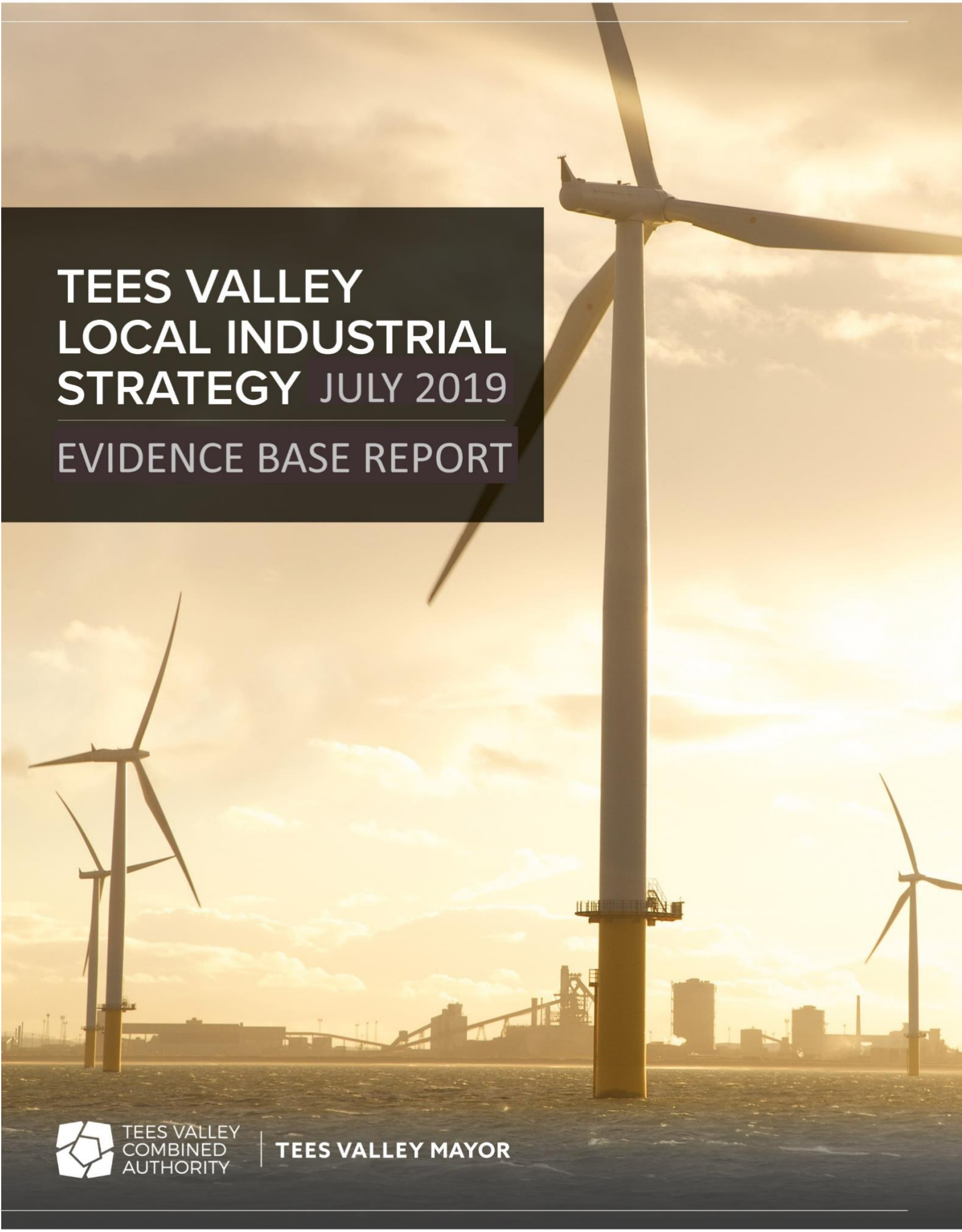
TEES VALLEY LOCAL INDUSTRIAL STRATEGY JULY 2019

EVIDENCE BASE REPORT



TEES VALLEY COMBINED AUTHORITY | TEES VALLEY MAYOR

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Executive Summary

TEES VALLEY COMBINED AUTHORITY

Overview of the Tees Valley Economy

Key Economic Headlines

£13.1bn
Gross Value Added generated (2017)

£206m
Trade in goods surplus (2017)

1st
Home to the UK's largest chemical complex

17.4m tonnes
Port of Tees and Hartlepool accounts for England's greatest volume of commodities transported by sea to other ports globally

27%
Growth of business base has exceeded UK average of 24% (2012-2018)

Key Opportunities

50%
Over 50% of UK's hydrogen is produced in Tees Valley

4,500 acres
The UK's largest single development site at South Tees Development Corporation

£40bn
Potential economic dividend from industrial decarbonisation (to 2050)

£1,020
Innovate UK funding per worker - four times the LEP network average (2019)

£45m
Committed funding for rail capacity improvements (Darlington and Middlesbrough)

Key Threats

68%
Low proportion of working age residents in employment (2018)

27%
Skills shortage vacancies are more prevalent than at the national level (2017)

9,500
Additional Tees Valley businesses required to close the 'enterprise gap' to the UK (2018)

1.4% p.a.
Low growth in scale-up businesses (2014-2017)

28%
Tees Valley has real strength in terms of innovation and research organisations attracting funding, but less than a third of projects were delivered in partnership with local businesses (2017/18)

192%
Tees Valley's CO_2 emissions per capita is almost double the national rate (2017)

1.0 Introduction

1.1 This report provides a summary of the evidence base, developed by the Tees Valley Combined Authority (TVCA), to inform the development of the area's Local Industrial Strategy (LIS). The report draws upon a range of primary and secondary research and data sources focused around the key foundations of productivity and their role in driving local economic growth.

Background

1.2 In November 2017, government published the *Industrial Strategy White Paper*[i], with the aim of transforming productivity at the national level. The Strategy identified five foundations of productivity as being the core, underlying fundamentals of improved productivity performance. In addition, Britain's ability to respond to key emerging societal/macroeconomic headwinds (referred to as the four 'Grand Challenges') was also highlighted as being critical to the successful implementation of the Strategy.

1.3 The five foundations of productivity are outlined below:

1 **Ideas:** establishing the UK as the world's most innovative economy;

2 **People:** supporting the availability of good jobs and greater earning power for all;

3 **Infrastructure:** delivering a major upgrade to the UK's infrastructure;

4 **Business Environment:** establishing the UK as the best place to start and grow a business; and

5 **Places:** creating prosperous communities across the UK.

1.4 The four 'Grand Challenges' comprise:

a **AI and Data Economy:** placing the UK at the forefront of the artificial intelligence and data revolution;

b **Future of Mobility:** establishing the UK as a world leader in the way people, goods and services move;

c **Clean Growth:** maximising the advantages for UK industry from the global shift to clean growth; and

d **Ageing Society:** harnessing the power of innovation to help meet the needs of an ageing society.

1.5 Guidance regarding the production of Local Industrial Strategies is set out in the *Local Industrial Strategies: Policy Prospectus*[ii] published by government. This is also supplemented by a *Local Industrial Strategy Evidence Pack* published by the Department for Business, Energy and Industrial Strategy (BEIS). The Evidence Pack advises on the key metrics/indicators that should be considered within a LIS, as well as available data sources.

1.6 Taken together, the Policy Prospectus and Evidence Pack point towards a requirement for Local Industrial Strategies to:

- Take a **long-term** view addressing issues related to local productivity, with a suggested time horizon to 2030;
- Set out locally distinctive strengths, weaknesses, opportunities and challenges, whilst **aligning with relevant Grand Challenges and foundations of productivity identified at the national level**; and
- Draw upon a **robust and transparent** evidence base, which provides a clear line of sight from existing opportunities/challenges to identified priorities.

Purpose of the document

1.7 This report sets out the baseline position in Tees Valley. It provides an evidential platform, which has informed the development and prioritisation of a series of policy interventions in the Local Industrial Strategy.

1.8 The report has been co-developed with BEIS and represents an evidence base that reflects the information requirements and methodological approach set out in the *Local Industrial Strategies: Policy Prospectus* and *Local Industrial Strategy Evidence Pack.* It assesses the local distinctiveness of the Tees Valley economy, with a particular focus on the foundations of productivity.

1.9 In producing this report, TVCA has drawn upon an existing suite of evidence-based documents including:

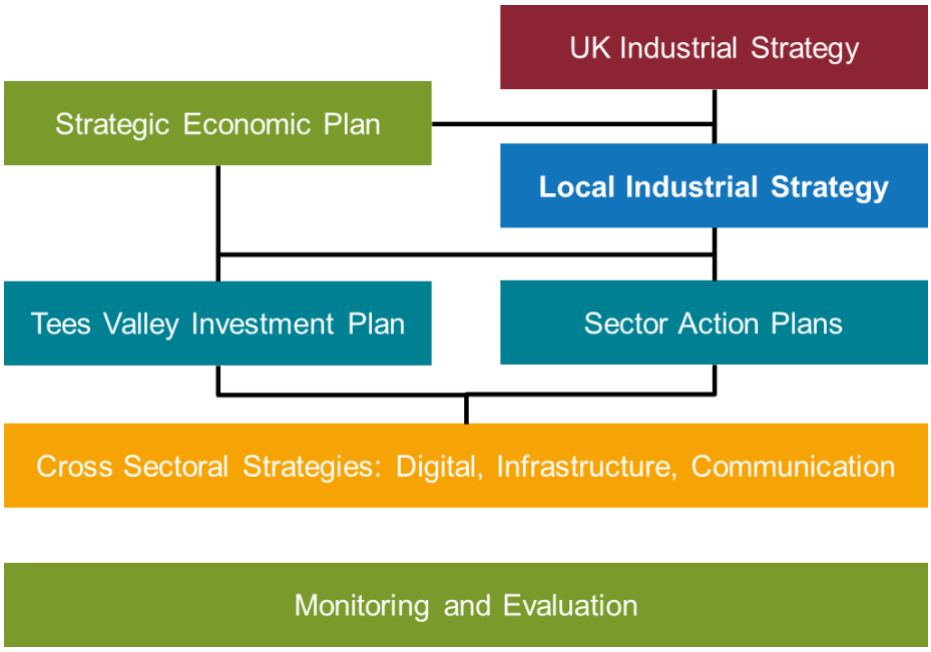
- *The Tees Valley Economic Assessment* (2018);
- *The Tees Valley Business Survey* (2018);
- The *Tees Valley Higher Education* report (2019);
- The *Tees Valley Job Vacancies* report (2019);
- Productivity Papers and Sector Action Plans produced by TVCA in relation to a number of Tees Valley's key sectors;
- *Tees Valley Combined Authority: Low carbon industrial cluster sector research*, KPMG (2018);
- *A proposal for a national Free Zone policy,* Tees Valley Mayor (2019);
- *Tees Valley Combined Authority: Specialist data requirements to inform the Local Industrial Strategy*, Durham University Business School (2019);
- *Tees Valley Combined Authority Culture and Visitor Sector Analysis and Baseline Insights,* Amion Consulting (2019)
- *Opportunities for the Tees Valley Bioscience Sector,* Teesside University (2019);
- *Research into the Digital Sector in Tees Valley,* Geek Talent and DMS (2019);
- *Northern Powerhouse: Chemical and Process Sector Science and Innovation Audit,* HM Government (2018); and
- *Tees Valley: Opportunity Unlimited*, The Rt Hon the Lord Heseltine of Thenford CH (2016).

Relationship with existing policy and strategy documents

1.10 The evidence base for the LIS complements the wider suite of economic policy and strategy documents in Tees Valley. It works with the grain of these, with a particular emphasis on considering economic growth through the lens of productivity improvements.

1.11 The overall hierarchy of policy/strategy documents, and the relative positioning of the LIS within this context, is summarised in Figure 1.1.

FIGURE 1.1 WIDER TEES VALLEY POLICY/STRATEGY ARCHITECTURE



Structure of the document

1.12 The report is structured as follows:

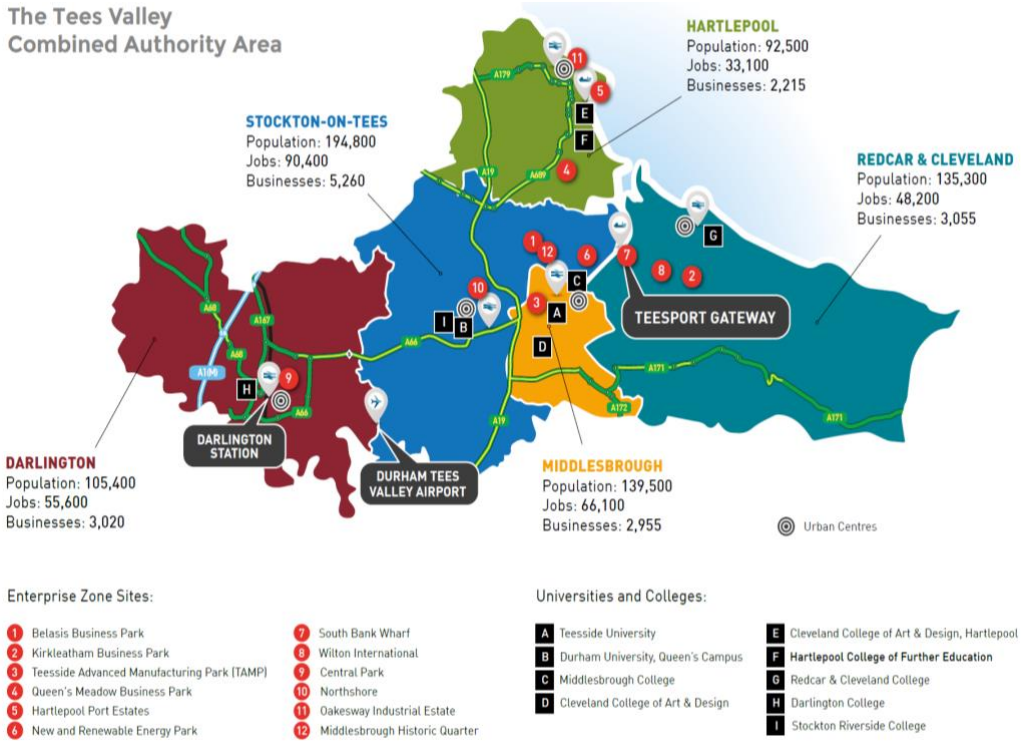
- **Section 2.0** provides an overview of the current position of Tees Valley and the particular productivity challenges facing the area;
- **Section 3.0** focuses on Ideas and the performance of Tees Valley with respect to issues related to innovation and research and development;
- **Section 4.0** considers the performance of Tees Valley with respect to People, with an emphasis on issues related to employment, education and skills;
- **Section 5.0** outlines the local position in relation to Business Environment, including an assessment of the relative importance of TVCA's key priority sectors;
- **Section 6.0** focuses on Infrastructure and the provision of transport and digital infrastructure;

- **Section 7.0** assesses the performance of Tees Valley in relation to Place. This includes a consideration of labour and housing markets and the existing commercial property, retail, culture and leisure offer of the area; and
- **Section 8.0** presents some of the key policy choices facing Tees Valley that must be taken into account in developing the LIS.

2.0 Current Position of Tees Valley

2.1 Tees Valley is a polycentric City Region covering an area of almost 80,000 hectares and with a population of approximately 670,000 people. It comprises of five local authorities (Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-on-Tees) with major employment and economic centres located in each. With 90% of the population living in urban areas, Tees Valley is highly urbanised.

FIGURE 2.1 TVCA GEOGRAPHICAL CONTEXT



Source: Tees Valley Strategic Economic Plan 2016-2026[iii]

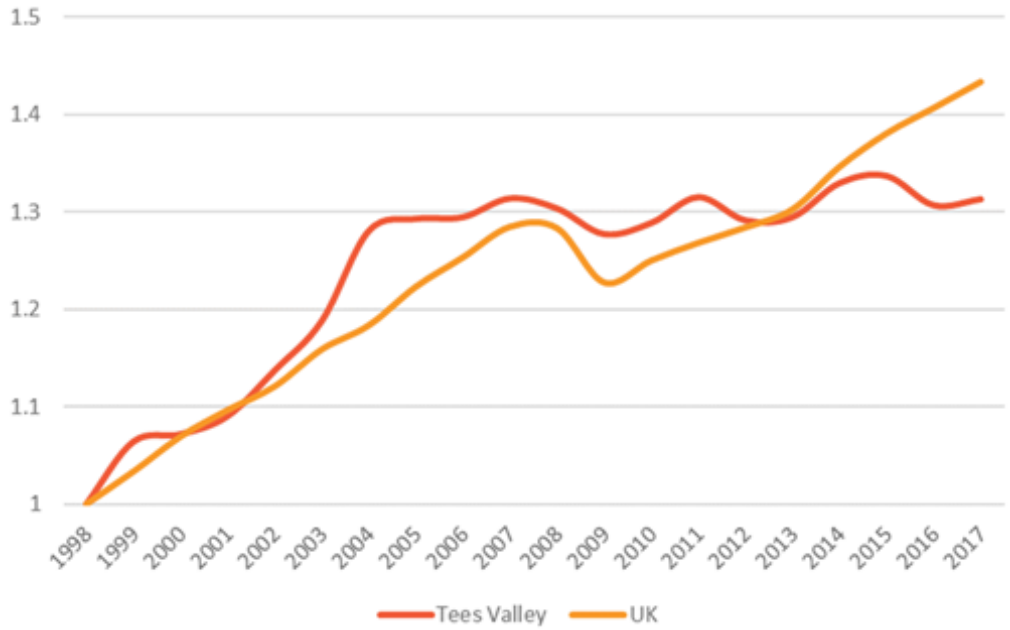
Economic output and productivity

Economic output

2.2 The latest data published by the Office for National Statistics (ONS) indicates that the aggregate economic output of Tees Valley (measured on the basis of Gross Value Added (GVA)) stood at £13.1bn in 2017. This corresponds to 0.8% of England's total and 0.7% of the UK's.

2.3 An analysis of real terms GVA performance (i.e. adjusted for inflation) shows that local growth has lagged national trends for more than 10 years. It can be seen from Figure 2.2 that real terms GVA at the Tees Valley level has remained largely stagnant since 2004/05, despite growing at a faster rate than the UK economy from the late 1990's to the mid 2000's.

FIGURE 2.2 REAL TERMS GVA INDEX, TEES VALLEY AND UK (1998 = 1)



Source: ONS/TVCA analysis

Productivity performance

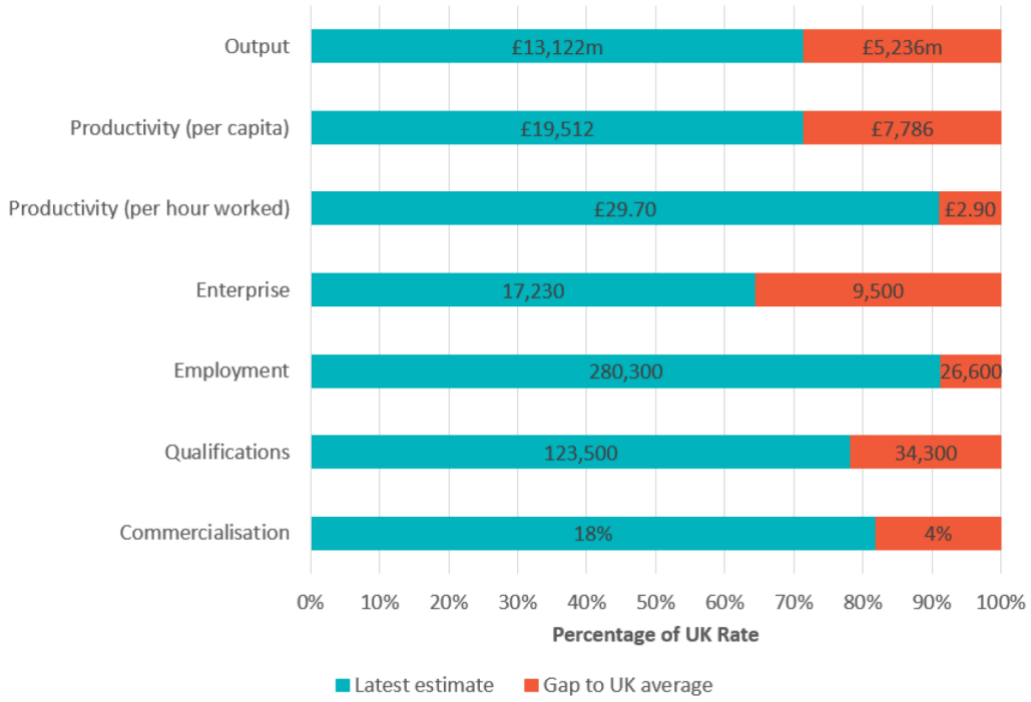
2.4 For the purposes of the LIS, it is important to understand the performance of productivity, rather than economic output. A basic measure of productivity can be derived by dividing economic output (GVA) by the population of an area.

2.5 Within Tees Valley, GVA per capita was estimated to stand at approximately £19,500 in 2017. This corresponds to approximately 71.5% of the UK rate and has declined from 79.9% of the UK rate in 2009. The latest data translates to an output gap in Tees Valley equivalent to £5.2bn. Expressed another way, the area would need to generate an additional £5.2bn of economic output per annum to match UK performance with respect to GVA per capita.

2.6 The above measure of productivity does not take account of commuting patterns. In addition, by including all of the resident population, it does not allow for differences in unemployment, economic activity etc. between areas.

2.7 In reality, the productivity performance of a locality is more nuanced, with a variety of factors interacting to influence the overall picture. The productivity scorecard presented at Figure 2.3 benchmarks Tees Valley performance against that of the UK with respect to some of the key determinants.

FIGURE 2.3 TEES VALLEY PRODUCTIVITY SCORECARD



Source: TVCA analysis

2.8 The figure shows that Tees Valley performance lags the UK average against each of the metrics considered, although the scale of underperformance is not uniform.

2.9 Those metrics where the gap between the performance of Tees Valley and the UK average is greatest are arguably those which currently make the largest contribution to the productivity gap. It can be seen from the chart that key components of the productivity gap include:

- **Low rates of enterprise:** there are 17,230 businesses registered within Tees Valley. When benchmarked against the resident working age population, this stands at 64.5% of the UK average. It is clear, therefore, that the local business base is under-developed relative to the national position, which has implications in relation to the overall availability of employment opportunities – particularly in the private sector;
- **Skills deficit:** there is a clear and well-established correlation between the skills of the workforce and the overall productivity of a locality[iv]. Within Tees Valley there are 123,500 residents qualified to NVQ Level 4 and above, which represents 30.0% of the working age population. The corresponding figure at the national level is 38.6%. In addition to a 22% gap to national performance in terms of high-level skills (shown in Figure 2.3), Tees Valley also lags the UK with respect to low level skills. 12.0% of the area's working age residents have no formal qualifications, in comparison with 7.7% across the UK; and
- **Low levels of commercialisation:** the proportion of Tees Valley businesses introducing either new or significantly improved products or services (a proxy

measure of innovation) in recent years is estimated to stand at 18%. This represents 81.8% of the national average.

2.10 Additionally, it can be seen from Figure 2.3 that whilst productivity per capita stands at 71.5% of the national average, the gap in relation to productivity per hour worked is much smaller. Productivity per hour worked in Tees Valley, at £29.70 corresponds to 91.1% of the UK average. The difference between the two measures (which both take the overall economic output of Tees Valley as their starting point) demonstrates that issues related to labour market participation, unemployment and the demographic profile of Tees Valley are also undermining local productivity performance. Analysis of changes in the productivity gap over time, presented within the *Tees Valley Economic Assessment* concludes that the recent poor performance of the local economy is largely attributable to labour market issues:

"Underlying Tees Valley productivity in terms of both GVA per hour worked and GVA per job are broadly unchanged in relation to the UK over the past decade so while these underlying structural challenges remain, it is the relative deterioration in the local labour market that has been the main factor constraining the Tees Valley economy in recent years. Issues negatively affecting the Tees Valley labour market include…persistently high rates of economic inactivity, poor health and well-being, benefit dependency and a shrinking workforce combined with a rapidly ageing population and a relatively high old age dependency ratio."

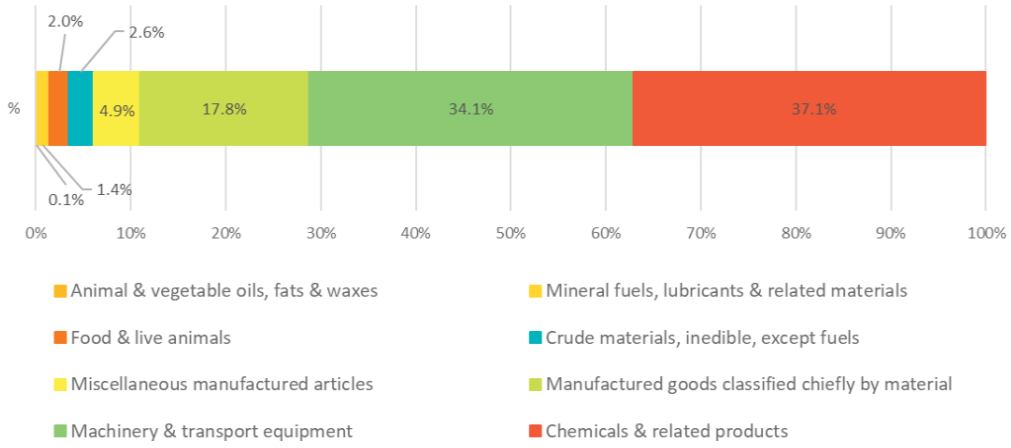
Structural characteristics

2.11 The scorecard presented at Figure 2.3 summarises the current performance and relative positioning of Tees Valley with respect to productivity and some of its key underlying determinants. Whilst this represents a point in time, it is important to acknowledge that, in many respects, it reflects a number of distinctive and longstanding structural characteristics of the area. Further details relating to the structural characteristics of the Tees valley economy are set out below.

Export

Tees Valley has a rich exporting heritage and is one of the few areas of the UK which continues to run a trade in goods surplus. Goods exports from the area correspond to 24% of Tees Valley GVA – significantly higher than the equivalent figures for the North of England (17%) and the UK (18%) – underpinned by strengths in chemicals and manufacturing.

FIGURE 2.4 TEES VALLEY AND COUNTY DURHAM GOODS EXPORTS BY SECTOR, % OF TOTAL



Source: HMRC Regional Trade Statistics

Entrepreneurial Activity

Tees Valley's traditional sector strengths created a reliance upon a small number of large employers. This has historically dampened down entrepreneurial activity[v], resulting in an under-developed business base, although this is beginning to change with strong recent start-up performance.

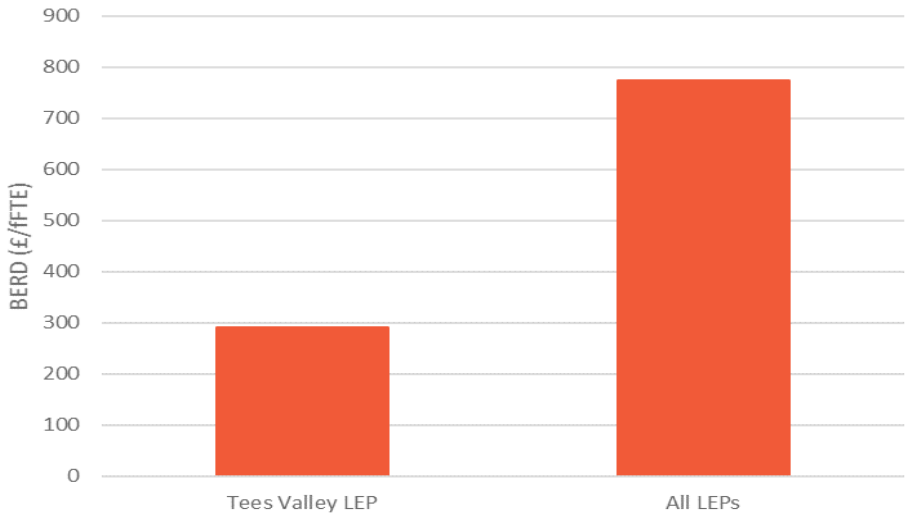
FIGURE 2.5 BUSINESS BIRTH AND DEATH RATES (2012-17)

Source: ONS Business Demography

Research & Development

The local economy has traditionally been characterised by a number of large, foreign-owned, branch plant operations in key sectors[vi]. This has impacted on levels of private sector R&D activity.

FIGURE 2.6 BUSINESS EXPENDITURE ON R&D

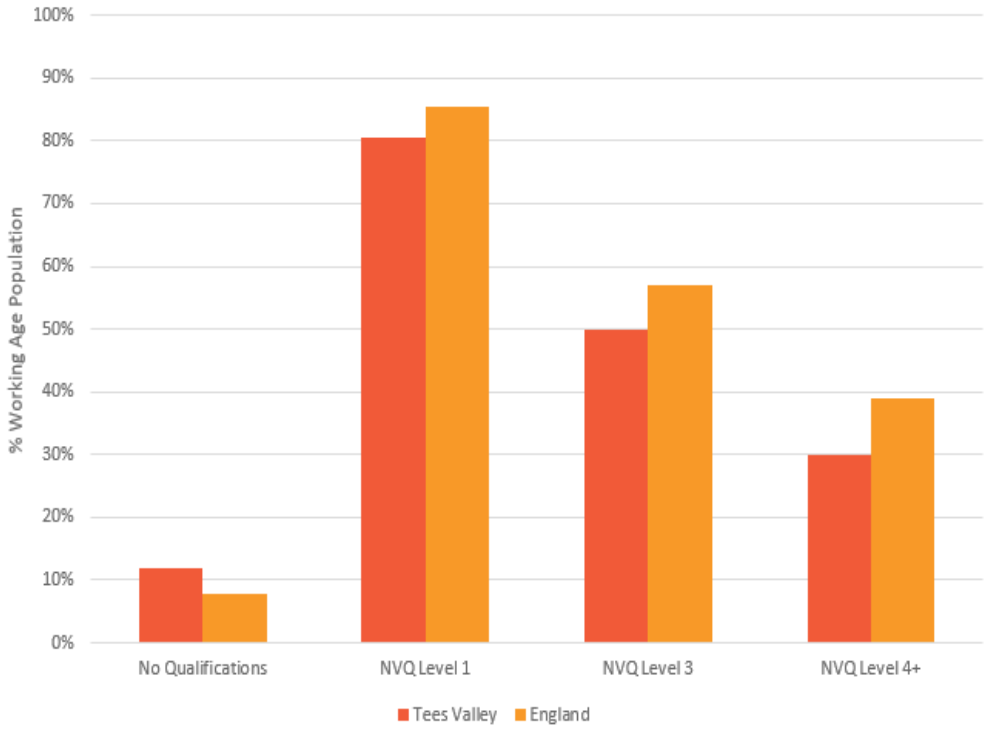


Source: Smart Specialisation Hub

Education and Skills

Underperformance in relation to education and skills has constrained the economic potential of the area. *Tees Valley: Opportunity Unlimited*[vii] recognised that *"problems with education and skills are really the thorn in Tees Valley's side."* Interventions are in place to address this, through the devolution of the Adult Education Budget and the launch of a new Education, Employability and Skills Strategy, but the impacts will not be felt in the immediate term.

FIGURE 2.7 TEES VALLEY QUALIFICATIONS DATA



Source: ONS Annual Population Survey (NB: data is not intended to sum to 100%)

Labour market participation

Low levels of participation in the labour market (including economic activity, unemployment and youth unemployment) amongst the resident population have also impacted upon productivity performance.

TABLE 2.1 PERFORMANCE AGAINST KEY DEMOGRAPHIC/LABOUR MARKET INDICATORS

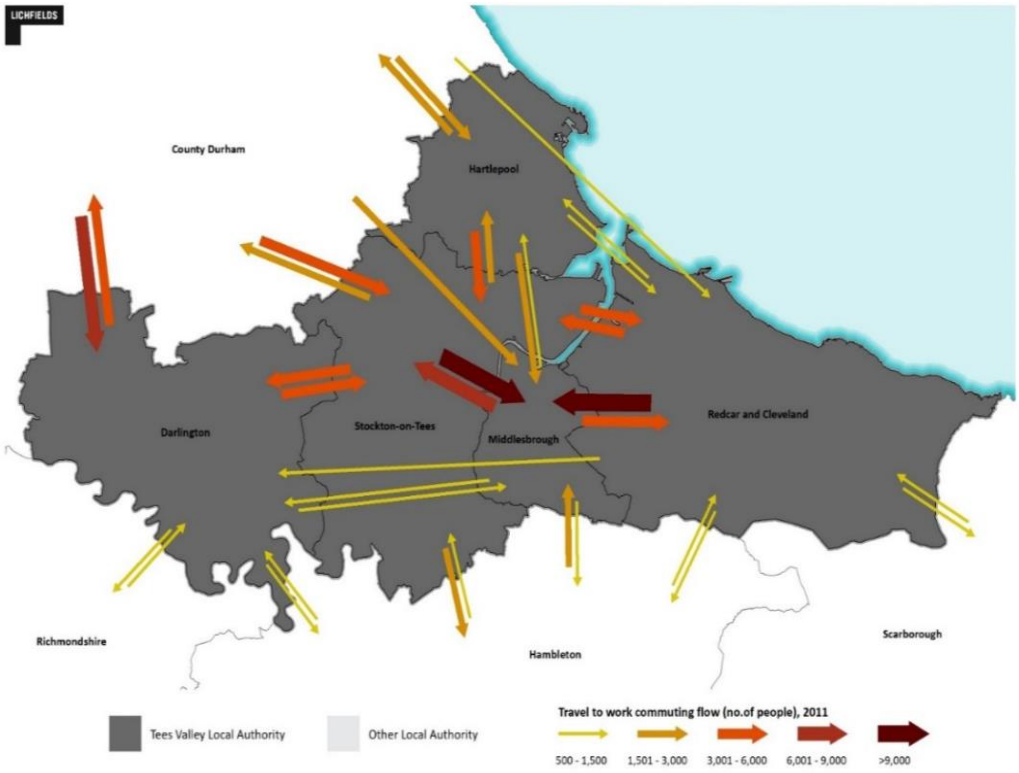
	Tees Valley	England
Working Age Population (16-64)	61.8%	62.8%
Economic Activity Rate	73.0%	79.0%
Employment Rate	68.4%	75.2%
NEETs	3.8%	2.7%

Source: ONS/Tees Valley Economic Assessment

Self-containment

A polycentric settlement pattern and high levels of self-containment (87% of Tees Valley residents work in the area) highlight the importance of effective internal transport infrastructure in order to connect the population with learning, employment and leisure opportunities.

FIGURE 2.8 TRAVEL TO WORK COMMUTING FLOWS, 2011



Source: ONS

Key Sectors

Key sectors such as manufacturing and the chemicals and process industries have a strong heritage of adapting to shifts in demand and global competition[viii]. This ability to adapt will be critical in future, as Tees Valley looks to build upon new sector strengths whilst maintaining its position as a global leader in energy intensive industries against a backdrop of: heightened international competition; high UK energy costs; and the climate change agenda.

Current sector strengths

2.12 The Tees Valley economy has well established strengths in the globally competitive Chemical & Process and Advanced Manufacturing sectors. In addition, the area has existing and developing strengths across the Clean Energy, Low Carbon & Hydrogen, Digital and Bioscience sectors. All of these sectors are underpinned by strong support sectors such as Logistics, Construction and Business & Professional Services. These priority sectors are supported by a number of key assets in the region, including:

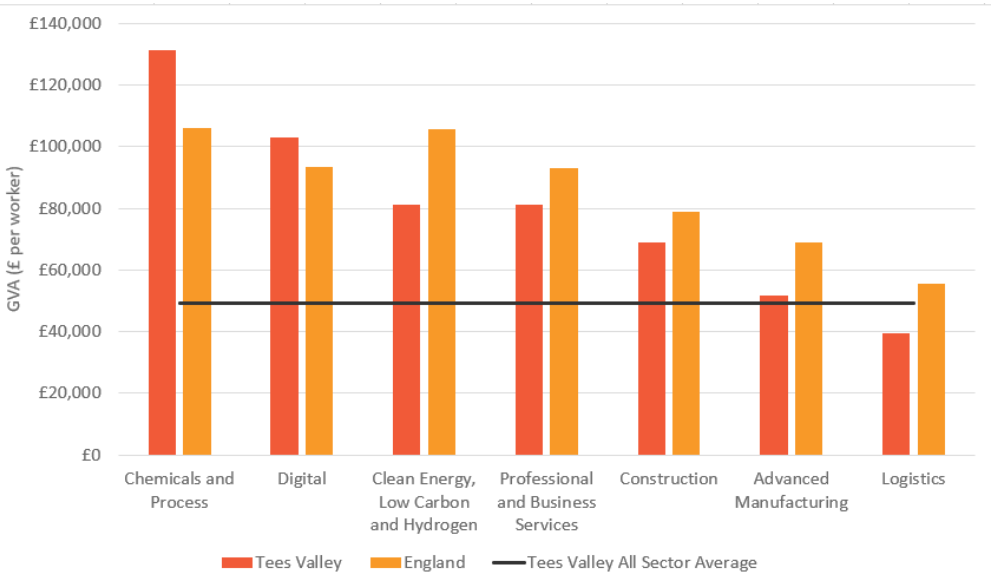
- Cost effective sites and premises, with significant opportunities for development at the 4,500 acre South Tees Development Corporation (Development Corporation) site, and further potential at the region's seven Enterprise Zones;

- Teesside University – described as one of the UK's leading higher education institutions for working with business[ix];
- National centres of excellence including the Materials Processing Institute, Centre for Process Innovation and National Horizons Centre (specialising in training for UK bioscience);
- A major East Coast rail hub at Darlington providing fast north-south connections across the country; and
- Port of Tees and Hartlepool – accounts for England's greatest volume of commodities transported to other ports globally[x], providing a critical gateway to world markets for the Tees Valley industrial platform.

2.13 In understanding how to deliver improved productivity outcomes within Tees Valley moving forwards, it is helpful to identify the current productivity of individual sectors. This is presented in Figure 2.9. The analysis focuses on a series of key priority sectors that were identified by TVCA in the *Strategic Economic Plan*.

2.14 Figure 2.9 highlights that the following sectors are more productive than the Tees Valley economy as a whole: chemicals and process; digital; clean energy, low carbon and hydrogen; construction; and advanced manufacturing. Of these sectors, two – chemicals and process and digital – are more productive locally than at the national level.

FIGURE 2.9 TEES VALLEY PRODUCTIVITY BY SECTOR

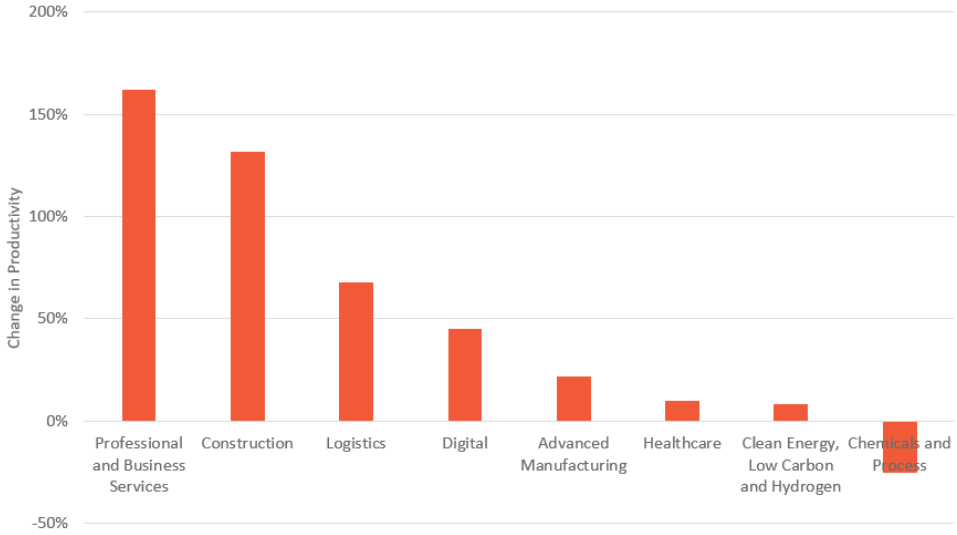


Source: ONS and EMSI (BRES)

2.15 The LIS is intended to set out a road map for productivity growth to 2030. During this period, significant technical, economic and societal changes can be anticipated. As a result, existing sectors will evolve and new sectors may emerge, with the potential to significantly improve Tees Valley's economic performance in productivity terms. This is particularly relevant for Tees Valley in relation to clean energy, low carbon and hydrogen.

2.16 Figure 2.10 provides a summary of productivity growth by sector in recent years. This highlights that the greatest productivity gains have been observed in relation to: professional and business services; construction; and logistics. Whilst Chemicals and Process productivity declined somewhat between 2010 and 2016, the rate of decrease was lower in Tees Valley than in both the North of England and Great Britain.

