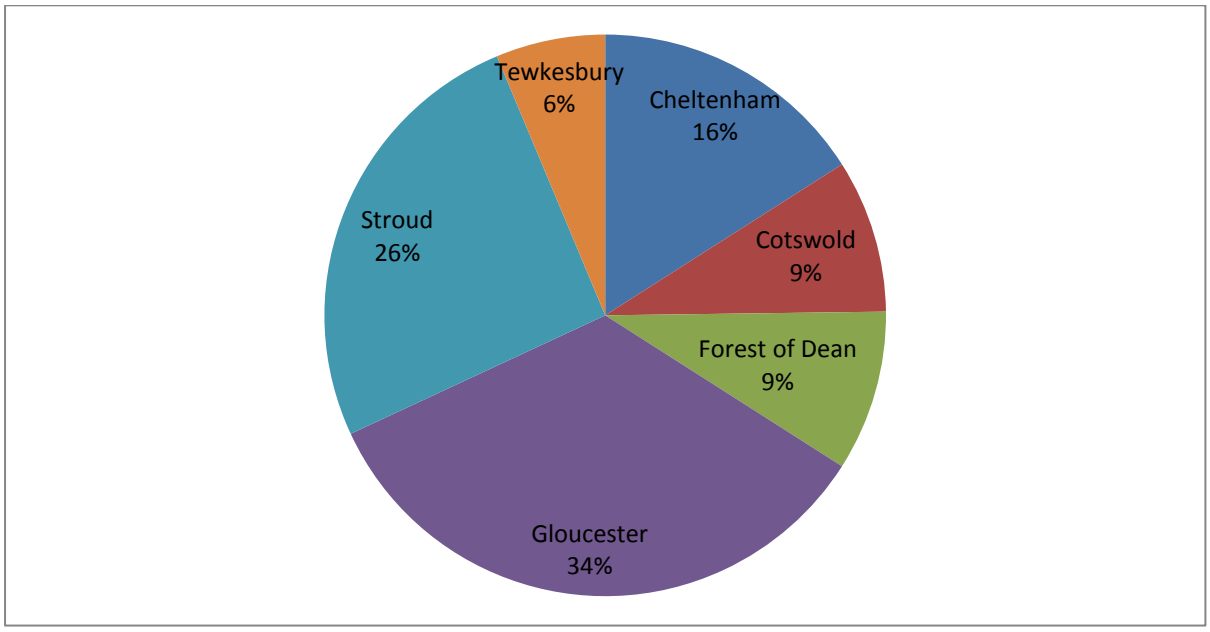

Figure 8: Distribution of construction workforce within the GFirst LEP (Annual Population Survey-work place analysis NOMIS 2016)

There are two main factors that are important when looking at the construction sector, these are:

- Direct employment vs self-employment
- Size of business

The construction sector traditionally has high levels of self-employment with around 40% of the UK construction workforce being self-employed. After the service sector, the construction sector is the second largest sector for self-employed individuals and therefore around 1/5 of those registered as self-employed in the UK belong to the construction sector. According to the Annual Population Survey (August 2017), self-employment in construction in the LEP area is currently lower than UK with only 35% of the workforce self-employed. Although in previous years this ratio was much higher with just over 50% of the workforce being self-employed in 2013. Currently it is also lower than the South West as a whole where 43% of the workforce is self-employed.

In contrast to the distribution of workforce and businesses, the business size distribution of companies across the GFirst LEP area is very close to the pattern seen across the South West as a whole and indeed the United Kingdom, with the majority of construction businesses being micro sized, i.e. less than 10 employees, ref.

Figure 9.

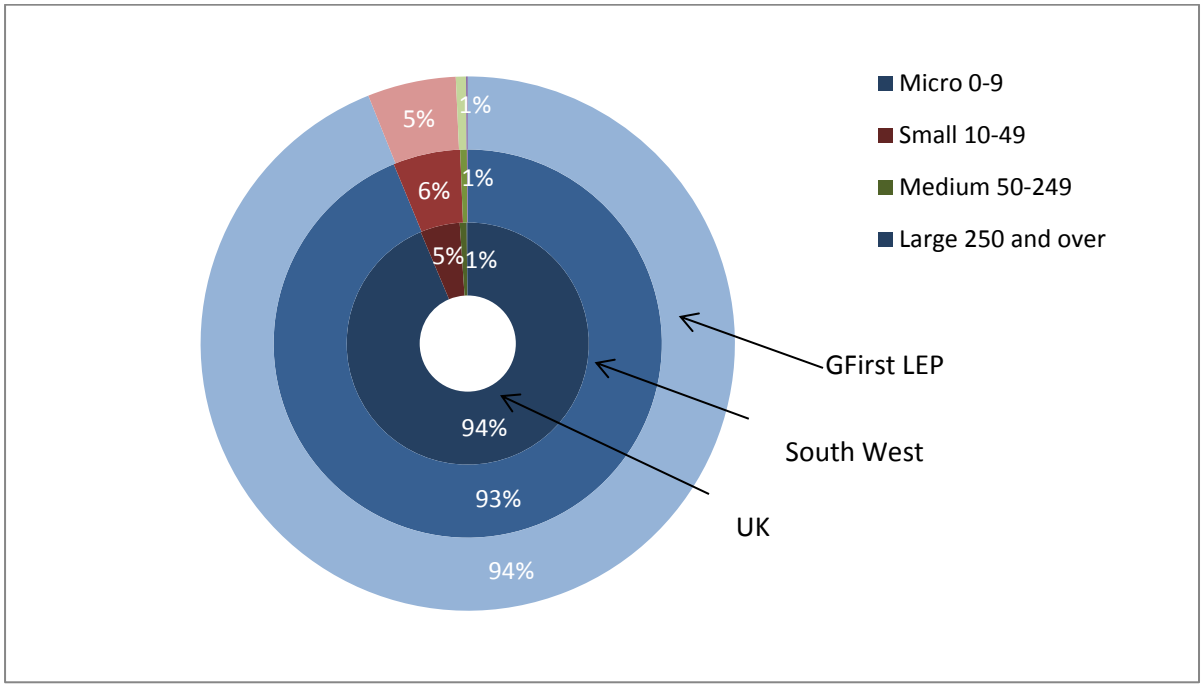

Figure 9: Size of Construction business (UK Business Count, NOMIS 2016)

In the GFirst LEP area, 94% of all construction businesses are micro sized (0-9 employees). This is in line with both the wider South West region (93%) and the United Kingdom as a whole (94%). The majority of growth in construction businesses has been due to an increase in the number of micro sized companies, accounting for 95% of the growth in construction businesses from 2012 to 2016 in the LEP during this period. The pattern of growth in the South West region as a whole is slightly

different from the GFirst LEP area as the number of large companies has increased by 100% although marginal in actual numbers, increasing from 10 companies in 2012 to 20 in 2016.

4.3. Training Provision

GFirst LEP area has:

- Nearly 79% of learner volumes covered by two main providers (Table 7)
- Training across the full range of construction occupations
- As a proportion of the South West, good levels of competence qualifications achievements across many construction occupations, most notably electrical trades and installation, specialist building operatives nec and wood trades and interior fit-out

After an increase of 24% in 2013/14 over 2012/2013, training starts have decreased by 22% in 2014/15 and 15% in 2015/16, giving an overall decrease of 17% over four academic years. The fall in starts is largest in Cheltenham (-44%) although Cotswold (68%), Forest of Dean (4%) and Tewkesbury (10%) all showed increases in starts.

