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<td>Low Carbon &amp; Environmental Technologies</td>
<td>132-142</td>
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<td>143-153</td>
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</tbody>
</table>

## Acknowledgement of Data/Evidence Input
Black Country Consortium Economic Intelligence Unit
Black Country LEP
West Midlands Growth Company
Coventry & Warwickshire LEP
Greater Birmingham & Solihull LEP
Warwickshire County Council
Evidence Base Approach/Process

1a) Mapping of existing evidence (March)
1b) Review of evidence gaps (March/April)
1c) Updated Evidence Base (May)

2a) Sector Action Plan development (April)
2b) Sector Action Plans (June-September)

Grand Challenges impact, via academia
Strategic Economic Plan (SEP) Evidence: Transformational Sectors

GVA - £52.6bn
- Logistics & Transport Technologies £7.3bn (14%)
- Advanced Manufacturing £8.6bn (16%)
- Low Carbon & Environmental Technologies £2.6bn (5%)
- Life Sciences & Healthcare £6.1bn (12%)
- Digital & Creative £3.8bn (7%)
- Construction (Building Technologies) £4.5bn (9%)

Growth - 2030
+£59.1bn

Jobs - 1,117,000
- Low Carbon & Environmental Technologies 23,000 Jobs (2%)
- Advanced Manufacturing 184,000 Jobs (16%)
- Logistics & Transport Technologies 153,000 Jobs (14%)
- Life Sciences & Healthcare 249,000 Jobs (22%)
- Business, Professional & Financial Services 318,000 Jobs (28%)
- Construction (Building Technologies) 119,000 Jobs (11%)

Jobs Growth - 2030
+349,000

Note: Data displayed here is for 2013 and therefore doesn’t match with 2015 data used in these slides
SEP Evidence: Enabling Sectors

GVA - £25bn
- Retail: £11.1bn (44%)
- Public Sector inc. Education: £10.8bn (43%)
- Cultural Economy inc. Sports: £3.1bn (13%)

Growth - 2030
+£15.6bn

Jobs - 782,000
- Retail: 316,000 Jobs (40%)
- Public Sector inc. Education: 318,000 Jobs (41%)
- Cultural Economy inc. Sport: 148,000 Jobs (19%)

Jobs Growth - 2030
+155,000

Note: Data displayed here is for 2013 and therefore doesn’t match with 2015 data used in these slides
## Summary Statistics Across LIS Sectors (Current)