FIGURE 2.10 CHANGE IN PRODUCTIVITY BY SECTOR (2010-16)



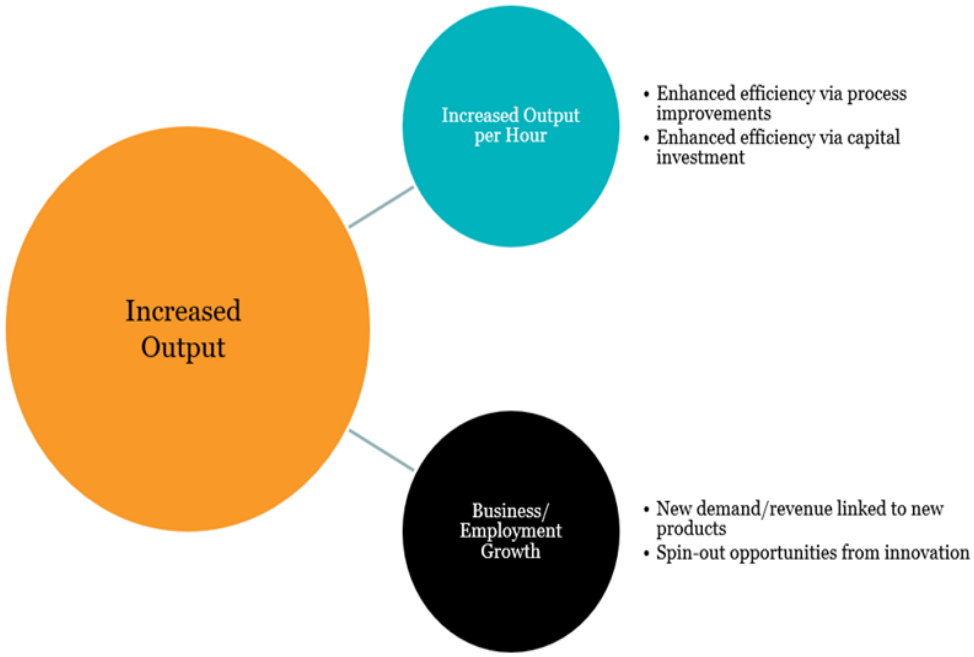
Source: Durham University

3.0 Ideas

3.1 Research and Development (R&D) and innovation play a critical role in productive economies[xi]. Innovation offers the potential to commercialise ideas to develop products or services which can: make production more efficient through process improvements/investment in new plant; and create new market opportunities which stimulate business and employment growth.

3.2 Figure 3.1 provides a summary of the mechanisms through which innovation activity drives increased economic output.

FIGURE 3.1 DELIVERING INCREASED OUTPUT THROUGH R&D AND INNOVATION



Tees Valley 'Ideas' Scorecard

3.3 The scorecard at Figure 3.2 provides a summary of Tees Valley's performance relative to that of other English Local Enterprise Partnerships (LEPs). From the analysis, it can be seen that the area performs strongly against a number of key innovation metrics:

- Innovate UK funding awarded to projects in Tees Valley (2007 to date) corresponds to £1,020 for every job in the area[xii] – driven by the presence of key innovation assets such as the Centre for Process Innovation and the Materials Processing Institute. The level of Innovate UK funding per job recorded within Tees Valley is more than four times the LEP network average of £252 per job, with the area ranked third nationally – behind Oxfordshire LEP (£1,045) and Coventry and Warwickshire LEP (£1,025);
- Graduate start-ups in Tees Valley are high – reflecting Teesside University's strong commitment to enterprise. 2015/16 data identified 163 active start-up enterprises (that had survived for 3 years) founded by graduates who studied

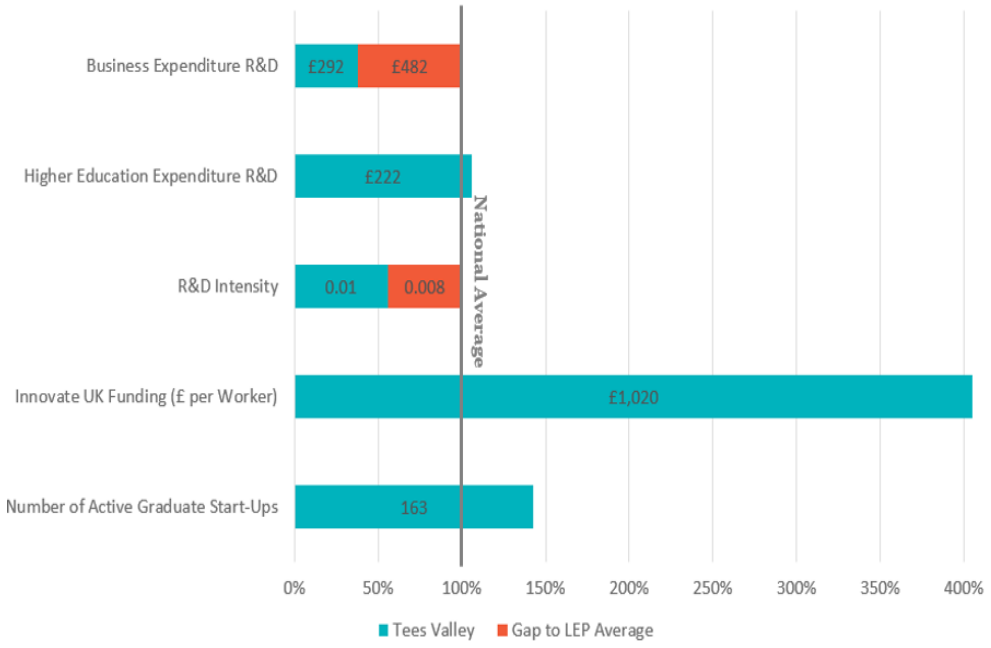
in Tees Valley[xiii]. This exceeds the LEP network average of 114 by more than 40%; and

- Higher Education Expenditure on Research and Development (HERD) in the area corresponds to £222 per Full-Time Equivalent (FTE) job. This is 6% higher than the LEP network average[xiv].

3.4 However, the data also highlights that Tees Valley lags the LEP network average in relation to business-led innovation activity:

- Business Expenditure on Research and Development (BERD) in the area translates to £292 for every FTE job. This is approximately 40% of the LEP network average of £774[xv]; and
- The R&D intensity of the local business base – the ratio of R&D stocks to sales – is in the order of 55% of the LEP network average[xvi].

FIGURE 3.2 'IDEAS' PRODUCTIVITY SCORECARD



Innovation Landscape

BERD and R&D Intensity

3.5 As outlined above, business-led innovation within Tees Valley is low, with BERD standing at 40% of the LEP network average and the R&D intensity of the local business base approximately 55% of the LEP average.

3.6 Table 3.1 provides a summary of the R&D intensity of Tees Valley's priority sectors, as well as change over time. Data for some sectors has been excluded due to issues relating to sample size and data reliability.

3.7 The table shows that R&D intensity in the area is highest in the advanced manufacturing, chemicals and process and digital sectors. Examining the

intensity of each sector relative to that of the wider LEP network, the business and professional services sector stands as Tees Valley's strongest performer with a ranking of 18 – making it the only sector positioned within the top half of LEPs nationally. This clearly highlights that issues related to low levels of business-led innovation affect all sectors of the local economy for which data is available.

TABLE 3.1 R&D INTENSITY BY SECTOR

Sector	R&D Intensity[xvii]	LEP Network R&D Intensity Ranking	Change in R&D Intensity (2010-16)
Advanced Manufacturing	0.050	28th	-17.0%
Chemicals and Process	0.005	33rd	-42.0%
Digital	0.005	38th	144.9%
Business and Professional Services	0.004	18th	70.7%
Logistics	0.000	37th	11.5%
Construction	0.000	35th	10.3%

Source: Durham University by Sector

3.8 The R&D intensity of the digital sector increased faster in Tees Valley than in any other LEP over the period 2010 to 2016, with the D2N2 LEP ranked second with growth of 99.4%. This suggests a significant shift towards more innovation focussed, value added activity locally – albeit from a low base – which will need to continue in order to support the growth of this emerging sector.

3.9 In contrast, the R&D intensity within two of area's established sector strengths – advanced manufacturing and chemicals and process – contracted over the same period. Business investment in R&D has been modest in Tees Valley for both sectors in recent years. In part this reflects:

- The 'branch plant' dynamic of the area's economy (the Northern Powerhouse Chemical and Process Sector Science and Innovation Audit highlighted that large companies in the industry are *"mostly 'branch plants' of international concerns with overseas headquarter and research functions");*
- This can result in a locational disconnect between R&D and production facilities within the chemicals and process sector (the Northern Powerhouse Chemical and Process Sector Science and Innovation Audit states that *"analysis of Business R&D spend within the sector has shown that there is evidence of disconnect between where the products are manufactured within the SIA area and company research, where a significant proportion is outside of the NPH"); and*
- Low levels of R&D investment amongst mid-tier, domestically owned companies, as well as a need to address the absorptive incapacity of micro and small enterprises in the chemicals and process sector – particularly in plastics, polymers and materials[xviii].

3.10 Despite the decline seen in R&D in advanced manufacturing and chemical process, it is important to recognise that Tees Valley has a number of innovation strengths focussed specifically on these sectors – reflecting the area's industrial heritage. Looking to the future, Tees Valley should look at how best to leverage these strengths in order to encourage greater levels of business innovation locally. This will help to maintain competitive advantage and support higher levels of added value in these sectors, whilst also helping to better embed firms within the local area.

Centre for Process Innovation (CPI)

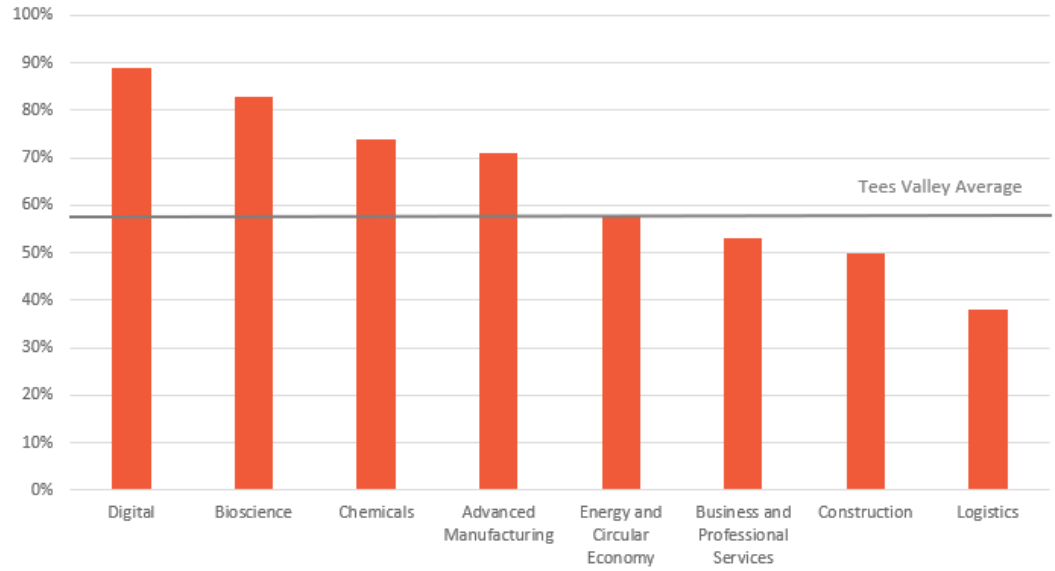
CPI is an internationally significant open access technology centre with facilities in Redcar and Darlington. Established in 2003, CPI was awarded 'Catapult' status as part of the High Value Manufacturing (HVM) Catapult programme launched in 2011, reflecting the quality of its support and outputs. It was created to stimulate and drive innovation across a number of sectors including healthcare, electronics, energy, aerospace and chemical processing. It assists companies to develop, prove, prototype and commercialise next generation products and processes.

Sectoral Variation

3.11 The Tees Valley Business Survey (2018) found that 58% of respondent businesses had undertaken some form of innovation activity in the previous 12 months. Figure 3.3 provides a summary of responses disaggregated by sector[xix]. This would appear to suggest that business engagement in innovation within the local economy is particularly strong amongst digital businesses (89%) as well as the health and bioscience (83%), chemicals and process (74%) and advanced manufacturing (71%) sectors.

3.12 Taken together with the evidence presented in Table 3.1, this suggests that innovation amongst the local business community is being driven by the established sector strengths of advanced manufacturing and chemicals, as well as the emerging sector strengths of digital and bioscience. This would appear to align well with core areas of focus of Tees Valley's innovation ecosystem (discussed below).

FIGURE 3.3 PROPORTION OF FIRMS UNDERTAKING INNOVATION ACTIVITY IN THE LAST 12 MONTHS



Source: TVCA Business Survey 2018

HERD and Graduate Start-Ups

3.13 The Higher Education sector plays an important role in helping to facilitate R&D and innovation activity within the local economy. HERD – providing a broad measure of innovative research activity led by universities – estimated to be in the order of £222 per FTE job in Tees Valley. This is 6% higher than the LEP network average.

3.14 In addition, graduate start-ups – typically a result of graduates linking university research specialisms or innovation with a potential business opportunity – are strong in Tees Valley. Data for 2015/16 data suggests that there were 163 active start-up enterprises founded by graduates who studied in Tees Valley[xx]. This exceeds the LEP network average of 114 by more than 40%. 2017/18 data from the Higher Education Business and Community Interaction Survey indicates that Teesside University ranks as follows in relation to graduate start-ups:

- 11th (out of 164 Higher Education Institutes) for turnover;
- 9th (out of 164) for investment; and
- 19th (out of 164) for employment.

3.15 Teesside University also performs well in relation to the survival of graduate start-ups, ranking 11th out of 164 Higher Education Institutes for the percentage of start-ups achieving 3 year survival (in 2017/18).

3.16 This success is underpinned by Teesside University's approach to start-ups. Nurturing and supporting graduate start-ups has been a key part of the organisation's mission for more than 15 years and a strong focus is placed on supporting graduate-level companies with high value potential and on developing sustainable businesses. There are two key programmes of activity, which both benefit from strong private sector input:

- Launchpad: provides a vibrant campus environment for pre-starts and new companies. Alongside incubation units and creative spaces to start-up, experiment and collaborate, it offers: an inclusive community of entrepreneurs; mentoring, coaching and workshops from partners; grant funding and access to finance; and
- DigitalCity: has worked to develop a strong digital cluster in Tees Valley and puts specific focus on supporting digital start-ups through a longstanding Fellowship programme providing participants with technical and business mentoring as graduates develop their tech business ideas and launch their companies. DigitalCity companies also have the option of taking incubation space in Launchpad.

Innovate UK Data

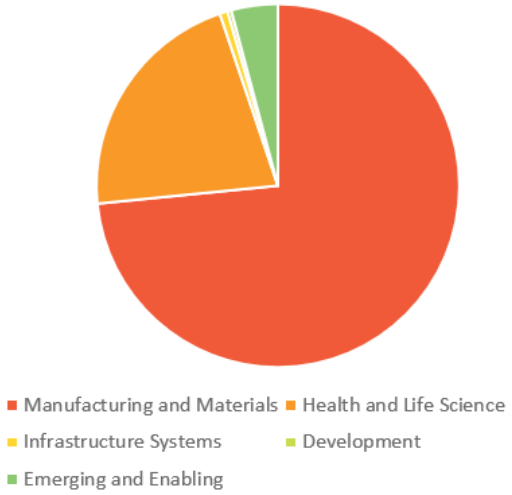
3.17 Data obtained in March 2019 indicates that Innovate UK has supported 293 projects in Tees Valley, through funding awards totalling £299m. Benchmarking this against total jobs[xxi] this translates to funding equivalent to £1,020 per worker. This is more than four times the national average and results in the area being ranked third nationally in relation to Innovate UK funding relative to the size of the workforce, behind Oxfordshire LEP (£1,045) and Coventry and Warwickshire LEP (£1,025).

3.18 More than 95% of the Innovate UK funding awarded to Tees Valley relates to projects undertaken by the Centre for Process Innovation, the Materials Processing Institute and Teesside University. This demonstrates the critically important role played by the wider innovation asset base in driving R&D activity – particularly in the context of the relatively weak performance of the local business base.

3.19 Figure 3.4 below provides a breakdown of Innovate UK funding in Tees Valley across the five main strands of activity. This clearly identifies the strength of the area's innovation ecosystem in relation to:

- Manufacturing and Materials, which accounts for 73% of funding; and
- Health and Life Sciences (including biosciences), which accounts for 21% of funding.

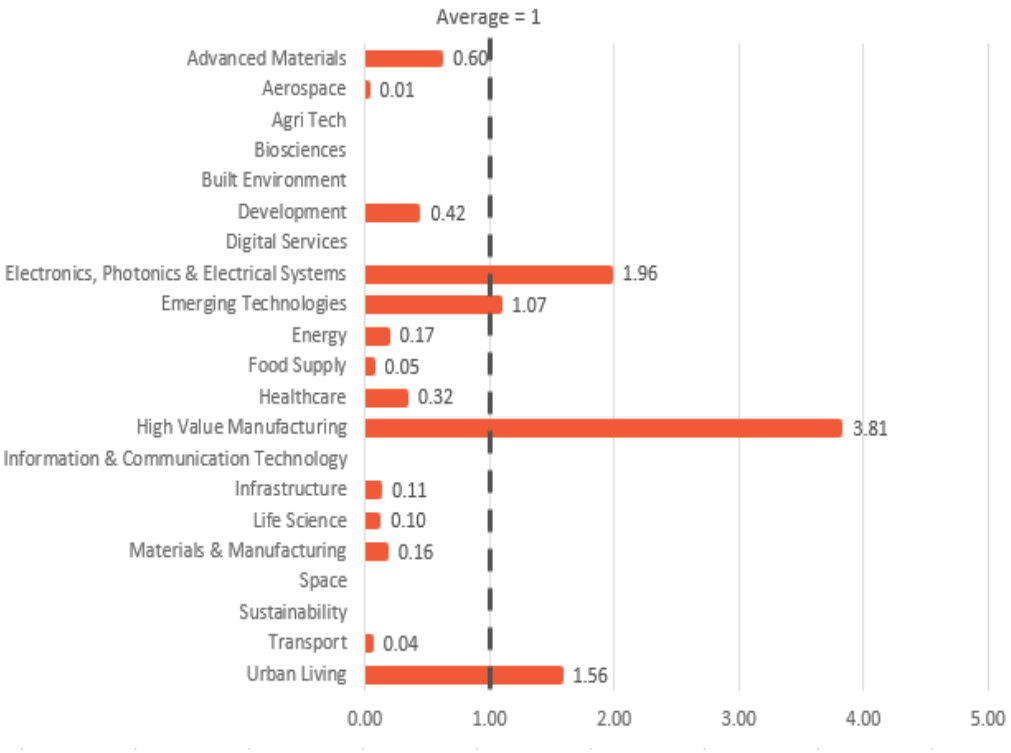
FIGURE 3.4 INNOVATE UK FUNDING IN TEES VALLEY (BY CORE ACTIVITY)



Source: Innovate UK

3.20 An analysis of Innovate UK grants awarded within Tees Valley, disaggregated by sector, published by the Smart Specialisation Hub provides a more granular understanding of the relative strengths of the area from an R&D and innovation perspective. For each sector, funding awards are indexed against the LEP network average (shown as a value of 1.0). The data, which covers the period March 2014 to March 2018, demonstrates high levels of activity with respect to advanced manufacturing and materials – most notably: High Value Manufacturing (3.81 times the LEP average); Electronics, Photonics and Electrical Systems (1.96 times the LEP average); and Emerging Technologies (1.07 times the LEP average).

FIGURE 3.5 GRANTS OFFERED BY INNOVATE UK (AS OF MARCH 2018)



Source: Smart Specialisation Hub: Tees Valley LEP Profile

3.21 Interestingly, Figure 3.5 indicates that the level of Innovate UK funding directed towards health and life sciences projects in Tees Valley is low within the national context, despite the sector accounting for more than 20% of all funding awarded locally. It is important to note, however, that the innovation infrastructure serving the bioscience sector in Tees Valley has benefitted from significant recent investment. As such, focussing on past trends in isolation risks understating the scale of opportunity in the area moving forwards.

Bioscience

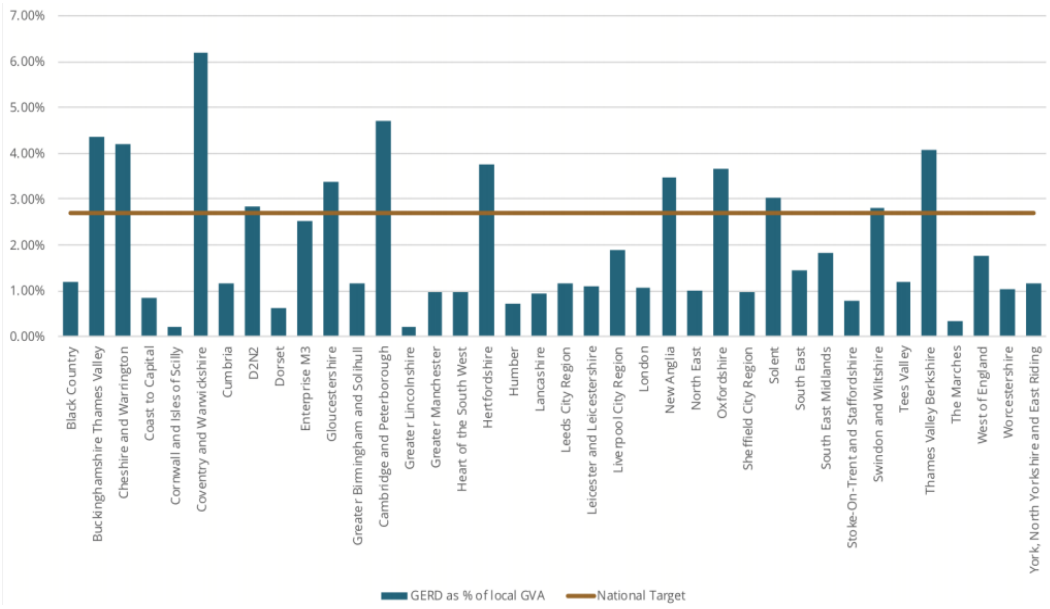
Tees Valley is home to the UK's National Biologics Manufacturing Centre (NBMC), combining state of the art facilities and technical expertise to support the growth and development of the bioscience industry and supply chain. It is also home to the National Horizons Centre (NHC). Opened in May 2019, the centre will provide specialist education, training and professional development for the current and future workforce.

It will also provide industry focused innovation and research to bioscience businesses with the aim of developing an internationally competitive R&D capability. NBMC and NHC are both located at Central Park, Darlington, and are pitched at distinct but complementary technology readiness levels. The intention is for firms to screen ideas at NHC before exploring scale-ups and commercialisation at NBMC. Recent investment into development of the Fujifilm BioCampus in Billingham provides an example of how Tees Valley is attracting growth in high value sectors and providing further opportunities for growth in high value employment and in applying digital technologies to improve performance and productivity.

R&D Intensity

3.22 The UK government has set out a target to increase overall expenditure in R&D to 2.4% of national economic output by 2027[xxii]. It can be seen from Figure 3.6 that current levels of expenditure in Tees Valley are in the order of 1.2% of GVA. This demonstrates that significant improvement is required if the area is to achieve – at the local level – the government's target of 2.4%. The chart also highlights that a number of LEPs are already exceeding this target. R&D expenditure in Coventry and Warwickshire LEP, for instance, currently stands at more than 6% of GVA.

FIGURE 3.6 LOCAL R&D EXPENDITURE AS % OF LOCAL GVA



Source: Smart Specialisation Hub (2019)

Impact of Local Innovation Assets

3.23 Tees Valley has a strong innovation ecosystem founded on a cluster of assets that underpin the area's traditional strengths in manufacturing and the chemical and process industries. A number of these assets are recognised as being of national or international significance and 'export' their expertise by providing testing, prototyping and scale-up support to clients from outside the UK. The area also benefits from a number of key assets focussed on delivering innovation in Tees Valley's emerging strengths related to the digital and bioscience sectors:

Chemical and Process Industries

- Materials Processing Institute: development of materials and commercialisation of technologies for industrial processes, to improve efficiency, productivity and yield. The Institute has particular expertise in the processing of materials and is currently focussed on four key areas of activity: advanced materials; low carbon energy; circular economy; and industrial digitalisation;
- Centre for Process Innovation (CPI): R&D and proving facilities in anaerobic digestion, chemistry, and thermal technologies; and
- Innovation Accelerator at the Wilton Centre: dedicated to nurturing innovative businesses within the science, technology and life sciences sectors. The Centre offers pilot plant and specialist laboratories, enabling businesses to develop new products and processes.

Advanced Manufacturing

- Centre for Process Innovation (CPI): High Value Manufacturing Catapult centre which provided R&D and proving facilities across a range of industries, including thermal technologies, industrial biotechnology and printable electronics;

- TWI: global leader in materials research, with strengths in fabrication, welding and coating technologies; and

  Teesside University's Technology Futures Institute: with research focussed on issues including: advanced processing; engineering and technology management; and sustainability (including carbon management and industrial symbiosis).

Digital Industries

- Teesside University: courses delivered by the University in digital media and technology, including animation and computer game design, have a long-standing international reputation.[xxiii] This technical expertise, alongside Teesside University's connections with global industry experts (it hosts two major industry conferences, Animex and the Showcase Digital Conference) is used to drive local innovation, most notably through Digital City; and
- DigitalCity: recognised as an exemplar initiative[xxiv] DigitalCity provides grant funding and bespoke innovation support to digital companies who want to develop or utilise innovative technology in a different way or for a new market – as well as non-digital businesses looking to adopt digital technology in order to improve their systems and processes. Support includes workshops and one-to-one mentoring with academics and consultants.

Bioscience

- National Biologics Manufacturing Centre (NBMC): led by CPI, the NBMC combines state of the art facilities and technical expertise to support the growth and development of the UK bioscience industry and supply chain, with a particular focus on the commercialisation of emerging technologies;
- National Horizons Centre (NHC): a state-of-the-art education, training, research and innovation facility opened in May 2019. Led by Teesside University (in partnership with CPI and FUJIFILM Diosynth Biotechnologies) the NHC has been established to: create a pipeline of graduate talent that matches industry need; design and deliver industry-informed programmes to address technical, leadership and digital skills issues; develop an internationally competitive applied R&D capability; and
- FUJIFILM Diosynth Biotechnology BioCampus: TVCA funding approved to deliver Phase 1 of the BioCampus, with two further phases planned to follow. The site will be anchored by FUJIFILM Diosynth Biotechnology, supporting the firm's continued growth (have increased from 90 employees to 700 over a period of 20 years).

3.24 As demonstrated in the preceding paragraphs, Tees Valley has real strengths in terms of locally-based research organisations and in attracting funding from national organisations such as Innovate UK. Further progress is required, however, to maximise the impact of these assets on the local business base.

3.25 <u>Centre for Process Innovation and Materials Processing Institute</u>

Data provided by CPI indicates that the Centre was involved in 185 research and innovation projects during 2017/18, of which 17 were with businesses based in Tees Valley. Similarly, data from the Materials Processing Institute indicates that the Institute was involved in approximately 300 projects in 2017/18, with an estimated 120 with businesses based in Tees Valley.

3.26 Taken together, therefore, the two organisations were involved in approximately 485 research and innovation projects in 2017/18. An estimated 137 of these (28%) were with Tees Valley businesses.

Materials Processing Institute

Located in South Bank, Redcar, the Materials Processing Institute is a globally recognised centre for industrial research with a commercialisation focus. Particular specialisms include: advanced materials, lov carbon energy and the circular economy. The Material Processing Institute is exploring opportunities and challenges involved with applying industrial digitalisation at the Normanton Steel plant, acting as a 'digital demonstrator' for the Steel and Process Industries.

Approach to Innovation

3.27 Research published by the Enterprise and Research Centre (ERC) benchmarks the innovation performance of all LEP areas against nine different measures of innovation. The performance of Tees Valley (relative to other LEPs) is shown to be strongest in terms of:

- Marketing innovation;
- Collaboration;
- Sales of innovative products/services; and
- Process innovation.

3.28 The ERC work states that the 'Outcomes/Success of Innovation' strand of the analysis is arguably the most important. This is because it reflects the success and commercialisation of innovation activity. It can be seen from table 3.2 that Tees Valley performs well in this strand – exceeding the median LEP score with respect to two of the three identified metrics. This reflects the fact that many of the area's innovation assets, such as the CPI and MPI above, are focussed specifically on activities related to commercialisation (including prototyping and scale of products and processes).

TABLE 3.2 TEES VALLEY INNOVATION PERFORMANCE

	Lowest LEP score	Median LEP score	Highest LEP score	Tees Valley score
Organisational and Marketing Innovation				
New business practices	17%	28%	38%	23%
New methods of work organisation	11%	21%	28%	21%
Marketing innovation	11%	17%	27%	20%
Structure and Approach to Innovation				
Engaged in R&D	12%	19%	31%	17%
Design investment	8%	13%	20%	11%
Collaboration	17%	25%	39%	29%
Outcomes/Success of Innovation				
Product and service innovation	14%	22%	34%	18%
Sales of innovative products/services	9%	31%	45%	32%
Process innovation	8%	16%	26%	17%

Source: Enterprise and Research Centre 2017/TVCA

Barriers to Innovation

3.29 As outlined in the preceding paragraphs, the low R&D intensity of the Tees Valley business base acts as a drag on the overall innovation performance of the area. In order to identify appropriate policy mechanisms to address this, it is helpful to understand the issues that are constraining business expenditure on R&D at present.

3.30 The Tees Valley Business Survey (2018) asked respondents to outline those issues that they believed had discouraged or prevented them from accessing innovation funding during the preceding 12 months, with the results summarised in Figure 3.7. Drawing this together with the stakeholder engagement undertaken as part of the LIS process it is clear that the key barriers to greater business investment in innovation are:

- Lack of awareness of the innovation funding landscape, with businesses unclear as to what is available and how/where it can be accessed;
- Perceptions amongst both large and small businesses that they were unlikely to be eligible for funding by virtue of their size; and
- Issues relating to the complexity of the bidding process and the time/cost impacts of this to the business, which were felt to be disproportionate relative to the level of funding available in some instances.

FIGURE 3.7 BARRIERS TO FIRMS ACCESSING FUNDING TO SUPPORT INNOVATION IN THE LAST 12 MONTHS

Source: TVCA Business Survey 2018

Funding Landscape

3.31 Tees Valley businesses are able to access innovation funding from a variety of sources. Some of the key mechanisms include:

- **British Business Bank:** the Northern Powerhouse Investment Fund (administered by the British Business Bank, working closely with the Combined Authority) also provides support to businesses in Tees Valley. Support is comprised of loan and equity investment from £50,000. In the period March 2017 to December 2018, the funds invested £6.9 million in the Tees Valley;
- **Business Compass:** Tees Valley Combined Authority currently provides funding to businesses through Business Compass – a £24 million ERDF project[xxv]. Business Compass provides an information, diagnostic and brokerage service to SME businesses looking to grow. This includes four grant pots – including innovation vouchers;
- **DigitalCity:** a programme of support for innovation in the digital sector (as well as digitalisation across the economy more broadly). DigitalCity is ERDF funded and provides a range of innovation services including consultancy assistance, an accelerator programme and market research/information; and
- **Partner Programmes:** beyond Business Compass, the majority of innovation activity in Tees Valley is delivered by external organisations, working closely in partnership with the Combined Authority. A key lever for innovation support has previously been Innovate Tees Valley (a joint ERDF programme delivered by Teesside University, DigitalCity, NEPIC and the Materials Processing Institute). At the time of publication, the programme is

no longer active and a replacement programme is subject to an ongoing ERDF funding application.

3.32 Further innovation support available through European Funding in Tees Valley includes:

- Innovation – a mix of capital and revenue activity. Projects funded to date include the National Horizons Centre, Innovate Tees Valley and other projects providing specialist support to SMEs;
- ICT – Tees Valley Broadband vouchers;
- SME competitiveness – Tees Valley Business Compass Growth Hub and Flexible Fund together with Business Compass start-up activity is funded via this theme;
- Low carbon – Energy Efficiency Vouchers (via Business Compass), demonstration and testing facilities with coaching and mentoring support and funding for low carbon activity via the Northern Powerhouse Investment Fund.

3.33 Table 3.3 provides a summary of the relative allocation and apportionment of current ERDF by theme. This shows that that the largest allocation has been directed towards measures focused on improving the competitiveness of SMEs.

TABLE 3.3 FUNDING ALLOCATIONS BY THEME

Priority	Total Allocation
Innovation	£24.7m
ICT	£2.8m
SME Competitiveness	£65.7m
Low Carbon	£18.2m
Total	£111.4m

Source: Tees Valley Combined Authority

Summary

3.34 Key issues highlighted within the preceding paragraphs are summarised below:

1 Despite high levels of innovation funding coming into Tees Valley, R&D intensity and business expenditure on R&D is generally low relative to national levels. Local R&D performance reflects – to some extent – the branch plant dynamic observed in parts of the Tees Valley economy, a view also expressed by stakeholders;

2 R&D intensity in the local chemicals and process and advanced manufacturing sectors – key strengths and sector specialism within the Tees Valley economy – has declined in recent years;

3 Key barriers to innovation at the local level are understood to include: awareness/knowledge of the funding landscape; the cost/time implications of the application process; and issues relating to perceived ineligibility;

4 The area benefits from a number of key innovation assets that are of national/international significance and align to Tees Valley's key sector strengths. Opportunities to encourage the local business base to better leverage these should be pursued; and

5 Tees Valley's innovation assets (and the area's approach to innovation generally) are positioned towards the commercialisation end of the innovation spectrum. This provides the opportunity to capture a greater number of spin-out businesses with a more co-ordinated and focused approach.

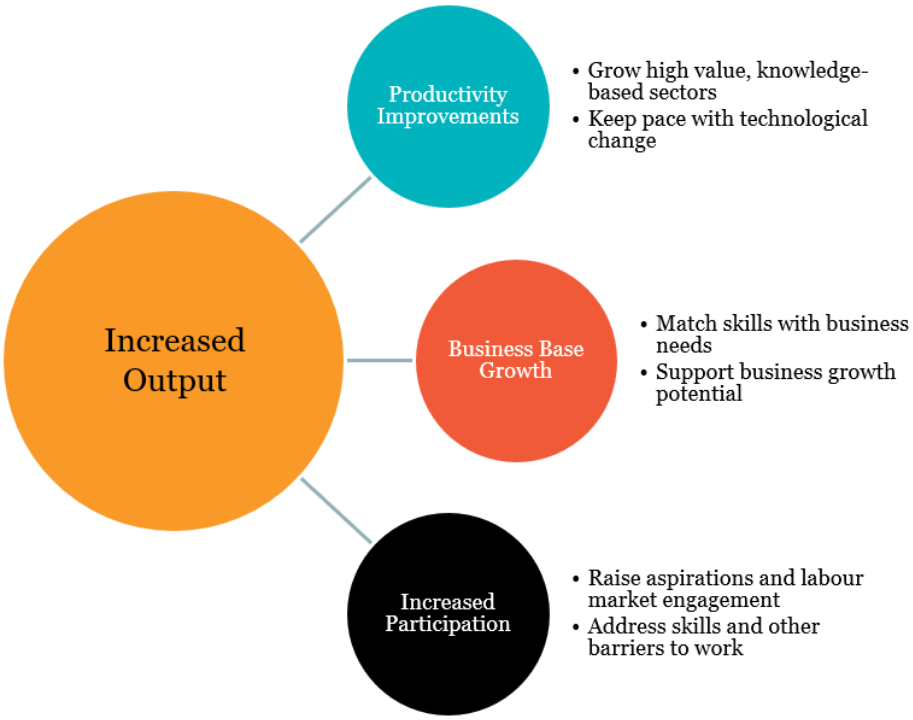
4.0 People

4.1 People and skills are critically important to supporting productivity growth. The Smart Specialisation Hub[xxvi] identified a clear correlation between the qualifications of the resident population and an area's overall level of productivity. Businesses cannot grow and fulfil their potential without the availability of a pool of talent with the necessary skills. This is true of all sectors – but particularly in high productivity, knowledge-based sectors where the skills and knowledge of the workforce are fundamental to creating value.

4.2 Whilst the creation of jobs in high value sectors generates the greatest productivity dividend on an individual basis, the importance of matching the skills of the local workforce with those of existing businesses at all points on the productivity spectrum must be recognised. This is particularly true in locations such as Tees Valley, where levels of labour market participation are low. Supporting more residents into employment across all sectors offers an opportunity to raise economic output and productivity per head of the population.

4.3 Figure 4.1 provides a summary of the mechanisms through which people and skills can contribute towards delivering higher levels of economic output.

FIGURE 4.1 DELIVERING INCREASED OUTPUT THROUGH PEOPLE AND SKILLS

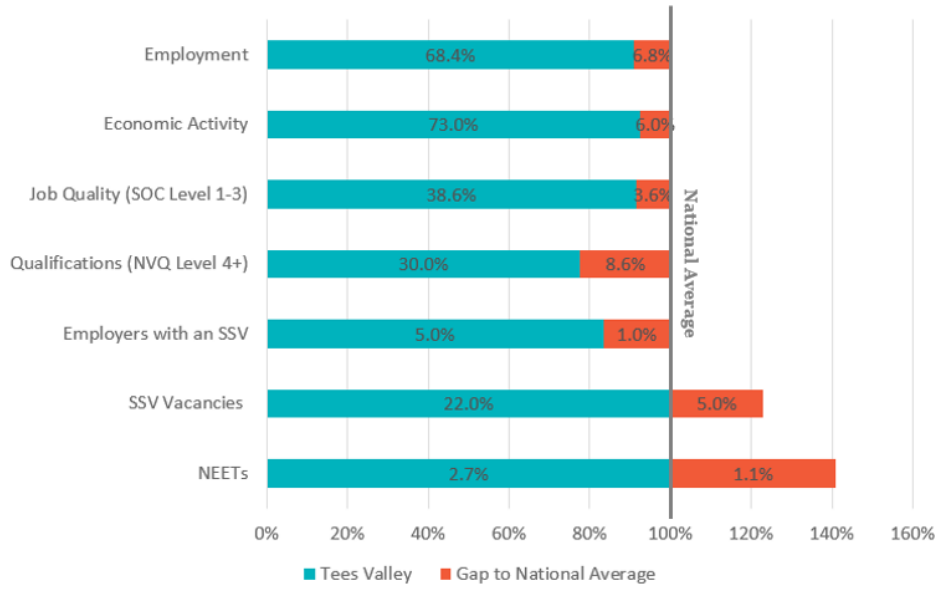


Tees Valley 'People' Scorecard

4.4 The scorecard at Figure 4.2 provides a summary of Tees Valley's performance on issues related to people and skills, benchmarked against the national average. From the analysis, it can be seen that a number of factors currently act as a barrier to higher levels of local productivity, including:

- Participation levels in Tees Valley are low. 73.0% of the area's working age population are economically active and 68.4% are in employment. Both figures are lower than the national averages (79.0% and 75.2% respectively)[xxvii]. A key challenge for Tees Valley – and one which could significantly increase overall levels of economic output – is to encourage more people to enter the labour market, through the provision of the necessary opportunities and support;
- 3.8% of 16-17 year olds in Tees Valley are Not in Education, Employment or Training (NEET). This is higher than the national average of 2.7%[xxviii];
- The skills base of the area lags national performance, with 30.0% of working age residents qualified to NVQ Level 4 or above locally. Whilst Figure 4.2 focusses on higher level skills, Tees Valley also underperforms relative to the national level with respect to lower level skills. This is reflected in the occupational profile of Tees Valley, with a lower proportion of jobs at SOC Levels 1-3 (Managers, Directors and Senior Officials, Professional Occupations and Associate Professional and Technical)[xxix]; and
- Skills issues within Tees Valley are having a clear impact on the ability of the local business base to recruit and grow. 27.0% of all job vacancies in the area are categorised as Skills Shortage Vacancies (SSVs)[xxx] – markedly higher than the national average of 22.0%. Taken together with the low levels of participation, this would suggest the need to better align the skills of the local population with the needs of the business community. It should be noted, however, that the proportion of businesses reporting an SSV is lower at the local level (5.0% compared to 6.0% nationally).