CITB analysis of Skills Funding Agency Individualised Learner Records from 2012/13 through to 2015/2016 academic years for construction learners shows that:

- The GFirst LEP area accounts for 13% of identified construction related training across the South West region; mirroring the size of the LEP relative to the South West
- The decrease in starts in the LEP area is mirrored in the South West as a whole although the fall in starts here is by 15% rather than 17%
- Although the overall number of starts has fallen in the South West England LEP area in 2015/16, the number of apprenticeships have increased since 2012/2013 and increased by 35% over the four academic years
- Even though the majority of training undertaken in the LEP area is more “Knowledge” based, the proportion of these in the overall starts has fallen with the proportion of “Competence” based qualifications increasing from a 30% share in 2012/13 to a 48% share in 2015/16
- An increase in “Competence” based qualifications would be beneficial as these qualifications are generally more readily sought by construction employers
- The increase in the proportion of “Competence” based qualifications is also seen in the wider South West area with the proportion of “Competence” based qualifications increasing from 22% in 2012/13 to 31% in 2015/16

Looking at the “Competence” based qualifications (which are in the main NVQs) 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.

Table 6 presents competence qualification achievement in GFirst LEP area as a % of total achievements in the South West as a whole (all qualifications levels) over the last four academic

years for the identified competence based qualifications. From this analysis we look for patterns for particular occupations.

The information shown in Table 6 has been produced by mapping qualification reference numbers and titles to the most appropriate Constructions Skills Network occupations. This has been built up

Construction Occupations	2012-13	2013-14	2014-15	2015-16	Total Achievements	Total
Total					2540	14%
Main Occupations						

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

Bricklayers	8%	6%	9%	11%	**210**	**12%**
Building envelope specialist	7%	30%	2%	0%	**290**	**41%**
Civil Engineering operatives nec*	3%	7%	19%	4%	**210**	**21%**
Electrical trades and installations	12%	10%	17%	28%	**400**	**13%**
Plant Operatives	18%	10%	8%	1%	**240**	**14%**
Specialist building operatives nec*	14%	5%	12%	9%	**250**	**36%**
Wood trades and interior fit-out	18%	11%	17%	21%	**409**	**33%**
Occupations to monitor						
Plumbing and HVAC	8%	3%	5%	5%	**168**	**8%**
Scaffolders	3%	1%	3%	1%	**50**	**9%**
Occupations with good provision						
Plasterers and dry liners	2%	1%	5%	4%	**40**	**23%**
Low overall learner volumes						
Construction managers	1%	0%	0%	0%	**<25**	**20%**
Construction trades supervisors	3%	0%	0%	0%	**<25**	**20%**
Floorers	1%	0%	1%	0%	**<25**	**5%**
Glaziers	2%	10%	4%	1%	**130**	**1%**
Other construction professionals and technical staff	0%	1%	0%	0%	**<25**	**5%**
Painters and decorators	5%	1%	1%	1%	**60**	**9%**
Plant mechanics and fitters	0%	0%	0%	0%	**<25**	**5%**
Roofers	1%	0%	1%	0%	**<25**	**9%**
Steel Erectors	0%	1%	0%	1%	**<25**	**15%**

Table 6: Competence achievements in GFirst LEP as a % of total achievements in the South West
**nec – not elsewhere classified*
Note: Total achievements are across the period 2012-2013 to 2015-2016 and have been rounded to the nearest 10

Table 6 are at Level 2 with a smaller proportion at Level 3 and a very small minority at Level 4 and above.

The percentage comparison with the South West as a whole is used as a device to demonstrate the provision of training in the GFirst LEP area by occupations relative to one another to gauge where provision is relatively high or low.

Relatively high provision is highlighted in green and

Relatively low provision is highlighted in red

There are a group of occupations that account for the main training volumes, which are generally consistent with the overall pattern seen in the South West. These are:

- Bricklaying
- Building envelope specialist
- Civil engineering operative
- Electrical trade and installation
- Plant operative
- Specialist building operative
- Wood trades and interior fit-out

Here the qualification achievements are consistent to the overall share of training being achieved in the South West or there is a larger volume 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 operative 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 operatives.

The second group – occupations to monitor identifies a number of occupations where we would expect higher levels of training, again linked to either occupations size and/or demonstrating competence. For this cluster which covers plumbing and HVAC and scaffolders the share of training happening through the LEP is slightly lower than would be expected. It is possible that individuals within the GFirst LEP area may be travelling outside of the area for this type of training.

For the third group – occupations with good provision the reverse is true and there appears to be a higher level of provision for occupations. For GFirst LEP area only plastering and dry lining fall within this category.

Lastly there is a group of occupations where the low level of volumes makes it difficult to judge patterns across the years. Whilst the training providers 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 specialist training providers.

In terms of training providers, from 2012/13 through to 2015/16 52 different providers have delivered training for the GFirst LEP area. However there is a consistent pattern with 78% of training being delivered by just 2 providers. (Table 7): Top 6 providers within the GFirst LEP area with training above 2% (source CITB/SFA)

Provider	2012/13	2013-14	2014-15	2015-16	Total	% Share of Total Quals
Gloucestershire College	1,119	1,392	889	562	**3,962**	**63.5%**
South Gloucestershire and Stroud College	281	290	214	175	**960**	**15.4%**
Bridge Training Limited	117	53	7	29	**206**	**3.3%**
Prospect Training Services (Gloucester) Limited	91	66	18	21	**196**	**3.1%**
Birmingham Metropolitan College		149			**149**	**2.4%**
Petroc			137		**137**	**2.2%**

Table 7: Top 2 providers within the GFirst LEP (Source: CITB/SFA)

Both the main providers are located within the GFirst LEP area; this profile is typical of many geographical 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 for those they provide training to, such as Birmingham Metropolitan College. In total this training covers the majority of the main occupations involved in the construction workforce.

When looking at training provision across the individual authorities within the GFirst LEP area three of the local authorities have seen an increase in learner starts from 2012/13 to 2015/16 with the other three local authorities all showing a decrease in starts as illustrated in detail in Table 8 below.

Local Authority	2012/13	2013-14	2014-15	2015-16	Total	% Net change
Cheltenham	176	153	111	98	**538**	**-44%**
Cotswold	22	28	47	37	**134**	**68%**
Forest of Dean	122	122	112	127	**483**	**4%**
Gloucester	935	1,301	915	639	**3,790**	**-32%**
Stroud	353	461	310	333	**1,457**	**-6%**
Tewkesbury	204	115	239	224	**782**	**10%**

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

As a whole, the GFirst LEP area saw a decrease in the number of construction learner starts of 17% across the four academic years. This is above the decrease in starts in the overall South West region.

However, focussing on only apprenticeship starts in the GFirst LEP area, these increased by 23% over 2012/13 to 2015/16. This is higher than apprenticeship starts in the South West as a whole which increased by 19% over the four academic years. For apprentice starts all the local authorities, with the exception of Cheltenham, have shown increases in apprentice starts between 2012/13 to 2015/16 as shown in Table 9 below.