### WMCA Sectors

<table>
<thead>
<tr>
<th>WMCA Sectors</th>
<th>GVA (£m, 2015)</th>
<th>%</th>
<th>Jobs (2015)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core Sectors &amp; Sub-Sectors (7 Transformational Sectors &amp; relevant sub-sectors)</strong></td>
<td></td>
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<tr>
<td>WMCA Total</td>
<td>£62,294</td>
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<td>1,252,215</td>
<td>62.6%</td>
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<td><strong>Advanced Manufacturing and Engineering</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive</td>
<td>£3,150</td>
<td>3.7%</td>
<td>46,500</td>
<td>2.3%</td>
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<tr>
<td>Rail</td>
<td>£32</td>
<td>0.04%</td>
<td>470</td>
<td>0.02%</td>
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<tr>
<td>Aerospace</td>
<td>£305</td>
<td>0.4%</td>
<td>4,500</td>
<td>0.2%</td>
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<td>Food &amp; Drink</td>
<td>£1,035</td>
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<td>20,683</td>
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<tr>
<td>Metals &amp; Materials</td>
<td>£4,047</td>
<td>4.7%</td>
<td>74,239</td>
<td>3.7%</td>
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<tr>
<td>Other Manufacturing</td>
<td>£2,057</td>
<td>2.4%</td>
<td>34,803</td>
<td>1.7%</td>
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<td>Machinery</td>
<td>£1,152</td>
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<td>17,000</td>
<td>0.8%</td>
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<td>Other Transport-Manufacturing</td>
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<td>1,400</td>
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<tr>
<td>Agriculture</td>
<td>£236</td>
<td>0.3%</td>
<td>10,996</td>
<td>0.5%</td>
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<td><strong>Business, Professional and Financial Services</strong></td>
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</tr>
<tr>
<td>Financial Services</td>
<td>£4,459</td>
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<td>56,265</td>
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<td>Real estate and Associated Consultancy</td>
<td>£10,457</td>
<td>12.2%</td>
<td>66,442</td>
<td>3.3%</td>
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<tr>
<td>Recruitment and HR</td>
<td>£1,583</td>
<td>1.8%</td>
<td>65,779</td>
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<td>Advertising and Market Research</td>
<td>£229</td>
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<td>7,148</td>
<td>0.4%</td>
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<td>Support Services</td>
<td>£2,576</td>
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<td>70,736</td>
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<td>Other Service Activities</td>
<td>£3,511</td>
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<td>96,478</td>
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<tr>
<td><strong>Construction (Building Technologies)</strong></td>
<td>£7,089</td>
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<td>186,615</td>
<td>9.3%</td>
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<tr>
<td><strong>Digital &amp; Creative</strong></td>
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<tr>
<td>Digital</td>
<td>£3,203</td>
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<td>46,061</td>
<td>2.3%</td>
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<tr>
<td>Creative</td>
<td>£1,445</td>
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<td>28,856</td>
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<td><strong>Life Sciences &amp; Healthcare</strong></td>
<td>£6,223</td>
<td>7.2%</td>
<td>228,289</td>
<td>11.4%</td>
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<tr>
<td>Logistics &amp; Transportation</td>
<td>£4,718</td>
<td>5.5%</td>
<td>122,630</td>
<td>6.1%</td>
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<tr>
<td>Low Carbon and Environmental Technologies</td>
<td>£3,356</td>
<td>3.9%</td>
<td>24,533</td>
<td>1.2%</td>
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<tr>
<td>Energy</td>
<td>£2,139</td>
<td>2.5%</td>
<td>11,913</td>
<td>0.6%</td>
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<td>Water &amp; Waste Activities</td>
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<td><strong>Supporting Sectors (3 Enabling Sectors)</strong></td>
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<td>162,769</td>
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<td>Retail</td>
<td>£10,101</td>
<td>11.8%</td>
<td>325,656</td>
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<td><strong>Total (All 10 Sectors)</strong></td>
<td>£85,736</td>
<td>100%</td>
<td>2,001,657</td>
<td>100%</td>
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</table>

*Source: Oxford Economic Model, via Black Country Economic Intelligence Unit Analysis*

% of GVA and jobs is calculated from the total of all sectors

The blue shaded sectors are part of current WMCA LIS sector action plans
Economic Modelling

WMCA SEP – Economy Plus approach

WMCA GVA Per Head – Summary Scenarios

- **UK**
- **WMCA Trend**
- **WMCA 3 LEP SEP**
- **WMCA SEP**
## Summary Statistics Across LIS Sectors (2030 Ambitions)