FIGURE 4.2 PEOPLE/SKILLS PRODUCTIVITY SCORECARD

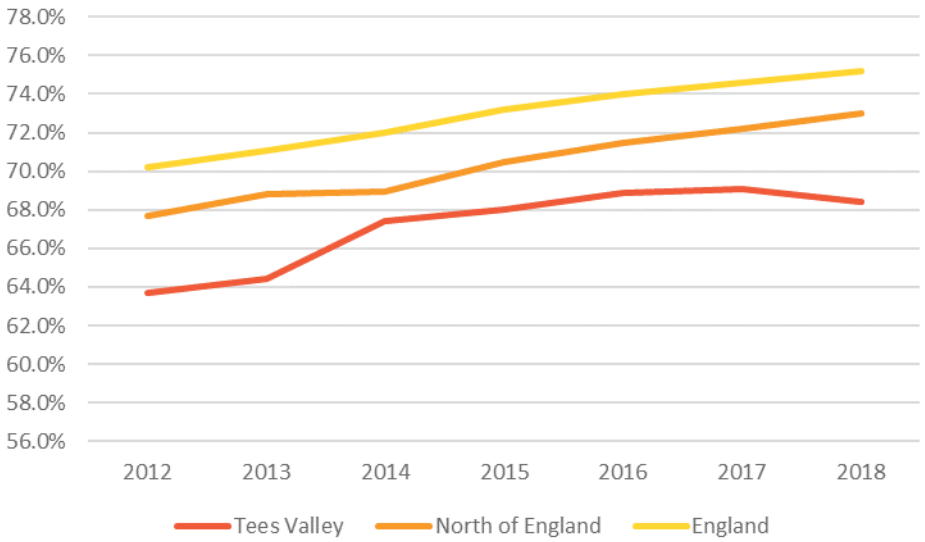


Source: Various

Employment

4.5 The employment rate in Tees Valley currently stands at 68.4% of the working age population. Local levels of employment have lagged national performance for a prolonged period, with the gap increasing in 2018 due to a fall of 0.7 percentage points in Tees Valley, coupled with a national increase of 0.6 percentage points (Figure 4.3).

FIGURE 4.3 TEES VALLEY EMPLOYMENT RATE



Source: ONS Annual Population Survey

4.6 The above data is based upon the Annual Population Survey, which is subject to sampling variability – particularly for smaller geographical areas. In recognition of this, it is helpful also to consider Alternative Claimant Count Data, as published by the Department for Work and Pensions. The Alternative Claimant Count Data indicates that 5.3% of the working age population in Tees Valley were claiming unemployment benefits in February 2019. This represents an increase of 0.1% on the previous quarter and a 0.1% reduction on the previous year. The current figure at the local level (5.3%) is significantly higher than the national average (3.1%).

4.7 With respect to youth unemployment, the Alternative Claimant Count Data indicates that 5.6% of 16-24 year olds in Tees Valley are claiming unemployment benefits – double the national figure of 2.8%.

4.8 In addition, the proportion of Tees Valley's working age population classified as being economically inactive (27%) is significantly higher than the national average (21%). Furthermore, local levels have risen over the last 2 years, against a backdrop of falling rates nationally[xxxi].

4.9 Low levels of employment, coupled with high rates of economic inactivity (and compounded by a small local working age population relative to national levels) means that the proportion of the Tees Valley population that is in employment and contributing towards the creation of economic output is low in comparison

with the national rate. This is a key factor underpinning the area's £5.2bn productivity gap.

4.10 Issues relating to unemployment are complex and reflect inter-relationships between the strength of the economy and skills base, as well as social issues related to health, low aspiration and inter-generational benefit dependency. It can be seen from Figure 4.4 that the higher rates of economic inactivity within Tees Valley are being driven primarily by the high proportion of residents categorised as:

- Long-term sick (25% compared to 22% nationally); and
- Temporary sick (4% compared to 2% nationally).

4.11 In addition, the proportion of economically inactive residents in Tees Valley who **do not** want a job stands at 84%. This is noticeably higher than the 78% observed at the national level[xxxii].

FIGURE 4.4 TEES VALLEY ECONOMIC INACTIVITY BY TYPE

Source: ONS Annual Population Survey

4.12 Rates of economic inactivity in Tees Valley exceed the national level across all age cohorts (Figure 4.5). However, stakeholder engagement as part of the LIS has identified particular concerns regarding current levels of youth unemployment and the high proportion of young people Not in Education, Employment or Training (see paragraph 4.17). 2018 data suggests that 62% of 16-19 year olds in Tees Valley are economically inactive – higher than the national figure of 56% – although it should be noted that this category includes students.

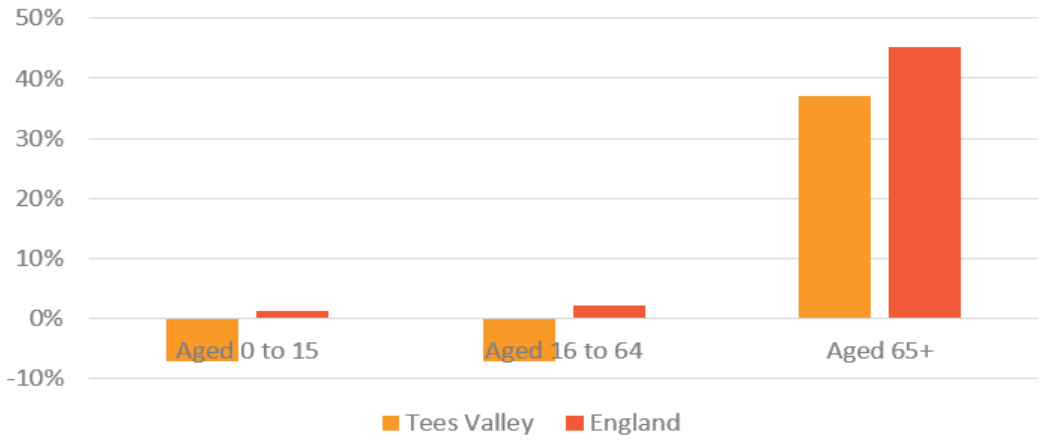
FIGURE 4.5 TEES VALLEY ECONOMIC INACTIVITY BY AGE BAND

Source: ONS Annual Population Survey

Working Age Population

4.13 The proportion of working age residents in Tees Valley currently stands at 61.8% of the population. This is marginally lower than the national average of 62.8%. Looking to the future, however, forecasts suggest that this gap is set to widen unless positive steps are taken to address the issue. It can be seen from Figure 4.6 that that the proportion of working age residents (16-64 years) is projected to decline by 7% locally over the period 2017 to 2037. This is in contrast with a modest growth of 2% at the national level. In addition, the proportion of residents aged 0-15 years is also projected to decline by 7% locally, whilst growing by 1% nationally.

FIGURE 4.6 PROJECTED POPULATION CHANGE (2017-2037)



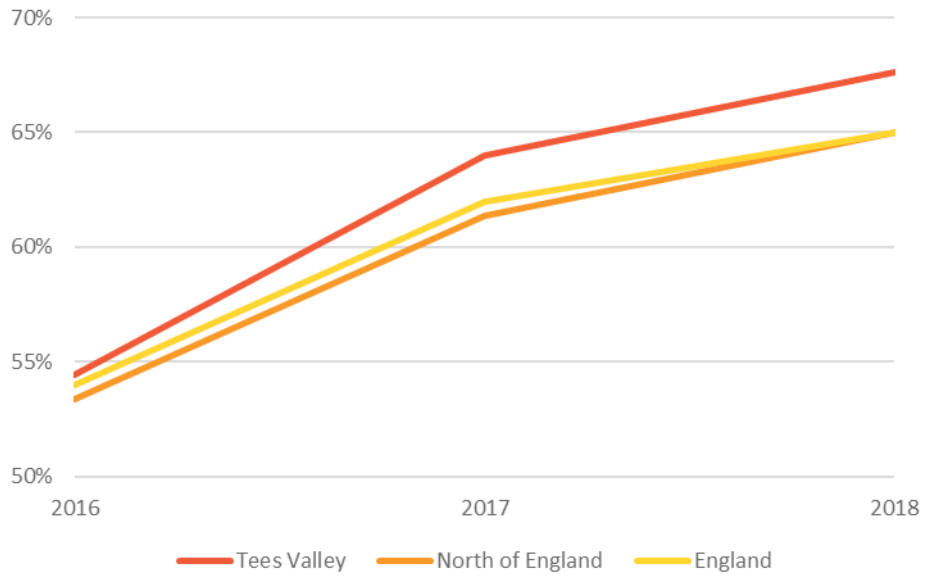
Source: ONS 2016 - Based Population Projections

Education

Primary Education

4.14 88% of Tees Valley primary schools are rated as 'good' or 'outstanding' by Ofsted. Whilst this is marginally higher than the national level (87%) it is down from 91% in 2016[xxxiii]. The performance of local primary schools is also strong. 68% of Tees Valley pupils achieved the expected standard (or above) for reading, writing and maths in 2018. This was above the national average of 65%. Furthermore, it can be seen (from Figure 4.7) that performance has improved at a faster rate locally in recent years, increasing the extent to which the area outperforms England as a whole.

FIGURE 4.7 PERCENTAGE REACHING EXPECTED STANDARD IN KEY STAGE 2 FOR READING, WRITING AND MATHS



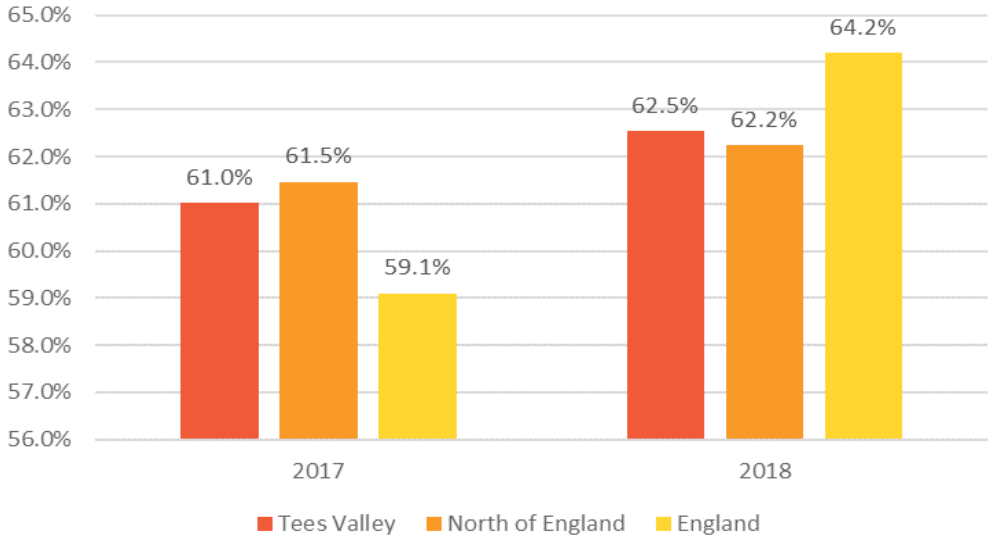
Source: Department for Education

Secondary Education

4.15 The performance of Tees Valley's secondary schools is, however, more mixed. Just 52% of local schools are rated as 'good' or 'outstanding' by Ofsted (compared to 75% nationally) and the average Attainment 8 score for pupils, at 44.0%, was below the national level (46.5%) in 2018[xxxiv].

4.16 Additionally, 62.5% of secondary pupils in Tees Valley achieved a 9-4 pass in English and Maths in 2018, compared to 64.2% nationally. It can be seen from Figure 4.8 that, whilst performance across Tees Valley improved between 2017 and 2018 a far greater increase was observed nationally. As a result, Tees Valley lagged the national average in 2018, having outperformed it the previous year.

FIGURE 4.8 PERCENTAGE ACHIEVING 9-4 PASS IN GCSE ENGLISH AND MATHS



Source: Department for Education

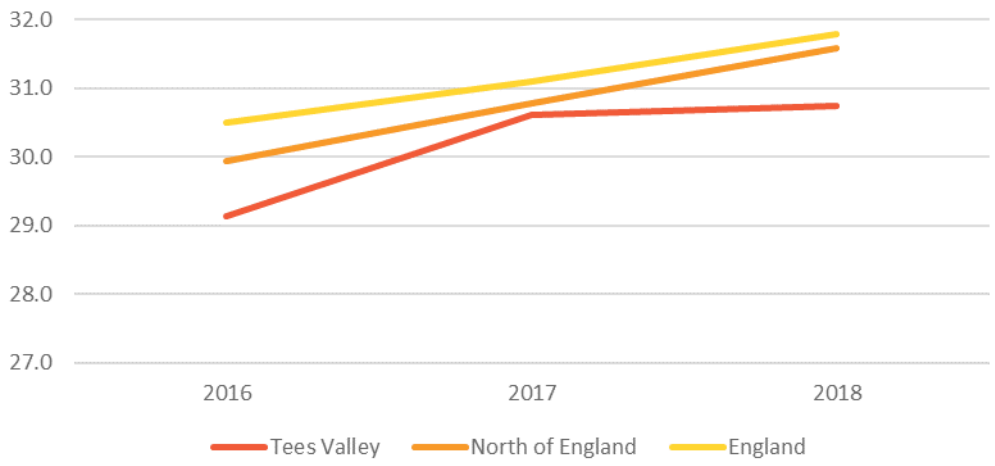
Further Education

4.17 Tees Valley has six Further Education (FE) colleges offering a range of education and training courses (including apprenticeships): Darlington; Hartlepool; Middlesbrough; Redcar & Cleveland; Stockton Riverside; The Northern School of Art. In addition, the area has four sixth form colleges and a number of schools with sixth form provision.

4.18 The quality of FE provision in the area is high. 88% of FE and skills provision in Tees Valley is rated as 'good' or outstanding' by Ofsted. This exceeds the national average of 82%[xxxv].

4.19 FE participation rates are marginally higher than the national average – despite the high level of NEETs in Tees Valley. 92% of 16-17 year olds in Tees Valley were in Education or Training in 2016 compared to 91% nationally[xxxvi]. Levels of attainment, however, are low locally, with an average point-score per A-level entry of 30.8 compared to 31.8 nationally (although the gap has narrowed slightly in recent years)[xxxvii].

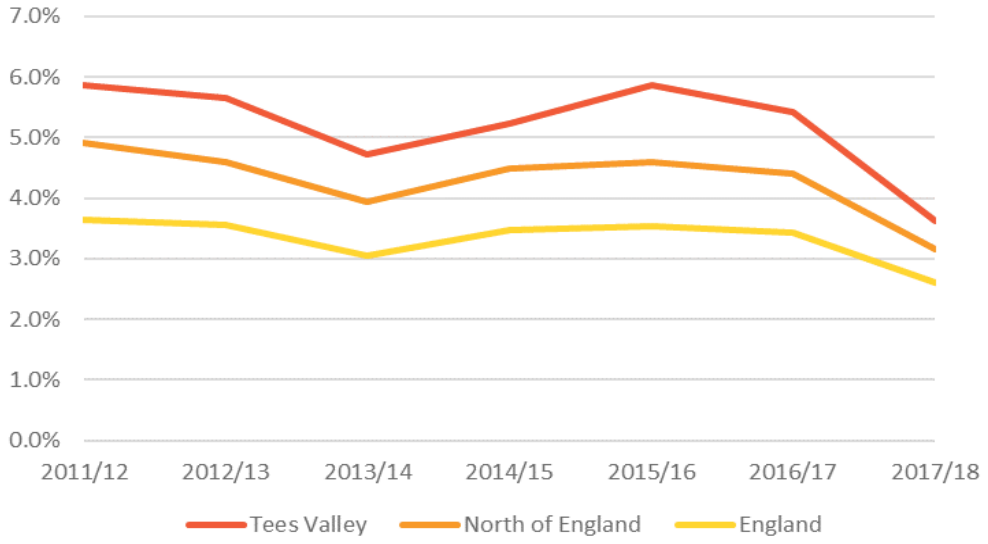
FIGURE 4.9 AVERAGE A LEVEL POINT SCORE PER A LEVEL



Source: Department for Education

4.20 Apprenticeships form an important part of the post-16 education and training landscape in Tees Valley, with 6,000 residents starting an apprenticeship in 2017/18. This corresponds to 3.6% of all 16-35 year olds – higher than the corresponding figure nationally (2.6%). This can be seen in Figure 4.10, which also highlights the sharp decline in apprenticeship starts in recent years (down 36% locally and 25% nationally since 2015/16).

FIGURE 4.10 PERCENTAGE OF 16-35 POPULATION STARTING AN APPRENTICESHIP



Source: Education Skills Funding Agency/ONS Mid-Year Population Estimates

4.21 In terms of the level of apprenticeship being undertaken, starts in Tees Valley in 2017/18 were dominated by intermediate level courses (49% compared to 43% nationally). In contrast, the proportion of starts categorised as advanced (40% compared to 44%) or higher (11% compared to 13%) were lower at the local

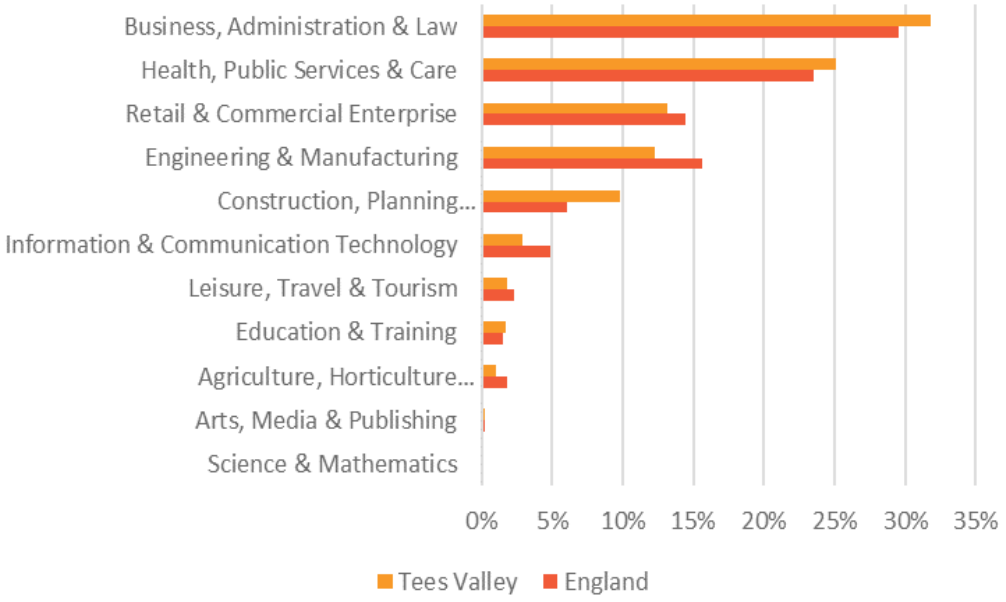
than the national level. This indicates a need to look at mechanisms to support greater progression through the system[xxxviii].

4.22 Figure 4.11 provides a summary of apprenticeship starts by subject area. It can be seen from the data that Tees Valley has a higher percentage of apprenticeship starts (relative to the national level) in: construction; planning and the built environment; business, administration and law; health, public services and care; and education and training. The low proportion of starts in the engineering and manufacturing and information and communication technology sectors is a cause for concern, however, having regard to:

- The existing strengths of the Tees Valley in manufacturing and the opportunity to support the evolution of the sector by leveraging Tees Valley's digital capabilities to position the area as being at the vanguard of the industrial digitalisation movement; and
- The analysis at Figure 4.21 which indicates that issues regarding SSVs are particularly acute locally in relation to the information and communications and manufacturing sectors.

4.23 Looking to the future, it is critically important that local training provision is aligned with the needs of businesses (particularly those where Tees Valley has an existing competitive advantage or strong growth potential) in order to support the growth aspirations of the Combined Authority.

FIGURE 4.11 PERCENTAGE OF APPRENTICESHIP STARTS BY FRAMEWORK SECTOR SUBJECT AREA 2017/18



Source: Education Skills Funding Agency

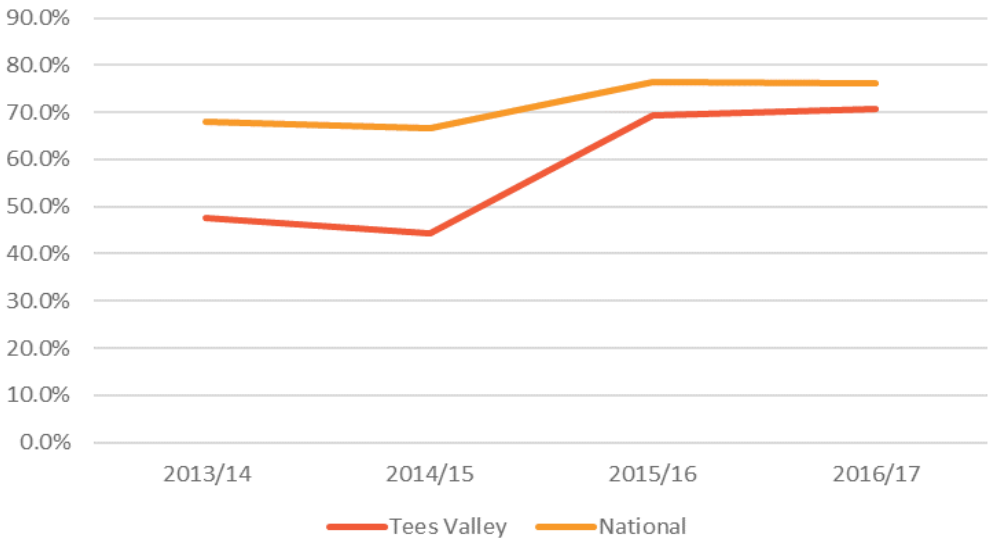
Higher Education

4.24 Higher Education (HE) provision in Tees Valley is focussed on Teesside University and Durham University (Queens Campus) alongside a number of FE colleges offering HE courses.

4.25 Participation rates are high, with 18.8% of Tees Valley residents aged 18-29 in HE in 2016/17 compared to 18.2% nationally[xxxix]. Interestingly, despite the higher rate of HE starts, data indicates that Tees Valley has:

- A lower proportion of students successfully completing HE courses (see Figure 4.12); and
- Lower levels of postgraduate take-up (2.8% of 18-29 years olds locally compared to 3.5% nationally).

FIGURE 4.12 PERCENTAGE OF HIGHER EDUCATION QUALIFICATION COMPLETIONS

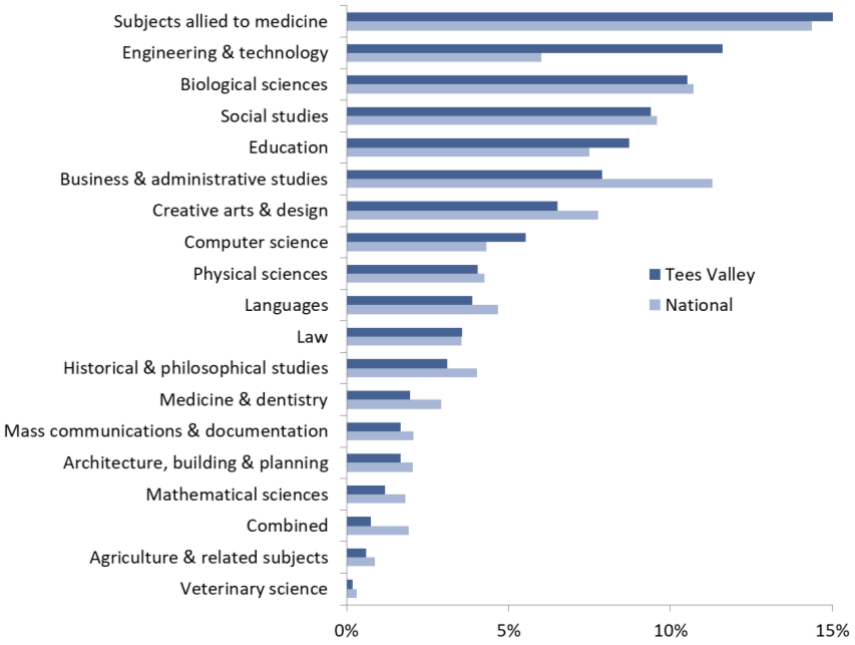


Source: Higher Education Statistics Agency

Subjects Studied

4.26 Figure 4.13 sets out the percentage of Tees Valley students participating in HE by subject studied. The data shows that the most popular subjects locally include: medicine; engineering and technology; biological sciences; social studies and education. Benchmarking the data against the national position identifies strong representation local in subjects such as: medicine; engineering and technology; education; and computer science.

FIGURE 4.13 HE COURSES BY SUBJECT STUDIED (2016/17)



Source: Tees Valley Higher Education (December 2018) Figure 4

Graduate Retention

4.27 In 2016/17, 51% of students whose permanent residence prior to commencing their studies was within Tees Valley gained their undergraduate or postgraduate qualification from Teesside University. Other popular university for study amongst those previously living within Tees Valley include:

- University of Northumbria at Newcastle (8%);
- University of Sunderland (5%);
- Newcastle University (4%); and
- University of Durham (4%).

4.28 59% of those graduating find employment in the area, with the majority taking up jobs in Middlesbrough and Stockton-on-Tees. The proportion of graduates that remain in the area for work has reduced year-on-year for the past five years from a high of 69%. The 41% of graduates that currently find employment outside of the Tees Valley represents a significant pool of talent that could help to address some of the existing and emerging labour shortages experienced by the local business base[xl].

4.29 The most popular destinations for Tees Valley graduates moving out of the area for work include:

- Tyne & Wear (9% of Tees Valley graduates);
- County Durham (5% of Tees Valley graduates); and
- Greater London (5% of graduates)[xli].

4.30 No data is available to unpack the reasons for the declining level of graduate retention. Discussions with Teesside University have, however, identified several factors that may have contributed towards this, including:

- The introduction of postgraduate loans in 2016, which resulted in more students progressing to postgraduate study (rather than employment); and
- Shifts in the local jobs market, with significant changes to large employers in steelmaking, oil and gas (as well as related supply chains) and significant NHS budget cuts which may have resulted in fewer graduate opportunities in the area.

4.31 Based upon qualitative intelligence gathered through the LIS process it is anticipated that measures designed to achieve the following could help to increase the proportion of graduates that remain in the area: increased availability/awareness of employment and career progression opportunities in Tees Valley; and continued improvement of Tees Valley's wider place offer to **a**ttract investment and establish a global reputation for Tees Valley as a vibrant and thriving place to be, with world leading opportunities in clean energy, low carbon and hydrogen.

Adult Education Budget

4.32 The devolved Adult Education Budget (AEB) for Tees Valley has been confirmed at £29.5 million for Academic Year 2019/2020. The AEB covers skills provision for learners aged 19+, including Adult Community Learning and enables more flexible tailored programmes of learning to be made available through a variety of learning providers. The Combined Authority will have the powers and responsibility to determine the funding priorities for the devolved AEB for Tees Valley residents. This is a unique and invaluable opportunity for Tees Valley which will help to create a more dynamic education offer to learners and businesses, helping to support a more responsive, flexible skills system.

4.33 The AEB will continue to include a number of statutory requirements and in addition, from 2020/21 the government will introduce a new statutory basic digital skills entitlement. Funding for the entitlement will come from within the devolved AEB.

4.34 It is the intention of the Tees Valley Combined Authority to continue to support the Low Wage Pilot introduced by government for 2018/19. The aim of the pilot is to help increase adult education participation and lift social mobility barriers to learning for those who would not otherwise engage due to course fees being unaffordable. It will also support those that are in low paid employment and are wanting to further progress in work and in their chosen career.

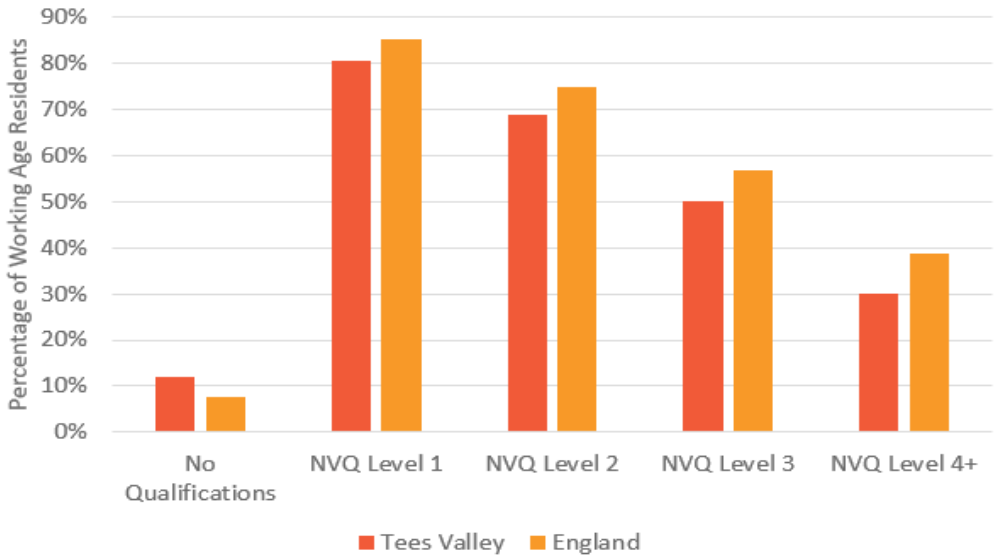
4.35 It is the Combined Authority's intention to maximise funding to the learner by creating an adult education and skills system that focuses upon measuring and delivering better outcomes for all learners – in terms of making well informed decisions about their future, finding work, the quality and sustainability of this work and their progression in work. This will provide a progressive offer that creates lifelong pathways of learning to identifiable outcomes, including career pathways.

Skills Levels

4.36 Figure 4.14 provides an overview of the skills base of Tees Valley's working age population. This clearly highlights that the performance of Tees Valley lags the national average with respect to both higher and lower level skills:

- 30% of Tees Valley's working age population are qualified to NVQ Level 4 and above, which is below the national figure of 39%;
- 81% of Tees Valley's working age population are qualified to NVQ Level 1, compared to the national average of 85%; and
- 12% of Tees Valley's working age population have no formal qualifications, which is higher than the national figure of 8%.

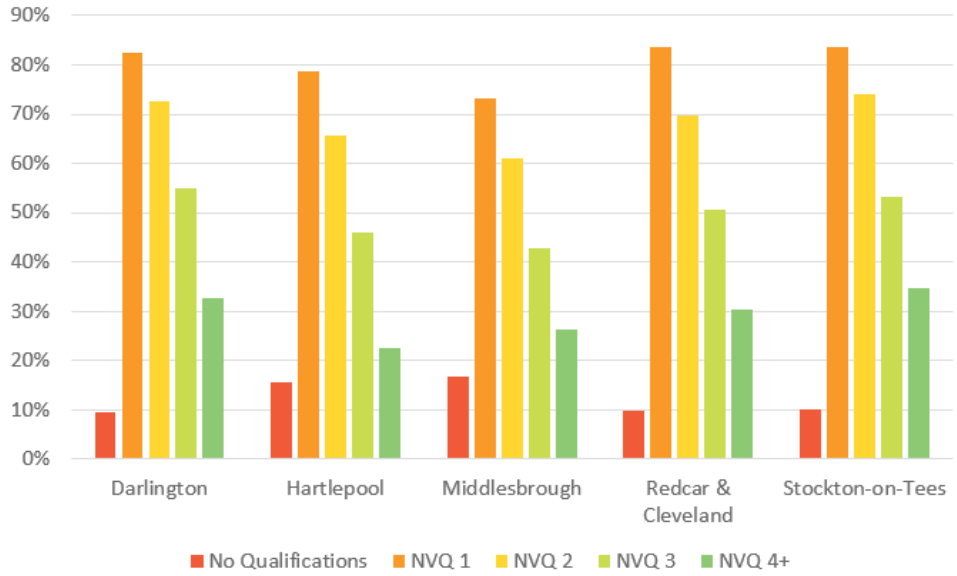
FIGURE 4.14 SKILLS LEVELS OF WORKING AGE POPULATION



Source: ONS Annual Population Survey (2017)

4.37 Figure 4.15 provides an overview of the skills base at the local authority level. From this it can be seen that, in general terms, performance is stronger in Stockton-on-Tees, Darlington and Redcar and Cleveland, where the highest proportion of residents qualified and NVQ Level 3 and 4 are observed (alongside a lower proportion of residents with no formal qualifications).

FIGURE 4.15 SKILLS LEVELS OF WORKING AGE POPULATION BY LOCAL AUTHORITY



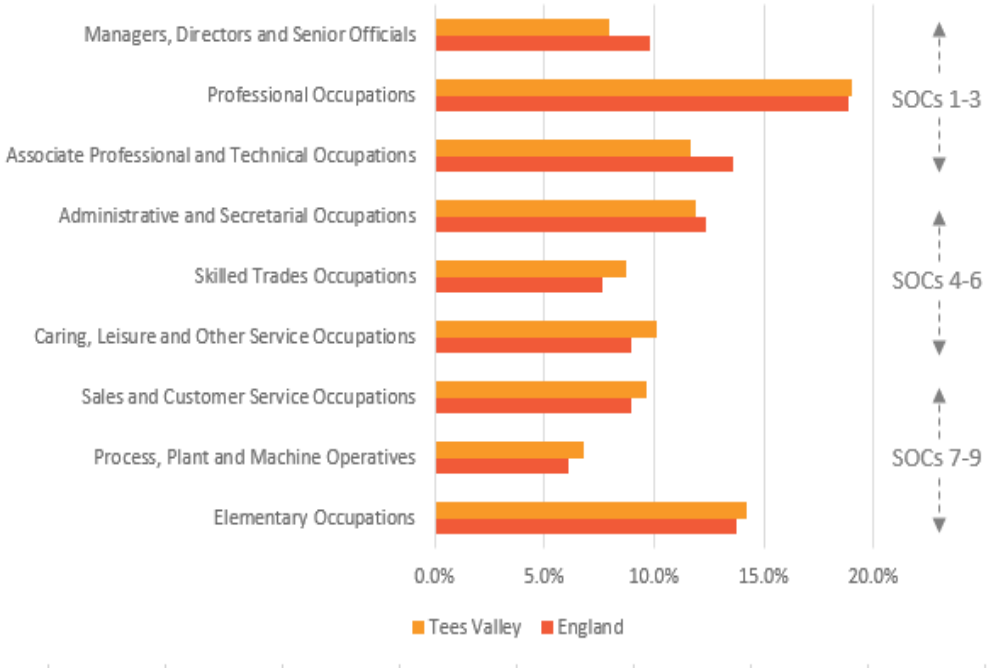
Source: ONS Annual Population Survey (2017)

Occupational Structure

4.38 The area's low skills base is also reflected in the occupation structure of the local economy. This is summarised in Figure 4.16, which shows that Tees Valley is characterised by:

- Lower levels of employment (38.6% compared to 42.2%) in SOC Groups 1-3 – those occupations that are generally categorised by higher skills requirements and higher rates of productivity; and
- Higher levels of employment (30.6% compared to 28.8%) in SOC Groups 7-9 – those occupations that are generally categorised by more modest skills requirements and lower rates of productivity.

FIGURE 4.16 DISTRIBUTION OF JOBS BY OCCUPATION (2017)



Source: ONS Annual Population Survey

Skills Strategy (2018-2021)

A result of greater control over local decision-making facilitated by the Devolution Deal with Government, the Tees Valley Skills Strategy 'Inspiring Our Future' sets out investment priorities for employment, education and skills. This focuses on a number of areas including supporting education innovation and collaboration, developing a skills system for business growth and addressing long-term unemployment supported by new initiatives including the Routes to Work pilot and Tees Valley Careers.com. Whilst the devolution of greater powers offers the opportunity to deliver a more responsive education and skill landscape locally, it is too early to see its full impact.

Job Vacancy Data

4.39 The 2019 *Tees Valley Job Vacancies* report provides an overview of the current demand for jobs within Tees Valley. This highlights that more than 30,000 job vacancies were advertised in Tees Valley during 2018.

4.40 In comparison with data for the previous year, this shows that the largest increases in vacancies were reported in relation to:

- Process, Plant and Machine Operatives with 129 additional reported vacancies (an increase of 54%); and
- Elementary Trades and Related Occupations with 72 additional reported vacancies (an increase of 35%).

4.41 In general terms, job vacancies advertised in Tees Valley required lower skills levels than those advertised nationally. At the local level, 36% of vacancies required a Level 5 qualification or above (compared to 53% nationally). 43% of vacancies in Tees Valley required a Level 2 qualification (compared to 28% nationally).

Future Skills Needs

4.42 Sector challenge sessions held as part of the development of the LIS raised concerns amongst stakeholders regarding the scale of replacement demand that must be address in key sectors. Whilst replacement demand is a normal function of the labour market, some areas of the local economy (including manufacturing and the chemicals and process industries) are faced with challenges relating to an ageing workforce[xlii] and the associated need to replace large volumes of skilled and experienced staff in the near future.

"The manufacturing and engineering sectors are facing a critical juncture. A key strength of the Tees Valley offer is the skills base of the sectors' established workforce. If we don't replace the expertise of our ageing workers, we risk losing one of our key USPs." Sector Challenge Session attendee

4.43 The *Northern Powerhouse Chemicals and Process Sector Science and Innovation Audit* outlines that almost 50% of the workforce across relevant sectors related to chemicals is over the age of 45 – with a similar situation observed in the wider manufacturing sector. The Audit goes on to state that:

"The ageing workforce will have significant implications for the sector going forward, in particular the high levels of replacement demand for higher skilled/technical and managerial functions, for which there is not an immediate source."

4.44 Analysis presented within the *Tees Valley Strategic Economic Plan 2016-2026* identifies the need for almost 116,000 replacement jobs in the area over the ten-year period. The document goes on to acknowledge that:

"Without urgent action there is a real threat that posts may need to be filled by people from outside the region and that more junior staff will not be able to progress within their existing company/sector. There is a clear need for training to aid progression paths for existing staff and also to further enhance the productivity of all workers across all sectors."

4.45 Table 4.1 provides a summary of the scale of replacement demand identified.

TABLE 4.1 REPLACEMENT DEMAND (2016-2026)

Sector	Replacement Demand (No. of Jobs)
Low Carbon/Process, Chemical and Energy	2,000
Advanced Manufacturing	900
Other Manufacturing	6,700
Construction	7,400
Professional and Business Services	13,200
Logistics	5,300
Digital	2,300
Education	10,000
Health and Social Care	21,900
Services	6,000
Culture and Leisure	11,400
Other Services	28,600
All Sectors	**115,900**

Source: Tees Valley Strategic Economic Plan

Skills Gaps

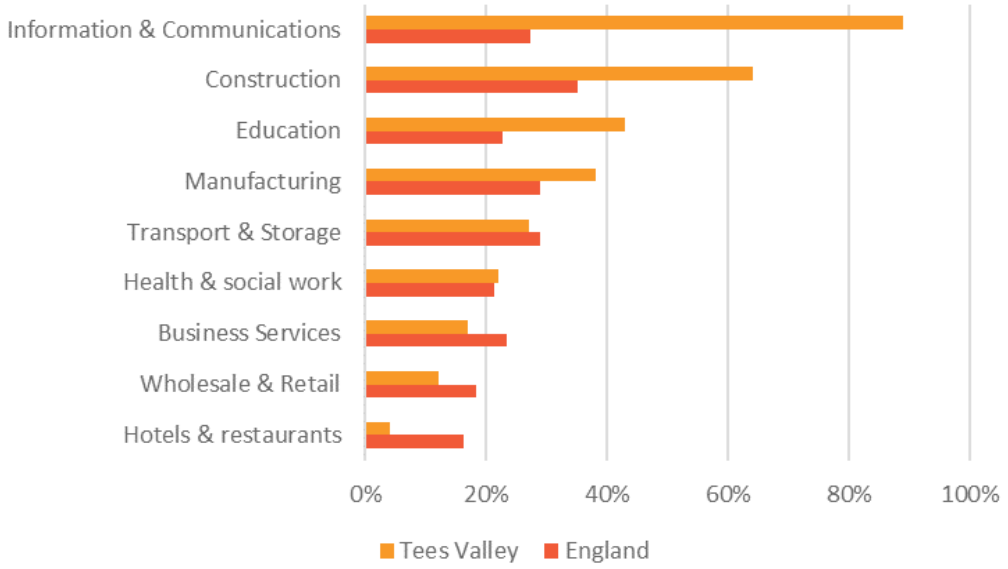
4.46 Anecdotal evidence collated via the LIS Sector Challenge Sessions suggests that the growth potential of the Tees Valley economy is being constrained as a result of difficulties in recruiting appropriately skilled staff. This is reinforced by the findings of *the Tees Valley Business Survey* (2018) which identified recruitment difficulties as the single biggest obstacle to the growth of the local business base – identified by 44% of respondents (see Figure 6.9).

4.47 Whilst the *Employer Skills Survey* (2017) conducted by the Department for Education highlights that recruitment challenges do appear to be more pronounced in Tees Valley than at the national level, with 27% and 22% of job vacancies categorised as SSVs respectively. Figure 4.17 provides a more granular analysis of the data, disaggregated by industrial sector. This indicates that the sectors facing the most acute recruitment challenges locally include:

- Information and communication, with 89% of vacancies categorised as SSVs (compared to 27% nationally);
- Construction, with 64% of vacancies categorised as SSVs (compared to 35% nationally);
- Education, with 43% of vacancies categorised as SSVs (compared to 23% nationally); and

- Manufacturing, with 38% of vacancies categorised as SSVs (compared to 29% nationally).