Local Authority	2012/13	2013-14	2014-15	2015-16	Total	% Net change
Cheltenham	24	19	16	17	**76**	**-29%**
Cotswold	20	11	28	36	**95**	**80%**
Forest of Dean	23	27	38	32	**120**	**39%**
Gloucester	235	281	283	263	**1,062**	**12%**
Stroud	90	120	115	157	**492**	**74%**
Tewkesbury	178	96	208	210	**692**	**35%**

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

Overall the picture remains the same for both learner starts and apprenticeships, with Cotswold seeing the largest increase over the time period and Cheltenham decreasing by the largest.

5. Mobility of the workforce

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

5.1. Main points

- Nearly a third of South West construction workers have worked in the construction industry for over 20 years (31%) and more than half have worked in the industry for at least 10 years (55%)
- Overall three quarters of all construction workers in the South West were interviewed in the same region in which they were living in when they started their construction career (76%). Sitting between the highest which is Northern Ireland (97%) and the lowest which is London (50%). The average distance from workers' current residence to their current site was 24 miles. The UK average is 22 miles
- Almost three quarters of all South West construction workers are confident when they finish their current job their next job will allow them to travel to work from their permanent home on a daily basis (73%)
- Overall nearly half of all construction workers have only worked on one project type
- Almost half (48%) of South West construction workers say they definitely will be working in construction in five years-time and a further two fifths (38%) think it is quite likely or very likely they will

5.1.1. Work history

Nearly a third of South West construction workers have worked in the construction industry for over 20 years (31%) and more than half have worked in the industry for at least 10 years (55%). The most likely reason for working in the region is because they grew up there/have always lived there (73%) higher than the UK average of 55%. The majority of construction workers in the region have remained in the South West for all or most of their career (83%), this compares with a UK average of 80%. Also in the majority of cases, the last site workers were based was also in the South West (76%).

In terms of the regions/nations in which workers' current employer operates in, workers in the South West (83%) reported that their employer operated within the region/nation they were currently working in. In addition 18% reported operating in the South East, 15% in the West Midlands and 10% in both the North East and Wales. This is shown in Appendix E **Error! Reference ource not found.**Region/nation employer operates in, compared with region/nation working in currently.

5.1.2. Workers Origins

Workers were asked which region they were living in just before they obtained their first job in construction in the UK. Overall three quarters of construction workers in the South West (76%) were interviewed in the same region in which they were living in when they started their construction career. By region/nation the highest proportion is 97% in Northern Ireland whilst the lowest is 50% in London.

In addition three quarters of construction workers in the South West (76%) have remained in the same region as they did their first qualification/training in. By region/nation, the highest proportion is 96% in Northern Ireland, followed by 95% in Scotland. At the lower end of the range, only around half of construction workers in the East of England (50%), South East (55%) and London (58%) are based in the same region/nation as where their first qualification was achieved.

5.1.3. 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 (83%) with 7% travelling in from the South East, 2% from Wales and the West Midlands and 1% from East of England, London and Northern Ireland.

All workers were asked to indicate the furthest distance they have worked from their permanent or current home in the last 12 months.

Figure 10 shows that within the South West, approximately 1 in 6 construction workers have worked no more than 20 miles away (16%) and a further third have worked between 21 and 50 miles away (31%). This leaves half that have worked more than 50 miles away from their permanent home (51%), with a quarter that have worked between 51 and 100 miles away (26%) and a quarter that have worked more than 100 miles away (25%). Workers in the South West were amongst those most likely to have travelled more than 100 miles from their home to their site in the last 12 months.

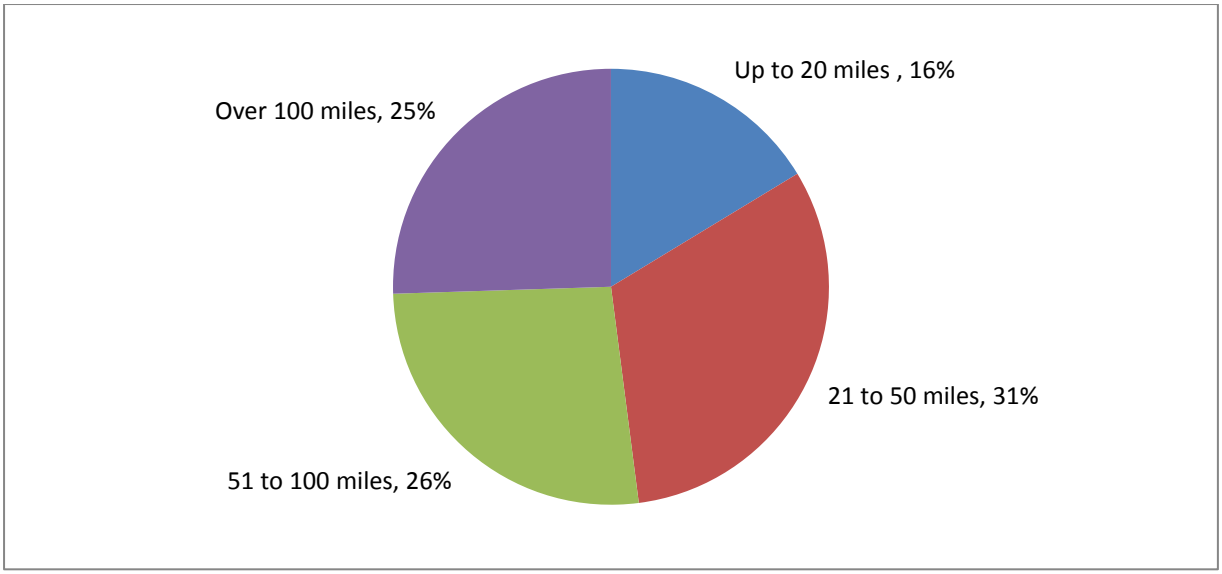

Figure 10: Furthest distance worked in past 12 months (CITB, 2015)

However within the South West, the average distance from workers current home to their current site was 24.1 miles. This compares to an average of 21.9 miles across the UK.

5.1.4. 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.

A quarter of all construction workers in the South West (24% compared to 23% in 2012) do not expect to work on that site for more than a month, including 6% that only expect to be there for about a week or less. A further quarter anticipated being on site for more than a month, but less than a year (24%), compared with a significantly higher proportion in 2012 (40%). Another quarter expect to stay on that site for a year or longer (27%), which is a significant increase compared with 2012 (17%), suggesting more stable employment than in 2012. However in the remaining quarter of cases (24%) 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 a certain amount of uncertainty and insecurity.

The youngest workers, aged 16-19 are most likely to be unsure of how much longer they can expect to work for (35% don't know).

Almost three quarters of all construction workers in the South West are confident that when they finish this job they will get a job that allows them to travel from their permanent home to work on a daily basis (73%); possibly indicating a strong preference for working within the South West as well as a high level of demand requested from within the South West.

5.1.5. Sub-sector and sector mobility

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

Compared with 2012 there has been an increase in the proportion of construction workers that have been working on new housing within the South West; up from 76% to 83%. For all other types of projects the proportion of construction workers that have worked on them has fallen since 2012; public non-housing from 52% to 33%; private industrial work from 48% to 30%; commercial work from 51% to 34%; infrastructure projects from 35% to 23%; housing repair from 46% to 36%.

Overall nearly half of all construction workers have only worked on one project type (47%), compared with closer to a quarter in 2012 (28%), which again suggests a pattern of increased stability in the sector.