<table>
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<th>WMCA Sectors</th>
<th>GVA (£m, 2030 ambition)</th>
<th>% Change required 2015</th>
<th>WMCA Total</th>
<th>% Change required 2015</th>
<th>Jobs (2030)</th>
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<td>WMCA Total</td>
<td>£113,438</td>
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<td>+£51,144</td>
<td>63.5%</td>
<td>+£273,087</td>
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<td>Advanced Manufacturing and Engineering</td>
<td>£18,562</td>
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<td>+£6,452</td>
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<td>Automotive</td>
<td>£3,790</td>
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<td>+£1,019</td>
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<td>Rail</td>
<td>£38</td>
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<td>+£6</td>
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<td>Aerospace</td>
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<td>0.2%</td>
<td>+£62</td>
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<td>Food &amp; Drink</td>
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<td>-3,876</td>
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<td>Other Transport manufacturing</td>
<td>£114</td>
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<td>+£19</td>
<td>0.04%</td>
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<td>WMCA Total</td>
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<td>+£566</td>
<td>0.6%</td>
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<td>Support services</td>
<td>£6,857</td>
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<td>+£4,282</td>
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<td><strong>Construction (Building Technologies)</strong></td>
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<td>WMCA Total</td>
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<td>+£3,802</td>
<td>9.7%</td>
<td>+47,550</td>
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<tr>
<td>WMCA Total</td>
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<td>+£6,349</td>
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<td>Digital</td>
<td>£7,855</td>
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<td>+£4,652</td>
<td>2.6%</td>
<td>+15,408</td>
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<tr>
<td>Creative</td>
<td>£3,142</td>
<td>2.1%</td>
<td>+£1,657</td>
<td>1.3%</td>
<td>+1,946</td>
</tr>
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<td>Life Sciences &amp; Healthcare</td>
<td>£12,114</td>
<td>7.9%</td>
<td>+£5,892</td>
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<td>+95,507</td>
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<td>+£2,372</td>
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<td>+2,846</td>
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<td>Low Carbon and Environmental Technologies</td>
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<td>3.1%</td>
<td>+£1,443</td>
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<td>Energy</td>
<td>£2,821</td>
<td>1.8%</td>
<td>+£683</td>
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<td>Water &amp; Waste Activities</td>
<td>£1,978</td>
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<td>+£760</td>
<td>0.5%</td>
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<td><strong>Supporting Sectors (3 Enabling Sectors)</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>WMCA Total</td>
<td>£39,241</td>
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<td>+£15,799</td>
<td>36.5%</td>
<td>+128,000</td>
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<tr>
<td>Tourism (Cultural Economy including Sports)</td>
<td>£6,070</td>
<td>4.0%</td>
<td>+£2,547</td>
<td>8.9%</td>
<td>+51,000</td>
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<td>Public Sector inc. Education</td>
<td>£10,963</td>
<td>7.2%</td>
<td>+£1,145</td>
<td>10.7%</td>
<td>-4,000</td>
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<td>Retail</td>
<td>£22,208</td>
<td>14.5%</td>
<td>+£12,107</td>
<td>16.9%</td>
<td>+82,000</td>
</tr>
</tbody>
</table>

**Total (All 10 Sectors)**: £152,679 100% +£66,943 2,402,979 +£401,000

Source: Oxford Economic Model, via Black Country Economic Intelligence Unit Analysis

% of GVA and jobs is calculated from the total of all sectors.
The blue shaded sectors are part of current WMCA LIS sector action plans.

West Midlands Combined Authority

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SUMMARY OF INCLUSIVE GROWTH:

The West Midlands Combined Authority (WMCA) is a strategic partnership of seven local authorities focused on delivering inclusive economic growth. This summary presents key statistical insights across several sectors aiming to achieve 2030 ambitions, with particular emphasis on net job growth and sectoral contributions.

### Key Points:

- **GVA (Total £152,679m):** The grand total for all sectors across the WMCA aims for a 100% increase by 2030.
- **Jobs (Total 2,402,979):** Similarly, the target is a 100% increase in employment across all sectors.
- **Change Required:** This indicates the additional investment or growth needed to meet these ambitious targets, with emphasis on sectors such as Advanced Manufacturing and Engineering, Business, Professional and Financial Services, Construction, and Digital & Creative sectors.

The table highlights core sectors and sub-sectors, alongside supporting sectors, identifying their contributions and required changes to meet the 2030 ambitions.