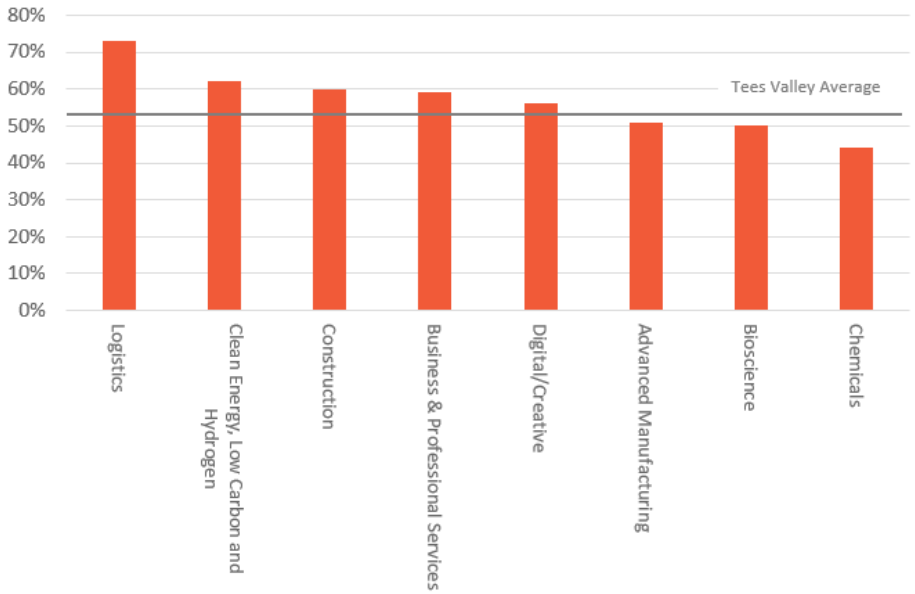
FIGURE 4.17 % SKILLS SHORTAGE VACANCIES BY INDUSTRY SECTOR (2017)



Source: Department for Education Employer Skills Survey

4.48 Further intelligence regarding local recruitment challenges is provided via the *Tees Valley Business Survey* (2018). The exercise found that 51% of respondent businesses had experienced difficulties in recruiting during the previous 18 months, with a breakdown by sector provided at Figure 4.18.

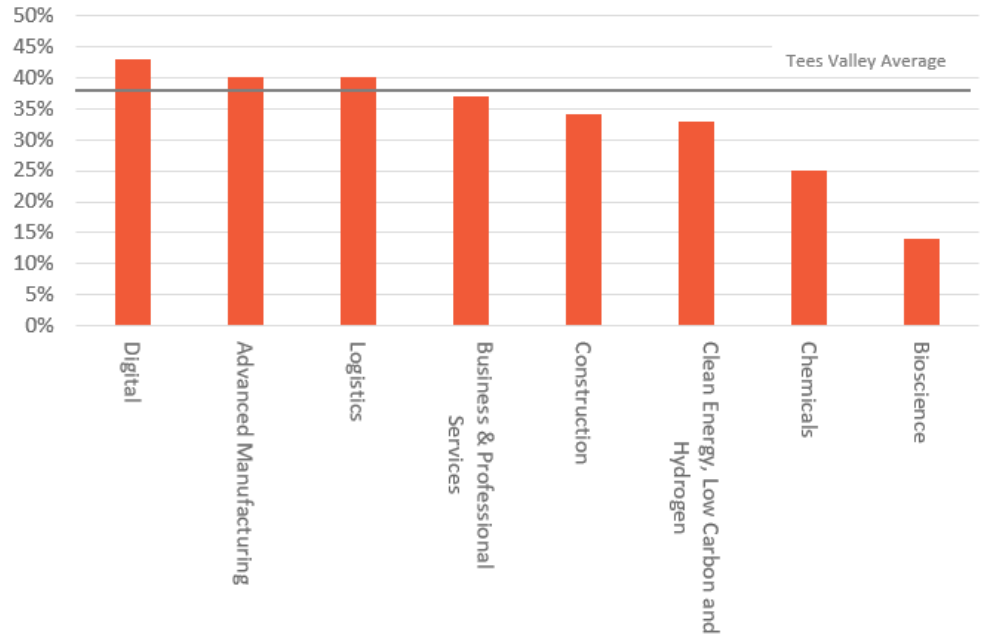
FIGURE 4.18 DIFFICULTIES IN RECRUITING STAFF (PREVIOUS 18 MONTHS)



Source: TVCA Business Survey 2018

4.49 Issues related to the availability of the skills required by business do not only materialise during the recruitment process. Some 37% of respondents to the *Tees Valley Business Survey* (2018) indicated that they were currently experiencing skills gaps within their existing workforce. The breakdown of responses by sector is shown in Figure 4.19, which suggests that skills shortages within the existing workforce are particularly prevalent within the digital, advanced manufacturing and logistics sectors.

FIGURE 4.19 SKILLS GAPS WITH EXISTING EMPLOYEES



Source: TVCA Business Survey 2018

Digital Skills

Findings from the research into the Digital sector in Tees Valley show that the challenge of finding skilled people to fill jobs is a key barrier to growth, especially for experienced staff. Of recent adverts for digital occupations in Tees Valley, Software Developers and IT Managers were the most frequently advertised posts, and Tees Valley has strong demand (relative to the national average) for Web Developers, IT Managers, IT Service Managers and IT Trainer roles. Popular skills that are in particularly high demand in Tees Valley include skills related to IT management (e.g. hardware, network security, configuration management, CompTIA A, Puppet), and web development (e.g. SEO, HTML5, accessibility). Less popular skills but which are in higher demand in Tees Valley than elsewhere include skills related to Tees Valley animation and games sub-sectors (e.g. character animation, character design).

This is corroborated by the Department for Education Employer Skills Survey which indicates that digital-facing firms in Tees Valley are experiencing skills shortages that significantly outstrip the national average.

The BoHo Zone in Middlesbrough is one of the number of successful digital locations and demonstrated the importance of a place and culture-oriented approach to establish a digital proposition and its importance in attracting and retaining staff.

Summary

4.50 Key issues highlighted within the preceding paragraphs are summarised below:

1 Productivity in Tees Valley is adversely affected by low levels of labour market participation (reflected in a small working age population and high rates of economic inactivity, unemployment and part-time working);

2 Issues of participation are compounded by poor local performance in relation to both high- and low-level skills;

3 The performance of local primary schools is strong, but is not currently matched at secondary level;

4 Skills issues are considered by local businesses to represent one of the biggest constraints to growth at present; and

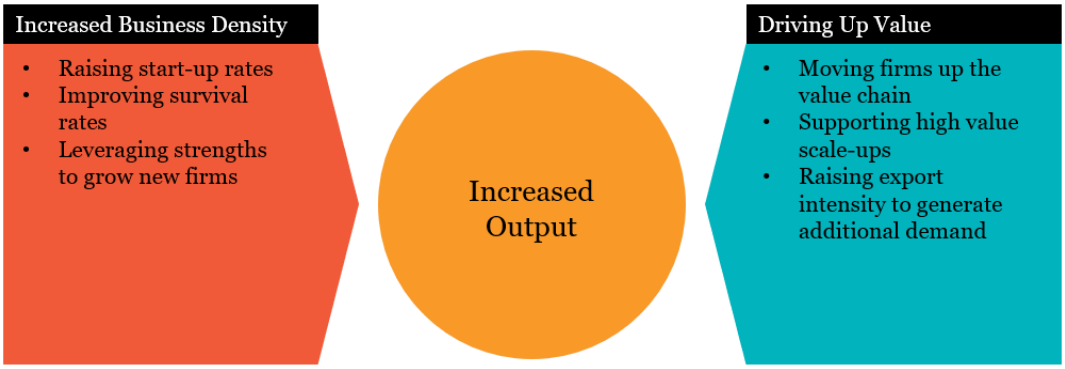
5 A number of sectors are facing a critical juncture in relation to resourcing, with an ageing workforce and significant levels of replacement need.

5.0 Business Environment

5.1 The strength of an area's economy is shaped – in part – by the size and composition of the business base, as well as the effectiveness of local systems in facilitating and supporting business growth (through start-ups, scale-ups and accessing new markets) and inward investment.

5.2 The mechanisms through which the business environment contributes towards increased economic output are summarised in Figure 5.1. They can largely be categorised according to: those that increase the number of active businesses in the economy; and those that support existing business to increase their economic contribution.

FIGURE 5.1 DELIVERING INCREASED OUTPUT VIA THE BUSINESS ENVIRONMENT



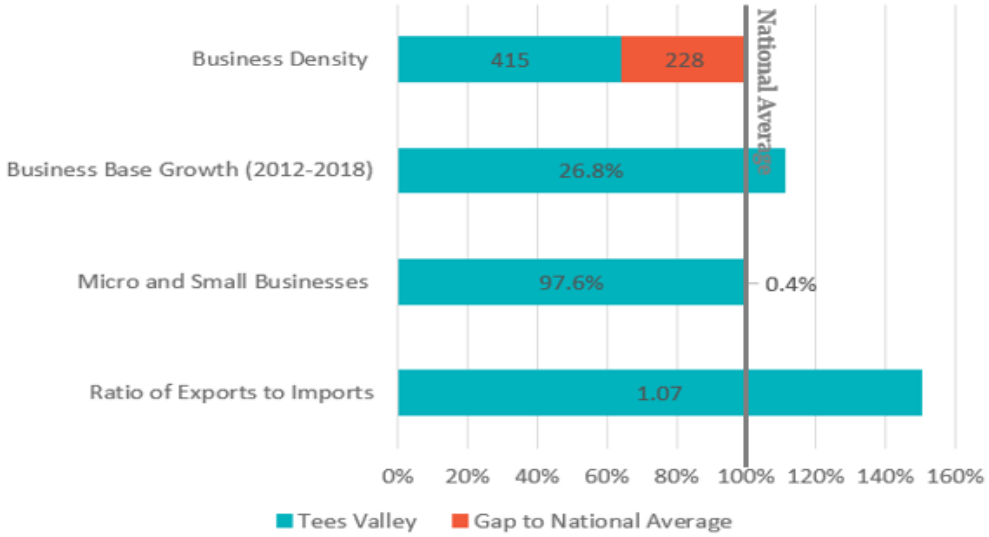
Tees Valley 'Business Environment' Scorecard

5.3 The scorecard at Figure 5.2 provides a summary of Tees Valley's performance relative the national average. From this analysis it can be seen that:

- Tees Valley has an under-developed business base relative to the size of the local population. There are 415 businesses for every 10,000 working age residents – this is approximately two-thirds of the national level and highlights the need to grow the area's business base as a means of creating additional employment opportunities and economic output;
- Whilst the scale of the challenge facing Tees Valley in respect of growing the business base is clear, recent performance has been encouraging. The number of businesses in Tees Valley grew by 26.8% over the period 2012 to 2018, outstripping the rate of growth observed nationally (24.2%), although it must be recognised that local growth was achieved from a much lower base. The recent increase in the number of local businesses must be accelerated moving forwards;
- Tees Valley is more export-oriented than the UK economy as a whole. In 2017, Tees Valley recorded a balance of trade in goods surplus with goods exports totalling £3,162m – 7% higher than goods imports (£2,956m)[xliii]. In contrast, the UK economy ran a balance of trade in goods deficit in the same year: goods exports totalled £338,739m – representing just 71% of goods imports (£475,774m)[xliv]. Growing the Tees Valley economy therefore offers

an opportunity to add value to UK PLC by reducing the national trade deficit[xlv].

FIGURE 5.2 BUSINESS ENVIRONMENT PRODUCTIVITY SCORECARD



Source: Various

Business Density

5.4 Tees Valley has the lowest business density of any LEP in England, with just 415 enterprises per 10,000 working age residents in 2018. This corresponds to approximately two thirds of the UK rate of 643 enterprises per 10,000 residents. In order for the Tees Valley to increase its business density in line with the national average, the area's business base would need to increase by a further 9,500 businesses.

5.5 The under-developed business base is, in part, a reflection of Tees Valley's industrial heritage. Traditionally, the area relied upon a small number of large employers and this has dampened down entrepreneurial activity.

5.6 The scale of the challenge facing Tees Valley in order to replicate national levels of business density is clear and a step change in levels of business start-ups and support will be required to facilitate this. Significantly increasing the growth trajectory of the local business base offers the potential to drive economic growth and new employment, whilst also creating companies that are embedded in the local area and supply chains. Increasing the number of businesses will also help to protect the local area against economic shocks, by reducing the reliance of particular sectors on a small number of major employers.

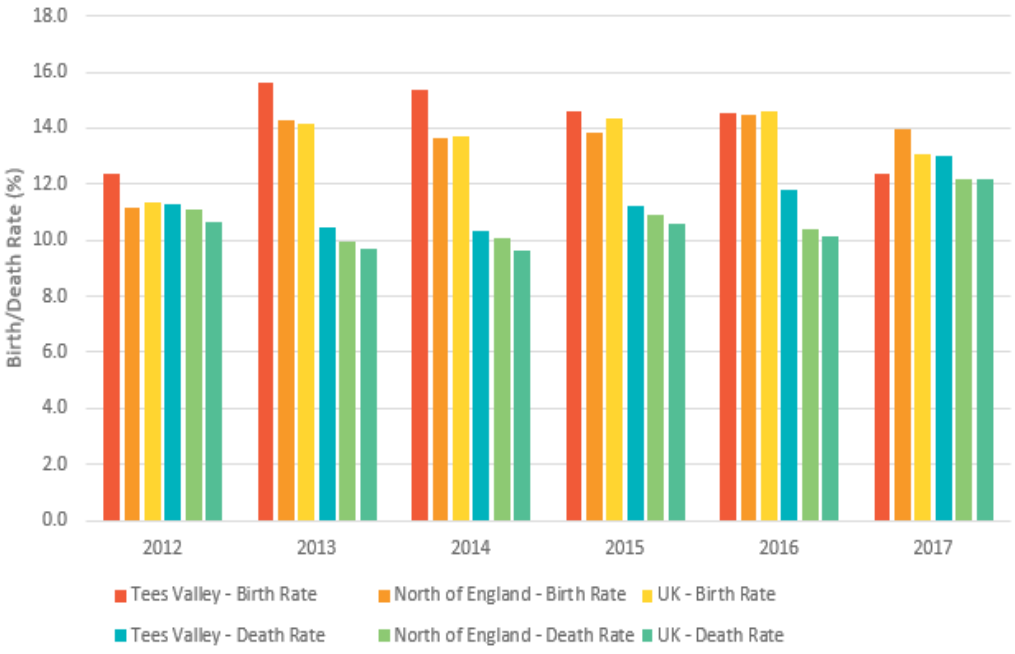
Business Growth

5.7 In recent years, the Tees Valley business base has grown at a faster rate than that of the Northern Powerhouse and the UK. Between 2012 and 2018, the total number of businesses in the local economy increased by 26.8%, in comparison with 24.2% across the UK.

5.8 The stronger performance observed within Tees Valley has been underpinned by higher business start-up rates, as opposed to higher levels of business survival, as shown in Figure 5.3 for the period 2012-2017 (the latest available data). The extent to which the local economy has outstripped the performance of the UK and the Northern Powerhouse appears to have softened in 2016 and 2017, however. The graph also shows that the Tees Valley business base contracted in 2017, with the business birth rate declining and being overtaken by an increasing death rate.

5.9 Moving forward, therefore, it is considered that efforts to grow the business base in Tees Valley should focus on both: raising levels of entrepreneurship in order to stimulate more business start-ups; and introducing measures to increase survival rates.

FIGURE 5.3 BUSINESS BIRTH AND DEATH RATES 2012-17



Source: ONS Business Demography

Teesside University

Teesside University represents a key strength of Tees Valley's business environment. Previously described by Vince Cable MP, as *"one of the best universities for business in Britain"* it was also a finalist in the Outstanding Entrepreneurial University category of the 2018 Times Higher Education Awards. The award recognises those institutions which have delivered an exceptional approach to embedding entrepreneurship within their culture and programmes.

The University is one of the few nationally to run the BA (Hons) Team Entrepreneurship degree. It runs a number of projects designed to support start-ups in their early stages and equip entrepreneurs with the skills, knowledge and support they need to grow their companies. This includes: the Launchpad Business Incubator (providing co-working space for students, graduates, alumni-entrepreneurs and corporate partners to collaborate in a unique start-up ecosystem); and Innovate Tees Valley* (providing support, funding and mentoring as well as a platform to help build innovation capacity and deliver growth).

Support is provided to existing businesses and university spin-outs. The success of the approach is reflected in HEBCIS** data which shows that, in 2017, there were 143 start-ups founded by Teesside University graduates which were still active after 3 years of business. These firms had a combined estimated turnover of £20.8m, placing Teesside amongst the top 10 performing universities nationally.

**Innovate Tees Valley is delivered in partnership with Digital City, NEPIC, MPI and Creative Fuse.*
***Higher Education Business and Community Interaction Survey*

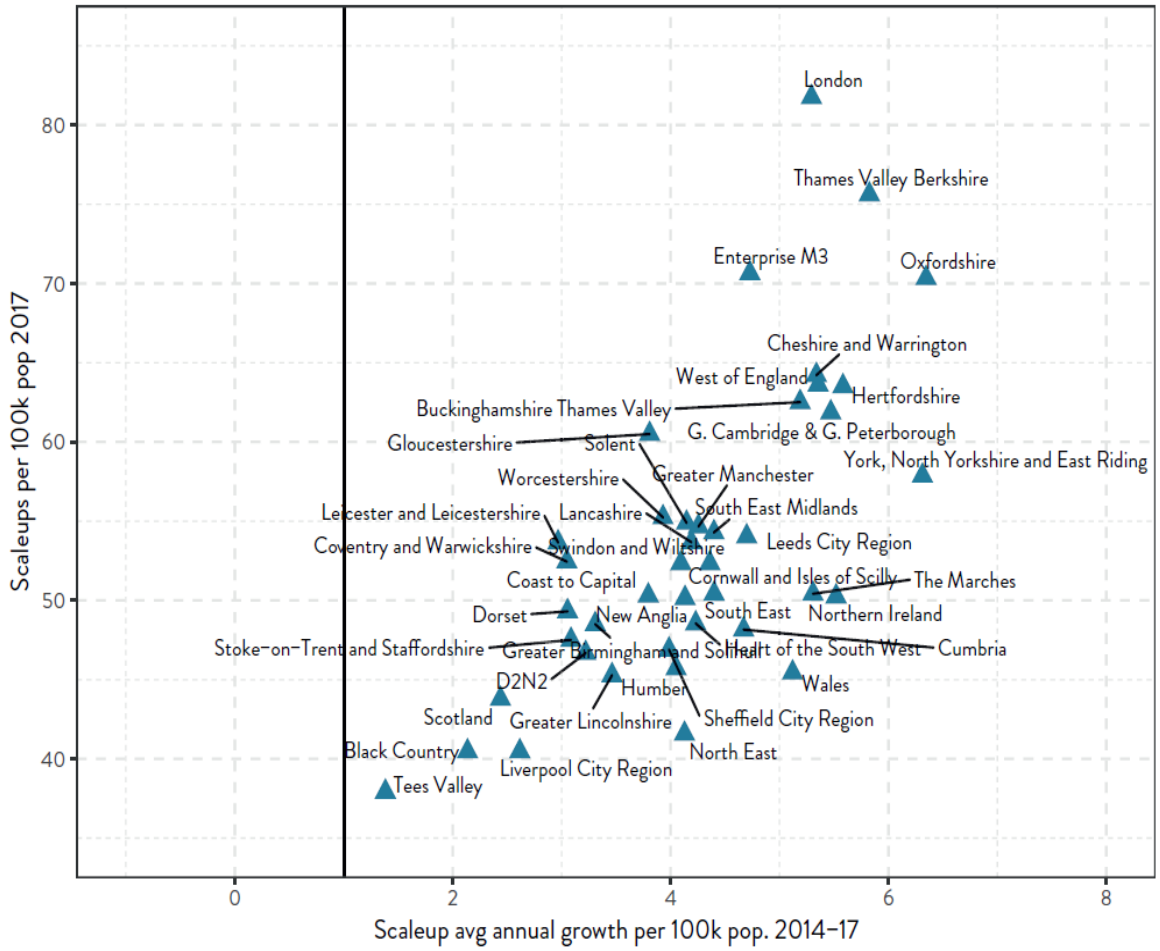
Scale-Ups

5.10 Issues of low business density within Tees Valley are compounded by weak scale-up performance. Scale-ups are defined as those businesses that demonstrate growth of 20% per annum over a three-year period with respect to employee numbers, turnover or both (achieved from a base of at least 10 employees). High representation or growth in scale-ups can help to drive growth in employment and value in local areas.

5.11 Research published by the ScaleUp Institute in 2019[xlvi] assessed the performance of all LEPs and devolved nations with respect to scale-up density and growth. This is summarised in Figure 5.4 and shows that:

- Scale-up density is low: Tees Valley is the only area LEP/devolved nation in the UK with less than 40 scale-ups per 100,000 residents; and
- Scale-up growth is low: between 2014 and 2017 the number of scale-up business in Tees Valley grew by 1.4% per annum. This is the lowest figures recorded across all the geographies assessed.

FIGURE 5.4 SCALE-UP PERFORMANCE: LEP'S/DEVOLVED NATIONS



Source: Scale-Up Institute (2019)

5.12 This is consistent with earlier research from the ScaleUp Institute[xlvii] work which classified Tees Valley as an area that 'needs improvement' with respect to both scale-up density and growth. Positive interventions have been put in place with a view to increasing local scale-up performance, although it is too early to evaluate the impacts and further support is likely to be required given the scale of the challenge. The ScaleUp Institute work acknowledges that the Combined Authority has: *"responded positively to the Institute's finding that scale-ups in its area were not capitalising on the opportunity to grow further. The Authority*

worked with Teesside University to develop LEAP 50 an imaginative offer focusing on the barriers that scale-up businesses can face."

5.13 Key barriers to the growth of scale-ups in Tees Valley[xlviii] have previously been identified as:

- Accessing available talent that meets the needs of businesses;
- Meeting the training and development needs of the existing workforce (including leadership development); and
- Accessing new markets and customers (including larger corporate supply chains).

5.14 In addition, research by Durham University Business School[xlix] concluded that absorptive capacity within Tees Valley is low relative to other Local Enterprise Partnership and that absorptive capacity tends to be lower amongst smaller businesses. This may also be constraining the growth of scale-ups. Previous analysis by the Enterprise Research Centre[l] highlights that absorptive capacity is disproportionately important in driving innovation and growth in SMEs. This is because R&D in SMEs is less likely to be formalised and therefore more dependent upon the ability to draw upon external knowledge spillovers.

Supporting Business Growth

5.15 The Tees Valley Business Survey (2018) sought views regarding those factors currently constraining business growth. Whilst the data is based upon a modest sample size (394 completed surveys were submitted) it nevertheless provides a useful 'temperature test' of local business views.

5.16 Key obstacles to growth identified by respondents are summarised below. This highlights that issues related to skills/recruitment and cashflow/finance, as well as the strength of existing/access to new markets emerged as particular barriers amongst participant businesses:

- Finding suitably skilled people: 44% of respondents;
- Cash flow: 33% of respondents;
- Access to finance: 29% of respondents;
- UK market demand: 19% of respondents;
- Access to new markets or supply chains: 18% of respondents;
- Skills of existing staff: 17% of respondents;
- Assistance for research, development and innovation: 16% of respondents; and
- Availability of suitable development sites/premises: 16% of respondents.

Business Demography

5.17 Historically, the Tees Valley economy was dominated by a small number of large employers. The latest ONS data (Table 5.1) indicates that the structure of the business base is now broadly in alignment with the UK average, albeit with:

- A lower proportion of micro-businesses locally (88.0%) in comparison with UK levels; and
- A higher proportion of small, medium and large firms relative to the UK average.

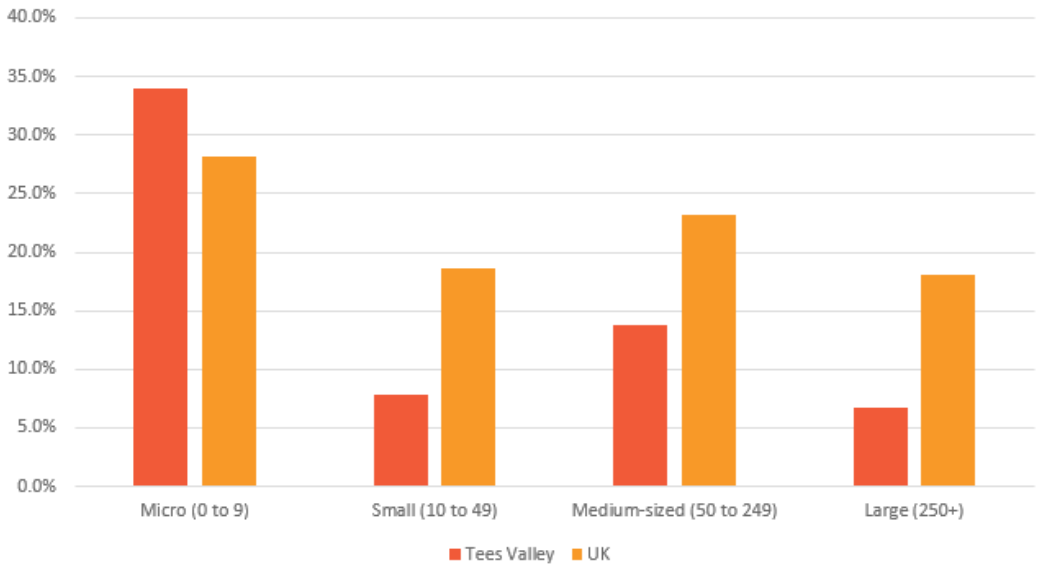
TABLE 5.1 STRUCTURE OF BUSINESS BASE BY SIZE (NUMBER OF EMPLOYEES) (2018)

	Micro (0 to 9)	Small (10 to 49)	Medium-sized (50 to 249)	Large (250+)
Tees Valley	88.0%	9.6%	1.9%	0.5%
UK	89.3%	8.7%	1.6%	0.4%

Source: ONS UK Business Counts

5.18 The structure of the local business base has shifted in recent years reflecting the increasing importance of micro-businesses. Figure 5.5 provides a summary of growth in the business base by employment size band. This shows that growth has been driven by an expanding cohort of micro-businesses, which increased by 34.0% between 2010 and 2018. This is higher than the corresponding figure for the UK (28.1%) and more than double the rate of growth observed across any other size band within Tees Valley. However, this was from a very low base and micro-businesses are still significantly under-represented in Tees Valley. This imbalance acts to increase the region's relative reliance on the economic contribution of its larger employers.

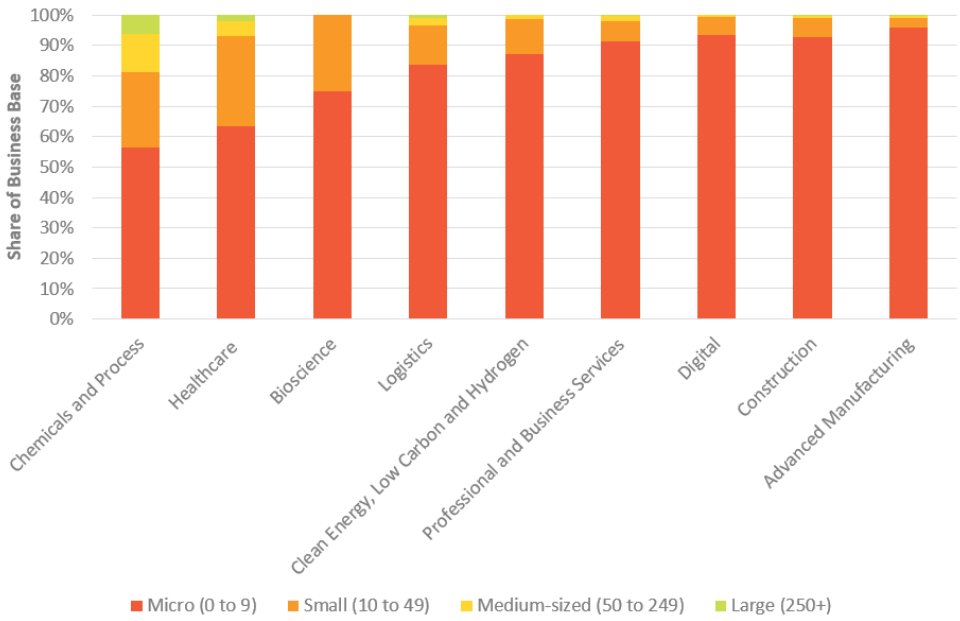
FIGURE 5.5 GROWTH IN BUSINESS BASE BY EMPLOYMENT SIZE BAND (2010-2018)



Source: ONS UK Business Counts

5.19 The size of the business base varies significantly by sector, however, as illustrated at Figure 5.6. This shows that the chemicals and process and healthcare sectors are characterised by a higher proportion of larger employers. At the other end of the spectrum, the advanced manufacturing, construction and digital sectors are comprised almost exclusively of micro and small businesses.

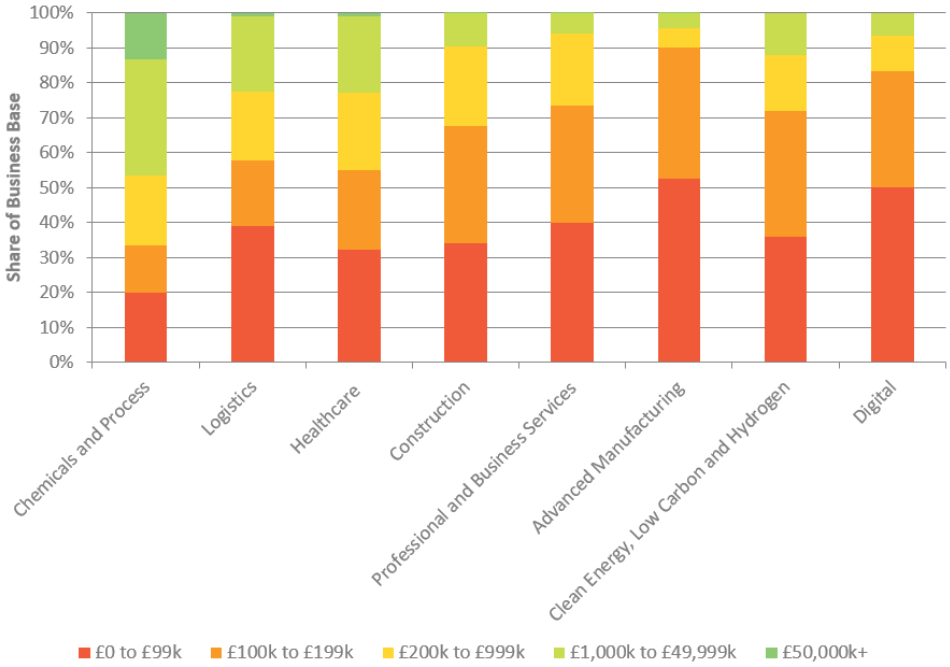
FIGURE 5.6 EMPLOYMENT BY SIZE BAND AND SECTOR



Source: ONS UK Business Counts (2018)

5.20 Similar sectoral variations can also be observed with respect to turnover, as shown in Figure 5.7. This illustrates that the chemicals and process, logistics and health sectors are generally characterised by a higher proportion of businesses with turnovers in excess of £1m. The scale of some of Tees Valley's major chemical and process operators is also highlighted, with the data indicating that more than 10% of businesses in the sector have a turnover greater than £50m.

FIGURE 5.7 TURNOVER BY SIZE BAND AND SECTOR



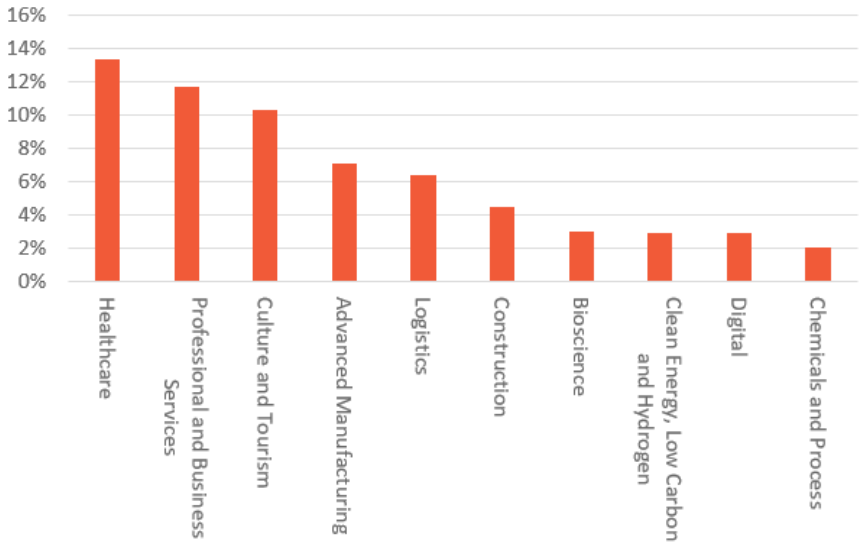
Source: ONS UK Business Counts (2018)

NB: Bioscience excluded from analysis due to sampling issues

Employment

5.21 Figure 5.8 provides a summary of the relative employment share of each of the Combined Authorities' priority sectors. This highlights the importance – in employment terms – of the healthcare, professional and business services and culture and tourism sectors. Levels of productivity by sector are considered in Table 5.2 and the accompanying analysis.

FIGURE 5.8 SECTORAL EMPLOYMENT



Source: Durham University/Tees Valley Economic Assessment (Figure 7.31)

Foreign Ownership and FDI Offer

5.22 **Port of Tees and Hartlepool:** what sets us apart from other locations are our excellent port facilities. Tees Valley has ten miles of operational river along the Tees, the deepest berths on the east coast of England, 5.4km of quayside, five roro berths and more than 1.4 million sq.ft. of warehousing space. The port is the UK's northern gateway for global shippers and, with lock-free access to the North Sea, Tees Valley is ideal for companies who need access to international markets. The port facilities are well-connected via road and rail, providing easy access to the rest of the UK.

5.23 **Durham Tees Valley Airport: r**ecently brought back into public ownership, Durham Tees Valley Airport connects Tees Valley to more than 300 global destinations with KLM Royal Dutch Airlines. There are three daily connections to the world-renowned, award-winning Schiphol hub as well as multiple daily flights to Aberdeen with connectivity to the Highlands & Islands and Scandinavia with Eastern Airways. A ten-year plan for the airport will see ten new routes for leisure and business passengers by 2022.

5.24 In overall terms, it is estimated that foreign-owned firms account for 23.0% of employment and 30.9% of turnover in Tees Valley. This would appear to suggest that foreign-owned firms are more productive than the indigenous business base and is likely to be a function of the tendency for foreign-owned firms to benefit from proprietary knowledge and high levels of absorptive capacity[li].

5.25 Foreign-ownership does not, however, represent a silver bullet with respect to productivity growth. Whilst such firms can import managerial and technical expertise, they can also: increase an area's vulnerability to external decision making; limit the capability to make local investment decisions; and act as 'branch plants' with investment in higher value-added functions (such as R&D)

focussed elsewhere. One of the principal challenges for Tees Valley in delivering future productivity growth is to better leverage the area's internationally significant innovation assets in sectors such as advanced manufacturing and process and chemicals in order to encourage foreign-owned businesses to undertake more R&D locally, particularly aligned to areas of sector growth, including clean energy, low carbon and hydrogen.

5.26 Those sectors of the local economy where foreign-ownership is most prevalent include:[lii]

- Clean Energy, Low Carbon and Hydrogen: accounting for 39.9% of employment and 63.6% of turnover in the sector within Tees Valley;
- Advanced Manufacturing: accounting for 32.6% of employment and 49.0% of turnover in the sector within Tees Valley; and
- Chemicals and Process Industries: accounting for 66.3% of employment and 39.3% of turnover in the sector within Tees Valley. This would suggest that, within this particular sector, foreign-owned businesses are less productive than domestic ones.

5.27 The above three sectors are also those where Tees Valley sees significantly higher concentrations in terms of both the number of enterprises and in employment.

5.28 The scale of employment and turnover supported by foreign firms in these high productivity sectors highlights the importance to Tees Valley of ensuring that the area maintains and builds upon its existing proposition to these sectors within the context of global competition.

5.29 The dominance of these sectors in relation to foreign-ownership is also highlighted by considering the 50 largest foreign-owned businesses in Tees Valley, which includes:

- 20 advanced manufacturing businesses (including 6 automotive manufacturers);
- 15 businesses in the process, chemicals and energy sectors; and
- 5 logistics businesses.

5.30 It is clear, therefore that inward investment and foreign-ownership is focussed on industrial activities, rather than the service sector. This reflects both Tees Valley's economic heritage, as well as those sectors where Tees Valley is recognised as internationally significant strengths at present.

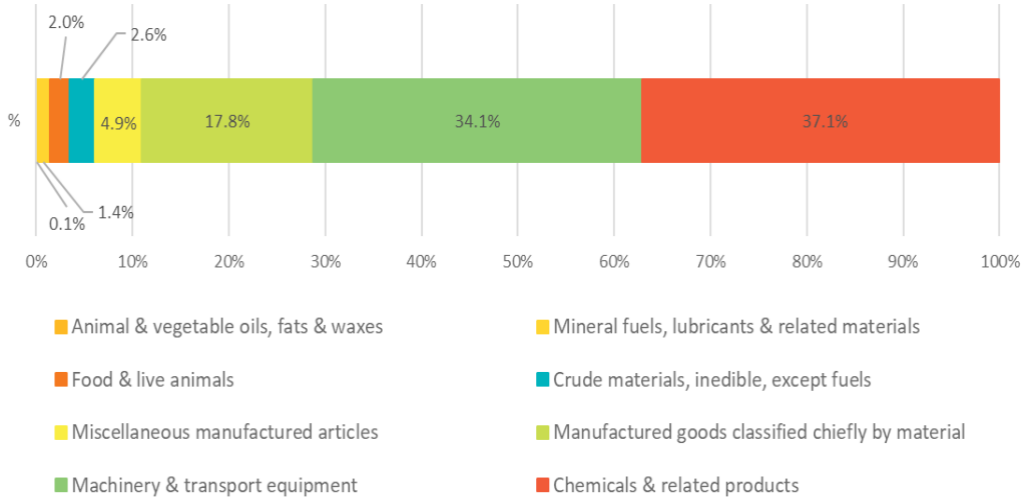
Exports

5.31 Tees Valley is an export-oriented economy and one of the few areas nationally to run a trade in goods surplus. In 2017, Tees Valley goods exports totalled £3,162m. Imports stood at £2,956m, resulting in a surplus of £206m[liii].

5.32 Official data regarding the sectoral breakdown of goods exports is not available at the Combined Authority level. Figures for Tees Valley and Durham are, however, available for a small number of broad sectors. This shows the importance of three key export (of goods) sectors:

- Chemicals and related products: £1.79bn of exports (37.1% of total exports from Tees Valley and Durham);
- Machinery and equipment: £1.65bn of exports (34.1% of total exports from Tees Valley and Durham); and
- Manufactured goods: £863m of exports (17.8% of total exports from Tees Valley and Durham).

FIGURE 5.9 TEES VALLEY AND COUNTY DURHAM GOODS EXPORTS BY SECTOR, % OF TOTAL

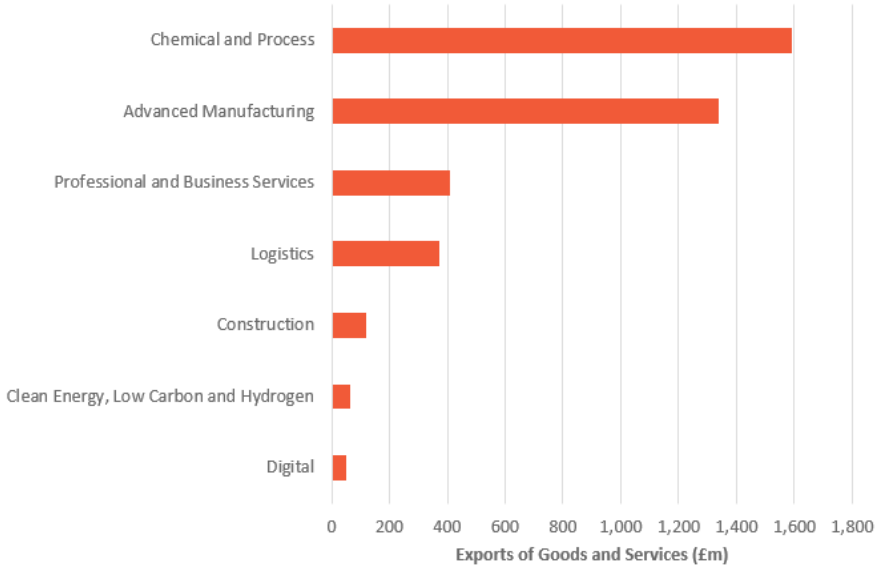


Source: HMRC Regional Trade Statistics

5.33 The above data relates to a geographical area that extends beyond the Combined Authority's boundary. Nevertheless, it is considered to reflect some of the key, internationally recognised, strengths of the local economy, in particular: chemicals and process industries; and advanced manufacturing (including automotive).

5.34 Additionally, Durham University have produced bespoke sectoral total (goods and services) export estimates at the Tees Valley geography. Figure 5.10 provides a breakdown of total exports of goods and services by sector for the Tees Valley in 2016. This clearly reinforces the dominance of the chemicals and process and advanced manufacturing sectors (estimated to account for around £1.59bn and £1.34bn of goods and services exports respectively in 2016 prices).