5.1.6. 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 five years-time they will still want to be working in construction. Within the South West, almost half of the construction workers say they definitely will be (48%); a further 38% think it is very or quite likely; 5% consider it unlikely; just 2% say they definitely won't be and a further 3% hope to be retired by then, while 4% 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): 49% believe they will definitely want to be working in the construction sector, 25% believe it is very likely they will want to be working in the construction sector and 14% believe it is quite likely they will want to be working in the construction sector. Only 8% 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 (13%).

Overall the findings from the Mobility Study indicate a stable, well established workforce across the South West. There is some evidence of movement between other regions/nations specifically the South East. However 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 Study research against the overall workforce and business patterns noted earlier indicated that whilst the South West as a whole region has a stable workforce, workers with the South West of England LEP will not be limited to working only within the LEP – they may travel to work in other areas of the South West outside of the GFirst LEP. Likewise, workers in other areas of the South West will also be travelling to work with the GFirst LEP.

6. Demand against supply

6.1. Main points

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

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.

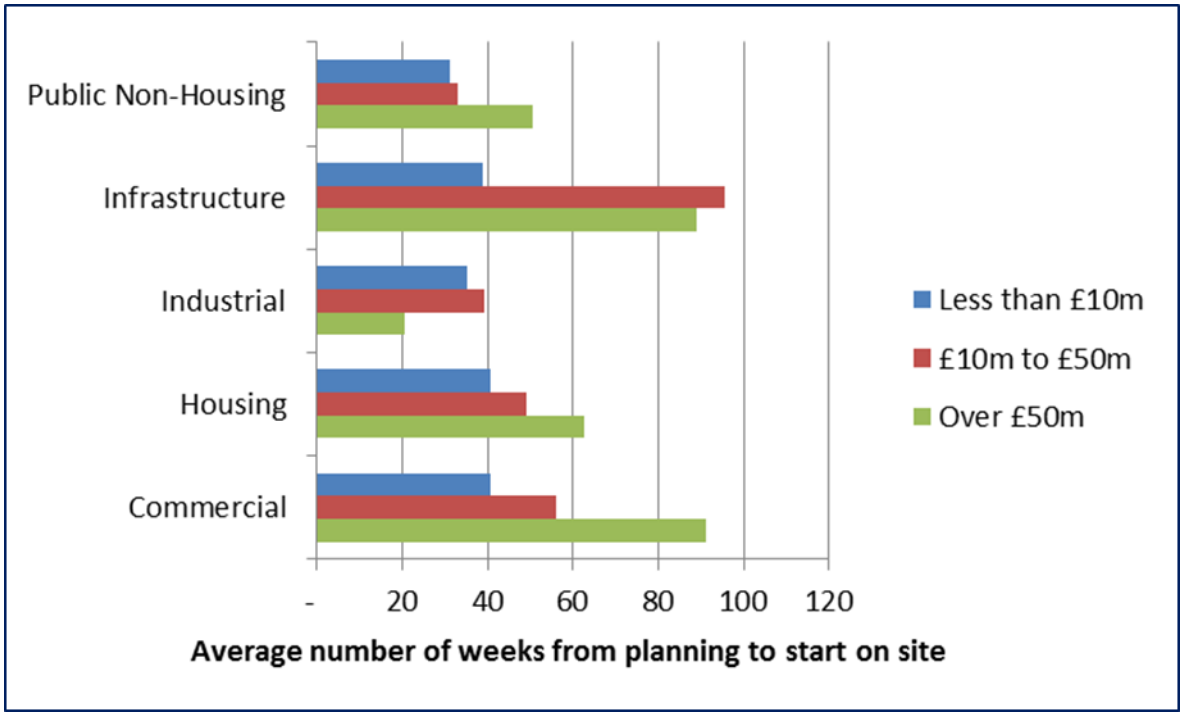

Figure 11: Average number of weeks from planning to work on site, UK 2010-2013 (Source: UKCG/Glenigan)

There will also be work carried out that does not require planning permission for example household repair and maintenance (R&M) work and this can account for a significant share of work in the construction sector. Current estimates for R&M work in the South West indicate that it accounts for 23% of yearly construction output[4].

[4] 2017-2021 Construction Skills Network – South West

Also 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 study shows that occupations such as banksmen/banksperson, dryliners and bricklayers are most likely to have worked on only one project type, while scaffolders, plant mechanics, roofers, painters and decorators and electricians are more likely to have worked on a wide range of projects[5].

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

6.2. Gap Analysis

With construction employment in the GFirst LEP area estimated at just over 29,000, the identified demand forecast from Glenigan accounts for 83% of current employment in 2017 before reducing as the identified projects visibility decreases (Table 10).

Table 10 shows that there are some possible disparities where demand is likely to outstrip or get very close to current employment estimates for a number of occupations. These occupations show a high relative gap in comparison with other occupations.

Among professional managerial roles

- Civil engineers
- Construction project managers
- Construction Trade Supervisors
- Other construction process managers

Among skilled trades

- Logistics
- Floorers
- Plant mechanics/fitters
- Civil engineering labourers
- Specialist building operatives
- Labourers
- Electrical trades and installation
- Glaziers

There is also a relatively high demand for non-construction operatives. While some of these occupations are construction specific, others have cross sector implications.

In Table 10, 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.

Occupations	GFirst LEP	Risk of shortfall: 2017 demand as % of 2016 employment
Logistics	120	2.08
Floorers	170	1.65
Plant mechanics/fitters	280	1.65
Non–construction operatives	240	1.44
Civil engineers	350	1.30
Civil engineering operatives nec*	310	1.27
Construction project managers	340	1.26
Specialist building operatives nec*	520	1.16
Construction trade supervisors	420	1.13
Other construction process managers	1520	1.12
Labourers nec*	1120	1.11
Electrical trades and installation	2080	0.94
Architects	360	0.91
Glaziers	360	0.91
Painters and decorators	1450	0.87
Roofers	580	0.84
Senior, executive, and business process managers	1940	0.81
Plant operatives	500	0.80
Non-construction professional, technical, IT, and other office-based staff	3990	0.80
Plasterers	650	0.79
Total	*29470*	*0.79*
Other construction professionals and technical staff	1970	0.70
Wood trades and interior fit-out	3590	0.66
Bricklayers	1000	0.63
Plumbing and HVAC Trades	2400	0.62
Surveyors	850	0.59
Building envelope specialists	1580	0.59
Steel erectors/structural fabrication	320	0.58
Scaffolders	480	0.50

*Table 10: Occupational breakdown of demand for the GFirst LEP area against current employment (Source: CITB/WLC) *nec – not elsewhere classified*

Key:

Manager and Professional
Skilled Trades
Office based staff

6.2.1. Construction specific

Professionally qualified occupations, which tend to require degree qualifications will require at least three years of education and training before becoming qualified plus years more to gain experience. Therefore if new candidates are to be encouraged to join the 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 GFirst LEP area from the wider region and possibly 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 some anecdotal evidence to suggest that demand is met by provision based in other centres of population.

6.2.2. 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 South West region.

Logistics and Plant Mechanics and Fitters skills also have an element of crossover particularly with retail, warehouse and distribution 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 always be other work carried out in the South West of England LEP 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 require planning consent; this is expected to mean a total workforce of almost 33,000 between 2017 and 2019.