### Reporting:

- **Source:** Oxford Economic Model, via Black Country Economic Intelligence Unit Analysis

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**Note:** The data presented is a projection aiming to illustrate growth potential and required investments, not an actual financial report, ensuring a clear and effective vision for the future economic landscape of the West Midlands region.
## WMCA LIS Sectors & Sub-Sectors

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Sub-sector Specialisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Manufacturing</td>
<td>Automotive</td>
</tr>
<tr>
<td></td>
<td>Rail</td>
</tr>
<tr>
<td></td>
<td>Aerospace</td>
</tr>
<tr>
<td></td>
<td>Food and Drink</td>
</tr>
<tr>
<td></td>
<td>Metals and Materials</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
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<tr>
<td>Business and Professional Services</td>
<td>Financial Services</td>
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<td>Legal &amp; Accounting</td>
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<tr>
<td>Low Carbon &amp; Environmental</td>
<td>Energy</td>
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<tr>
<td>Logistics and Transport Technology</td>
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<td>Life Sciences</td>
<td>Diagnostics and Trials</td>
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<td></td>
<td>Devices</td>
</tr>
<tr>
<td>Tourism</td>
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</tr>
</tbody>
</table>
Supporting Sector Evidence Base – All Sectors

### Ideas

**WMCA Science & Innovation Audit**
- Scale & concentration of activity in WMCA, description of supportive assets & academic output

### People

**Oxford Economic Model**
- Jobs by sub-sectors, occupations by sub-sectors & geographies

**ESFA Data cube**
- FE provision data (inc. apprenticeships) across subjects/sectors

**HESA data**
- HE provision data across subjects/sectors

**Black Country Skills Factory supply/demand matrix**
- Employer demand mapped against FE provision

**NOMIS analysis**
- Jobs, qualifications, earning, business counts etc

**Labour Insight**
- Job vacancy data from Burning Glass – skills, qualifications, sectors, job titles and more

**NOMIS analysis**
- Detailed occupational and sectoral datasets – incl. wages, LQ’s, qualifications

### Business Environment

**Oxford Economic Model**
- GVA and productivity by sub-sectors & geographies

**HVM City platform**
- Supply chain portal hosting company & projects details

**‘FAME’ database access**
- Detailed company information, allows assessment of local strategic companies and details such as their ownership structure.

**West Midlands Growth Company research**
- Including knowledge of successful FDI projects

**IDBR – Coventry & Warwickshire**
- Government Business Register - Detailed company information; including location, full-time and part-time employees and sector

**Chamber Quarterly Economic Survey (QES)**
- Local business confidence survey

### Places

**Spatial analysis of companies and assets**
- Mapping of companies across sectors

**GIS**
- Detailed labour market analysis of areas located within 1 hour drive/train from WMCA
Advanced Manufacturing & its Sub-Sectors
DELIVERING INCLUSIVE GROWTH

Advanced Manufacturing & Engineering (AME) Summary Statistics (Current)

- £12.1bn WMCA GVA is attributed to AME, which is 14.1% of the whole economy. This makes AME the second largest sector behind BPFS. The 2030 GVA ambition for this sector is £18.6bn
- There are 209,000 jobs attributed to AME in the WMCA area, 10.5% of overall employment.
- Since 2010, GVA in AME has grown over 30% in the WMCA, far higher than the 5% growth for the sector in the UK overall.
- The WMCA has much more jobs reliant on key AME sectors than the UK overall: transport & machinery (inc. automotive, aerospace & rail) makes up 3.4% of jobs in the WMCA compared to 1.4% in the UK overall.
- The AME sub-sectors included for the LIS (see slide 4) make up 71% of GVA (£8.6bn) and 70% of jobs (146,000).

Source: Oxford Economic Model, via Black Country Economic Intelligence Unit Analysis
Previous deep-dive analysis on the sector (2013 data)

Source: Oxford Economic Model, via Black Country Economic Intelligence Unit Analysis
SECTOR SCOREBOARD - Advanced Manufacturing & Engineering

Source: FAME Database
Automotive
WMCA Automotive Cluster

- In 2016 UK automotive manufacturers produced 1.8m vehicles; operations in the WMCA area produce around 1/3 of these.
- These include Jaguar Land Rover’s Castle Bromwich and Solihull plants, Geely’s LEVC in Coventry and Aston Martin in Gaydon.
- Automotive supply chain companies are a large part of the region’s cluster. 21.2% of all the UK’s motor vehicle parts & accessories manufacturing businesses are situated in the West Midlands region – the most of any of the 12 UK regions.