FIGURE 5.10 TEES VALLEY GOODS AND SERVICES EXPORTS BY SECTOR, 2016

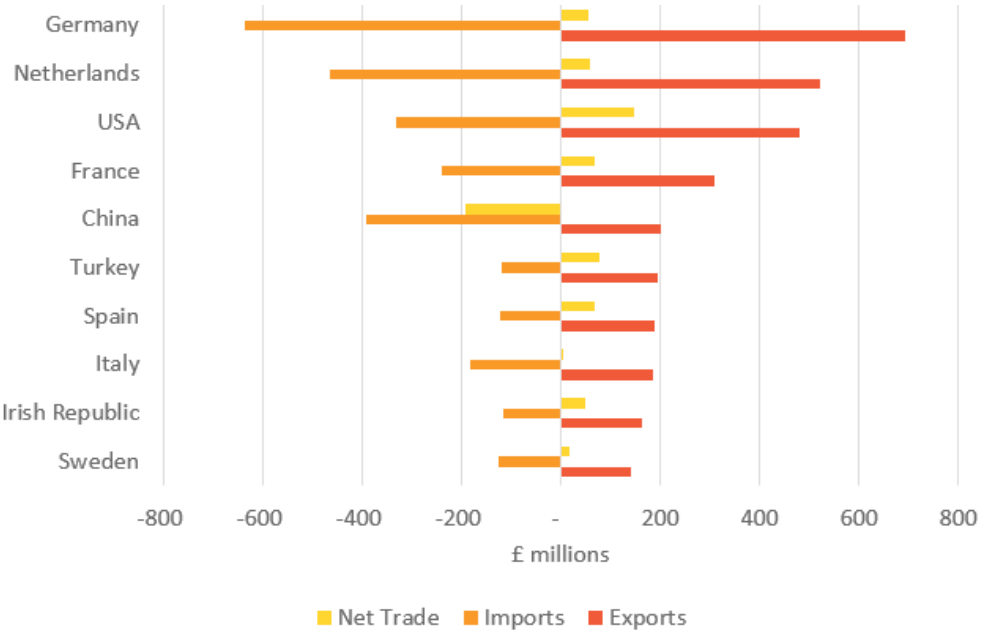


Source: Durham University[liv]

5.35 The top 10 goods export destinations for Tees Valley and Durham are summarised at Figure 5.11. Seven of the countries listed are members of the European Union, showing the importance of Tees Valley's trade links to the area.

5.36 In total, the 10 countries listed accounted for 64% of all exports from and the area and 59% of imports into the area in 2017 and it can be seen that Tees Valley and Durham recorded a net surplus on its trade in goods with all of the countries excluding China.

FIGURE 5.11 TEES VALLEY AND DURHAM: TOP 10 GOODS EXPORT DESTINATIONS (2017)



Source: HMRC Regional Trade Statistics

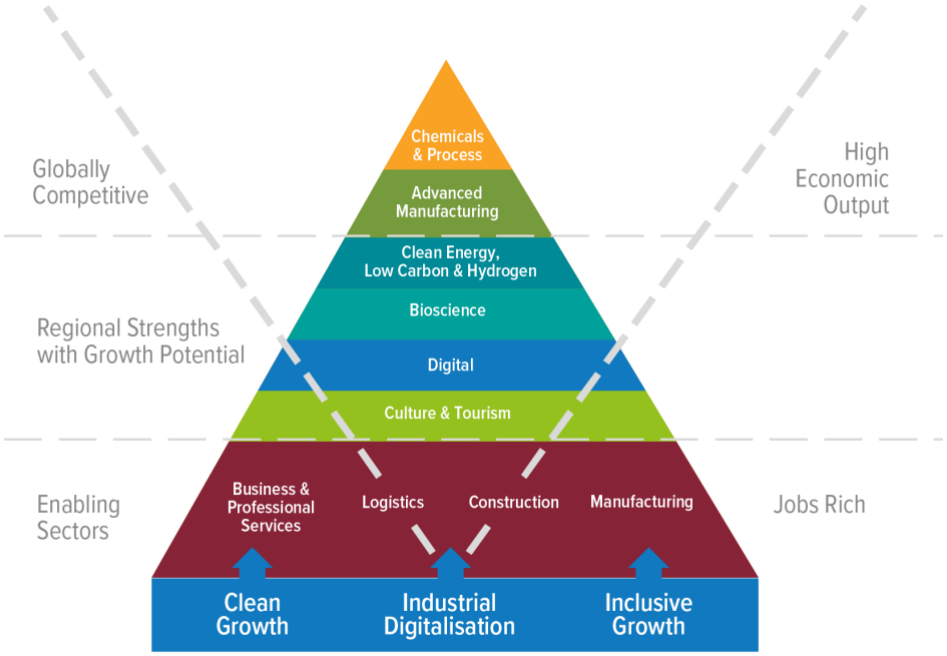
Sectoral Strengths

5.37 The Tees Valley business base is diverse and comprises of a range of sectors characterised by different levels of maturity, productivity and labour intensity. In high level terms, sectors can largely be considered to fall within one of three categories, although there is inevitably a degree of overlap between each:

- **Globally Competitive Sectors:** well-established sector strengths where the Tees Valley is widely regarded as benefitting from world class expertise and a business base comprised (largely) of globally significant firms. Local concentrations of employment and economic output are typically high in these sectors, reflecting the presence of high volumes of activity;
- **Regional Sector Strengths with Growth Potential:** sectors where the Tees Valley is not currently recognised as being globally competitive, but where the conditions are in place locally – or could be established – to drive growth moving forwards. Often these are sectors where strong growth is anticipated at the national level and where an opportunity exists for the area to outstrip national performance by better exploiting: locally-driven research/innovation assets; or emerging synergies with existing sector specialisms; and
- **Enabling Sectors:** job rich sectors that account for high volumes of employment in overall terms and which play an important role in supporting the effective functioning of the wider economy through the goods or services that they provide. The logistics sector, for example, supports the efficient movement of raw materials and finished products, which is beneficial to all parts of the economy. In many instances, enabling sectors also account for high volumes of employment at the national level and, as a result, do not shape the local distinctiveness of the Tees Valley economy in the same way as the global and regional sector strengths outlined above.

5.38 The diagram overleaf provides an overview of the relative positioning of Tees Valley's priority sectors, within this context, as well as the inter-relationships between them. Table 5.2 (and supporting text) explore the economic contribution of each and the role that they play in supporting the local distinctiveness of the Tees Valley economy. An overview of the definition of each sector (based upon 4 digit SIC codes) is provided at Appendix 1. It should be noted, however, that GVA data for Tees Valley is not available at the 4 digit SIC level. As such, broader sector definitions (based upon 2 digit SIC codes) have necessarily been applied as a 'best fit'.

FIGURE 5.12 TEES VALLEY SECTOR INTER-RELATIONSHIPS AND LINKS TO PRODUCTIVITY



Source: TVCA Sector Action Plan

NEPIC

The North East of England Process Industry Cluster (NEPIC) was established in 2004. It is a membership organisation that helps to build a globally-competitive chemical processing cluster across the North East of England, including Tees Valley. Its contribution to the North East's economic output since 2004 was estimated at £3.5 billion in 2016. In 2014, NEPIC was the first UK cluster to be awarded the Gold standard ESCA accreditation for cluster management excellence.

TABLE 5.2 SECTOR SUMMARY TABLE

	Advanced Manufacturing	Bioscience	Chemicals and Process	Clean Energy, Low Carbon and Hydrogen	Construction	Culture and Tourism	Digital	Logistics	Professional and Business Services	Source
Employment (2017)	18,910	7,975[lv]	5,445	7,760	12,100	27,560	7,800	17,090	31,315	BRES
Employment Change (2012-2017)	26%	n/a	-21%	4%	-23%	9%	2%	14%	-6%	EMSI
Location Quotient (Employment)	1.5	1.8[lvi]	2.2	1.4	1.1	0.9	0.6	0.9	0.7	BRES
Enterprises (2018)	2,790	495[lvii]	80	385	2,215	1,980	750	950	2,840	ONS, NOMIS, UK Business Counts – enterprises.
Change in number of enterprises (2017-2018)	-9.9%	n/a	6.7%	-1.3%	1.8%	3.1%	0.7%	-5.0%	0.7%	ONS, NOMIS, UK Business Counts – enterprises.
Location Quotient (Enterprises)	2.5	n/a	1.4	1.2	1.0	0.9	0.5	0.8	0.8	ONS, NOMIS, UK Business Counts – enterprises.
GVA per worker (£.000, 2017)	51.7	135.4[lviii]	131.5	81.4	69.0	n/a	103.1	39.5	81.3	ONS, Annual Business Survey
R&D intensity (2016 R&D stock per unit of sales) (£m 2000 prices)	0.05	n/a	0.005	n/a	0	n/a	0.005	0	0.004	Durham University
Change in R&D intensity (2010-2016)	-17.0%	n/a	-42.0%	n/a	10.3%	n/a	144.9%	11.5%	70.7%	Durham University
Exports (£m) (2016)	1,344	n/a	1,592	48.8	89.4	n/a	38.6	377.3	421.5	Durham University
% firms exporting (2016)	55.1%	n/a	68.3%	26.9%	15.9%	n/a	55.3%	30.4%	38.5%	Durham University
Change in exports (2011-2016)	83.1%	n/a	56.9%	-49.2%	n/a	n/a	102.8%	-28.7%	153.8%	Durham University
Exporting intensity - % sales exported (2016)	42.6%	n/a	26.3%	2.8%	0.8%	n/a	2.2%	6.9%	5.9%	Durham University
% foreign-owned employment (2016)	32.6%	n/a	66.3%	39.9%	14.6%	n/a	20.1%	27.1%	11.8%	Durham University
% turnover belonging to foreign-owned firms (2016)	49.0%	n/a	39.3%	63.6%	11.9%	n/a	8.3%	21.2%	21.0%	Durham University

Performance of Key Sectors

5.39 Key headline messages from the table on the preceding page are summarised below:

- Six sectors (bioscience[lix]; chemicals and process; digital; clean energy, low carbon and hydrogen; professional and business services; construction; and advanced manufacturing) are more productive than the Tees Valley all sector average. This is based upon an average GVA per worker of £49,300 in the local area;
- Three sectors (bioscience; chemicals and process; and digital) are more productive in Tees Valley than at the national level. It should be noted, however, that analysis contained within the *Tees Valley Combined Authority: Specialist data requirements to inform the Local Industrial Strategy* report identifies advanced manufacturing as having the highest Total Factor Productivity of all Tees Valley sectors. The analysis, which is not presented in the table above, also led Durham University to conclude that – in the national context – *"Tees Valley performs relatively well [in relation to Total Factor Productivity] in advanced manufacturing and to some extent energy and the circular economy"*;
- Four sectors (advanced manufacturing; chemicals and process; clean energy, low carbon and hydrogen; and healthcare) have location quotients higher than 1.0 in relation to both employment and the number of enterprises. The advanced manufacturing and chemicals and process sectors recorded the highest values. Location quotients are a measure of local concentration of activity relative to the national position, with a value of more than one being indicative of over-representation;
- Whilst no data is available to calculate an enterprise location quotient for bioscience, the sector has an employment location quotient of 1.8. This would suggest strong local representation;
- In absolute terms, the value of exports from Tees Valley is dominated by the chemicals and process and advanced manufacturing sectors. Both also perform strongly with respect to the proportion of firms involved in export activity, as does digital; and
- Over the period 2011-2016, growth in exports was observed in the following sectors: professional and business services; digital; advanced manufacturing; and chemicals. The rate of growth was strongest in professional and business services and digital.

5.40 Consultation with stakeholders as part of the LIS process identified the difficulty in obtaining robust data that fully reflects the scale and strength of the local digital and bioscience sectors. In recognition of this, bespoke, deep-dive exercises were commissioned by the Combined Authority. Wherever possible, the analysis presented in the preceding table reflects the findings of these exercises. Given the richness of the data gathered through the deep-dive work, it is considered helpful to provide more detailed overviews of each sector and their contribution to the Tees Valley economy. These are presented in the following paragraphs.

Digital

5.41 *Research into the Digital Sector in Tees Valley (2019)* provides a more detailed understanding of the sector and its drivers. The document recognises that there are alternative ways of defining the sector and the level of employment that it supports but acknowledges that several sources (including BRES and EMSI) suggest that digital currently supports in the order of 7,000 jobs in Tees Valley.

5.42 Although the sector is under-represented relative to the national level in employment terms (with a location quotient of less than one) the report suggests that recent growth in employment has been stronger in Tees Valley. Looking to the future, the number of digital jobs in Tees Valley is projected to grow by 8% between 2017 and 2024.

5.43 With respect to the spatial distribution of employment, the highest number of jobs are in Darlington and Stockton-on-Tees, although figures for Darlington are skewed by a strong telecommunications sub-sector (linked to call centre activities in the borough).

5.44 Across Tees Valley as a whole, the digital offer is particularly strong in relation to the following sub-sectors:

- Smart public sector services: with key local businesses including Cubic, Northgate Public Services and Transend;
- Advanced web development: with key local businesses including Clicksco, Colewood, Mabo and Visualsoft;
- Telecommunications call centres: with key local businesses including EE and Virgin Media; and
- Animation, visualisation and games: with key local businesses including Animmersion, Double Eleven, SockMonkey and Spearhead Interactive.

5.45 The research examines the digital intensity of all key industrial sectors in Tees Valley, concluding that each is *"broadly in line"* with the national average. Professional and business services (including legal and finance) appear to have higher levels of digital intensity at the local level. The manufacturing (digital intensity of 17%) and engineering (digital intensity of 18%) sectors – and process engineering in particular (digital intensity of 21%) – generally have lower levels of digital intensity within Tees Valley than nationally, but are identified within the research as having made *"significant progress in recent years towards exploiting digital technologies."*

5.46 This is reflected in the fact that a number of non-digital businesses in these sectors are amongst the top ten recruiters of digital talent in Tees Valley. This includes:

- Johnson Matthey (chemicals and process);
- Cummins (manufacturing); and
- Worley (chemicals and energy).

5.47 The research highlights the importance of an area's quality of place offer in attracting and retaining digital talent. Whilst the place offer of Valley is considered in greater detail in Section 7.0, the research states that:

*"The **cost of living, cost of housing, access to coast and the beauty of the countryside** are significant factors in helping to retain digital talent. However, Tees Valley has an **image problem** with people not familiar with the area: it is perceived as unattractive and run down by outsiders, and it is difficult to win over people drawn by the brighter lights of Newcastle, Leeds, Manchester and London."*

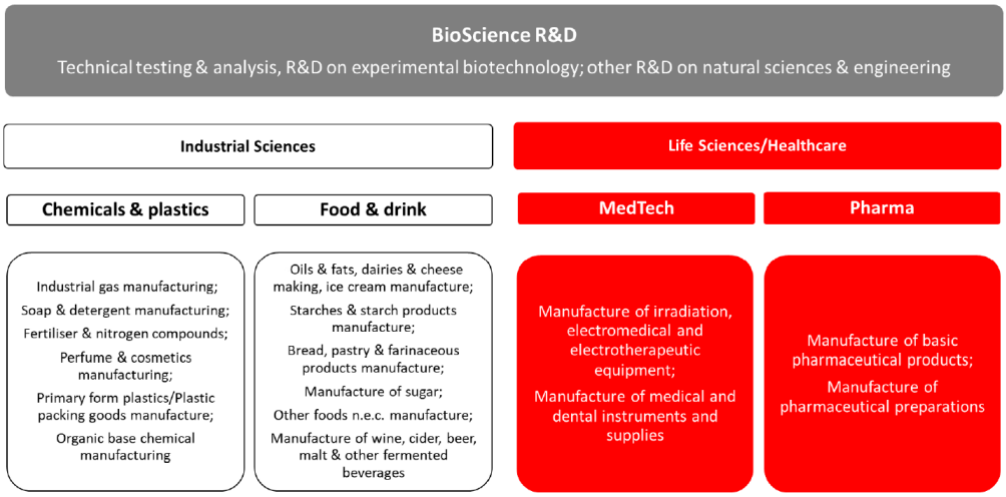
Bioscience

5.48 *Opportunities for the Tees Valley Bioscience Sector* applies an alternative, broader, definition to the bioscience sector than that adopted by Durham University in *Tees Valley Combined Authority: Specialist data requirements to inform the Local Industrial Strategy*. The definition focused on recognises the overlap between activities in wider sectors that have a broader overall focus (including bio-based production in the chemicals and plastics sector). It brings together Tees Valley's distinctive blend of key world-leading and innovative players, including:

- FujiFilm Diosynth Biotechnologies: development and manufacture of biologics and biopharmaceuticals;
- Calysta: development and testing of animal feed for global market introduction;
- Invista Performance Technologies: R&D and biotechnology for materials;
- Marlow Foods: manufacture of food and drink using fermentation-based biotechnology processes[lx];
- Ensus: one of Europe's largest bioethanol plants, located at Wilton.

5.49 The definition identified via this approach is made up of 27 individual industries or sub-sectors across five broad segments of the economy: bioscience R&D; chemicals and plastics; food and drink; medtech; and pharmaceuticals. This is summarised in the diagram overleaf.

FIGURE 5.13 BESPOKE BIOSCIENCE SECTOR DEFINITION AND INTER-RELATIONSHIPS



Source: Opportunities for the Tees Valley Bioscience Sector (2019)

5.50 Based upon this wider definition, Opportunities for the Tees Valley Bioscience Sector estimates that the local bioscience sector comprises of 495 companies, with the majority being SMEs. The collective economic contribution of these businesses is set out below:

- 7,975 direct jobs supported, which translates to a location quotient of 1.8. The research states that both the existing location quotient and forecast growth in bioscience job numbers for Tees Valley are higher than other northern regions; and
- Responsible for sales worth £2.6 billion in 2015.

5.51 Tees Valley also benefits from a distinctive and integrated innovation eco-system. This supports the existing activity in the area and could provide the platform for further development of a locally-based cluster. Key innovation assets include:

- Centre for Process Innovation: the High Value Manufacturing Catapult offers R&D and facilities related to industrial biotechnology and represents the UK's largest bio-innovation centre;
- National Biologics Manufacturing Centre: a key element of CPI's integrated innovation offer, the NBMC is a central hub for the UK-wide biologics sector, focussed on the commercialisation of R&D;
- National Horizons Centre: a Teesside University-led centre of bioscience excellence, offering higher education provision, R&D, knowledge exchange, CPD and access to facilities for the sector;
- The Healthcare Innovation Centre: a collaboration between Teesside University and TWI which works with industry and clinical partners for the development of new tools and therapies for healthcare;
- FujiFilm Biocampus: provision of office and lab spaces. The importance of further planned investment by FujiFilm is recognised in the Life Sciences Sector Deal; and

- South Tees Institute for Learning, Research and Innovation: part of the South Tees Hospitals NHS Foundation Trust, the Institute supports clinical research projects, offers opportunities to collaborate and partner with other organisations, and an Innovation Hub supporting medical and health-related innovation and R&D.

Clean Energy, Low Carbon and Hydrogen

National Context

5.52 There is a clear government commitment to pursuing clean energy, low carbon and hydrogen as part of the wider Clean Growth agenda. The national Clean Growth Strategy[lxi] sets out how the country can benefit from low carbon economic opportunities through the creation of new technologies and new businesses. In addition, government has established, through the Industrial Clusters Mission an ambition to create: *"the world's first net-zero carbon industrial cluster by 2040 and at least one low-carbon cluster by 2030"*[lxii].

5.53 Embracing the transition to clean energy, low carbon and hydrogen, including the creation of a low-carbon exemplar location that others in the UK and internationally can learn from and replicate, offers an opportunity to position at least one UK cluster as a leading area for global inward investment and innovation[lxiii]. Furthermore, the transition will also ensure that industry is better equipped to tackle climate change (now and in the future) – helping to support the environmental and economic sustainability of energy intensive industry in the long-term[lxiv].

5.54 Government is currently consulting on the Industrial Energy Transformation Fund (IETF), which will have a UK-wide budget of £315m over a five year period (to 2024). The IETF is intended to support businesses within energy intensive industries to:

- Cut their bills and emissions through increased energy efficiency; and
- Transition to a low carbon future through the use of lower carbon energy and processes.

5.55 It is anticipated, by government, that the IETF and the Industrial Clusters Mission will complement one another, with:

- The IETF supporting short-term projects across the UK; and
- The cluster focus adopting a more long-term and place-based approach to industrial decarbonisation.

Tees Valley Position

5.56 With one of Europe's largest integrated industrial complexes and a concentration of both energy producing and energy intensive industries, Tees Valley represents an ideal location to pilot and demonstrate the benefits of clean energy, low carbon and hydrogen on productivity and supply chain integration – focussing on industrial decarbonisation and the application of the circular economy. The Oil and Gas Climate Initiative, a group of ten of the world's leading oil and gas companies, assessed over 50 locations across Europe to develop a 3GW gas Carbon Capture and Storage (CCS) power station, and

concluded that Tees Valley was the optimal location. The initiative is now developing what will be the world's largest CCS power station in Tees Valley, a key element of what will be the world's largest CCS network based in Tees Valley.

5.57 The area's clean energy, low carbon and hydrogen proposition is focussed on the potential to successfully deliver industrial decarbonisation through a range of complementary initiatives including: Carbon Capture Utilisation and Storage (CCUS); the Hydrogen Economy; and bulk low carbon/renewable energy. It is supported by the coalescence of a unique breadth and depth of assets:

- An established industrial ecosystem: Tees Valley is home to the largest chemical complex in the UK and the second largest in Europe (by manufacturing capacity)[lxv];
- Geographically concentrated and highly integrated: the area benefits from many chemical and process businesses being located within close geographical proximity of one another, with key sites at Wilton, Billingham and Seal Sands connected via pipeline corridors (Figure 5.14). This allows for easy movement of outputs and feedstocks between businesses;
- Geographical location: Tees Valley's is situated in close proximity to potential North Sea carbon storage sites. Coupled with the existing concentration of industry, this makes the area a prime candidate for piloting CCUS. Tees Valley is also ideally positioned to land power from large scale offshore wind power developments (building on the commitments of the Offshore Wind Sector Deal) and provides deep water port access to sites such as Dogger Bank;
- Infrastructure and expertise to support the Hydrogen Economy: more than 50% of all UK hydrogen is produced in Tees Valley. The area already has significant expertise in operating hydrogen systems at scale (including hydrogen production and storage) and has an operational distribution infrastructure in place; and
- Existing innovation specialisms: a network of innovation providers, with existing specialisms and internationally significant capabilities linked to clean energy, low carbon and hydrogen is already established in Tees Valley. This is considered in greater detail overleaf.

FIGURE 5.14 INTEGRATION AND CONCENTRATION OF SITES IN TEES VALLEY

Source: Low carbon industrial cluster sector research

Current Situation

Scale and Importance of the Clean Energy, Low Carbon and Hydrogen

5.58 Tees Valley's clean energy, low carbon and hydrogen proposition is principally intended to address downside risks and emerging opportunities in key sectors.

5.59 The chemicals and process industries represent a significant local strength with a clear comparative advantage relative to Great Britain:

- The sector supported an estimated 5,445 jobs in Tees Valley in 2017, resulting in a location quotient of 2.2; and
- Gross Value Added from the sector in 2017 was estimated at approximately £802million. This represents a location quotient of 2.6.

5.60 The same analysis provides the following estimates of the economic footprint of the clean energy, low carbon and hydrogen sector at the local level:

- Approximately 7,760 jobs supported in Tees Valley in 2017, representing a location quotient of 1.4; and
- Gross Value Added of approximately £727million in 2017. This represents a location quotient of 1.1.

5.61 Taken together, the sectors make up a significant part of the Tees Valley economy, accounting for 5.0% of employment in the area and 11.7% of Gross Value Added. Nevertheless, it is important to recognise that the data risks understating their wider economic importance.

5.62 The chemicals and process industries, for instance, act as an enabler, providing technological solutions to many of the challenges faced 'downstream' in other parts of the economy. It is estimated that the industries have supply chain impacts for 90% of UK manufacturing. A strong and competitive Tees Valley chemicals and process sector – as the largest cluster in the UK – can help to enhance the productivity of UK manufacturing in overall terms.

Key Drivers

5.63 Pursuit of the clean energy, low carbon and hydrogen agenda offers an opportunity to address three strategic challenges currently facing Tees Valley:

- A high concentration of Energy Intensive Industries (EIIs);
- EIIs face relatively high energy costs; and
- Tees Valley is competing for investment in an increasingly competitive international market place.

High Concentration of Energy Intensive Industry (EII)

5.64 The Tees Valley economy is characterised by a high carbon intensity manufacturing base. This reflects the area's industrial heritage, as well as the continued strong representation of businesses (particularly in the chemical and process industries) which are either: energy intensive; or emit high levels of carbon in their own right.

5.65 Consequently, CO_2 emissions in Tees Valley are significantly higher than the UK average, even allowing for the closure of the SSI steelworks[lxvi]. In 2017, CO_2 emissions per capita were almost double that observed nationally – 10.2 tonnes in Tees Valley compared to 5.3 tonnes across the UK. In order to comply with the Climate Change Act, there is a need to deliver significant CO_2 emissions reductions in the area moving forward. EIIs remain a key strength of the local economy and will remain so into the future. As a result, there is a need to decouple economic growth (both generally and in EIIs specifically) from CO_2 emissions through adopting a strategic approach to industrial decarbonisation.

High Energy Prices

5.66 Many EIIs in Tees Valley (particularly those in the chemical and process industries) sell their products on international markets. As a result, the ability to be price competitive at a global level is fundamental to their economic success. For EIIs, this is heavily influenced by energy prices – reflecting the importance of power as a key input.

5.67 Natural gas prices within the UK are amongst the lowest in Europe. In contrast, electricity prices paid by extra-large industrial consumers (EIIs) in the UK are amongst the highest[lxvii]. These high electricity costs represent a competitiveness issue for EIIs in the area.

Increased Competition

5.68 Tees Valley competes globally for inward investment in the chemicals and process industries and many of the largest businesses currently based within the area are in foreign ownership. The sector is becoming increasingly clustered around a smaller number of internationally significant locations, and it is therefore critically important that Tees Valley maintains its position as a major European chemicals complex.

5.69 The European Chemistry Industry Council and the European Chemical Site Promotion Platform consider that successful chemicals and process clusters share the following characteristics:

- Positive investment environment
- Availability of land
- Raw material and feedstock supplies at competitive prices
- Energy and utilities at competitive prices
- Relative proximity and easy access to most important customers
- Availability of efficient services (logistics, finance, IT, packaging, security, marketing, promotion etc.)
- Availability of labour (skilled and unskilled) at competitive prices
- Efficient logistics infrastructure
- Low-risk and stable business climate and stable regulatory environment
- Good schooling and educational facilities
- Co-siting & partnering opportunities

These characteristics all exist to varying degrees in Tees Valley, and it will be critical to retain a focus on these to ensure sustainability and future competitiveness for the sector.

The Clean Energy, Low Carbon and Hydrogen Response

5.70 Establishing Tees Valley as an exemplar clean energy, low carbon and hydrogen location (underpinned by industrial decarbonisation and the circular economy) offers the potential to address a number of the challenges outlined above. As a local authority area with significantly higher than average CO_2 emissions per capita, Redcar & Cleveland Council's announcement of a climate emergency and setting a carbon neutral target by 2030 demonstrates strong local support towards the development of Tees Valley's Clean Energy, Low Carbon and Hydrogen sector.

5.71 Tees Valley will look to harness the existing integration of the sector in order maximise opportunities to use outputs from one sector as energy/feedstock for another. This will enable the area to ensure the certainty and reliability of feedstocks and energy at competitive prices, whilst also reducing the need to import raw materials. This will help to improve the sector's net balance of trade (which has worsened in recent years at the national level) and reduce its vulnerability to exchange rate volatility.

5.72 In addition, a strategic approach to industrial decarbonisation will help to: decouple growth from emissions – enabling Tees Valley to pursue significant further investment from EIIs whilst making a significant contribution to delivering the Climate Change Act; and future-proof local industry from the rising costs of emitting CO_2 – helping to ensure that energy costs become more competitive.

5.73 Tees Valley's clean energy, low carbon and hydrogen aspirations are not simply a response to existing and emerging challenges. Fully embracing clean energy, low carbon and hydrogen will also help to strengthen the area's proposition in relation to EIIs and provide a renewed platform for growth – to be driven by inward investment and the indigenous business base. It will help to establish Tees Valley as the location of choice for global businesses looking to reduce their exposure to future CO_2 emissions costs (with many opportunities focussed on sites such as Wilton, Billingham, Seal Sands and the Development Corporation site). The *Process, Chemicals and Energy Sector Action Plan* August 2018) summarises the potential impact as follows:

"The development of and investment in the circular economy and resource efficiency represents a significant opportunity for the chemical and process sector to re-shore activity and build new product bases."

Tees Valley's Clean Energy, Low Carbon and Hydrogen Strengths

5.74 The size, geographical concentration and integration of the process, chemicals and energy cluster within Tees Valley – and the important role that these factors play in underpinning the area's clean energy, low carbon and hydrogen proposition – are considered in the paragraphs above. The following section focuses on exploring: how well embedded the concept is locally; which clean

energy, low carbon and hydrogen specialisms are already established in the area; and the key actors across each specialism.

Strategic Commitment

5.75 The clean energy, low carbon and hydrogen potential of Tees Valley has been acknowledged and promoted as a strategic priority for the area for a number of years, with much of the work being led by key stakeholders including: Tees Valley Combined Authority; North East Process Industry Cluster (NEPIC); and Teesside Collective (an industry-led public-private sector group including some of the area's major multinational chemical and process businesses).

Teesside Collective

Teesside Collective is a cluster of energy-intensive industries with a shared vision: to establish Teesside as the go-to location for future clean industrial development by creating a Carbon Capture and Storage (CCS) equipped industrial zone.

The project offers a compelling opportunity to progress the UK's industrial and environmental interest's hand-in-hand. Teesside Collective can play a significant role in the UK's Industrial Strategy of a low carbon Northern Powerhouse, helping to retain the UK's industrial base, attract new investment and jobs, and meet the UK's climate change targets.

Teesside Collective published a blueprint for delivering Industrial Carbon Capture and Storage in the UK in 2015 which received widespread support from business organisations, environmental groups, the public sector and academics.

Through an industry-led approach, Tees Valley has succeeded in attracting a group of major oil and gas companies (the Oil and Gas Climate Initiative – OGCI) to develop what will be the world's largest CCUS equipped power station in the area. In addition, we have witnessed one of the world's largest chemical companies replace natural gas for hydrogen for their heating in Tees Valley, significantly reducing their carbon emissions. The region is ready to adopt the technology on a large scale, making a significant contribution to the UK's carbon budget.

5.76 Much of the work pre-dates the publication of government's Industrial Strategy White Paper and the production of the LIS. As such, it has not always been presented under the Clean Growth – or more the more Teesside-specific – Clean Energy, Low Carbon and Hydrogen 'straplines'. Rather, it has often been presented using the underlying themes of industrial decarbonisation and the circular economy – both of which feature prominently in the Combined Authority's key policy and strategy documents, including: *Tees Valley Strategic Economic Plan*; and *Investing in Tees Valley's Future 2017-2021*. In addition, the case for establishing Tees Valley as a clean energy, low carbon and

hydrogen exemplar region has been considered more explicitly within documents such as:

- *Tees Valley Combined Authority Low carbon industrial cluster sector research*; and
- Research published by Teesside Collective, which includes a business case for Carbon Capture and Storage and a proposition for an industrial Carbon Capture and Storage pilot.

5.77 It is clear, therefore that the clean energy, low carbon and hydrogen aspirations reflected within the LIS are an extension of existing policy priorities and that much work has already been carried out with key organisations to crystallise, and confirm the rationale for the Tees Valley offer.

Current Clean Energy, Low Carbon and Hydrogen Landscape

5.78 At present, process, chemicals and energy-related industries within Tees Valley are focussed on three key sites of Wilton, Billingham and Seal Sands. All three are located in close proximity to one another and have the additional benefit of being connected via a network of pipelines. In addition, a Mayoral Development Corporation has been established to acquire, remediate and market the Development Corporation site, which represents the largest single development opportunity – and the only Special Economic Area – in the UK. The vision for the site is to create 20,000 skilled jobs, with an emphasis on manufacturing innovation and advanced technologies within a high value, low carbon, diverse and circular economy.

5.79 Existing clean energy, low carbon and hydrogen sector specialisms within Tees Valley include:

- **Chemicals/process industry**, comprising of key employers such as: Sabic (one of the world's largest manufacturers of chemicals, fertilisers and plastics and recently invested in a world-scale ethylene cracker and associated storage in Tees Valley); INEOS (global company whose nitriles technology is responsible for over 90% of global acryionitrile production); Lotte Chemicals (one of Korea's largest corporations with sales in excess of $45bn per annum); Ensus (one of the largest bioethanol production plants in Europe); BOC (the largest supplier of industrial gases, speciality gases and gas equipment in the UK); and Sembcorp (major industrial energy, utilities and services provider to international process industry companies)[lxviii];
- **Offshore wind supply chain companies**, including businesses such as: JDR Cables (cable manufacturer for sub-sea and power installations); Able UK; CTC Marine (trenching and installation services); Heerema (construction of substation platforms) Wilton Engineering (design and fabrication of offshore wind turbines); and EEW Industries (manufacture of large diameter pipes for offshore turbine foundations)[lxix].

  In recognition of the area's supply chains, as well as the skills of the workforce and the existing port infrastructure (with 16.5GWE of wind farm development within easy reach of the area's ports) Tees Valley has been awarded UK Government Core status as a Centre for Offshore Renewable Engineering[lxx];

- **Decommissioning assets,** Tees Valley benefits from substantial available quayside with water depths of up to 11m. Able UK's facilities at Seaton Port boast the strongest quay in Europe, as well as significant crane capacity, and have been constructed to meet the requirements of the heavy fabrication industry.[lxxi] This resulted in the site being selected to decommission the 24,200 tonne Brent Delta topside – the largest single North Sea decommissioning project undertaken to date. Coupled with the wider offshore supply chain, Tees Valley's decommissioning assets leave the area well placed to secure further business in an area of growth.

  The scale of opportunity is significant, with the North West European Continental Shelf forecast to be worth approximately £2 billion per annum over the period to 2025, based upon a requirement to decommission 349 fields. Within this, the UK Continental Shelf is the largest sub-market, with spending of between £17 billion and £20 billion forecast (on the basis of 214 fields)[lxxii]; and

- **Clean energy producers**, including: EDF (Hartlepool Nuclear Power Station – the Nuclear Sector Deal recognises that the future success of the industry is central to achieving government's Clean Growth Grand Challenge); and SUEZ/SITA (Energy from Waste plant at Wilton, biomass plant at Wilton and facilities at Haverton Hill). In addition, a 250MW biomass power station is being constructed at the Port of Tees and Hartlepool.

- **Biofuel production.** Ensus Limited, operates one of the largest bioethanol production plants in Europe. Based on the Wilton International site, it has an annual production capacity of 400 million litres (314kt) of bioethanol, produced from fermentation of 1 million tonnes of grain crops, primarily wheat and maize. Greenergy is Europe's largest manufacturer of biodiesel from waste vegetable oils and tallow, with a plant based at Seal Sands, capable of producing 250,000 tonnes of biodiesel (the UK's largest)) and a 2nd at Immingham. The move to use of mainly waste oils and fats as feedstocks was prompted by changes in UK policy within the Renewable Transport Fuels Obligation (RTFO) which now, after consultation in 2016, encourages the development of waste-based and advanced fuels whilst limiting the use of fuels made from crops. However, the amended RTFO did provide some time limited relief to bioethanol producers.

5.80 Research by the Smart Specialisation Hub also recognises the emerging strengths of the area with respect to the circular economy, with Tees Valley ranked 5th highest across the LEP network in relation to the number of commercial organisations engaged in circular economy activities[lxxiii]. It should be noted that the data underpinning the analysis is presented in absolute terms. Re-basing the top 5 to take into account the size of each area's population results in Tees Valley rising to 2nd.

5.81 Linked to the circular economy and our wider clean energy, low carbon and hydrogen ambitions, the current landscape affords a potential opportunity exists to develop a supply chain in Tees Valley linked to the production of lithium ion batteries for electric vehicles. Research published by the UK Advanced Propulsion Centre[lxxiv] identifies the potential for UK chemical and process companies to supply the battery industry – a market estimated to be worth £2.7 billion a year in the UK by 2030.

5.82 Given the scale of the chemicals and process industry within Tees Valley, this is an opportunity that the area should look to exploit. Tees Valley is home to parts of the supply chain for the wider North East Electric Vehicle market, including Mitsubishi Chemical Corporation's electrolyte plant and Johnson Matthey's growing R&D capability both located in Billingham. The Wilton Centre is the European home of Lucite International's Strategic Projects Group, Global Safety Health and Environment and New Business Development teams. Venator, a global leader in pigments such as Titanium Dioxide, have their global HQ and innovation and technology functions in Billingham. Tees Valley is also home to CPI's advanced battery chemicals formulation centre. CPI has 10 major battery and drive innovation projects with partners in the UK supply chain with visibility of investment opportunities.

5.83 The clean energy, low carbon and hydrogen specialisms of the private sector, as outlined above, are also supported by Tees Valley's network of innovation assets. This includes a number of internationally significant research organisations with a focus on industrial decarbonisation and related issues:

- Centre for Process Innovation: Research and Technology Organisation (RTO) whose specialisms include assessing feedstock and materials to determine how they can be utilised to create new products in order to reduce (or re-use) waste and support the move away from fossil fuels;
- Materials Processing Institute: RTO with industrial scale pilot equipment which can be used to demonstrate hydrogen deployment in an industrial environment. Particular research specialisms of the Institute include: low carbon (underpinned by extensive experience of improving energy efficiency and energy recovery in relation to industrial processes); and circular economy (building on an established track record of developing, piloting and commercialising technology and processes to add value to secondary raw materials);
- TWI: RTO with expertise in materials for gas transmission and storage, polymers and metallic – including systems integration and joining technologies; and
- Teesside University: Grid Modelling capabilities and research interests in novel low carbon hydrogen production and purification.

5.84 Currently, a large proportion of the work conducted by the above innovation assets is undertaken with or on behalf of national/international clients. Establishing and actively promoting Tees Valley as an exemplar clean energy, low carbon and hydrogen location present an opportunity to foster greater collaboration between the area's innovation ecosystem and its business base. This, in turn, could help to drive up levels of BERD in the local economy through increased engagement in business-led innovation.

Clean Energy, Low Carbon and Hydrogen Priorities

5.85 The *Tees Valley Combined Authority Low carbon industrial cluster sector research* identifies a series of strategic interventions that offer the potential to reduce carbon emissions in the local area whilst also facilitating economic growth. Such an approach is consistent with governments' *Clean Growth Strategy* as well as the economic aspirations of the Combined Authority.

5.86 The interventions have been developed to recognise Tees Valley's baseline position with respect to the chemicals, process and energy sectors, whilst also allowing the flexibility to adopt to newly developed technologies as they emerge. Taken together, the research estimates that the interventions have the potential to deliver the following (Table 5.3) over the period to 2050:

- Total Tees Valley emissions reductions equivalent to 80Mt CO_2; and
- An additional £40billion in GVA to the UK economy.

Methodology

5.87 The methodology applied by the *Tees Valley Combined Authority Low carbon industrial cluster sector research* in quantifying the estimated impacts is summarised below.

5.88 In assessing the **economic impacts** of each strand set out in the research, the following approach has been adopted. For industrial development, total costs of building and operating new installations have been calculated (in today's prices). These costs reflect future reductions in technology costs and have been discounted by applying 'Green Book' rates. Revenues to be generated by new industrial development have also been calculated, with the same approach to discounting applied.

5.89 The gross margin (discounted revenue – discounted costs) has been calculated for each technology and an industry-specific multiplier applied to each to calculate the direct. Indirect and induced GVA associated with each opportunity.

5.90 In assessing the **employment impacts** of each strand (see below) the methodology applied has distinguished between jobs supported during construction and longer-term jobs to be created by operational plant. A bottom-up approach to estimating job impacts associated with each technology, using publicly available statements and sources from projects around the world. These have then been scaled to reflect the assumptions developed for Tees Valley projects.

5.91 **CO_2 emission reductions** have been derived by estimating the emission saving produced each year under each opportunity and totalling the figures over the period of operation. Emission savings for each opportunity have been calculated having regard to a counterfactual scenario. The counterfactual has been used to express how a good would have been provided in the absence of the proposed intervention(s). For example. Power emissions under the various options considered have been benchmarked against the average emissions intensity of the electricity grade (as a counterfactual).