This is quite a static level of future work that would account for around 111% of current employment which indicates that in some areas there could be some shortages and an overall increase in demand.

6.3. Gap Analysis – Long Term

When looking beyond 2017, the amount of work in the LEP areas decreases. However, the short term issue of supply shortages is not expected to ease in the coming years. This is primarily due to an ageing construction workforce; the average age of a worker is slighter higher than a number of other sectors. With a significant number of the workforce due to retire in the coming years, the industry is likely to continue to have difficulties recruiting skilled workers. 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 with the South West CSN 2017-2021 can be used, bearing in mind that the GFirst LEP area has consistently related to around 13% of regional employment in recent years. With this relative share, it is fair to assume that the GFirst LEP area will face similar long term demands to those of the South West as a whole.

Occupations	2016 Employment Forecast South West	ARR 2017-2021 South West	ARR as % of 2016 Employment Forecasts
Non-construction professional, technical, IT, and other office-based staff	30,693	1,080	3.5%
Senior, executive, and business process managers	14,925	380	2.6%
Wood trades and interior fit-out	27,608	370	1.3%
Plasterers	4,979	270	5.4%
Bricklayers	7,684	250	3.2%
Surveyors	6,512	250	3.8%
Painters and decorators	11,116	240	2.2%
Electrical trades and installation	15,958	240	1.5%
Roofers	4,493	230	5.1%
Plumbing and HVAC Trades	18,474	210	1.1%
Other construction process managers	11,649	190	1.6%
Glaziers	2,762	130	4.7%
Building envelope specialists	12,168	70	0.6%
Construction project managers	2,619	60	2.3%
Construction trades supervisors	3,256	50	1.5%
Floorers	1,287		0.0%
Specialist building operatives nec*	4,001		0.0%
Scaffolders	3,702		0.0%
Plant operatives	3,867		0.0%
Plant mechanics/fitters	2,169		0.0%
Steel erectors/structural fabrication	2,431		0.0%
Labourers nec*	8,613		0.0%
Logistics	940		0.0%
Civil engineering operatives nec*	2,355		0.0%
Civil engineers	2,656		0.0%
Other construction professionals and technical staff **Architects**	15,121 2,795		0.0% 0.0%
Total	**224,835**	**4,180**	**1.9%**

Table 11: Occupational breakdown of ARR for South West as a whole
**nec – not elsewhere classified*
Key:

Managers /Professional occupations
Skilled Trades
Office based

The CSN analysis showed that over the longer term there could be a requirement for the following occupations:

- Non-construction professional, technical, IT and other office based staff
- Plasterers
- Bricklayers
- Surveyors
- Roofers
- Glaziers

Non-construction professional, technical IT and other office based staff are likely to have skills that can be transferred over a range of industries so there will be a wider pool of potential recruitment to draw from in this instance.

Surveyors whilst analysis of the ARR does indicate a potential shortage for surveyors, this is a role that could have an office location away from the site location and travel between them and therefore this requirement could be met by provision based in other regions.

Plasterers, Bricklayers, Roofers and Glaziers, the ARR as a percentage of current employment for these occupations is notably above the regional average which indicates potential occupational pressure to meet forecasted demand.

6.4. Gap Analysis – Training Needs

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

- Is there training in the areas of potential demand?
- Is there 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 identified a number of occupational gaps in the short and long term.:

Occupational Gaps

Short term	Long term
civil engineers	non-construction professional
construction project managers	technical, IT and other office based
construction trade supervisors,	staff
other construction process	plasterers
managers	bricklayers
logistics	surveyors
floorers	roofers
plant mechanics/fitters	glaziers
civil engineering operatives	
specialist building operatives	
labourers	
non construction operatives	

As covered earlier non-construction professionals, technical IT and other office based staff and logistics are not construction specific and we would anticipate supply and demand to be more influenced by retail/warehouse/transport demands. Construction project managers would be typically met by graduate level recruitment which would not be restricted to supply from within the GFirst LEP area. With the wider impacts on these occupations, a training needs analysis specific to the GFirst area is unlikely to give credible views. This means a broader view and approach will need to be taken in order to address shortages to these professions; given the high level of mobility in these occupations.

The GFirst LEP area, like the wider region, already delivers a significant number of bricklayers and although not covered by the GFirst LEP area, the wider South West region provides a good supply of floorers.

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

- Provision for training across the range of occupations
- A core of providers who deliver the majority of training
- Good provision of competence qualifications for certain occupations most notably building envelope specialists, floorers, plant mechanics and scaffolders

However:

- There are occupations such as glaziers, roofers plasterers, steel erectors where the levels of competence based training either needs further monitoring or appears to be slightly low.

Although limited, the growth that is occurring in education and training within the GFirst LEP area appears to be within practical competence based qualifications that employers have a preference for, as opposed to the “knowledge/theory” based qualifications.

7. Conclusions and recommendations:

The aim of the GFirst LEP should be to address the immediate and long term challenges of the construction industry in its area. This should be based on the evidence presented in this report as well as other forms of information that it may have access to. In addition, it should target 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 LEP 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 GFirst LEP area will suffer a shortage of 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.

Based on the evidence presented in this report, below are five recommendations which are discussed in further detail in the following section:

a) Promotion of the construction industry in the GFirst LEP area in order to enhance the reputation and image of working in the construction sector
b) The investigation of any potential barriers in the industry to progression, development and entry into the construction industry that may exist for businesses, institutions and individuals
c) Collaboration with current and future potential stakeholders as well as neighbouring LEPs
d) Planning and development initiatives
e) Procurement as a lever to enable skills development

7.1. Promoting the construction sector

Conclusion:

Based on the evidence presented in this report, it is estimated that there will be a significant shortfall in the number of workers in the construction industry within the GFirst LEP area over the next five years (2017-2021). This shortfall is expected to occur in a number of key construction occupations. It is therefore essential for the LEP to ensure that a significant number of individuals are attracted into the sector in order to maintain adequate provision. In society it is becoming increasingly clear that the construction industry has, to a certain extent, a negative image. It is therefore essential that the LEP embark on an initiative to transform the image of construction within the GFirst LEP area.

Recommendations:

a) To work in conjunction with groups, related to education, to actively promote the construction sector in schools and colleges. The aim should be to change the construction sectors image among the young and of those currently in the education system. By engaging

in this activity, it may be possible to increase in the number of participants enrolled on construction skills courses as well as apprenticeships. This may lead to a higher proportion of young people entering the construction sector after education and recognising the industry as a viable attractive sector to join

b) The GFirst LEP should look at alternative sections of society, expanding their outreach to non-traditional entrants. These could include, but not limited to, ex-offenders, ex-military, ex-construction workers that are now working in other sectors as well as those currently unemployed. As a consequence of taking on this initiative, not only should the size of the construction workforce increase but the general economic conditions within the LEP area may improve as a result. Potentially lowering re-offending and unemployment rates and improving the overall health of the local economy

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

7.2. Potential barriers that may exist in the construction industry

Conclusion:

The evidence shows that around 78% of the training in skill trades is carried out by two colleges. The trend tends to show that an uneven distribution of colleges carry out courses related to the construction sector. The top four training centres have significantly decreased the number of construction courses over the four year period. Gloucestershire College, the largest provider, has decreased construction courses by circa 50% over a four year period from 2012/2013. The LEP needs to understand whether there are barriers restricting growth and efficiency in the industry for businesses, individuals as well as for those (FE institutions) providing skills training.