- UK produces 2.5m engines (2016) per year, over 500,000 units in the West Midlands, at i54 (JLR) and Hams Hall (BMW).
- The West Midlands is the centre of UK Auto R&D; major centres include HORIBA-MIRA, Ricardo and the APC, NAIC and the NTDC. The region leads the way in CAV & drivetrain technology including battery.
- Location quotient of 4.5 (7MET, 2015) – the highest of all sectors in WMCA and second highest LQ for automotive in UK.
OEM Vehicle and Off-Highway Brands in the WMCA Area
Strong Comparative Advantage

Supply Chain (tiers 1-3):
Manufacture of parts and accessories for motor vehicles

- C&W LQ 5.54
- WMCA LQ 3.84
- West Mids LQ 3.71

OEM vehicle makers:
Manufacture of motor vehicles

- C&W LQ 12.78
- WMCA LQ 5.78
- West Mids LQ 4.44

LQ – Location Quotient, WMCA – Combined Authority constituent members
Source: EMSI
Connected Autonomous Vehicles

Powertrain and Battery Propulsion

Prototyping & Product Development

Key automotive sub-sector specialisms
• £970bn global market by 2035, 50,000 UK jobs and £9bn GVA (£1-2bn UK) – CAV Vehicles and CAV Technologies.
  *Excludes new business models and mobility as a service*

• Major centres of CAV R&D at HORIBA-MIRA and WMG, University of Warwick.
  Potential for CAV application in agriculture with Harper Adams.

• WMCA area home to the UK’s two main CAV vehicle manufacturers, Westfield and RDM

• Meridian is a £100 million initiative through UK Government to develop a coordinated national platform of CAV testing infrastructure, from London along the M40 corridor to Coventry, Meridian is based at University of Warwick

• 4 Major CAV trials here: UK CITIE, UK Autodrive, UK Central CAV Testbed and TIC-IT

• JLR and Waymo partnership to trial 20,000 driverless Jaguar i-Pace

• MIRA Technology Park is a 2msqft R&D campus, supplemented by the new 92 acre Southern Manufacturing Site (SMS). MIT spinout companies among those setting up there.

• New National Automotive Innovation Campus at the University of Warwick is Europe’s largest auto R&D facility, and will drive new technologies

• SMART Mobility plan of WMCA, Midlands Connect and 5G digital infrastructure among opportunities for region with CAV

• Opportunities for links to Silicon Spa, Silicon Canal, Innovation Birmingham and AR/VR/ Simulation
Powertrain and Battery Propulsion

- Rapid growth in global EV sales: 1m units 2015 and 2m by 2016
- One third of sales in China; Norway 29% market share, followed by Netherlands 6.4%
- Challenge of charging infrastructure
- Existing WMCA area OEMs all developing Evs: Aston Martin and Jaguar Land Rover; BMW manufactures their flagship i8 hybrid powertrain at Hams Hall
- WMCA area attracting new EV investments, such as Geely LEVC, Detroit Electric and China Red Sun
- Cluster of powertrain tiers 1s: Delphi, Changan, Ricardo, Emerald Auto, WMG and recent announcements from FEV, Hofer Powertrain and AVL
- Innovative SMEs like Adelan, Sirius Automotive and Vehicle Repowering Solutions
- Strengths in universities and centres of excellence such as APC, and new facilities like NAIC
- UK Battery Industrialisation Centre opportunity to grow EV powertrain, attract battery manufacture
- Opportunities in EV power in off highway (e.g. JCB) and rail (Viva Rail electric D-Train, WMG Revolution very light rail
- EV light commercials – WMCA now home to Geely LEVC with scalable EV CV platform, fully electric Dynamo taxi and new £100m Metrocab Ecovotive CV platform
- Opportunity/ need to help existing diesel/ petrol supply chain to adapt to new hybrid and electric future. New supply chain opportunities
- Challenge to provide enough power for battery manufacture and other modern powertrain; challenge to create charging infrastructure
- Site of first purpose built EV factory in Geely London Electric Vehicle Company £320m facility to build new Txe City electric hybrid taxi
• The WMCA area has the deepest, most diverse auto supply chain in UK
• Includes product design and powertrain engineering, prototype, test, low and volume build, light-weighting, BIW, interior trim, cyber and software
• Specialist auto engineering companies include Envisage, CadCam and HORIBA-MIRA, Ricardo, Multimatic,
• Prototype companies include HPL Prototypes, Arrk Europe
• Opportunities to further reshore supply chain, above the current 44%; WMCA proximity to OEM manufacturing sites
• Nissan is asking for £100m to help reshoring process
• UK supply chain gaps include forging of parts such as crankshafts; alloy wheels (Rimstock in the Black Country service the high end of the market); battery manufacture
Automotive: Spatial Focus