Prioritisation by Intervention

5.92 The *Low carbon industrial cluster sector research* also identifies and ranks the three interventions that should be prioritised by the Combined Authority and which offer the greatest combined economic and environmental dividend:

- **Establish an operational Carbon Capture Utilisation and Storage (CCUS) network:** develop a carbon transport and storage network that can be used by industry and the energy sector. This will allow Tees Valley to

manage carbon emissions and become the leading UK location to develop CCUS at scale for power, industry and hydrogen production;

- **Begin using hydrogen for heat and transport:** utilise the area's nationally significant hydrogen production and storage assets to trial hydrogen-based heat and transport projects within Tees Valley and beyond. The availability of CCUS at scale would present a route to large scale low carbon hydrogen production for the UK; and
- **Develop bulk low carbon and renewable energy:** Tees Valley is ideally located to land power from large scale offshore wind developments. By providing low carbon electricity (and potentially hydrogen) this could offer an additional mechanism through which low-cost, clean power is generated in the area. Opportunities also exist to focus on nuclear electricity production and supply chain sources for nuclear generation.

TABLE 5.3 ECONOMIC AND ENVIRONMENTAL EFFECTS ASSOCIATED WITH LOW CARBON INTERVENTIONS

Option	Total GVA (discounted, 2018-2050)	Total emissions reduction (MtC02) (2018-2050)	Short-term (construction) FTE	Long-term (operation) FTE
Enhancing infrastructure	-£0.4bn - -£0.6bn	0	Unknown	Unknown
Using waste and biomass resources	£11bn - £12bn	-6	18-19,000	3-4,000
Capturing carbon (CCS)	£2bn - £3bn	37	15-16,000	1-2,000
Using hydrogen for heat and transport	£6bn - £7bn	13	4-5,000	500-1,000
Utilising carbon (CCU)	£3bn - £4bn	3	2-3,000	500-1,000
Developing bulk low carbon and renewable electricity	£1.5bn - £2.5bn	26	2-3,000	2-3,000
Building on our strengths	£8bn - £9bn	4	7-8,000	4-5,000

Source: Tees Valley Combined Authority Low carbon industrial cluster sector research

5.93 In addition to the quantitative benefits associated with establishing Tees Valley as a leading clean energy, low carbon and hydrogen economy, the research also outlines that this could make a significant and positive contribution at the national and local level across each of the five foundations of productivity:

- Ideas: Tees Valley will be a centre for the development of innovation approaches in industry and energy;
- People: low-carbon industries will provide well paid jobs for Tees Valley residents;
- Infrastructure: increased energy integration;
- Business environment: Tees Valley will be the best place nationally for energy-intensive industries; and
- Places: a low-carbon hub that is able to take advantage of future industrial opportunities.

Summary

5.94 Key issues highlighted within the preceding paragraphs are summarised below:

1 Tees Valley suffers from an under-developed business base relative to the size of the local population. Stakeholder consultation has indicated that this reflects the area's industrial legacy and a historical reliance upon a small number of large employers;

2 Recent growth in the business base has outstripped the national average, driven by high start-up rates. Scale-up performance in the area remains weak, however;

3 Export performance in the Tees Valley is strong, with chemicals and manufacturing key contributors to this. Tees Valley runs at a balance of trade in goods surplus and is one of the few areas nationally to do so;

4 The local business environment is characterised by existing strengths in established sectors (including chemicals/process industries and advanced manufacturing) as well as emerging specialisms in high value sectors;

5 The promotion of industrial decarbonisation will be critical to maintaining the area's strengths in energy intensive industries. It offers an opportunity to address competitive threats related to the availability and cost of feedstocks, as well as energy prices, whilst also presenting opportunities to develop new business propositions.

6 Building on the area's existing and established strengths in terms of size, concentration and integration of the process, chemicals and energy cluster, the development of the Clean Energy, Low Carbon and Hydrogen sector is a key priority for the Tees Valley.

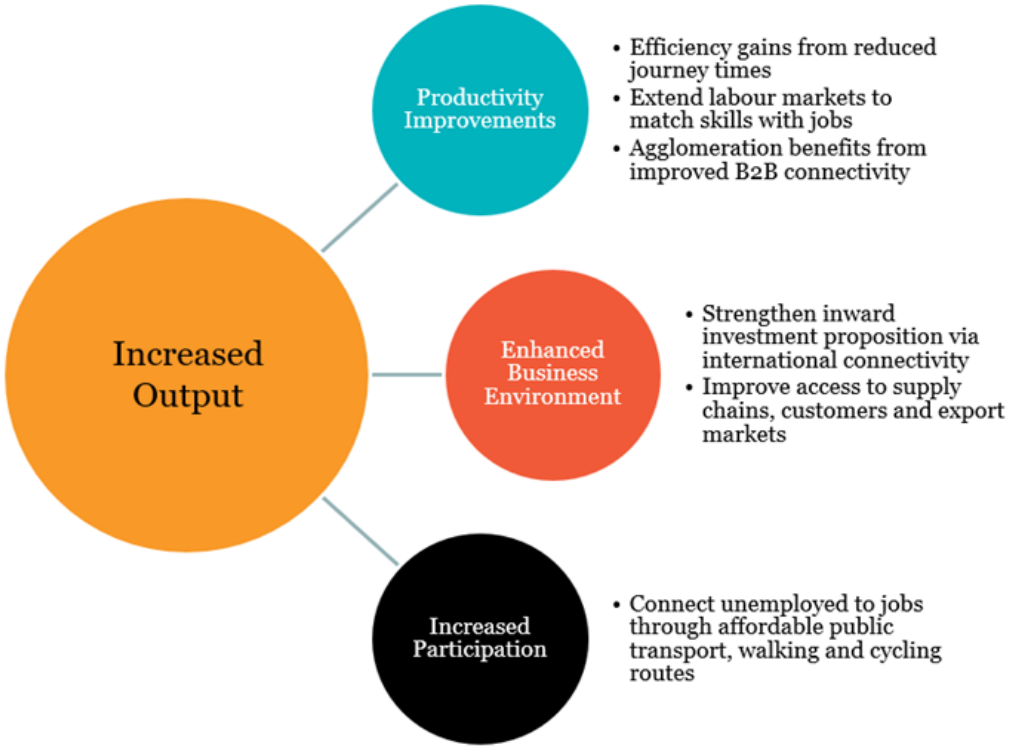
6.0 Infrastructure

6.1 Infrastructure provision is a key determinant of a local economy's internal and external connectivity which – in turn – influences productivity. Academic literature[lxxv] recognises that investment in improved infrastructure contributes towards a range of positive economic outcomes, which can broadly be categorised as follows:

- **Economic Well-Being Benefits**: including impacts on local participation rates/unemployment levels (improving access to employment opportunities) and business model improvements (better matching jobs with skills, creating agglomeration benefits, stimulating innovation and attracting globally mobile investment);
- **User Benefits**: including greater journey time reliability, as well as productivity gains and driver experience benefits associated with commuting and business trips made during working hours; and
- **Unlocking development opportunities**: including impacts on residential and commercial property market values (reflecting that better-connected locations are viewed as being more attractive to prospective occupiers).

6.2 Figure 6.1 provides a summary of the mechanisms through which infrastructure drives increased economic output.

FIGURE 6.1 DELIVERING INCREASED OUTPUT THROUGH INFRASTRUCTURE

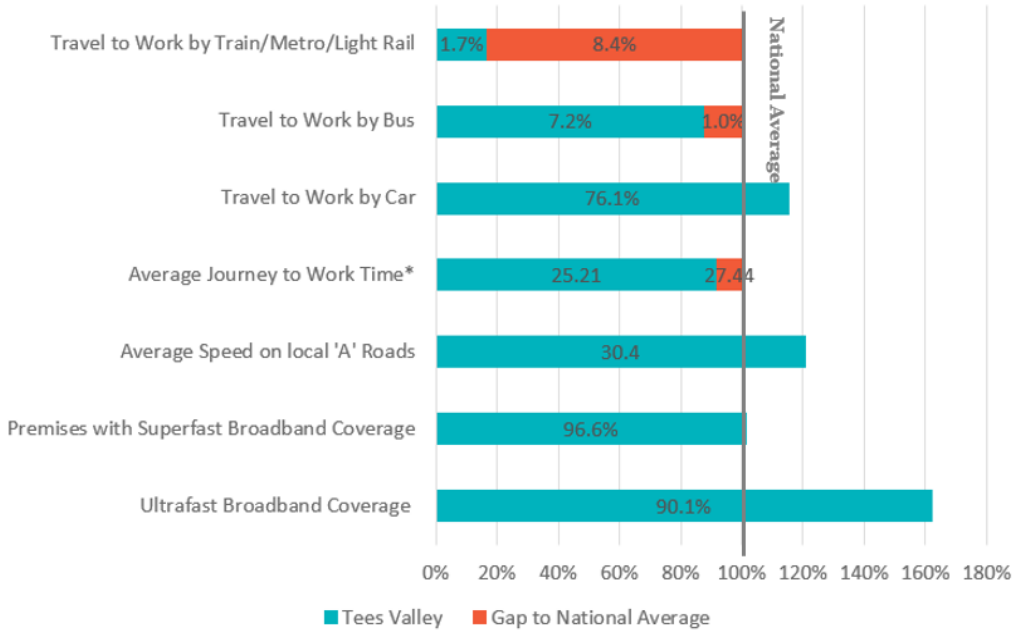


Tees Valley 'Infrastructure' Scorecard

6.3 The scorecard at Figure 6.2 provides a summary of Tees Valley's performance relative to the national average for a package of key infrastructure-related metrics. Based upon the analysis, it can be seen that:

- The modal share of commuting journeys within Tees Valley is skewed towards journeys by car, with journeys via rail/light rail and bus much less prevalent than at the national level. 76.1% of all commuters travel by car in Tees Valley, 15% more than nationally;
- Tees Valley performs well in terms of the duration of commuter journeys, with the average journey to work time (25 minutes) being shorter than at the national level (almost 28 minutes). In part, this is likely to reflect the relatively compact geography of Tees Valley as well as the self-contained nature of the local labour market;
- Average speeds achieved on local 'A' roads, at 30 miles per hour exceed the national average by 20%. This indicates that traffic is able to move well on the local network, for the most part, although it should be noted that a small number of significant pinch points do exist;
- Tees Valley scores well in terms of digital infrastructure. The proportion of homes and business premises with access to superfast (96.6%) and ultrafast (90.1%) broadband exceed the national average. It should be noted, however, that stakeholders have raised concerns regarding the age and fitness-for-purpose of the area's digital infrastructure moving forwards.

FIGURE 6.2 INFRASTRUCTURE PRODUCTIVITY SCORECARD



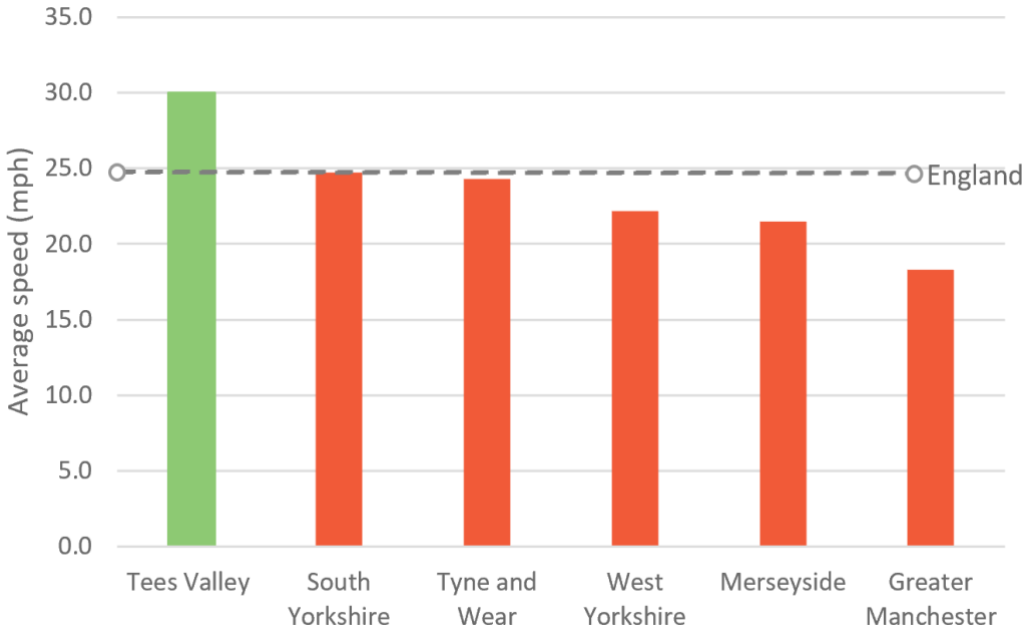
*Source: Various [lxxvi] (*based on LEP average)*

Road

6.4 As a polycentric geography, with high levels of self-containment, it is important that residents are able to move around Tees Valley quickly and easily. The local road network is a key part of this – particularly given the modal share of commuter journeys. A higher proportion of commuter journeys take place via private car locally, (76% in Tees Valley compared to 66% across England)[lxxvii] despite low levels of car ownership in Tees Valley.[lxxviii]

6.5 In headline terms, the local road network performs well. This is demonstrated in Figure 6.3, which draws upon analysis published by the Depart for Transport[lxxix]. The data shows that, at over 30 miles per hour, the average speed on Tees Valley's 'A' roads exceeds the national average, as well as the corresponding figures for other metropolitan areas in the North of England.

FIGURE 6.3 AVERAGE SPEED ON LOCAL A ROADS



Source: Department for Transport

6.6 It should be noted that there has been a trend of falling average speeds across much of Tees Valley, as a result of increased congestion. This is illustrated in the table below, which shows that in Middlesbrough, the average speed has reduced by 3.7mph since 2015. This compares to a drop of 0.6mph across England. Should this trend continue, average speeds in Middlesbrough would be lower than the national average within just 3 years.

TABLE 6.1 AVERAGE SPEED ON LOCAL A ROADS OVER TIME

	Average Speed (mph)			
	2015	2016	2017	2018
Darlington	29.1	28.6	28.4	28.2
Hartlepool	33.2	33.4	33.4	33.7
Middlesbrough	30.9	33.3	28.7	27.2
Redcar and Cleveland	37.4	38.4	36.3	36.0
Stockton on Tees	25.6	25.3	25.0	25.0
England	25.5	25.2	25.2	24.9

Source: Department for Transport

6.7 Analysis of data at the Tees Valley and local authority level, however, fails to reflect the existence of a small number of significant pinch points which are currently constraining the growth potential of the area. The key road infrastructure issues at present relate to the strategic routes of the A19 and A66. Further detail and analysis with respect to each are provided in the paragraphs below.

A19

6.8 A key north-south corridor within Tees Valley (carrying 96,000 vehicles per day at the point it crosses the River Tees) the A19 is also vital to the area's external connectivity, linking Tees Valley with East Durham, Sunderland and Cramlington to the north, as well as York and Doncaster to the south. Department for Transport analysis[lxxx] indicates that 55% of journeys on the Tees Valley section of the A19 are currently classed as being 'on time' – considerably lower than the national average of 78% for strategic routes.

6.9 The importance of addressing the issue is recognised by Transport for the North[lxxxi], who state that:

"Improving transport connectivity between the cities and surrounding economic centres, such as along the A19, will increase productivity and support the growth of complementary industrial capabilities."

6.10 In addition, research published by IPPR[lxxxii] identified the development of a new Tees Crossing to address the current capacity issues on the A19 as one of six quick wins for the North of England's transport network. The accompanying report concluded that:

"A new bridge across the Tees would help this small but important economy reach its potential and have a wider impact on the North."

A66

6.11 The principal east-west route through Tees Valley, passing through the local authorities of Redcar and Cleveland, Middlesbrough, Stockton-on-Tees and Darlington on a route that runs between Teesport and the A1(M) (and beyond to connect with the M6 at Penrith). Department for Transport analysis[lxxxiii] indicates

that the proportion of journeys classed as being 'on time' ranges from 55% to 66% – in comparison with a national average of 78% for strategic routes.

6.12 Transport for the North[lxxxiv] identify improving the resilience of the A66 as one of several interventions required to improve east-west connectivity across the North of England – with current east-west routes viewed as:

"a significant barrier for future growth in the North, and a key constraint to agglomeration and transforming the North's economy."

Proposed Interventions

6.13 TVCA's Strategic Transport Plan identifies the provision of an additional major road crossing of the River Tees and improvements to the A66 corridor as key road priorities for the area moving forwards. Strategic Outline Business Cases have been prepared in relation to both interventions in order to support future funding bids.

Rail

6.14 Tees Valley benefits from an East Coast Mainline station at Darlington, providing regular services to most major cities the UK, including:

- London: journey times of under 2 hours and 30 minutes;
- Edinburgh: journey times of under 2 hours; and
- Manchester: journey times of under 2 hours.

6.15 The national connectivity that this provides is critical to both business and leisure travel, helping to underpin Tees Valley's inward investment proposition and growing tourism economy. Recent research[lxxxv] estimates that East Coast Mainline services at Darlington benefit the Tees Valley economy by £400million per annum.

6.16 The services at Darlington are supplemented by Middlesbrough Station – which provides direct links to Leeds, Manchester, York and Newcastle – as well as a wider network of local stations. Proposals are in place to establish a direct route between Middlesbrough and London from 2020, helping to enhance the area's external rail connectivity.

6.17 Whilst external rail connectivity remains a key asset of the Tees Valley, local rail journey times are generally uncompetitive. Travelling by train from Darlington to Stockton and Middlesbrough, for instance, can take between 40 and 60 minutes[lxxxvi] compared to a journey time of 19 to 23 minutes by car. In addition, local services are often infrequent (the Combined Authority's Draft Rail Strategy identifies improved frequency of services on existing local routes as a key priority). Taken together, these factors mean that the local rail network is relatively unattractive to commuters travelling within Tees Valley, as reflected in the modal share data set out above.

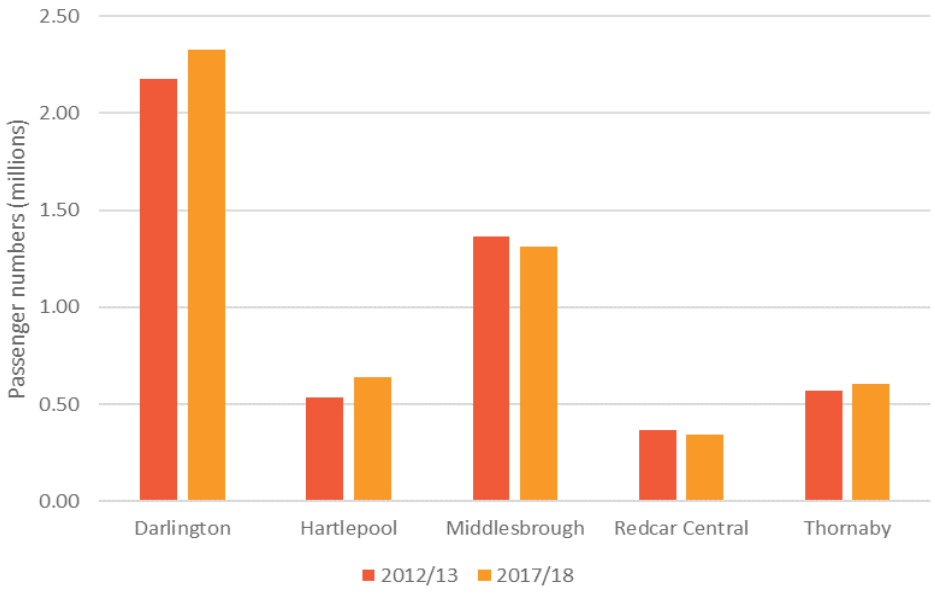
Passenger Numbers

6.18 Within Tees Valley, the busiest stations (entry and exit) are as follows[lxxxvii], clearly highlighting the current importance of Darlington the area's rail network:

- Darlington: 2.33m passengers;
- Middlesbrough: 1.31m passengers;
- Hartlepool: 642,000 passengers;
- Thornaby: 604,000 passengers; and
- Redcar Central: 345,000.

6.19 Over the period from 2012/13 to 2017/18, overall levels of rail usage in Tees Valley increased from 6.2m to 6.6m passengers. It can be seen from Figure 6.4, however that changes have not been uniform across the key stations, with growth observed at Darlington, Hartlepool and Thornaby and a fall in numbers recorded at Middlesbrough and Redcar Central.

FIGURE 6.4 TOTAL RAIL PASSENGER NUMBERS (ENTRY AND EXIT)



Source: Office of Rail and Road

Strategic Issues

6.20 At present, there are three key strategic issues affecting the rail network in Tees Valley, as identified within TVCA's Strategic Transport Plan and recent IPPR research[lxxxviii]. These are summarised below:

Darlington Station Upgrade

6.21 Darlington station currently has a number of constraints, including: a lack of capacity on mainline and local passenger services; a lack of capacity on some

southbound freight services; a lack of integration with Darlington Town Centre and Central Park (an Enterprise Zone site adjacent to the station); and a lack of high-quality station facilities.

6.22 A masterplan has been developed to remodel and upgrade the station to address these constraints. Proposals include the provision of: additional platform and track capacity; an enhanced station building (with an improved retail and commercial offer); and improved access and integration with the surrounding area. The improvements will also ensure that Darlington can be integrated into Northern Powerhouse Rail and HS2 – enhancing the potential for Tees Valley to make a greater contribution to the wider Northern Powerhouse economy moving forwards.

6.23 It is anticipated that the proposals will cost £150m. £25m of funding has been committed by TVCA to deliver the first phase of the masterplan, whilst a strategic outline business case for further funding has been submitted to the Department for Transport.

Middlesbrough Station Upgrade

6.24 Middlesbrough station is facing a number of challenges, including: a lack of platform capacity and operational flexibility for current service levels (a significant proportion of total delays on the TransPennine service have originated from issues at Middlesbrough in recent months – impacting on wider Northern Powerhouse connectivity[lxxxix]); a lack of integration with other modes of transport; and a lack of integration with Middlesbrough Town Centre and the Middlehaven Enterprise Zone.

6.25 A masterplan for the station has been produced. This will ensure that provide additional capacity and flexibility – addressing current constraints impacting on the TransPennine service and enabling Middlesbrough to cater for planned increases in the number of services and passengers using the station (most notably through direct links to London). £20m of funding has already been committed by TVCA in order to fund this phase of works.

6.26 The masterplan also includes further proposals improve station facilities, as well as the integration issues referenced above. A strategic outline business case is currently in development, with a view to identifying the total cost of the proposals, as well as providing a basis for future funding bids.

Northallerton to Teesport Gauge Clearance

6.27 Rail gauge clearance in the Tees Valley is a constraint to enhanced freight connectivity at present. Currently, all container traffic from Teesport to or from the South, Midlands, Yorkshire and the North West is required to make a reversing manoeuvre at Darlington (due to an absence of the correct gauge clearance and electrification on the alternative route). This is inefficient, adding time, distance and cost to each journey, whilst also placing a limit on train path availability.

6.28 Improved gauge clearance on the rail line between Northallerton and Teesport is proposed so that it can be used more effectively by both freight and passenger

trains. This will help to ensure that the rail network is equipped to cater for the largest freight growth market in Tees Valley (high cube containers to/from Teesport)[xc] thereby supporting the continued to development of Teesport – a major infrastructure asset within both Tees Valley and Northern Powerhouse context.

6.29 Technical feasibility work has been commissioned in order to identify appropriate engineering solutions, costs and a programme of works. Funding is not, however, in place to deliver any emerging proposals.

Ports

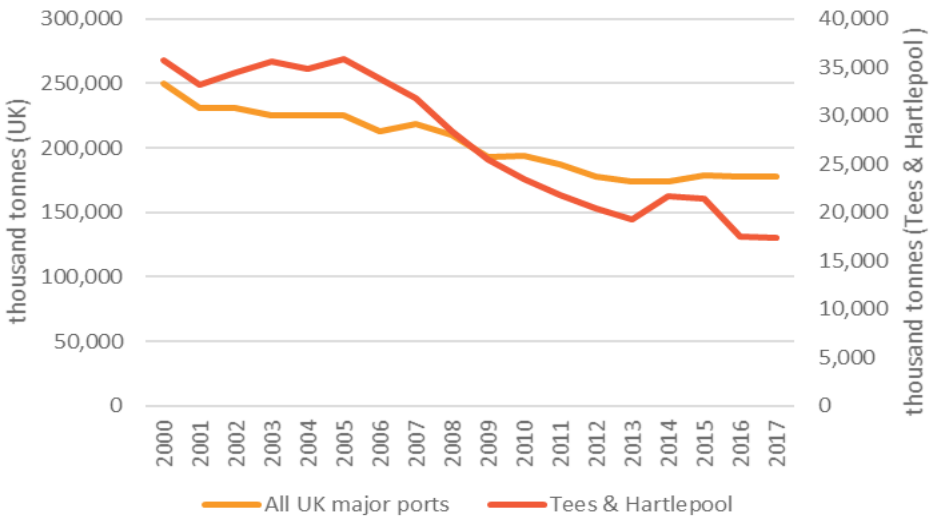
6.30 Tees Valley is homes to two tidal, deep-water ports – Port of Tees and Hartlepool. In total, they provide more than eighty operational berths and 10 miles of operational river, including the deepest facilities on the East Coast.[xci] This represents a significant competitive advantage for the area, as Tees Valley's ports are subject to fewer limitations on maximum vessel size than most UK ports.

6.31 Taken together, the ports represent a major international trade gateway and key economic asset for Tees Valley and the wider Northern Powerhouse (alongside major ports in Liverpool and Humberside). The Port of Tees and Hartlepool has consistently placed within the UK's top ten ports in terms of tonnage handled since the 1970s. Unlike many ports, however, it is export facing – ranked as the largest English port in terms of outward tonnage in 2017 (17.4m tonnes) and 7th largest overall.

6.32 PD Ports advise that investment totalling nearly £120 million has taken place at the Port of Tees and Hartlepool in recent years. This investment has focussed on upgrading and enhancing capacity to meet customer demand (including a £50 million quay redevelopment).

6.33 An analysis of the recent performance of the Port of Tees and Hartlepool, however, is more mixed and heavily influenced by the metric against which performance is assessed. The Port was ranked 7th in the UK in terms of volume of cargo in 2017 – down from 3rd in 2014. Figure 6.5 shows that, whilst there has been a national trend toward reduced volumes of tonnage handled across the UK's major ports (down 15% between 2000 and 2017) a more pronounced contraction (-45%) has been observed at the Port of Tees and Hartlepool over the same period of time.

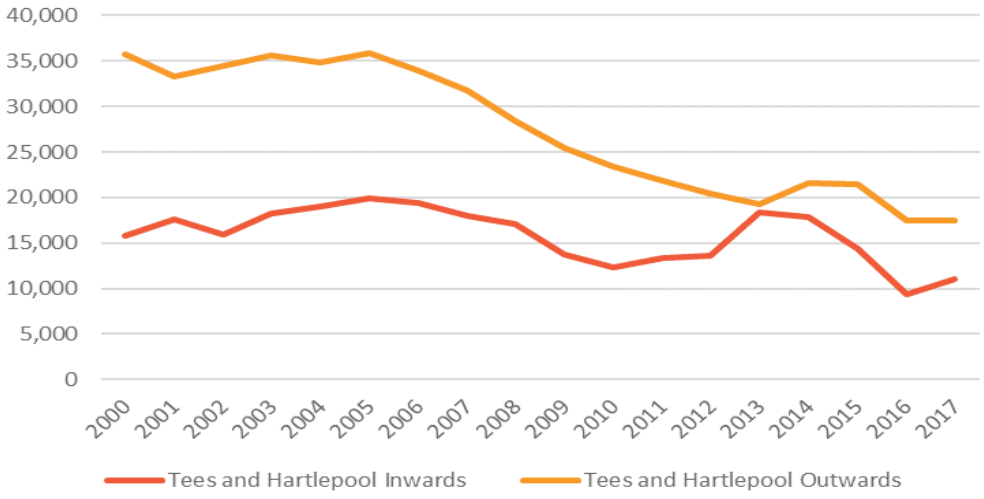
FIGURE 6.5 UK MAJOR PORT FREIGHT TRAFFIC, INBOUND AND OUTBOUND, 2000-2017



Source: Department for Transport

6.34 The reduction in volume has primarily been driven by a decline in outbound freight (down by 51% from 35.7m tonnes to 17.4m tonnes). Levels of outbound freight have also fallen since 2000, albeit to a lesser extent (down by 30% from 15.8m tonnes to 11.0m tonnes) (see Figure 6.6).

FIGURE 6.6 TEES AND HARTLEPOOL INBOUND AND OUTBOUND PORT FREIGHT COMPARISON, 2000-2017



Source: Department for Transport

6.35 In recent years (2015-2017) the decline in outbound cargo has been as a result of falls in three main cargo types[xcii], reflecting the Port's vulnerability to fluctuations in key markets; and some economic restructuring within Tees Valley:

- Crude Oil: whilst the overall decline was modest (-9%) crude oil accounts for the majority of outward tonnage handled by Tees and Hartlepool Ports (70% in 2017);
- Dry Bulk: down by 0.81m tonnes (a reduction of 49%); and
- Iron and Steel: fell by 2.08m tonnes (-87%) as a result of the closure of the SSI steelworks at Redcar in 2015.

6.36 It is important to note, however, that significant growth in the level of container traffic handled has increased significantly in recent years. Data provided by PD Ports indicates that the Port has experienced 12% year on year growth in container traffic for the last seven years.

6.37 The Port is established as the port of choice for rail car imports linked to Hitachi's manufacturing facility in Newton Aycliffe, County Durham. Since manufacturing began in 2015, carriages and locomotives have been handled, stored and re-delivered to the factory (for fit-out and completion) via the Port of Tees and Hartlepool. It is estimated that more than 860 carriages and locomotives have been handled to date.

6.38 In addition, the Port is well established as one of the UK's leading specialists in portcentric logistics. It is home to Teesport Logistics Park, the largest retailer-backed, portcentric logistics park in the UK and home to two of the UK's largest retailers (Tesco and Asda). In November 2015 a new rail terminal opened at the Port of Tees and Hartlepool, further strengthening its portcentric logistics offer.

Airport

6.39 Durham Tees Valley Airport has the potential to operate as a significant asset for the Tees Valley, providing national and international connections for business and leisure visitors and helping to support a stronger local inward investment and tourism proposition. In recent years, however, passenger and freight numbers have declined significantly. In 2006 approximately 911,900 passenger travelled via the airport. By 2016, this had fallen to just 131,500. As a consequence, Durham Tees Valley Airport is the second smallest in the North of England in terms of passenger numbers, as shown in Table 6.2.

6.40 The airport currently provides daily scheduled services to Aberdeen and Amsterdam Schiphol, charter programmes to Bulgaria and Jersey as well as ad hoc packaged tours.

TABLE 6.2 PASSENGER NUMBERS BY NORTH OF ENGLAND REGIONAL AIRPORT

Airport	Passenger Numbers
Durham Tees Valley	131,500
Blackpool	36,300
Doncaster/Sheffield	1,255,600
Humberside	201,300
Leeds/Bradford	3,611,500
Liverpool	4,777,000
Manchester	25,598,800
Newcastle	4,804,958

Source: DfT Aviation Statistics

6.41 The volume of freight handled by Durham Tees Valley Airport has also declined markedly. In 2007, Newcastle Airport and Durham Tees Valley Airport handled comparable levels of air freight (785 tonnes and 786 tonnes respectively). By 2017, however, airfreight handled by Durham Tees Valley Airport had all but ceased, with 4 tonnes recorded (linked to activity from a small number of ad hoc, chartered freighters). In contrast, freight volumes at Newcastle have grown to 5,482 tonnes

6.42 In early 2019, Durham Tees Valley Airport was purchased by the Combined Authority. Subsequently a Joint Venture agreement was signed with Stobart Group to assist in the airport's operational management and strategic direction. This represents a major opportunity to reverse the historic decline of activity at the airport and reposition it as a significant asset for Tees Valley and the surrounding area. The Tees Valley Combined Authority intends to develop and deliver a 10-year growth strategy for the airport, which is likely to focus on a series of measures to reposition it at the heart of a successful local economy:

- Strategic route development (including a new route to London);
- Explore the possibility of establishing the airport as an Enterprise Zone; and
- Investment to enhance the use of the airport for freight.

Alternative Transport

6.43 An extensive network of cycle routes that caters for both leisure and utility trips is being developed within Tees Valley. Sections of the National Cycle Network pass through the Tees Valley including NCN1, which links Stockton and Middlesbrough Town Centres on a traffic free route along the River Tees. NCN14 also passes through the area. This route links Stockton and Darlington Town Centres through a mixture of on and off-road sections, some of which follow the track bed of the original Stockton-Darlington railway.

6.44 Significant investments have been made in recent years across Tees Valley in order to help provide sustainable access to employment for both pedestrians and

cyclists. This includes Parkgate Bridge in Darlington, which links Darlington Bank Top Station with the Business Central employment site. Investments have also been made in Riverside Park, Middlesbrough and in the vicinity of industrial estates in the Brenda Road area of Hartlepool.

TVCA Investment Plan and Transforming Cities Fund

6.45 The Tees Valley Investment Plan, 2019-2029, highlights the key role that transport will play in supporting and unlocking the growth potential of the Tees Valley. It outlines the key transport investment priorities that will help achieve this and commits £256.7m of funding to deliver them. A critical and significant element of this funding is the £75.5m that has been secured from government from the Transforming Cities Fund. This covers the period up to 2022/23, was devolved directly to the Combined Authority rather than through a competitive process and is enabling good early progress to be made in the development of our key transport schemes.

Freight

6.46 The availability of robust data on freight movements is limited. The quality of information varies by mode and much of the information is fragmented, with lags in published data.

6.47 The absence of robust, timely and integrated data regarding freight movements makes it more difficult for the Combined Authority to make evidence-based investment decisions. The availability of richer, more co-ordinated data would be welcomed, enabling the Combined Authority to more effectively identify potential interventions which could support supply chain optimisation and greater productivity.

6.48 Notwithstanding the above, the following paragraphs provide a summary of the data that is available in relation to freight, across each of key modes.

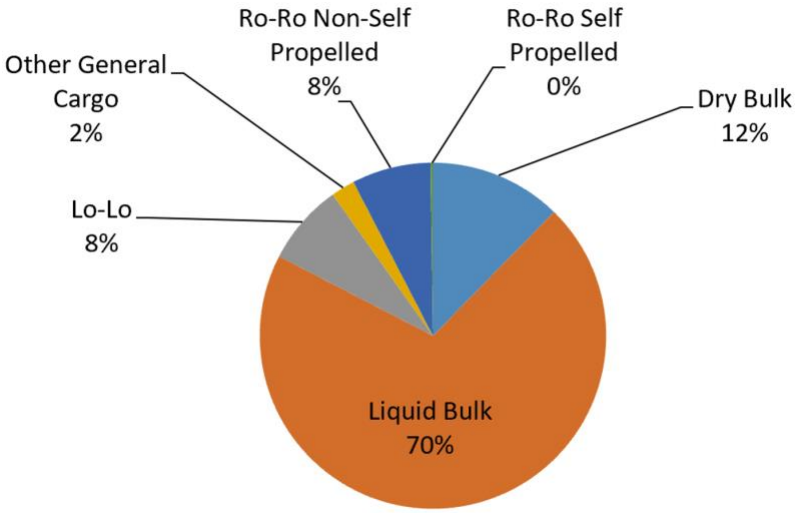
Freight by Pipeline

6.49 The Tees Valley chemicals and process sector has significant pipeline networks for the transport of liquid bulk commodities between terminals. No current data is available regarding the volumes being moved or the capacity within these pipelines (the Department for Transport last published data in 2012). It is understood, based upon qualitative intelligence gathered by the Combined Authority, that the Port of Tees and Hartlepool alone handles 20 million tonnes of liquid bulk per annum.

Sea Freight

6.50 Figure 6.7 provides an overview of sea freight by type in Tees Valley. The data relates to total freight (i.e. inward and outward bound) and demonstrates the dominance of liquid bulk, which accounts for 70% of total freight handled by the Port of Tees and Hartlepool.

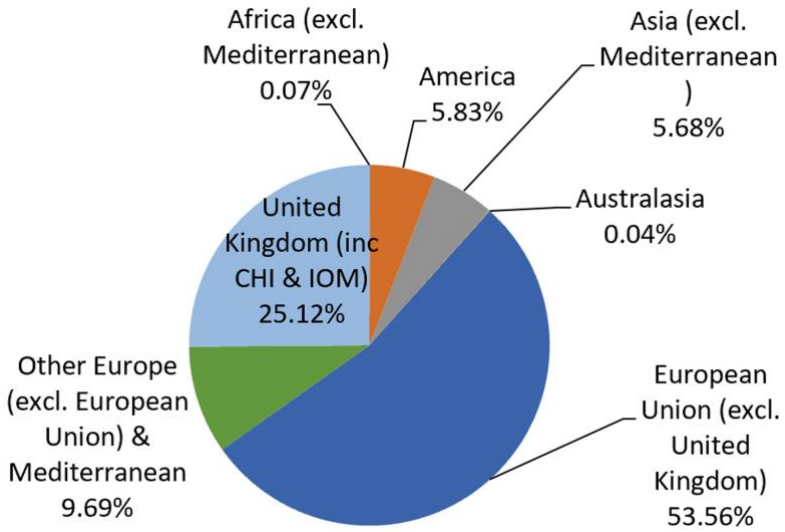
FIGURE 6.7 PORT OF TEES AND HARTLEPOOL SEA FREIGHT BY TYPE (2017)



Source: Department for Transport,, Port Freight Annual Statistics

6.51 The majority of sea freight movements are to or from the European Union (54%) followed by the UK (25%) as shown in Figure 6.8. Freight movements of 5-10% are also observed with respect to America, Asia and other European nations, demonstrating the Port of Tees and Hartlepool's role as a global trade gateway.

FIGURE 6.8 PORT OF TEES AND HARTLEPOOL SEA FREIGHT BY REGION (2017)



Source: Department for Transport,, Port Freight Annual Statistics

Road Freight

6.52 Data from the Department for Transport's Continuing Survey of Road Goods Transport Great Britain suggests that road freight from Tees Valley totalled 21,285 thousand tonnes in 2017. A summary of the key destinations for good moved by road from Tees Valley is provided below. This shows that the majority

of road freight movements are focussed elsewhere in Tees Valley and across the wider Northern Powerhouse area:

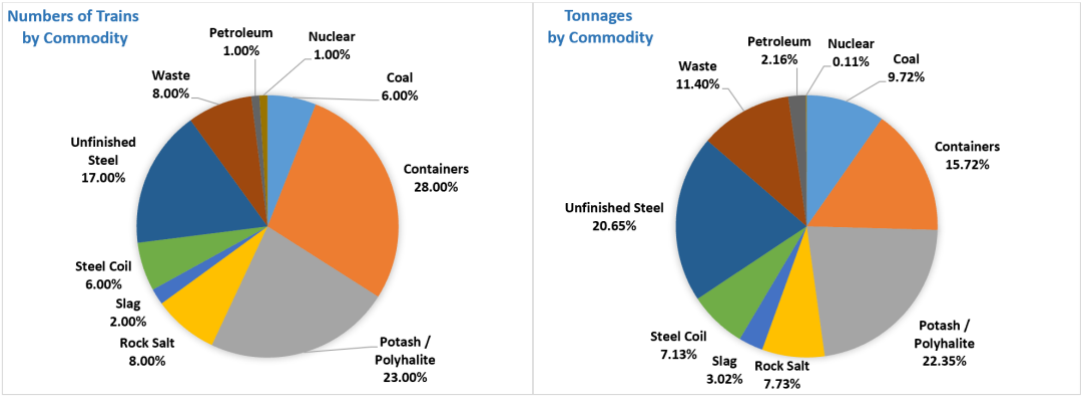
- Tees Valley: 8,645 thousand tonnes;
- Yorkshire and Humber: 5,546 thousand tonnes;
- North East (excluding Tees Valley): 2,225 thousand tonnes; and
- North West: 1,950 thousand tonnes.

Rail Freight

6.53 Due to data availability issues, the chart below is based upon data collated across a single week (week commencing 16th April 2018). As such, it should be interpreted with a degree of caution.

6.54 Notwithstanding the above, the data would appear to suggest that rail freight movements in Tees Valley are largely focused on: containers; potash/polyhalite; and unfinished steel.

FIGURE 6.9 TEES VALLEY RAIL FREIGHT DATA (2018)



Source: Open Rail Data

Digital Infrastructure

6.55 Digital connectivity is critically important to business. It has become an essential part of an area's economic infrastructure[xciii] and will increase in prominence as the way we work continues to evolve. In addition, Tees Valley's sectoral strengths across Advanced Manufacturing, Chemical & Process and Clean Energy, Low Carbon & Hydrogen provide significant scope for greater than average returns to industrial digitisation.

6.56 In general terms, Tees Valley's digital connectivity is a key strength of the area as place to live and work. The proportion of residential and commercial premises with access to superfast broadband across the area (96.6%) is marginally higher than the UK average (95.4%), whilst coverage of ultrafast broadband far outstrips the UK average.

6.57 Across the five local authority areas, only Darlington falls below the UK figure in relation to the provision of superfast broadband.