Recommendations:

a) GFirst LEP should look into whether transport links are adequate for the construction workforce; ensuring suitable connections to and from training sites and locations. Potentially helping to overcome any barriers to upskilling as well as easing mobility within the sector. This has the potential to be a significant barrier to individuals without the means to attend college courses or site work experience

b) It is important for the LEP to understand the reasons behind reductions in training courses by liaising with skills institutions in order to formulate action plans that will seek to enable more courses in the key areas where skill gaps are present. By working together, the major colleges can avoid duplication of effort or share resources, enhance specialisations and explore innovative ways of delivering a curriculum that meets employer needs.

c) In the GFirst LEP area, 94% of all construction businesses are micro sized; less than 10 employees. Increased collaboration with smaller micro sized companies is necessary in order to outline a more inclusive action plan aimed at the majority of the industry rather than a few large businesses. The aim should be to increase the LEPs knowledge on micro sized business needs, particularly in the area of their development, and whether they have access

to the finance and skills they need in order to expand and progress in the industry. For example employers often report that new starters are not often site ready

7.3. Greater collaboration with neighbouring LEPS, Construction businesses and Institutions

Conclusion:

The GFirst LEP area borders a number of LEPs with key UK cities such as Bristol, Oxford and Birmingham. These are key UK centres attracting high population densities, the LEP should collaborate with neighbouring LEPs as well as further and higher education institutions in order to focus on both long and short term goals. In addition to this it is also important to work alongside influential business stakeholders in order to yield influence within the construction sector.

Recommendations:

a) The LEP should establish contact with neighbouring LEPs which may have already made progress or have set out initiatives designed to deal with the construction skills shortages. It should seek to share ideas about how to address skills shortages and garner whether shortages inside the GFirst LEP area could be resolved by involving constructions workers from other LEPs. There are also opportunities to understand the existing provision of qualification training in neighbouring LEPs so as not to promote initiatives that are being fulfilled only short distances away

b) The GFirst LEP should ensure that this contact with neighbouring LEPs is regular, so that it is aware of opportunities or risks for the area regarding potential withdrawals or influx from neighbouring LEPs. This will ensure that initiatives put in place by the LEP will not only consider the LEP in isolation but also considers the environment in which it operates. For example many LEPs have to meet housing targets which tends to be the largest denominated pipeline component, it is likely the neighbouring LEPs will be competing for the same resources and so the LEP will need to ascertain how to retain the local workforce

There should be greater collaboration with institutions in order to understand where the LEP can intervene and add value. Working with 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. Given the evidence provided in the report, that LEPs should aim to exercise influence over boosting the courses that are linked to professions that are in the high risk category of the gap analysis section

In the longer term there may also be opportunities for the LEP 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

7.4. 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 to encourage those bidding for construction and infrastructure contracts to be mandated to include provision for co-ordinated recruitment, training, apprenticeships and outreach within their responses to tender. Provision would also be required to hold contractors to account for commitments made. Such an approach could be co-ordinated through local authorities and be a requirement of planning applications and local authority and public sector contracts

b) It may also be possible to encourage major contracting businesses to follow such an approach in support of the Region's skills and economic development. Early engagement with employers to discuss any such approach is recommended

c) Similarly 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.

7.5. Planning and development initiative

Conclusion:

For any organisation it is essential to understand its current commitments and needs but also to outline a future course of action. Given the impending exit of the UK from the European Union, although the majority of construction workforce is local, the LEP may not have an ability to fall back on migrant workers in the future. As a consequence it is important for the LEP to construct a plan stating the desired outcomes given the evidence presented in this piece of research.

Recommendations:

a) Housing building commitments are essential for the LEP and is the largest denominated pipeline figure; requiring approximately 3,650 people. This is a sizable proportion of the construction workforce in the GFirst LEP area. Due to the lack of resources, there is a possibility that house building has the potential to attract a number of workers away from major infrastructure projects or cause delay. The number of people working in the house building sector has increased over the years while all other sectors have decreased, which provides some evidence that this may be already happening. It may be necessary to develop scenarios in order to assess the potential impact of fluctuations in demand on either house building or infrastructure components

b) There is evidence to suggest that competence based qualifications are generally more sought after by employers rather than knowledge based qualifications. The FE colleges already provide a number of competence based courses; however the LEP could encourage a further increase in competence based qualifications in order to ensure that those that enrolled in these courses have the maximum opportunity to be employed on completion of courses. The LEP could also coordinate with FE colleges on the levels being offered by these institutions. Based on businesses requirements, there is a need for more level 3 and 4 qualifications to be acquired, at the moment the majority of achievements are at levels 2

c) In order to fulfil existing infrastructure investment requirements in the GFirst LEP area. It might be essential that the GFirst LEP considers alternative building methods such as modular build. Alternative building methods tend to be less labour intensive and may require less construction professionals in the future. Relative to other sectors the construction industry has shown very small productivity gains over the last ten years. This implies that there may be good reason to invest in off-site approaches that require less labour but that yield potentially higher productivity gains. As house building is one of the top priorities for the LEP, seeking alternative building methods may be an accessible and smart partial solution

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.

Appendices

Appendix A. Demand analysis methodology

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. Calculating construction output

A.1.1. Data sources

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

A.1.1.1. 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. 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.

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%

Table 12: Proportion of total value related to construction

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.1.1.2. 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 GFirst LEP 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 12. 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 GFirst LEP in the NICP (i.e. projects at a national level have not been considered).

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

A.1.1.3 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.1.1.4. Validation by the GFirst LEP

Finally, the resulting pipeline of work is forwarded to the GFirst LEP who check its validity and identify any omissions or other issues.

A.2. Calculating labour demand

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

A.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:

i. Considering the government region within which the GFirst LEP lies (in this case, the South West), identify only the new build in the denominated projects by removing all repair and maintenance projects.

ii. 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.

iii. If in any sector the denominated new-build regional output for the peak year is more or less than that forecast by the CSN for the same year then the value of ***each new build denominated*** **project** is factored by the following ratio:

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

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

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

To take account of housing repair and maintenance (R&M) in the denominated projects at the LEP level, it is assumed that the proportion of the total output represented by housing R&M is the same

at the LEP level as it is at the regional level in the CSN. The Glenigan new build factored output is therefore multiplied by the following ratio:

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

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

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

A.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.