Super Strengths

**Connected & Autonomous Vehicles (CAV)**
- Leading location in UK for CAV R&D, including at WMG & Horiba Mira
- World-class testbeds for developing the next generation CAVs
- Private sector engagement with technology developments

**Powertrain and Battery Propulsion**
- Home to Multiple Low Carbon Centres of Excellence, and UKBIC from 2019
- Presence of companies developing EVs, and the first UK purpose built factory for EVs
- Integrated automotive supply chain supporting this development.

**Prototyping & Product Development**
- The WMCA features in all parts of the automotive process from component design to manufacturing commercial, motorsport and military land vehicles.
- Underpinned by a strong metals/materials sector.
- Strong connectivity & established skills base in the sector
Industry Profile

Our Competitive Advantage

• Strong cluster presence with 20 vehicle manufacturing sites, 35 automotive and off-highway OEM brands
• 26 OEM Vehicle R&D Centres, 8 Automotive Centres of Excellence and 4 Low Carbon Centres of Excellence
• Good access to auto supplier base
• Good connectivity with well developed road and train network and international airport
• The WM region has export expertise in machinery & transport goods (71% of all goods exports compared to 41% nationally)
• High quality, sector focused science & research facilities and institutes
• GBSLEP (22,000) & CWLEP (21,000) have the most automotive jobs of all LEP areas
• The Midlands ranks as a top global destination for automotive FDI

Products, Services & Brands

• JLR’s Engine Manufacturing Centre is home to the high technology, low emission Ingenium diesel engine for the Range Rover Evoque, Discovery Sport and Jaguar XE cars
• Geely LEVC’s factory for the Txe City Taxi is the first UK purpose built factory for EVs
• CAB Auto, IAC, Lear, IM Kelly, Grupo Antolin produce interiors for major OEMs, including JLR, Aston Martin & Nissan
• Leading location in UK for automotive R&D; including CAV and EV battery and energy storage
• CAB Auto’s seating goes into the cars of some of the biggest automotive manufacturers, including JLR, Aston Martin & Nissan
• Rimstock PLC is a world leading producer of alloy wheels
• The region produces 1/3 of all cars made in the UK
• From 2014-2017, there were 82 successful WMCA FDI projects in automotive, creating 10,000 new jobs and safeguarding a further 3,000
  In 2017-18, successful FDI investments have included:
  • Aston Martin Lagonda 130,000sqft unit
  • Geely LEVC – new HQ & factory open
  • JLR Gaydon – Triangle and NVH

Centres of Excellence/Assets

Innovation:
• Advanced Propulsion Centre, University of Warwick
• National Automotive Innovation Centre (NAIC), University of Warwick (opening 2018)
• The National Transport Design Centre, Coventry
• HORIBA-MIRA Consultancy and MIRA Technology Park
• Battery Prototype Centre, Warwick
• Wton Science, Technology & Prototyping Centre
• UK Battery Industrialisation Centre (UKBIC), Coventry – opens 2019
• Wton Science, Technology & Prototyping Centre
• Changan UK Research and Development Facility