TABLE 6.3 DIGITAL BROADBAND COVERAGE AT NOVEMBER 2018 (PERCENTAGE OF RESIDENTIAL AND COMMERCIAL PREMISES COVERED)

	Superfast (>30mbps)	Ultrafast (>100mbps)
Darlington	94.4%	86.4%
Hartlepool	97.3%	90.5%
Middlesbrough	97.2%	93.4%
Redcar & Cleveland	97.7%	90.2%
Stockton-on-Tees	96.4%	89.8%
Tees Valley	96.6%	90.1%
United Kingdom	**95.4%**	**55.6%**

Source: thinkbroadband.com

6.58 In addition, the area has the highest take-up across the LEP network in relation to the fastest broadband line speeds (>30mbit/s), as shown in Table 6.4.

TABLE 6.4 TAKE UP OF LINES BY SPEED, % SPLIT, 2014

	<2 Mbit/s	2-10 Mbit/s	10-30 Mbit/s	>30 Mbit/s
Lowest	2.6	26.1	22.7	8.8
Highest	11.7	50.5	36.2	44.3
LEP average	6.4	36.3	28.8	28.5
Tees Valley	**5.9**	**26.1**	**23.8**	**44.3**

Source: Mapping Local Comparative Advantages in Innovation, BIS

6.59 Despite the strong current performance of the area as a whole, pockets of poor broadband provision do exist at a more localised level. These are not just confined to rural locations, but are also observed in more isolated pockets within existing employment areas.

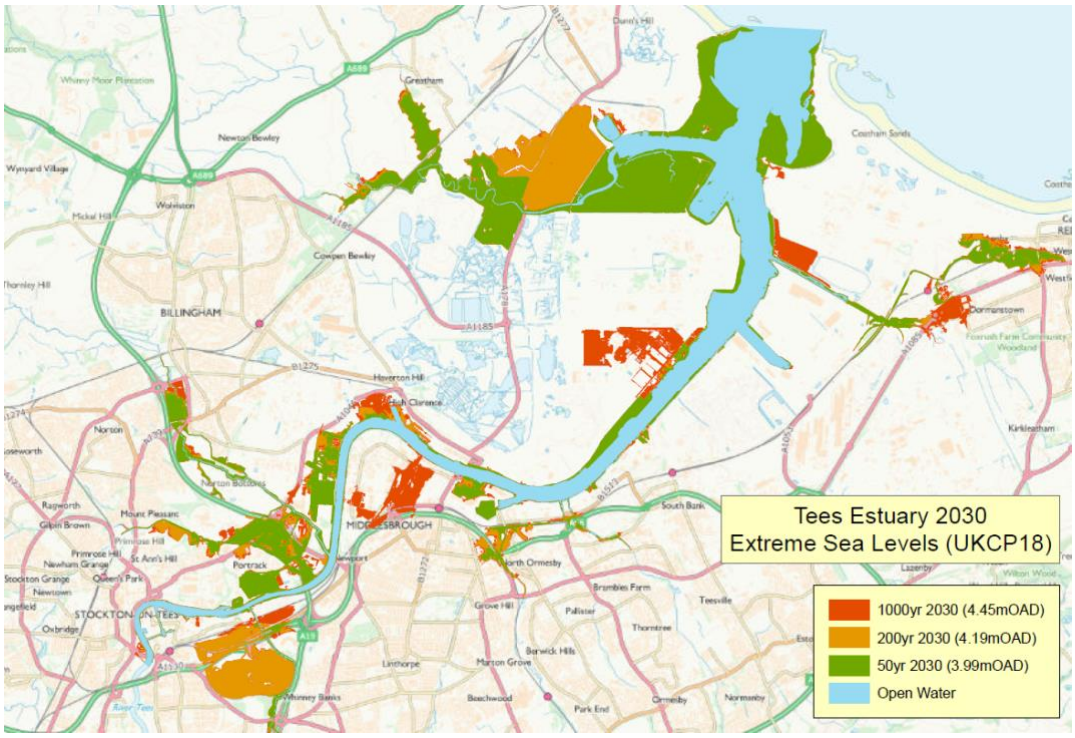
6.60 Stakeholder engagement undertaken as part of the LIS process has identified a widely held perception amongst local businesses that significant investment is required to future proof Tees Valley's digital infrastructure. In order to facilitate the move towards 5G networks moving forwards, it was suggested that it may be necessary to replace much of the existing cabling.

Climate Change Resilience

6.61 Figure 6.10 provides a summary of current flood defences in Tees Valley and their resilience to climate change. The map, produced by the Environment Agency, highlights the anticipated likelihood (i.e. 1 in 50-year event) and extent of flooding. From an economic development perspective, this identifies flood risk in the Portrack area of Stockton as a particular concern over the time horizon of the LIS. The Environment Agency are currently considering a number of options to address the issue and indicative funding (post 2020/21) has been identified.

6.62 In the medium to long term, the industrial complex at Seal Sands – a key part of the area's chemicals and process industry offer – becomes increasingly at risk of flooding. The Environment Agency has advised that any intervention is likely to fall beyond the Environment Agency's current 10 year investment plan horizon, but that preparatory work in relation to the site is anticipated during this period.

FIGURE 6.10 TEES ESTUARY FLOOD RISK RESILIENCE UNDER 2018 UK CLIMATE PROJECTIONS (UKCP18)



Source: Environment Agency

6.63 The importance of ensuring that Tees Valley remains resilient to climate change is highlighted by the *Tees Tidal Flood Risk Management Strategy.* The Strategy

considered tidal risk in the estuary up to the Tees Barrage. The Strategy was informed by a detailed survey of major businesses in the estuary and concluded that the economic cost of tidal flooding in Tees Valley could be more than £1 billion locally and £2.5 billion nationally. This reflects the high inter-connectivity and inter-dependency between key businesses, meaning that impacts on a single major employer could have a domino effect across the area.

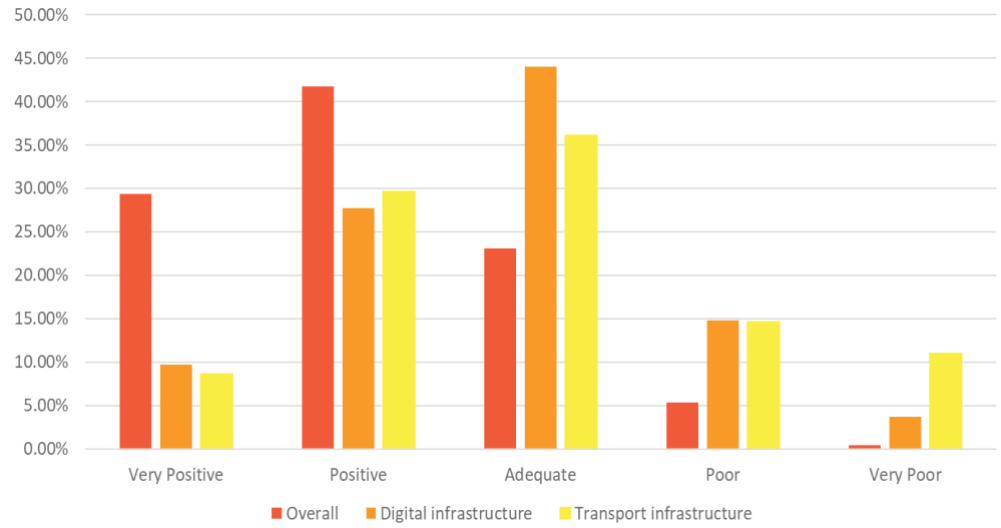
6.64 This was illustrated by the 2013 tidal event, when breaching of a flood embankment resulted in significant direct damage to SABIC UK's infrastructure. This affected SABIC UK's ability to provide its customers at Seal Sands with the chemicals required for their manufacturing processes. Damage from this single event is understand to have resulted in an economic cost (primarily through lost business) of more than £20 million.

Infrastructure as a constraint to growth

6.65 The *Tees Valley Business Survey (2018)* sought to understand business satisfaction with Tees Valley as a place to live, work and invest – both in overall terms and with a specific focus on key elements of the area's offer. The findings in relation to infrastructure are summarised in Figure 6.11. This illustrates that business views in relation to digital and transport were generally positive or neutral, with 38% of respondents viewing the digital and transport infrastructure positively or very positively. This was, however, significantly lower than views of Tees Valley in overall terms.

6.66 Similarly, the proportion of negative feedback was markedly higher in relation to transport infrastructure (viewed as poor or very poor by 26% of respondents) and digital infrastructure (19%) than for the Tees Valley's overall offer.

FIGURE 6.11 HOW WOULD YOU RATE TEES VALLEY AS A PLACE TO LIVE, WORK AND INVEST IN?



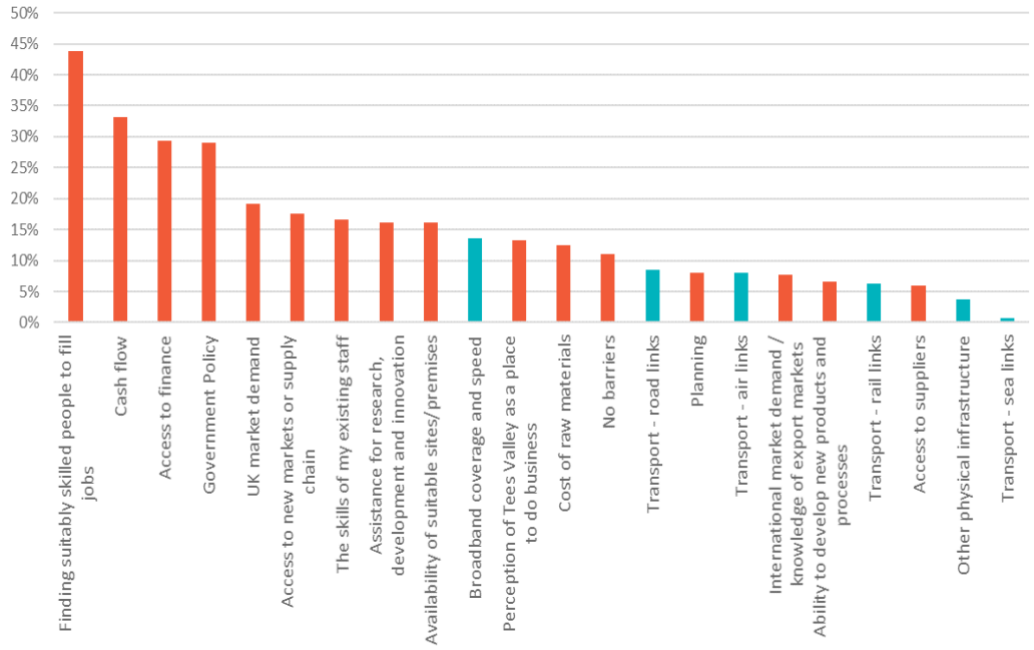
Source: TVCA Business Survey

6.67 Despite the comparatively negative views of the area's infrastructure offer, when businesses were asked to identify those issues or obstacles that represent the

most significant constraint to growth, infrastructure issues did not feature particularly prominently. As shown in Figure 6.12, respondents viewed issues related to skills/recruitment and cashflow/access to finance as the principal barriers to growth in Tees Valley.

6.68 The Business Survey identifies infrastructure as a constraint to growth in Tees Valley with broadband coverage/speed (14%) identified as a principal constraint. The coverage and speed of broadband was the most frequently cited infrastructure-related barrier to growth. This was identified by 14% of participating businesses, placing it within the 'top 10' of key issues raised. With respect to transport infrastructure road and air connectivity were viewed as the most significant barriers (8% of respondents).

FIGURE 6.12 BUSINESS BARRIERS TO GROWTH



Source: TVCA Business Survey, 2018

Summary

Key issues highlighted within the preceding paragraphs are summarised below

1 Commuting in Tees Valley is dominated by private car, despite local car ownership levels being below the national average;

2 Whilst overall performance regarding journey time metrics exceeds the national average, a number of key pinch points exist on the road network (notably the A19 and the A66). Strategic Outline Business Cases are in development with a view to delivering projects to address each;

3 Excellent digital infrastructure and connectivity - broadband coverage and speeds outperform the national average. Stakeholder consultation has,

however, highlighted the existence of some geographical gaps in provision and a need to future proof the digital infrastructure;

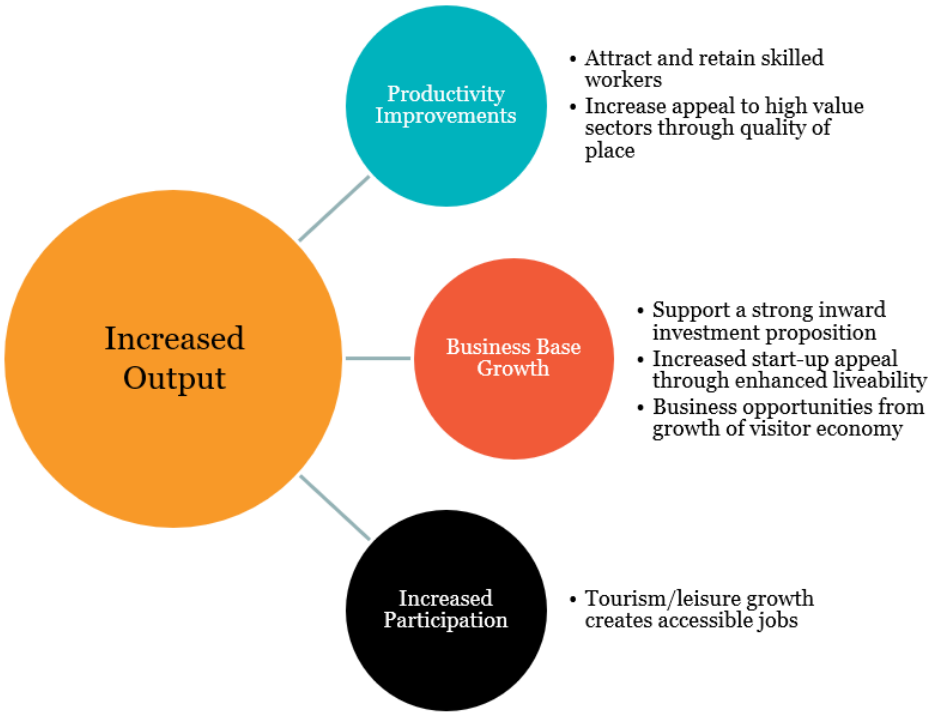
4 A number of key strategic rail issues currently exist, including capacity constraints at Darlington Station and Middlesbrough Station. Funding has been committed to both projects, albeit further funding is needed to harness the benefits of HS2 to Darlington; and

5 Port of Tees and Hartlepool and Durham Tees Valley Airport are critically important to the area's international connectivity.

7.0 Place

7.1 The sense of place associated with any local economy is unique and multi-dimensional. It reflects spatial patterns of development and the inter-relationship between different settlements, as well as the built and natural environment and cultural/recreational amenities. There is a growing body of evidence that supports the view that businesses and highly-skilled workers are increasingly basing their location decisions on the 'liveability' of a town or city, as well as the strength of its economy[xciv]. As a result, establishing and effectively promoting a strong place proposition can help to support productivity growth by: attracting and retaining skilled workers; increasing an area's appeal to business start-ups and inward investors; and creating additional economic output through tourism.

FIGURE 7.1 DELIVERING INCREASED OUTPUT THROUGH QUALITY OF PLACE



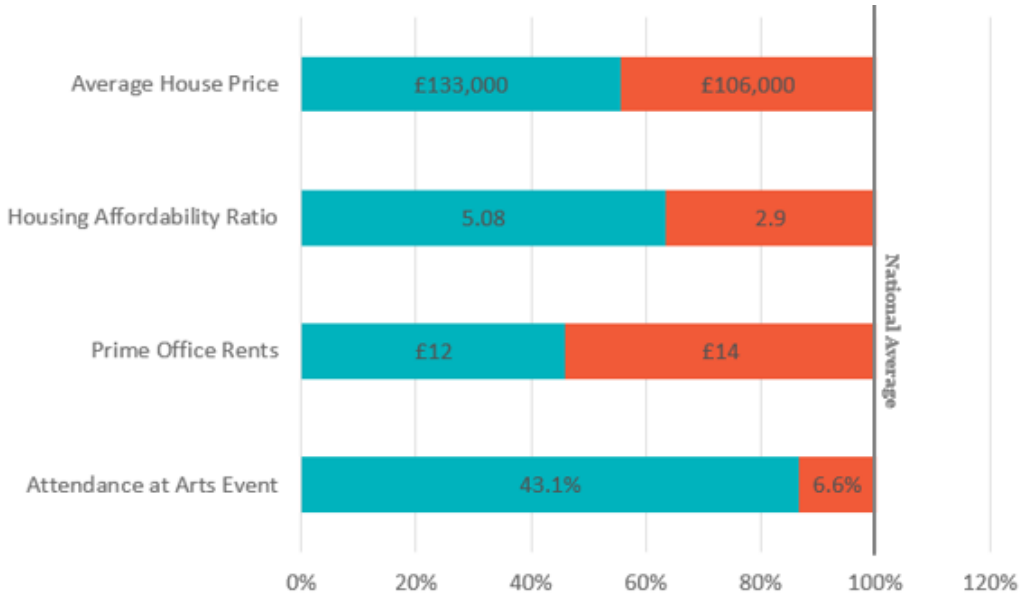
Tees Valley 'Place' Scorecard

7.2 The scorecard at Figure 7.2 provides an overview of Tees Valley's performance (relative to the national average) with respect to a number of key place-based metrics. Of the five foundations of productivity, Place is arguably the one where many of the underlying determinants are difficult to quantify in a way that lends itself to comparisons with national benchmarks. As such, the analysis set out in Figure 7.1 should not be viewed as an exhaustive review of the area's place-based competitiveness.

7.3 Notwithstanding the above, the key messages that emerge from the scorecard can be summarised as follows:

- Tees Valley represents a cost competitive business location. Average rental costs for Grade A office space in Middlesbrough are in the order of £12/sq.ft. This is significantly lower than the cost of premises in other major cities in the North of England and less than half the average cost identified via an assessment of key regional office markets (£26/sq.ft.)[xcv]. In addition, average wages in Tees Valley are also low (see Table 7.1);
- Whilst wages in Tees Valley are relatively low, it remains an affordable place to live and work, with the average local house price corresponding to 5.08 times the average salary (in comparison with 8.00 times annual salary at the national level).[xcvi] Although not considered in Figure 7.2, the ratio of earnings to rental costs is also lower within Tees Valley. This should be promoted by the area as part of the wider quality of life offer, with a view to attracting and retaining young, skilled workers who might find it more difficult to get a foot on the property ladder in other major cities; and
- Local engagement in culture and the arts is below the national average. Data published in January 2018 indicates that just 43.1% of Tees Valley residents attended 3 or more arts events over a 12 month period, in comparison with 49.7% nationally[xcvii]. Consultation undertaken as part of the LIS process highlighted a perception amongst some stakeholders that the area is currently constrained by a modest cultural infrastructure and has traditionally experienced below average levels of cultural investment. It was also acknowledged that there is a renewed commitment to investing in enhancing the cultural offer/profile of the area under the Combined Authority and that the area benefits from a number of key assets upon which to build.

FIGURE 7.2 PLACE PRODUCTIVITY SCORECARD



Source: Various

Rural-Urban Split

7.4 Tees Valley is a polycentric City Region covering an area of almost 80,000 hectares and with a population of approximately 670,000 people. It comprises of five local authorities (Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-on-Tees). It is highly urbanised, with 90% of the population in urban areas. Figure 7.3 compares the urban/rural composition of the Tees Valley.

FIGURE 7.3 RURAL-URBAN SPLIT OF TEES VALLEY

Housing and Demographics

Travel to Work Patterns

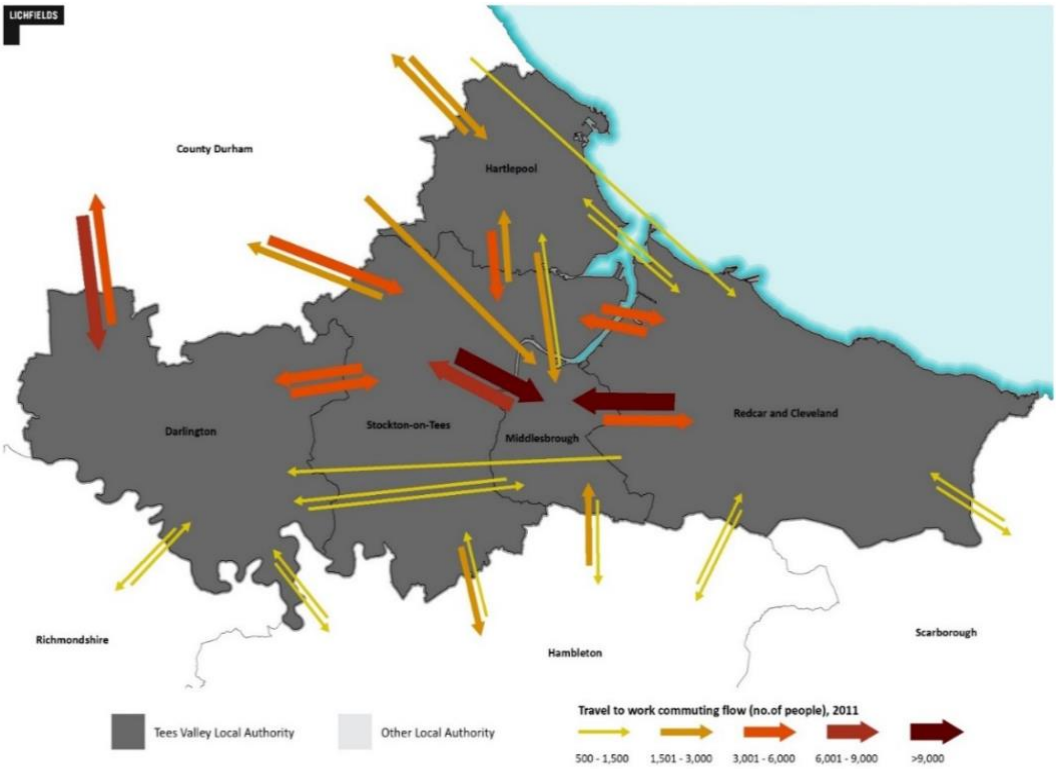
7.5 In overall terms, Tees Valley is a modest net exporter of labour. It is estimated that the area has a net outflow of 3,000 workers, based upon:

- 35,000 people travelling into the area (from homes outside of Tees Valley) for employment; and
- 38,000 Tees Valley residents travelling out of the area for employment.

7.6 An analysis of travel to work patterns highlights that the Tees Valley labour market is relatively self-contained, with 87% of all Tees Valley residents in employment work in the area (with the majority living and working within the same local authority). Cross boundary travel to work movements can be observed in Figure 7.4. Whilst this shows Middlesbrough to be a net importer of

labour, it also highlights the polycentric settlement pattern of Tees Valley, which means that no single location dominates the economic and demographic landscape.

FIGURE 7.4 TRAVEL TO WORK COMMUTING FLOWS, 2011



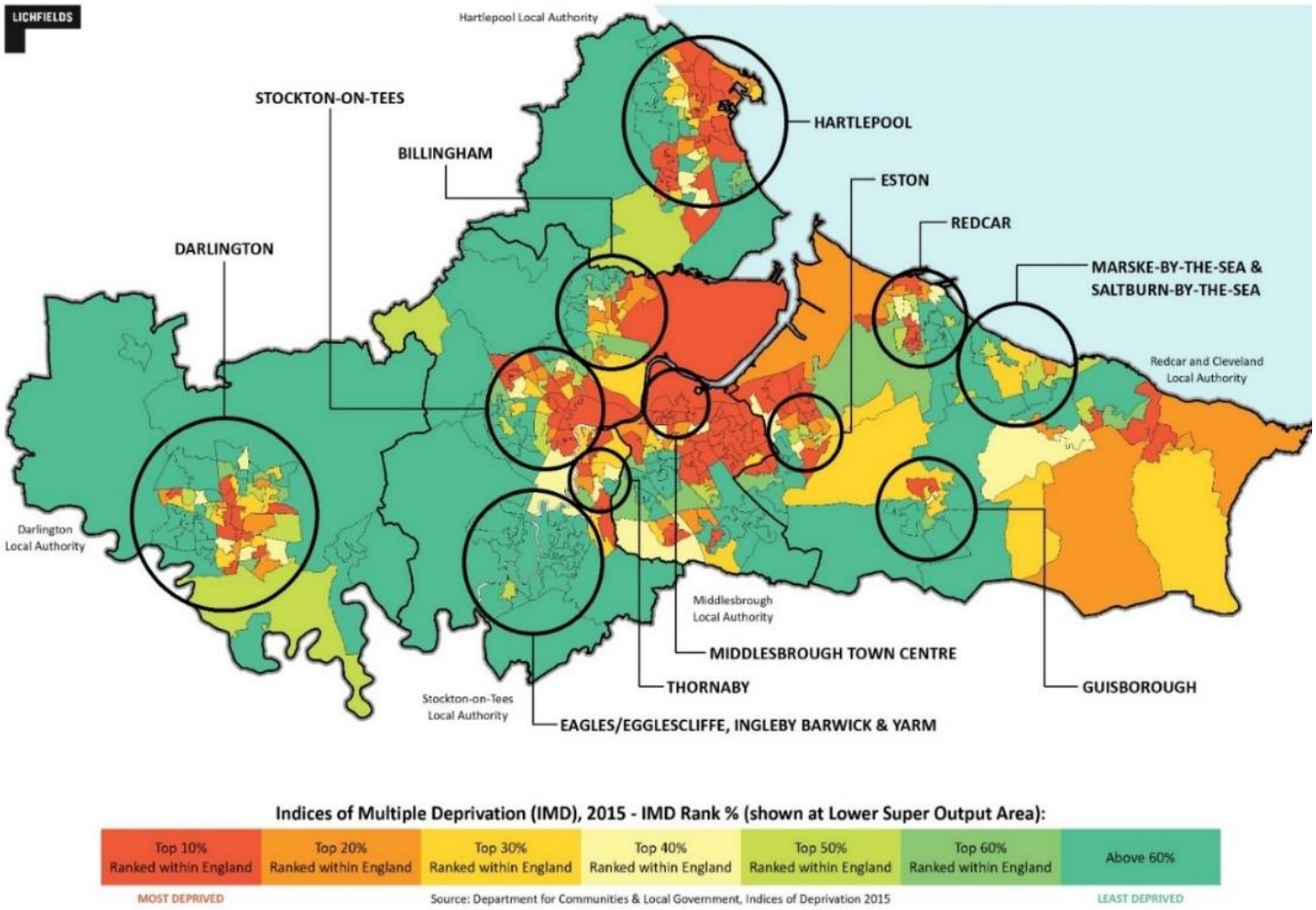
Source: ONS

Deprivation

7.7 At the local authority level, deprivation within Tees Valley is highest in Middlesbrough (ranked as one of the 5% most deprived areas in England) and Hartlepool (ranked as one of the 10% most deprived areas in England). Redcar & Cleveland, Stockton-on-Tees and Darlington are all placed within the 30% most deprived authorities in England.

7.8 At a more granular level, significant variations can be observed across each of the five authorities. As shown in Figure 7.5, all five include concentrations of acute deprivation (10% most deprived Lower Super Output Areas nationally). These are generally concentrated within urban areas, with much lower levels of deprivation observed in the more rural areas towards the northern, western southern boundaries of Tees Valley.

FIGURE 7.5 DEPRIVATION MAP OF TEES VALLEY



Source: DCLG, Indices of Deprivation, 2015

Housing

7.9 The availability of good quality, affordable housing – as part of an area's wider quality of life offer – can play an important role in attracting and retaining workers. Table 7.1 shows that mean average house prices in Tees Valley, at £133,000, are approximately 56% of the national level. Whilst the average local salary (£26,200) is also lower, the scale of difference is much less stark, with the average salary in Tees Valley approximately 88% of the national level.

7.10 As a consequence of the above, the average house price in Tees Valley is 5.08 times that of the average annual salary. This compares with a multiple of 8.00 nationally, highlighting the relative affordability of homes in the local area.

TABLE 7.1 HOUSING AFFORDABILITY

	Mean Annual Gross Pay	Mean House Price	Ratio of House Price to Earnings
Tees Valley	£26,200	£133,000	5.08
North of England	£26,900	£160,000	5.95
England	£29,900	£239,000	8.00

Source: ONS, House Price Statistics for Small Areas and ONS, ASHE 2018 estimates

7.11 A similar position can also be observed with respect to rental costs, as illustrated in Table 7.2. On average, Tees Valley residents could be expected to spend 27% of their monthly take home pay on renting a 1-bedroom home, or 32% on renting a 2-bedroom home. This compares to 43% and 47% respectively at the national level.

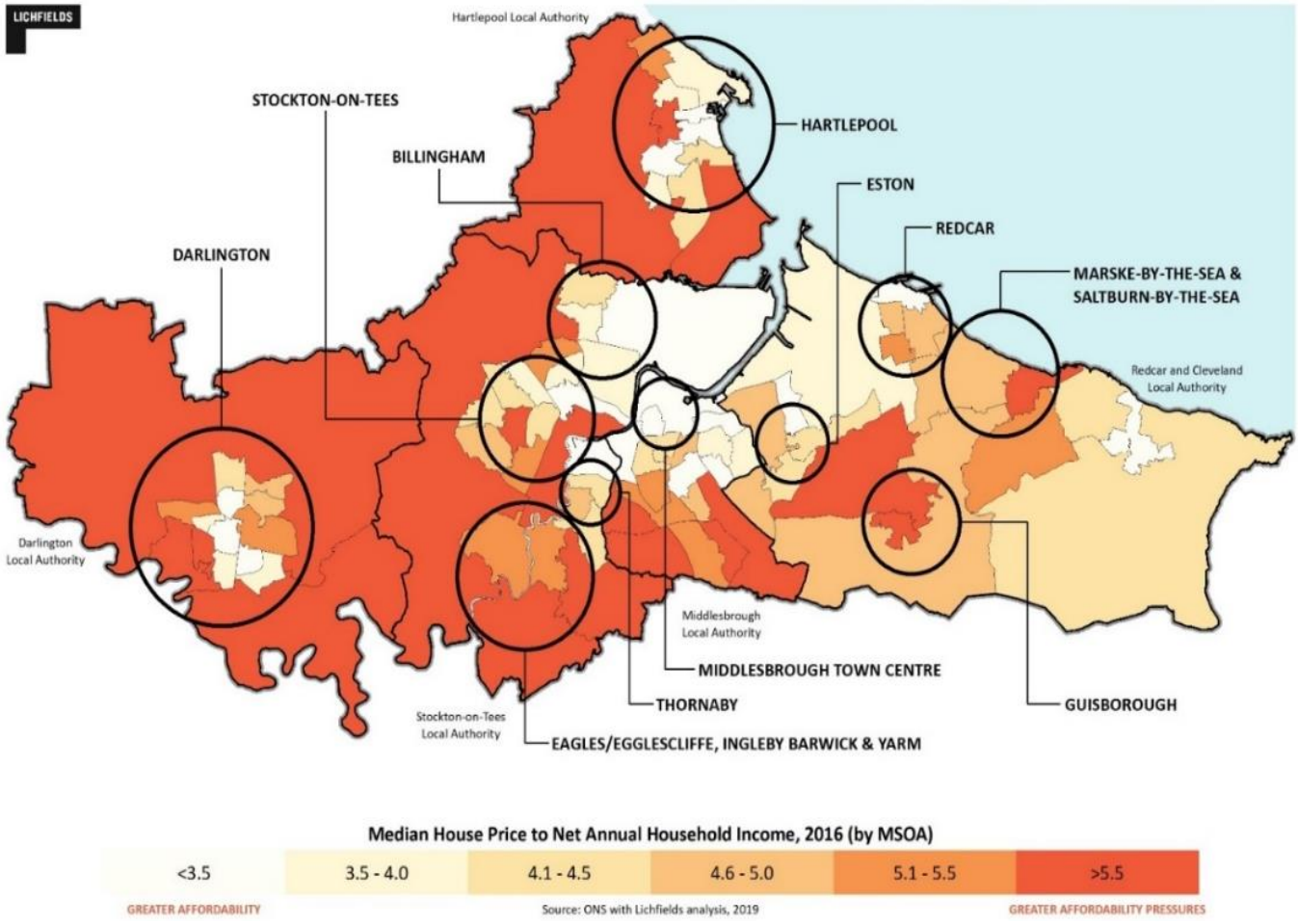
TABLE 7.2 EARNINGS AND HOUSING RENTAL COSTS

	Median Monthly Net Take Home Pay	Mean Rent (1 Bedroom)	% Take Home Pay (1 Bedroom Rent)	Mean Rent (2 Bedroom)	% Take Home Pay (2 Bedroom Rent)
Tees Valley	£1,443	£394	27%	£462	32%
North of England	£1,505	£452	30%	£533	35%
England	£1,628	£707	43%	£772	47%

Source: Tees Valley Economic Assessment, Table 9.2

7.12 The relative affordability of housing is not, however, uniform across the Tees Valley, as highlighted in Figure 7.6. This shows that, in general terms, local housing affordability pressures are more pronounced in the west and north of Tees Valley – particularly in less urban areas.

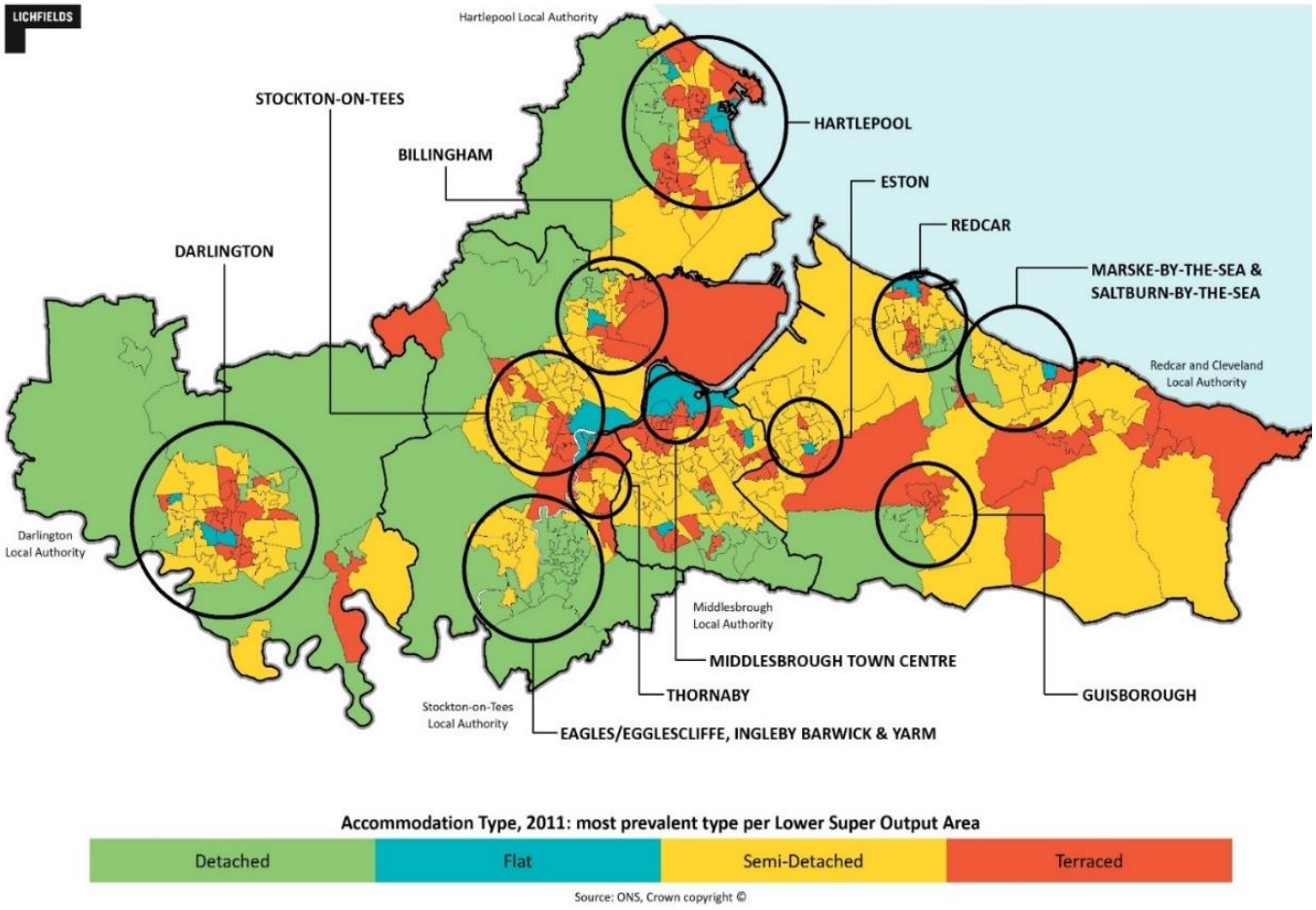
FIGURE 7.6 TEES VALLEY HOUSING AFFORDABILITY RATIOS



Source: ONS

7.13 In part, this is likely to reflect the nature of the housing stock in the west and north, which is characterised by higher levels of detached properties (see Figure 7.7). Similarly, those parts of the Tees Valley which are most affordable (the town centres of Hartlepool, Middlesbrough, Billingham and Darlington and the immediately surrounding areas) generally contain high proportions of terraced properties and flats.

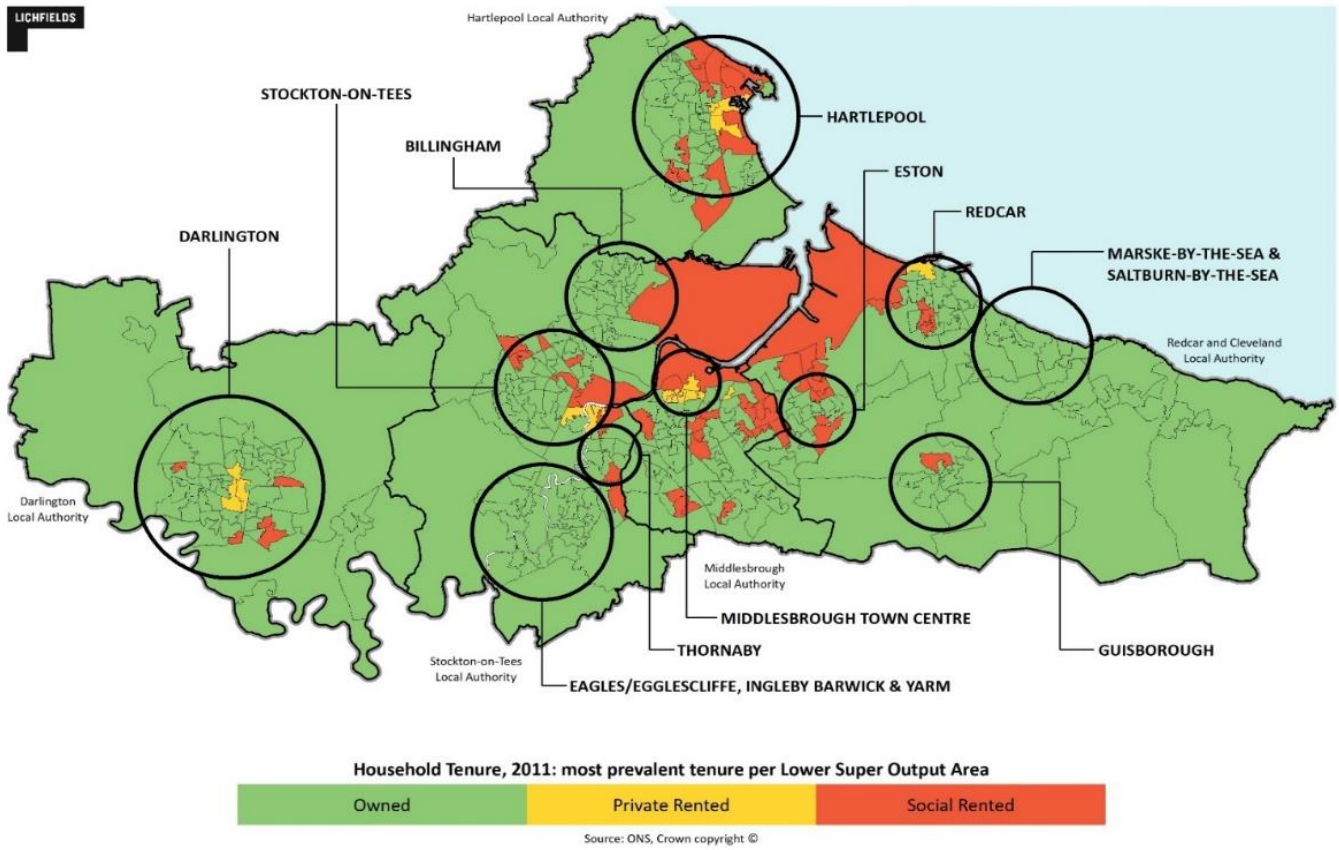
FIGURE 7.7 TEES VALLEY HOUSING STOCK BY TYPE



Source: ONS

7.14 Figure 7.8 indicates that the most affordable parts of Tees Valley are generally those locations dominated by social rented and private rented accommodation.