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
	(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
5 Construction trades supervisors	
	(5250) Skilled metal, electrical and electronic trades supervisors
	(5330) Construction and building trades supervisors
6 Wood trades and interior fit-out	
	(5315) Carpenters and joiners
	(8121) Paper and wood machine operatives
	(5442) Furniture makers and other craft woodworkers
	(5319) Construction and building trades nec (25%)
7 Bricklayers	
	(5312) Bricklayers and masons
8 Building envelope specialists	
	(5319) Construction and building trades nec (50%)
9 Painters and decorators	
	(5323) Painters and decorators
	(5319) Construction and building trades nec (5%)
10 Plasterers	
	(5321) Plasterers
11 Roofers	
	(5313) Roofers, roof tilers and slaters
12 Floorers	
	(5322) Floorers and wall tillers
13 Glaziers	
	(5316) Glaziers, window fabricators and fitters
	(5319) Construction and building trades nec (5%)
14 Specialist building operatives not elsewhere classified (nec)	
	(8149) Construction operatives nec (100%)
	(5319) Construction and building trades nec (5%)
	(9132) Industrial cleaning process occupations
	(5449) Other skilled trades nec

15 Scaffolders	
	(8141) Scaffolders, stagers and riggers
16 Plant operatives	
	(8221) Crane drivers
	(8129) Plant and machine operatives nec
	(8222) Fork-lift truck drivers
	(8229) Mobile machine drivers and operatives nec
17 Plant mechanics/fitters	
	(5223) Metal working production and maintenance fitters
	(5224) Precision instrument makers and repairers
	(5231) Vehicle technicians, mechanics and electricians
	(9139) Elementary process plant occupations nec
	(5222) Tool makers, tool fitters and markers-out
	(5232) Vehicle body builders and repairers
18 Steel erectors/structural fabrication	
	(5311) Steel erectors
	(5215) Welding trades
	(5214) Metal plate workers, and riveters
	(5319) Construction and building trades nec (5%)
	(5211) Smiths and forge workers
	(5221) Metal machining setters and setter-operators
19 Labourers nec	
	(9120) Elementary construction occupations (100%)
20 Electrical trades and installation	
	(5241) Electricians and electrical fitters
	(5249) Electrical and electronic trades nec
	(5242) Telecommunications engineers
21 Plumbing and heating, ventilation, and air conditioning trades	
	(5314) Plumbers and heating and ventilating engineers
	(5216) Pipe fitters
	(5319) Construction and building trades nec (5%)
	(5225) Air-conditioning and refrigeration engineers
22 Logistics	
	(8211) Large goods vehicle drivers
	(8212) Van drivers
	(9260) Elementary storage occupations
	(3541) Buyers and purchasing officers (50%)

	(4134) Transport and distribution clerks and assistants
23 Civil engineering operatives not elsewhere classified (nec)	
	(8142) Road construction operatives
	(8143) Rail construction and maintenance operatives
	(8123) Quarry workers and related operatives
24 Non–construction operatives	
	(8117) Metal making and treating process operatives
	(8119) Process operatives nec
	(8125) Metal working machine operatives
	(8126) Water and sewerage plant operatives
	(8132) Assemblers (vehicles and metal goods)
	(8133) Routine inspectors and testers
	(8139) Assemblers and routine operatives nec
	(9249) Elementary security occupations nec
	(9233) Cleaners and domestics
	(9232) Street cleaners
	(5113) Gardeners and landscape gardeners
	(6232) Caretakers
	(9241) Security guards and related occupations
	(3319) Protective service associate professionals nec
25 Civil engineers	
	(2121) Civil engineers
26 Other construction professionals and technical staff	
	(2122) Mechanical engineers
	(2123) Electrical engineers
	(2126) Design and development engineers
	(2127) Production and process engineers
	(2461) Quality control and planning engineers
	(2129) Engineering professionals nec
	(3112) Electrical and electronics technicians
	(3113) Engineering technicians
	(3114) Building and civil engineering technicians
	(3119) Science, engineering and production technicians nec
	(3121) Architectural and town planning technicians
	(3122) Draughtspersons
	(3115) Quality assurance technicians
	(2432) Town planning officers
	(2124) Electronics engineers

	(2435) Chartered architectural technologists (3531) Estimators, valuers and assessors (3116) Planning, process and production technicians
27 Architects	
	(2431) Architects
28 Surveyors	
	(2433) Quantity surveyors (2434) Chartered surveyors

Appendix C. Glenigan projects removed from the GFirst LEP

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	14 Flats (Conversion)	Cheltenham	0.7			Missing dates
2	18 Flats & 4 Houses (New/Alterations)	Gloucester	1.1			Missing dates
3	15 Flats & 1 Shop (Conversion/Alterations)	Gloucester	0.8			Missing dates
4	11 Flats & 3 Town Houses	Cheltenham	0.7			Missing dates
5	5 Flats/2 Houses & Offices (New/Extension)	Cheltenham	0.4			Missing dates
6	143 Residential & 2 Commercial Units	Cheltenham	55			Missing dates
7	8 Flats & 3 Retail Units (Conversion/Extension)	Cheltenham	0.55			Missing dates
8	Community Centre	Cotswold	1.3			Missing dates
9	Asbestos Removal Services	Tewkesbury	0.32			Missing dates
10	Wholesale Horticultural Glass Housing (Extension)	Forest Of Dean	1.205			Missing dates
11	Catering Facility	Cotswold	0.318			Missing dates
12	Hotel (Extension)	Tewkesbury	1.127			Missing dates
13	Hotel (Conversion)	Stroud	6.047			Missing dates
14	11 Houses & 4 Bungalows	Tewkesbury	1.125			Missing dates
15	59 Houses & 1 Leisure Building	Cotswold	4.5			Missing dates
16	6 Houses & 2 Office Units (New/Conversion)	Stroud	0.6			Missing dates
17	Indoor Sports Centre	Cheltenham	2.671			Missing dates
18	Industrial Building	Cotswold	0.792			Missing dates
19	Manufacturing Facility	Forest Of Dean	2.5			Missing dates
20	4 Commercial Units	Stroud	0.764			Missing dates
21	Museum Workshop (Extension)	Tewkesbury	0.962			Missing dates

Number	Heading	Local Authority	Value (£m)	Start Date	End Date	Reason for omission
22	Care Home (Extension)	Cheltenham	1.2			Missing dates
23	Residential Care Unit	Forest Of Dean	1.913			Missing dates
24	3 Office Buildings (New/Extension)	Gloucester	6			Missing dates
25	Office Accommodation (Extension)	Tewkesbury	2.1			Missing dates
26	Church	Forest Of Dean	0.542			Missing dates
27	Solar Photovoltaic Park	Cotswold	5			Missing dates
28	Solar Photovoltaic Panels	Stroud	5			Missing dates
29	School Classroom Block (Extension)	Stroud	0.486			Missing dates
30	School Classroom Block (Extension)	Tewkesbury	1.06			Missing dates
31	School (Extension)	Cheltenham	0.381			Missing dates
32	School (Extension)	Forest Of Dean	0.81			Missing dates
33	Retail Unit	Cheltenham	0.343			Missing dates
34	Football Club (Extension)	Forest Of Dean	0.527			Missing dates
35	12 Commercial & Student Accommodation Units (New/Refurb)	Cotswold	8			Missing dates
36	Supermarket & Petrol Filling Station	Stroud	5			Missing dates
37	9 Supermarket & Industrial/Office Units	Forest Of Dean	7.094			Missing dates
38	Storage Building (New/Extension)	Cotswold	0.87			Missing dates
39	Consultancy Framework	Gloucester	36	20/03/2017	16/03/2020	Consultancy
40	Specialist Nuclear Services	Gloucester	140	03/11/2014	05/11/2018	Consultancy

Appendix D. Significant Glenigan projects in the GFirst LEP

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

WLC ID	Description	Local Authority	Value (£m)	Construction Value	Start Date	End Date	Project Type
GLOUCS272	Highways & Transportation Services	Gloucester	450.0	450.0	01/04/2014	01/04/2019	Infrastructure
GLOUCS190	Dual Carriageway	Gloucester	255.0	255.0	13/04/2020	17/10/2022	Infrastructure
GLOUCS119	Contractor Partnering Framework Agreement	Gloucester	95.0	95.0	01/02/2016	01/02/2019	Public Non-housing
GLOUCS030	Hotel (Conversion/Extension)	Cotswold	44.5	44.5	26/06/2017	05/02/2018	Private Commercial
GLOUCS122	University Business School/Student Units/Sports Centre	Gloucester	32.5	32.5	24/04/2017	22/10/2018	Public Non-housing
GLOUCS278	Canal Redevelopment	Stroud	35.0	31.5	15/05/2019	12/05/2021	Infrastructure
GLOUCS132	123 Houses & Flats	Cotswold	31.0	31.0	07/03/2016	31/07/2018	New housing
GLOUCS200	335 Houses & 41 Flats	Tewkesbury	28.2	28.2	06/12/2018	09/01/2020	New housing
GLOUCS091	Residential Development	Cheltenham	26.0	26.0	04/05/2015	04/12/2017	New housing
GLOUCS261	120 Houses/Town Houses	Cotswold	22.5	22.5	01/12/2015	04/06/2018	New housing
GLOUCS092	295 Houses	Tewkesbury	22.1	22.1	06/11/2017	06/12/2018	New housing
GLOUCS266	80 Flats & 11 Retirement apartment (New/Conversion)	Cheltenham	22.0	22.0	05/12/2016	04/12/2017	New housing
GLOUCS267	48 Houses & 47 Luxury Houses/12 Flats	Cheltenham	21.5	21.5	01/05/2017	13/05/2019	New housing
GLOUCS101	Motorway Improvements	Stroud	20.0	20.0	19/10/2015	19/10/2017	Infrastructure
GLOUCS246	Care Village Development	Cotswold	20.0	20.0	13/06/2016	13/04/2018	Public Non-housing
GLOUCS007	261 Houses	Tewkesbury	19.6	19.6	02/05/2018	30/05/2019	New housing
GLOUCS286A	Construction Infrastructure/Enabling Strategic Framework	Gloucester	19.0	19.0	03/01/2013	03/01/2023	Infrastructure
GLOUCS234	219 Houses & 31 Flats	Cotswold	18.8	18.8	19/12/2016	30/11/2018	New housing
GLOUCS251	50 Care Flats (Conversion/Extension)	Cheltenham	18.0	18.0	04/04/2016	01/10/2017	Public Non-housing
GLOUCS084	238 Residential Units	Tewkesbury	17.9	17.9	16/01/2017	23/02/2018	New housing

WLC ID	Description	Local Authority	Value (£m)	Construction Value	Start Date	End Date	Project Type
GLOUCS066	10 Shepherds Huts & 1 Hotel	Cotswold	17.6	17.6	12/12/2016	24/07/2017	Private Commercial
GLOUCS301	250 Houses	Cotswold	17.2	17.2	02/05/2016	04/05/2018	New housing
GLOUCS289	Transport Scheme	Gloucester	16.5	16.5	22/08/2016	08/09/2017	Infrastructure
GLOUCS052	Office Development	Cheltenham	15.0	15.0	04/09/2017	04/06/2018	Private Commercial
GLOUCS064	Residential Development	Gloucester	14.8	14.8	01/03/2016	30/10/2017	New housing
GLOUCS239	197 Houses	Stroud	13.7	13.7	21/05/2017	21/11/2017	New housing
GLOUCS304a	581 Residential & 4 Retail Units	Tewkesbury	13.7	13.7	02/02/2015	05/10/2018	New housing
GLOUCS304b	581 Residential & 4 Retail Units	Tewkesbury	13.7	13.7	02/02/2015	05/10/2018	Private Commercial
GLOUCS304c	581 Residential & 4 Retail Units	Tewkesbury	13.7	13.7	02/02/2015	05/10/2018	Public Non-housing
GLOUCS020	Student Accommodation	Gloucester	13.3	13.3	01/05/2017	28/09/2018	Public Non-housing
GLOUCS168	164 Houses & 8 Flats	Gloucester	12.9	12.9	14/08/2017	13/08/2018	New housing
GLOUCS054	165 Houses/Flats & Bungalows	Stroud	12.4	12.4	02/10/2017	26/10/2018	New housing
GLOUCS076	Bridges (Refurbishment)	Tewkesbury	12.0	12.0	16/05/2016	28/07/2017	Infrastructure
GLOUCS196	150 Residential Units	Tewkesbury	11.3	11.3	05/06/2017	02/07/2018	New housing
GLOUCS002	Council Offices (Refurbishment)	Gloucester	10.7	10.7	08/05/2017	08/05/2018	Public Non-housing
GLOUCS262	150 Houses	Stroud	10.6	10.6	07/08/2017	03/09/2018	New housing
GLOUCS248	44 Extra Care Apartments	Cotswold	10.6	10.6	04/01/2017	04/10/2017	Public Non-housing
GLOUCS118	University Technical College	Stroud	10.5	10.5	18/07/2016	28/08/2017	Public Non-housing
GLOUCS045	College (Extension)	Cheltenham	10.3	10.3	31/07/2016	31/07/2017	Public Non-housing
GLOUCS142	137 Houses	Tewkesbury	10.3	10.3	04/07/2016	31/07/2017	New housing
GLOUCS191	45 Residential Units	Cheltenham	10.0	10.0	29/08/2017	29/08/2018	New housing
GLOUCS079	128 Residential Units	Tewkesbury	9.6	9.6	14/08/2017	10/09/2018	New housing

WLC ID	Description	Local Authority	Value (£m)	Construction Value	Start Date	End Date	Project Type
GLOUCS060	113 Houses/Flats	Tewkesbury	8.5	8.5	26/06/2017	23/07/2018	New housing
GLOUCS124a	Industrial/Warehouse & Office Building	Tewkesbury	7.7	7.7	04/09/2017	12/03/2018	Private Industrial
GLOUCS124b	Industrial/Warehouse & Office Building	Tewkesbury	7.7	7.7	04/09/2017	12/03/2018	Private Commercial
GLOUCS298a	7 Residential & 2 Commercial Units	Cheltenham	7.5	7.5	25/09/2017	25/09/2018	New housing
GLOUCS298b	7 Residential & 2 Commercial Units	Cheltenham	7.5	7.5	25/09/2017	25/09/2018	Private Commercial
GLOUCS147	Medical Industrial & Car Showroom/Repair (Extension)	Tewkesbury	6.2	6.2	04/09/2017	12/03/2018	Private Industrial
GLOUCS067	3 Restaurant/Bars (Conversion/Alterations)	Cheltenham	5.9	5.9	24/10/2016	24/04/2017	Private Commercial
GLOUCS108	Dairy (New/Extension)	Tewkesbury	4.0	4.0	07/08/2017	12/02/2018	Private Commercial
GLOUCS244a	Industrial/Warehouse Unit	Stroud	2.2	2.2	21/08/2017	21/02/2018	Private Industrial
GLOUCS244b	Industrial/Warehouse Unit	Stroud	2.2	2.2	21/08/2017	21/02/2018	Private Commercial
GLOUCS284A	Construction/Infrastructure Minor Projects	Gloucester	1.3	1.3	01/04/2013	01/04/2018	Infrastructure

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

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%