FIGURE 7.8 TEES VALLEY HOUSEHOLD TENURE



Source: ONS

Employment

Distribution of Employment

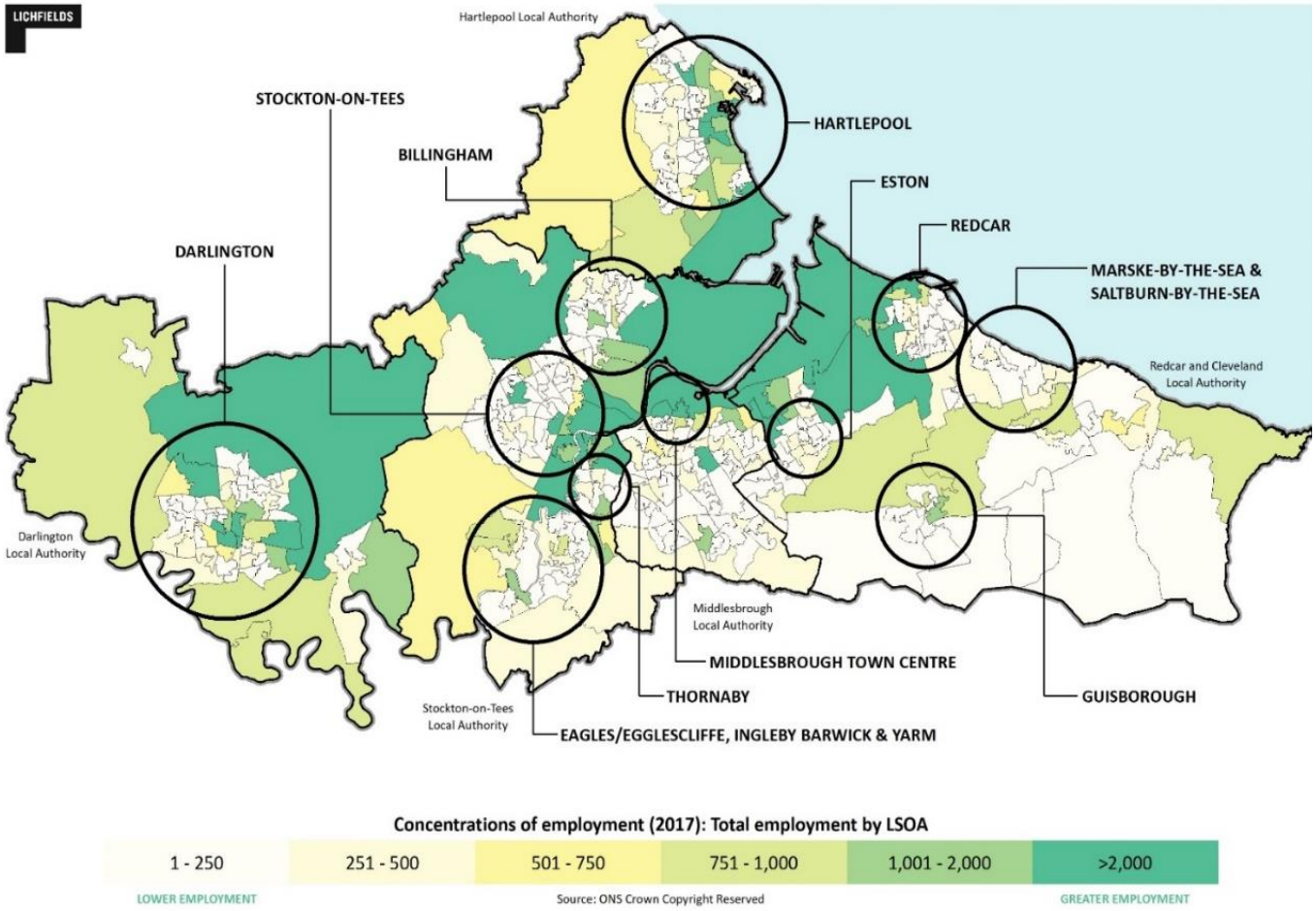
7.15 The spatial distribution of employment in Tees Valley is summarised in Figure 7.9. This highlights the polycentric nature of the settlement pattern in Tees Valley, no single centre emerging as the sub-regional focal point for employment and economic activity. Rather, the Tees Valley economy is characterised by the presence of important employment locations spread across the five local authority areas.

7.16 This includes some concentrated pockets of employment within the area's town and city centres. However, a significant number of jobs are concentrated on large business parks and industrial complexes located in less central locations (including Teesdale Business Park, Wynyard, Belasis Business Park, Wilton and the south bank of the Tees).

7.17 Qualitative intelligence gathered through the LIS process suggests that accessibility via public transport to some of these major employment locations is currently challenging and represents a potential barrier to effectively matching jobs and workers. This is a particular concern with respect to lower skilled, lower

paid employment opportunities, where workers are more likely to be reliant on public transport.

FIGURE 7.9 TEES VALLEY EMPLOYMENT CONCENTRATION



Source: ONS

Provision of Employment Space

7.18 Tees Valley has a plentiful supply of employment land. This includes a series of Enterprise Zone designations comprising over 400 hectares of land across seven sites. More detail on these sites, identified below, is available through TVCA's dedicated investment support website, Invest Tees Valley:

- Government Funded Enterprise Zone (Enhanced Capital Allowance Sites) at: Hartlepool Port Estates; New Energy and Technology Park; South Bank Wharf & Prairies; and Wilton International.
- Tees Valley Funded Zone (Business Rate Relief Sites) at: Central Park; Northshore; and Middlesbrough Historic Quarter.

7.19 In addition, the Development Corporation has been awarded £123million to begin land remediation on 4,500 acres of prime land to the south of the River Tees, providing another major development opportunity for the area. The ultimate vision for the site is:

7.20 *"To see South Tees transformed into a hotbed of new industry and enterprise for Tees Valley that makes a substantial contribution to the sustained economic growth of the area and communities it serves, through the delivery of an exemplar, world-class industrial business park that is renowned as a destination for manufacturing excellence"*[xcviii]

South Tees Development Corporation Site

The South Tees Development Corporation was launched in August 2017. It is the UK's first Special Economic Area and comprises the single biggest development opportunity in the UK today, covering 4,500 acres of land. It is also home to many thriving companies, including PD Ports, British Steel, Redcar Bulk Terminal, Northumbrian Water and BOC. The site already attracted 125+ enquiries despite the focus being on land acquisition rather than marketing to date. The Development Corporation is in discussions with 10+ live projects with a potential collective land take up of 500 acres demonstrating that the site is an internationally credible opportunity. Emerging interest to date has clustered around three themes: energy, metals and offshore wind supply chains.

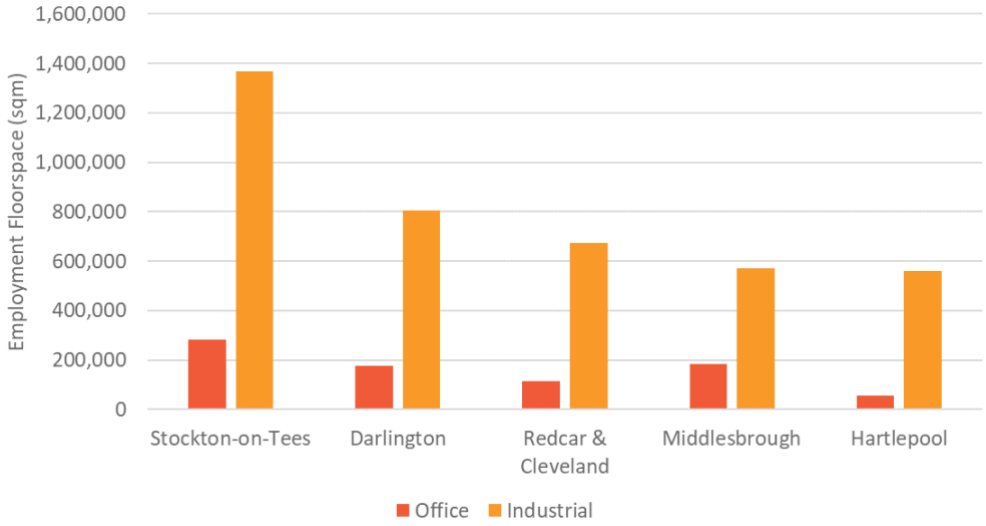
7.21 An analysis of Valuation Office Agency data (Figure 7.10) indicates that Tees Valley contains almost 4,795,000sq.m. of office and industrial floorspace, comprising of:

- 3,976,000sq.m. of industrial floorspace (83% of the total stock); and
- 819,000sq.m. of office floorspace (17% of the total stock).

7.22 This distribution reflects the industrial focus of the local economy. Stockton-on-Tees accounts for the highest absolute level of employment floorspace (1,650,000sq.m.) and a far higher level of industrial floorspace than any other Tees Valley authority. The data excludes significant levels of floorspace at Port of Tees and Hartlepool and Wilton (as well as Seal Sands), however. As a result, the importance of Redcar & Cleveland to the provision of industrial floorspace is likely to be understated.

7.23 Stockton-on-Tees also accounts for the highest absolute level of office floorspace (284,000sq.m.) – representing 17% of all employment space in the Borough. In proportionate terms, however, the economies of Middlesbrough and Darlington would appear to have a stronger office focus, with office space accounting for 24% and 22% (respectively) of employment floorspace.

FIGURE 7.10 TEES VALLEY EMPLOYMENT FLOORSPACE STOCK

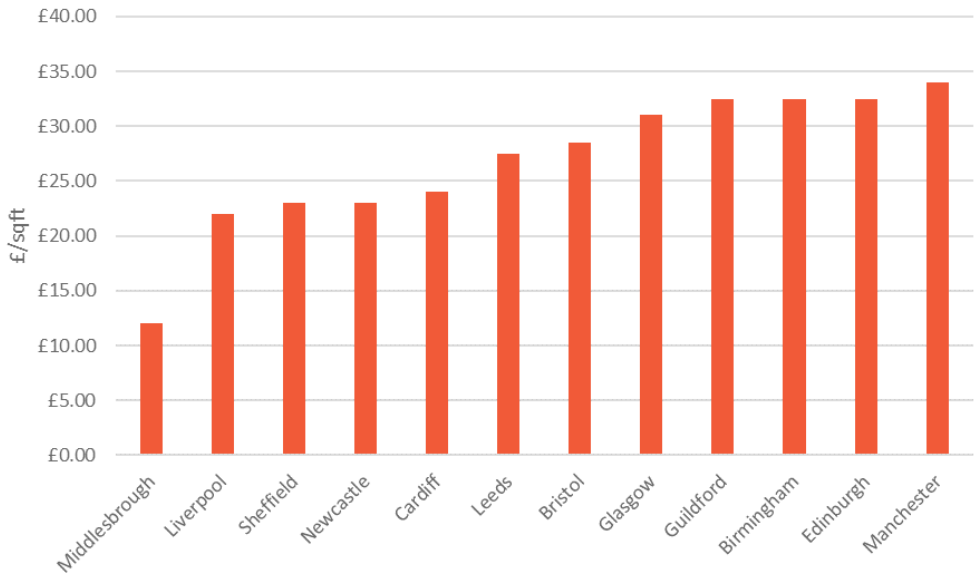


Source: Valuation Office Agency, 2016

7.24 Tees Valley is a cost competitive business location, with low labour (Table 7.1) and premises costs. It is estimated that average rental costs for Grade A office space in Middlesbrough are in the order of £12/sq.ft. (data is not available on a consistent basis for Tees Valley's other key commercial centres). This is significantly lower than the cost of premises in other major cities in the North of England and less than half the average cost identified via an assessment of key regional office markets (£26/sq.ft.)[xcix] as shown in Figure 7.11.

7.25 Whilst this should be promoted as a benefit of Tees Valley, low commercial property values do impact adversely on the viability of development where new provision is required. It is understood from previous work undertaken in the area[c] that, under current market conditions, speculative development of office and industrial space in Tees Valley generally requires some level of gap funding to be financially viable.

FIGURE 7.11 AVERAGE COST OF PRIIME OFFICE SPACE (EXCL. LONDON)



Source: BNP Paribas, 2016

Free Trade Zone Proposals

7.26 Tees Valley Combined Authority has an ambition to establish the UK's first Free Trade Zone (FTZ) using the South Tees site as a test case. This can provide a means to accelerate the growth potential of the Development Corporation site and strengthen the area's proposition to (domestic and international) inward investors.

7.27 In support of this ambition, FTZ options were presented to government in April 2019, underpinned by analysis contained within *A proposal for a national Free Zone (2019).* The document calls for a regionally targeted industrial policy response to address some of the barriers to trade, investment and regional equality that exist at the national level. Within this context, it highlights that FTZs have been used internationally to promote investment in sectors which involve international supply chains. Successful FTZs combine investment in hard and soft infrastructure with fiscal and financial incentives, whilst branding and marketing is also critically important.

7.28 Analysis contained with *A proposals for a national Free Zone (2019)* estimates that a successful FTZ in Tees Valley could create £2 billion of GVA and 32,000 jobs both directly and within local supply chains after 25 years. These benefits could reduce by half when deadweight and displacement effects are taken into account, although these effects and associated risks could be mitigated through careful incentive design and appraisal of applicants.

Culture and Leisure

Retail Provision

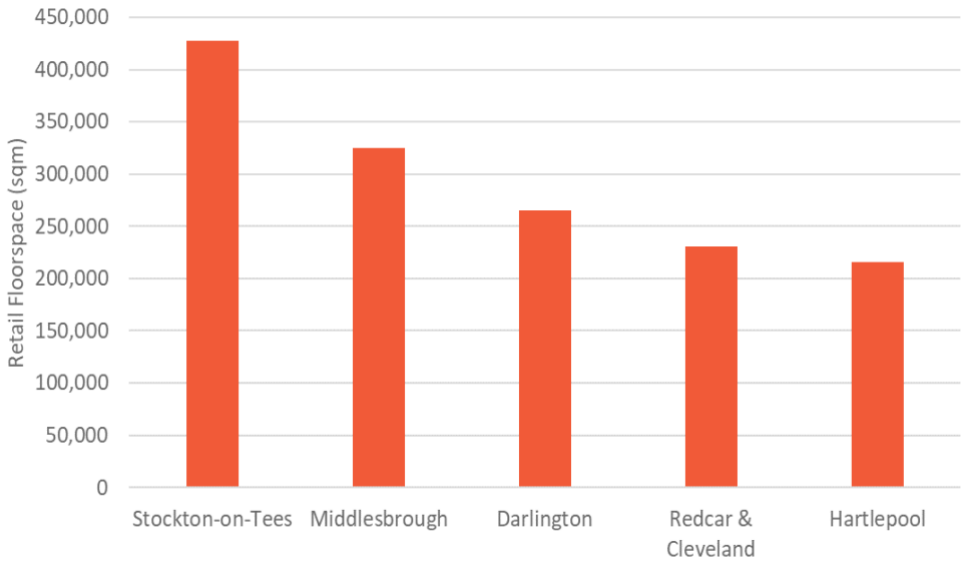
7.29 Town and city centres often serve as the focal point for the provision of retail, culture and leisure facilities in a local economy. The quality and vibrancy of an area's centres, therefore, can play a key role in supporting growth in economic output – by underpinning an attractive inward investment offer and by attract additional tourists and tourism expenditure to an area.

7.30 Data relating specifically to the culture and leisure offer of a locality is not readily available in a format that can be benchmarked against the performance of other areas. Such data is, however, available with respect to retail provision and provides a proxy measure of the overall strength of a centre. Those locations with a high volume of retail floorspace and strong representation of major, national multiples, for instance, are likely to have higher overall levels of footfall and dwell times and be capable of supporting a stronger culture/leisure/food and drink offer.

7.31 Data from the Valuation Office Agency (Figure 7.12) indicates that Tees Valley contains 1,465,000sq.m. of retail floorspace. No single authority emerges from the analysis as the dominant retail centre for the wider conurbation, which is consistent with the polycentric nature of Tees Valley's economic geography.

7.32 Stockton-on-Tees accounts for the largest share of floorspace with 428,000sq.m. (29%). However, this reflects the presence of Teesside Retail Park in addition to the scale of provision within Stockton town centre. In addition, it can be seen from Figure 7.13 that Darlington and Middlesbrough are considered to be 'stronger' town centres when the range and quality of the offer is taken into account.

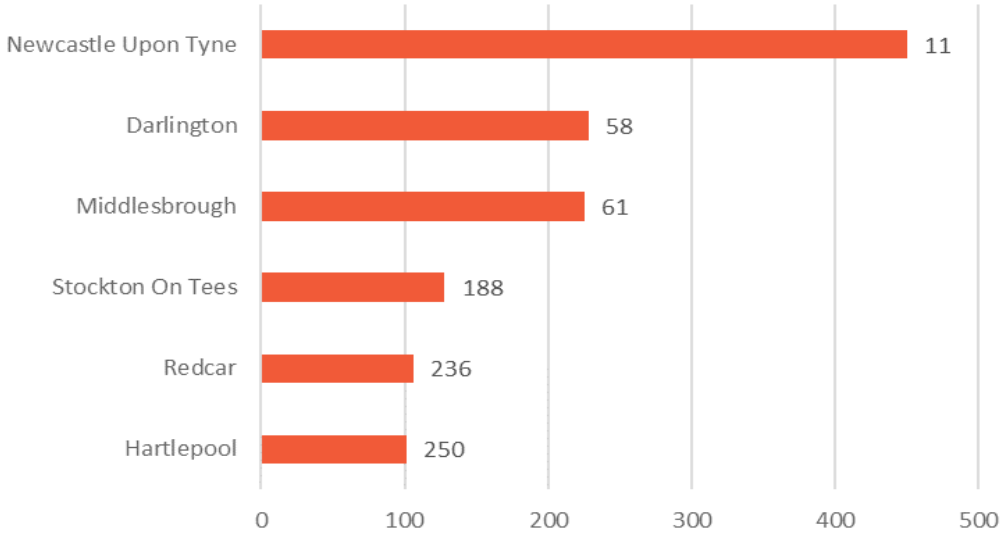
FIGURE 7.12 RETAIL FLOORSPACE STOCK



Source: Valuation Office Agency, 2016

7.33 Figure 7.13 is based upon data from Javelin VenueScore, which ranks locations according to the provision of (anchor, fashion and non-fashion) multiple retailers and foodservice outlets in order to understand the positioning of each within the wider local/national hierarchy of centres. This indicates that Darlington (ranked 58th out of over 400 council areas nationally) and Middlesbrough (ranked 61st nationally) are the strongest individual retail centres in the local area.

FIGURE 7.13 VENUESCORE FOR MAIN TEES VALLEY RETAIL CENTRES (CENTRE RANKING IN BRACKETS)



Source: Javelin VenueScore, 2016

7.34 Stakeholder consultation undertaken as part of the development of the LIS identified the need to maintain a network of vibrant and successful town and city centres, whilst acknowledging the challenges that they face from out of town retail parks and the rapid growth of online shopping. It was generally accepted, that town and city centres need to reposition themselves through the development of an experience-led offer. This is consistent with recent research[ci] which recommends that locations such as Tees Valley's main centres should look to extend the range of uses beyond retail by incorporating more leisure and cultural activity (including markets and festivals) as well as the growth of the evening and night time economy. Encouraging the temporary use of vacant units and adopting a flexible approach to the conversion of excess office space for residential is also recommended.

7.35 A number of these measures are already being successfully applied in Tees Valley, but stakeholders generally felt that more could be done moving forwards to strengthen the draw of the area's town and city cities.

Cultural Attributes

7.36 The cultural infrastructure of Tees Valley comprises of a small number of successful arts and cultural venues. This includes:

- 18 art and sculpture galleries, with the most notable being the Middlesbrough Institute of Modern Art (MIMA). MIMA is a partnership between Teesside University and Tate Plus;
- 22 cultural performance venues, including nationally recognised producing theatres in Stockton ARC and Theatre Hullabaloo in Darlington; and
- 14 museums, which collectively present the area's rich maritime and railway heritage. Head of Steam (the Darlington Railway Museum) and the National Museum of the Royal Navy, in Hartlepool, represent key assets.[cii]

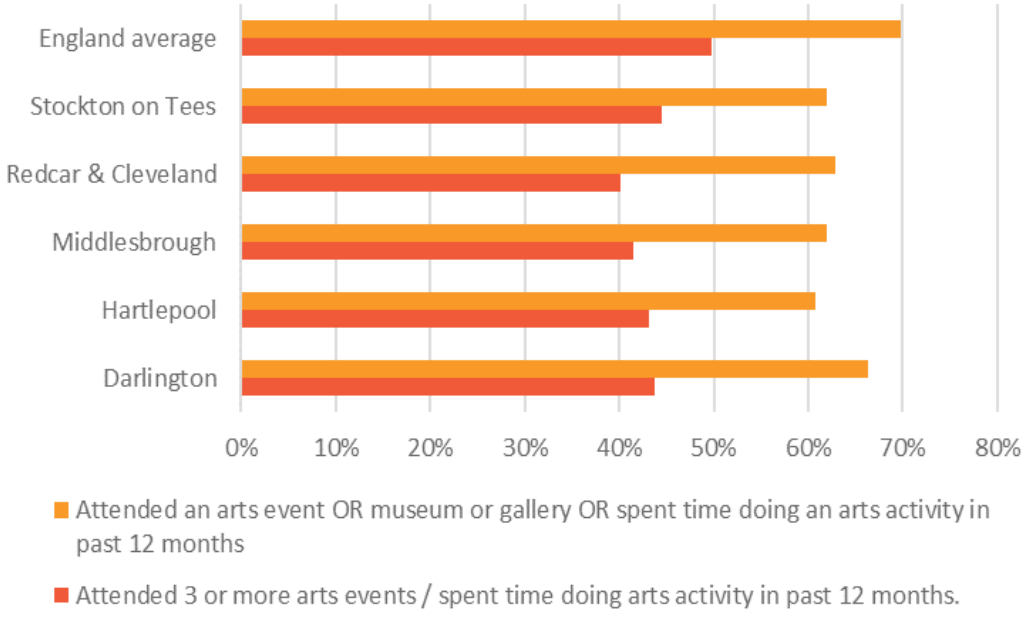
7.37 The above assets are supported by a burgeoning programme of festivals and events. Whilst numbers fluctuate year on year, it is estimate that there are approximate 140 regular events (i.e. those that take place each year). Many of the events attract a mainly local audience. Some of the higher profile events, however – such as the Festival of Thrift (45,000 visitors), Stockton International Riverside Festival (65,000 visitors), Hartlepool Waterfront Festival (15,000 visitors) and the Middlesbrough Art Weekender – are widely recognised as drawing audiences from a catchment that extends beyond Tees Valley. [ciii]

Events Programme

Tees Valley has a burgeoning programme of festivals and events including Kirkleatham's Festival of Thrift and the Stockton International Riverside Festival. In 2019, BBC Radio One's Big Weekend festival took place in Middlesbrough. Looking forwards, the area is confirmed as a host venue for the 2021 Rugby League World Cup whilst the Railway Bicentenary and bid to become UK City of Culture 2025 provide further opportunities to boost the local economy and elevate the profile of Tees Valley nationally.

7.38 Local engagement with the arts is lower than the national average. This is highlighted in the Figure below. The data shows that the proportion of residents attending art events, museums and galleries (or participating in an arts activity) in each of Tees Valley's five authorities was significantly below the corresponding figure for England.

FIGURE 7.14 TEES VALLEY ARTS ENGAGEMENT



Source: Active Lives Survey, 2017

7.39 The cultural assets outlined above are supplemented by a number of sporting facilities and attractions. This includes the Riverside Stadium (home of Middlesbrough Football Club) and championship golf courses at Rockliffe Hall, Seaton Carew and Wynyard Hall.

7.40 *Tees Valley Combined Authority Culture and Visitor Sector Analysis and Baseline Insights* acknowledges that the area has been successful in attracting a range of national level competitions in different sports:

- The 2018 European ITU Sprint Distance Triathlon Qualifier (a qualifier for the European Championships) was held on Redcar seafront;
- The 2016 British Cycling National Road Championships were held in Stockton; and
- The Middlesbrough Municipal Golf Centre has hosted the national schools golf championships and regular pro-am events. [civ]

7.41 In addition, the area is confirmed as a host venue for the 2021 Rugby League World Cup and will host the Great City Games athletics event from 2019.

Tees Valley Watersports

Tees Valley benefits from a number of watersport facilities and attractions. The Olympic standard white water rafting and kayaking course at Tees Barrage, the paddleboarding and yachting at Hartlepool Marina, the surf school at Saltburn and FlowRider at Redcar & Cleveland Leisure and Community Heart combine to form a 'thematic cluster' and a key part of the local tourism offer.

Visitor Economy

7.42 The *Tees Valley Combined Authority Culture and Visitor Sector Analysis and Baseline Insights* includes an analysis of the latest STEAM data for Tees Valley. This shows that the area attracted 19.85 million visitors in 2018 – an increase of 0.5% on the previous year. The majority of visitors (89.4%) were day visitors, with just 10.6% staying overnight.

7.43 The STEAM data indicates that the total economic impact of tourism in Tees Valley was more than £960 million in 2018 – an increase of 4.2% when compared to 2017. This is comprised of direct tourism expenditure of almost £710 million, with a further £250 million in indirect expenditure.

7.44 STEAM data presented within the *Tees Valley Combined Authority Culture and Visitor Sector Analysis and Baseline Insights* indicates that those visiting Tees Valley support 12,000 jobs, with a further 2,500 employed in the cultural sector. The report does acknowledge, however, that – in overall terms – the tourism and culture sector employs far higher numbers of employees (closer to 30,000 on the basis of data from the Business Register and Employment Survey (BRES) published by ONS).

Enjoy Tees Valley

Tees Valley visitor economy attracted 20 million visitors in 2017 – a growth rate of 6% on the previous year. The launch of the 'Enjoy Tees Valley' destination marketing offer in 2018 provides a platform for promoting the area further. Continuing to develop and grow the visitor economy in Tees Valley will create jobs in the tourism industry. In addition, by improving perceptions of the area as an attractive place to invest, work, live and visit, it can also contribute to the attraction of talent and a stronger inward investment proposition.

Natural Capital and the Economy

7.45 Natural capital – the elements of nature that directly or indirectly produce value to people – underpins wellbeing and prosperity, as well as economic growth. Natural capital can impact on productivity through a number of channels, including:

- Helping to improve natural resources and aid the delivery of carbon reduction targets;
- Building economic and infrastructure resilience (e.g. adapting to climate change); and
- Increasing an area's appeal as a healthy place to live and work – boosting its attractiveness as a location for both UK and international investment.

7.46 Tees Valley has a number of unique natural assets – distinctive components of natural capital – that act to support sustainable growth in the area. These include:

1. RSPB Saltholme;
2. Roseberry Topping;
3. Guisborough Forest and Walkway (walking and cycling);
4. Rivershack, Preston Park (river cruises and rowing boats);
5. Tees Barrage, Stockton (white water rafting, paddle boarding and power boating;
6. Hartlepool Marina (jet skiing, paddle boarding and seafaris);
7. Tees & Hartlepool Yacht Club (sailing, power boating and jet skiing);
8. Saltburn (surfing);
9. Greatham Creek (seal watching); and
10. Various parks (see below).

7.47 The area benefits from a variety of parks, including:

- Stewart Park and Fairy Dell in Middlesbrough;
- South Park in Darlington;
- Preston Park and Wynyard Woodland Park in Stockton on Tees;
- Ward Jackson Park and Summerhill Local Nature Reserve in Hartlepool; and
- Locke Park and Saltburn Valley Gardens in Redcar and Cleveland.

Summary

7.48 Key issues highlighted within the preceding paragraphs are summarised below:

1 The settlement pattern in Tees Valley is polycentric, with no single town centre acting as a focal point for the employment, retail, leisure and cultural offer of the conurbation;

2 The Tees Valley labour market is characterised by high levels of self-containment, with 87% of those residents in employment working in the area;

3 Employment within the area is principally concentrated on large business parks and industrial locations, rather than in and near to town centres;

4 The area benefits from a cost competitive housing and business accommodation offer; and

5 Tees Valley has growing visitor economy, underpinned by a burgeoning festival and events programme.

8.0 Future Position of Tees Valley

8.1 The Tees Valley SEP, refreshed in 2016, sets out a vision of future success for the area. It aims to deliver 40,000 new residents, 25,000 new jobs, 2,000 new businesses and £2.8bn of additional GVA between 2016 and 2026, whilst reducing the environmental impact of Tees Valley's industrial base. In order to do so, the SEP identifies the following targets:

- 10% increase in business density;
- 55% increase in employment density;
- 30% increase in GVA per hour;
- 20% increase in residents qualified to NVQ Level 4; and
- 25% reduction in CO_2 emissions.

8.2 These targets reflect many of the key productivity challenges facing the area, as outlined within the preceding sections. As such, whilst the LIS is underpinned by its own evidence base, which considers the local economy specifically through the lens of productivity, many of the constraints and opportunities that the LIS considers are consistent with and complementary to the overarching vision set out in the SEP.

8.3 These constraints and opportunities point towards a series of key priorities facing the Tees Valley over the period to 2030, which are outlined below.

1 Ensure that the area's existing cluster of energy intensive industries can operate as efficiently as possible. There is a shift towards such industries increasingly clustering around a smaller number of globally competitive locations. Access to competitively priced raw material and feedstocks; access to competitively priced energy and utilities; integration; and an efficient logistics infrastructure are critical to an area's proposition. Tees Valley is faced with a choice: address these issues (through industrial decarbonisation and other initiatives) to underpin an established sector strength; or see the area's competitive advantage in the field eroded;

2 The UK and global economies are on the cusp of a fourth industrial revolution – driven by digital data, connectivity and robotics[cv]. Tees Valley, with its existing strengths in advanced manufacturing and an established digital sector should look to fully embrace the opportunities presented by industrial digitalisation as a means of moving businesses up the value chain. Failure to do so risks continued decline and sluggish productivity growth in the advanced manufacturing sector;

3 Develop the business base to increase business density and continue the transition away from the area's legacy of large-scale corporate industry and foreign ownership. Successfully growing the indigenous business base offers the potential to deliver greater sectoral diversity (hedging against the impact of economic shocks); and ensures that firms are more effectively embedded in the area;

4 Harness the full potential of the existing innovation ecosystem to maximise opportunities to land inward investment spin-outs and support indigenous businesses to increase their R&D intensity. This will need to be supported

by a range of interventions aimed at both facilitating cultural change and ensuring access to the necessary finance and support;

5 Address the skills and labour market issues currently constraining business and productivity growth. This includes ensuring that businesses have access to the pipeline of talent required to address existing gaps and replacement demand challenges, as well as supporting people into entry level employment by addressing issues related to lower level skills and low aspiration;

6 Ensure that people can move around Tees Valley as easily as possible, whilst also improving external connectivity/linkages. This will help to address issues of low labour market participation (by connecting those out of work with employment opportunities) and deliver business/productivity growth by extending the geographical reach of labour markets in order to better match jobs with the requisite skills; and

7 Explore opportunities to support the continued growth of critical economic infrastructure including Port of Tees and Hartlepool and Durham Tees Valley Airport in order to maintain the area's exporting strengths.

[i] *Industrial Strategy: Building a Britain fit for the future, HM Government (November 2017)*
[ii] *Local Industrial Strategies: Policy Prospectus, HM Government (October 2018)*
[iii] *Note that five of the Enterprise Zone Sites identified in this graphic have now ceased to be. The remaining seven are identified in section 7.18*
[iv] *Benchmarking Skills and Productivity, Smart Specialisation Hub (November 2018)*
[v] *Tees Valley: Opportunity Unlimited, The Rt Hon the Lord Heseltine of Thenford CH (June 2016)*
[vi] *Tees Valley: Opportunity Unlimited, The Rt Hon the Lord Heseltine of Thenford CH (June 2016)*
[vii] *Tees Valley: Opportunity Unlimited, The Rt Hon the Lord Heseltine of Thenford CH (June 2016)*
[viii] *Tees Valley: Opportunity Unlimited, The Rt Hon the Lord Heseltine of Thenford CH (June 2016)*
[ix] *Vince Cable, MP*
[x] *Department for Transport, Port Table 0101. Based upon total outward freight (tonnes)*
[xi] *https://www.ecb.europa.eu/explainers/tell-me-more/html/growth.en.html*
[xii] *Based upon analysis of Innovate UK data and ONS Job Density data*
[xiii] *Higher Education Business and Community Interaction Survey (2015/16)*
[xiv] *Smart Specialisation Hub, LEP Profiles (Tees Valley)*
[xv] *Tees Valley Economic Assessment (2018) – based upon analysis from the Smart Specialisation Hub*
[xvi] *Tees Valley Combined Authority: Specialist data requirements to inform the Local Industrial Strategy, Professor Richard Harris, Durham University Business School (2019)*
[xvii] *R&D stock per unit of sales*
[xviii] *Northern Powerhouse Chemical and Process Sector Science and Innovation Audit (2018)*
[xix] *It should be noted that sample sizes vary by sector*
[xx] *Source: Higher Education Business and Community Interaction Survey (2015/16)*
[xxi] *ONS Job Density data shows there are 293,000 jobs in Tees Valley*
[xxii] *What does the 2.4% of GDP R&D Expenditure Target Mean for Places? Smart Specialisation Hub (January 2019)*
[xxiii] *Delivering change: Supporting links between universities and high-growth firms in cities, Centre for Cities (April 2014)*
[xxiv] *Digital Sector Action Plan, Tees Valley Combined Authority (June 2018)*
[xxv] *£10 million of direct funding is available from ERDF, with the remainder comprised primarily of private sector match funding*
[xxvi] *Benchmarking Skills and Productivity, Smart Specialisation Hub (November 2018)*
[xxvii] *ONS, Annual Population Survey, 2018 data*
[xxviii] *Department for Education (2017/18)*
[xxix] *ONS Annual Population Survey, 2017 data*
[xxx] *DfE Employer Skills Survey 2017*
[xxxi] *ONS Annual Population Survey (2018)*
[xxxii] *ONS Annual Population Survey (2018)*
[xxxiii] *Tees Valley Economic Assessment (2018) Section 7.1a*
[xxxiv] *Tees Valley Economic Assessment (2018) Section 7.1a*
[xxxv] *Tees Valley Economic Assessment (2018) Section 7.1b*
[xxxvi] *Tees Valley Economic Assessment (2018) Section 7.1b*
[xxxvii] *Department for Education, 2018 data*
[xxxviii] *Tees Valley Economic Assessment, Section 7.4*
[xxxix] *Higher Education Statistics Agency*
[xl] *Tees Valley Higher Education (December 2018) Section 14*
[xli] *Tees Valley Higher Education Report, Tees Valley Combined Authority (December 2018)*
[xlii] *Advanced Manufacturing Sector Action Plan, Tees Valley Combined Authority (March 2018)*
[xliii] *HMRC Regional Trade Statistics*
[xliv] *ONS, UK Trade in Goods*
[xlv] *Analysis presented within this paragraph comprises of HMRC and ONS data. The two datasets are not directly comparable due to underlying methodological differences, but represent a 'best fit' due to data availability limitations*
[xlvi] *ScaleUp Insights, ScaleUp Institute (March 2019)*
[xlvii] *Annual ScaleUp Review, ScaleUp Institute (November 2018)*

[xlviii] *Annual ScaleUp Review, ScaleUp Institute (November 2017)*
[xlix] *Tees Valley Combined Authority: Specialist data requirements to inform the Local Industrial Strategy, Durham University Business School (2019)*
[l] *SME Innovation, Exporting and Growth ERC White Paper No 5, Enterprise Research Centre (2013)*
[li] *Source: Durham University Business School (2019)*
[lii] *Source: Durham University Business School (2019). Based upon data from the ONS Annual Business Survey, Secure Access (9th Edition)*
[liii] *Source: Tees Valley Economic Assessment (2018) Section 4.6.*
NB – data regarding the export of services is only available at the regional level and has been excluded from the analysis within this document
[liv] *Tees Valley Combined Authority: Specialist data requirements to inform the Local Industrial Strategy, Durham University Business School (2019)*
[lv] *Opportunities for the Tees Valley Bioscience Sector, Teesside University (2019)*
[lvi] *Opportunities for the Tees Valley Bioscience Sector, Teesside University (2019)*
[lvii] *Opportunities for the Tees Valley Bioscience Sector, Teesside University (2019)*
[lviii] *Tees Valley Combined Authority: Specialist data requirements to inform the Local Industrial Strategy, Durham University Business School (2019)*
[lix] *It should be noted that data for the biosciences sector is not directly comparable with other sectors (due to definitional issues) and is based upon research from Durham University which does not provide full coverage of GVA. Further, the figure relates to the North of England, rather than Tees Valley due to sample size issues.*
[lx] *Whilst Marlow Foods' HQ is located just outside of Tees Valley, all manufacturing expertise is based on Tees Valley sites*
[lxi] *The Clean Growth Strategy: Leading the way to a low carbon future, HM Government (October 2017)*
[lxii] *What is the Industrial Clusters mission? HM Government*
[lxiii] *What is the Industrial Clusters mission? HM Government*
[lxiv] *Designing the Industrial Energy Transformation Fund, HM Government (2019)*
[lxv] *Process, Chemicals and Energy: Sector Action Plan, Tees Valley Combined Authority (2018)*
[lxvi] *Tees Valley Combined Authority: Low carbon industrial cluster sector research, KPMG (September 2018)*
[lxvii] *Designing the Industrial Energy Transformation Fund: Informal Consultation, Department for Business, Energy and Industrial Strategy (2019)*
[lxviii] *Process, Chemicals and Energy Sector Action Plan, Tees Valley Combined Authority (2018)*
[lxix] *Offshore Wind Opportunities in Tees Valley: An Overview, Tees Valley Unlimited*
[lxx] *https://teesvalley-ca.gov.uk/business/key-sectors/energy-and-renewable/*
[lxxi] *Offshore Tees Valley: A World Class Offshore Sector, Tees Valley Combined Authority*
[lxxii] *Decommissioning Insight, Oil and Gas UK (2017)*
[lxxiii] *Mapping Circular Economy Activity in the UK, Smart Specialisation Hub (January 2019)*
[lxxiv] *The UK chemicals and process supply chain for battery manufacture, UK Advanced Propulsion Centre (2018)*
[lxxv] *Based upon a literature review undertaken by as part of a confidential exercise. Further details available upon request*
[lxxvi] *Source data as follows:*
Ultrafast and Superfast broadband coverage: thinkbroadband.com
Average speed on local 'A' roads: Department for Transport
Average journey to work time: Labour Force Survey
Travel to work by mode: Office for National Statistics
[lxxvii] *Source: ONS*
[lxxviii] *Census 2011 data, as presented in Connecting the Tees Valley: Strategic Transport Plan, Tees Valley Combined Authority (2019)*
[lxxix] *Tees Valley Economic Assessment (2018) Chart 8.2*
[lxxx] *Congestion and Reliability Statistics, Department for Transport*
[lxxxi] *Strategic Transport Plan, Transport for the North*
[lxxxii] *Quick Wins for the North's Transport Network, IPPR (March 2019)*
[lxxxiii] *Congestion and Reliability Statistics, Department for Transport*
[lxxxiv] *Strategic Transport Plan, Transport for the North*

[lxxxv] *Connecting the Tees Valley: Rail Strategy, Tees Valley Combined Authority (2019)*
[lxxxvi] *Connecting the Tees Valley: Draft Rail Strategy, Tees Valley Combined Authority (2019)*
[lxxxvii] *Office of Rail and Road, 2016/17*
[lxxxviii] *Quick Wins for the North's Transport Network, IPPR (March 2019)*
[lxxxix] *Connecting the Tees Valley: Draft Strategic Transport Plan, Tees Valley Combined Authority (2018)*
[xc] *Connecting the Tees Valley: Rail Strategy, Tees Valley Combined Authority (2019)*
[xci] *Connecting the Tees Valley: Freight Strategy, Tees Valley Combined Authority (2019)*
[xcii] *Department for Transport Freight Statistics, as presented in the Tees Valley Economic Assessment (2018)*
[xciii] *Delivering Digital Infrastructure, World Economic Forum (2013)*
[xciv] *Liveanomics: Urban liveability and economic growth, Economist Intelligence Unit (2011)*
[xcv] *UK Total Office Occupancy Costs, BNP Paribas Real Estate (September 2016)*
[xcvi] *Tees Valley Economic Assessment (2018) Table 9.1*
[xcvii] *Active Lives Survey (January 2018)*
[xcviii] *https://www.southteesdc.com/about-us/about-us/*
[xcix] *UK Total Office Occupancy Costs, BNP Paribas Real Estate (September 2016)*
[c] *Stockton-on-Tees Employment Land Review, Lichfields (October 2016)*
[ci] *The Future of our Town and City Centres, Key Cities*
[cii] *Tees Valley Combined Authority Culture and Visitor Sector Analysis and Baseline Insights, Amion Consulting (2019)*
[ciii] *Tees Valley Combined Authority Culture and Visitor Sector Analysis and Baseline Insights, Amion Consulting (2019)*
[civ] *Tees Valley Combined Authority Culture and Visitor Sector Analysis and Baseline Insights, Amion Consulting (2019)*
[cv] *https://innovateuk.blog.gov.uk/2017/03/28/what-does-the-fourth-industrial-revolution-4ir-mean-for-uk-business/*