Training:
• Rolls-Royce University Technology Centre, Birmingham
• EEF Technology Training Centre
• WMG Academy for Young Engineers
• Black Country Skills Factory
• Lloyds Bank Advanced Manufacturing Centre
• Institute for Advanced Manufacturing

Production Processes:
• Manufacturing Technology Centre (MTC)
• Warwick Manufacturing Group (WMG)
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

Clean Growth
- Widespread manufacture and adoption of electric vehicles (EVs) – WM supply chain and residents will have to adapt.
- Powertrain & battery propulsion
- WM has significant innovation strengths – UK Battery Industrialisation Centre, Energy Research Accelerator etc)
- Energy Innovation Zones can help automotive innovation
- Opportunity for the WM to become a key area for EV charging infrastructure

Future Mobility
- Connected and autonomous vehicles, and better integration of passengers and goods.
- New automotive business models such as mobility as a service
- The West Midlands is the centre of UK transport innovation, including significant R&D facilities, industrial capacity and transport demonstration expertise

AI & Data
- Industry 4.0 opportunities and digital supply chains
- CAV
- Optimising more productive travel in the WM
## 20 vehicle manufacturing sites

<table>
<thead>
<tr>
<th>Area</th>
<th>Company</th>
<th>Town</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWLEP</td>
<td>Aston Martin Lagonda</td>
<td>Wellesbourne</td>
<td>Car</td>
<td>Low volume build</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Aston Martin Lagonda</td>
<td>Nuneaton</td>
<td>Car</td>
<td>BIW Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Aston Martin Lagonda</td>
<td>Gaydon</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>BMW</td>
<td>Coleshill</td>
<td>Engine</td>
<td>Powertrain Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Detroit Electric</td>
<td>Leamington Spa</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Dynamo Taxi (Nissan Electric)</td>
<td>Bedworth</td>
<td>Car</td>
<td>Taxi Coachbuilding</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Geely LEVC</td>
<td>Ansty</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Gibbs Amphibians</td>
<td>Nuneaton</td>
<td>Truck</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>BSLEP</td>
<td>JLR Castle Bromwich</td>
<td>Birmingham</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>BCLEP</td>
<td>JLR i54</td>
<td>Wolverhampton</td>
<td>Engine</td>
<td>Powertrain Manufacture</td>
</tr>
<tr>
<td>BCLEP</td>
<td>JLR Lode Lane</td>
<td>Solihull</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>JLR Oxford Rd</td>
<td>Ryton</td>
<td>Car</td>
<td>Bespoke and limited edition vehicle preparation</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Microcab Industries Ltd</td>
<td>Coventry</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Penso-Mercedes Vivio Taxi</td>
<td>Coventry</td>
<td>Car</td>
<td>Taxi Coachbuilding</td>
</tr>
<tr>
<td>CWLEP</td>
<td>RDM Group</td>
<td>Coventry</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Terberg Ros-Roca Group - Dennis Eagle</td>
<td>Warwick</td>
<td>Truck</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>CWLEP</td>
<td>Terex</td>
<td>Coventry</td>
<td>Offeway</td>
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<td>Thwaites Dumpers</td>
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<td>Offeway</td>
<td>Vehicle Manufacture</td>
</tr>
<tr>
<td>BCLEP</td>
<td>Westfield</td>
<td>Kingswinford</td>
<td>Car</td>
<td>Vehicle Manufacture</td>
</tr>
</tbody>
</table>

Supported by a wealth of local tier 1,2 and 3 automotive suppliers...

Source: Black Country Bullet
Inward Investment Prospects

Typical investors
- Major/diversified players (e.g. OEMs and first tier component suppliers)
- Smaller niche suppliers in lower tiers of the supply chain

The region’s USPs
The region has significant competitive advantage in this sector, based on:
1. Access to the region’s extensive automotive and transport technologies cluster with its extensive supply chain linkages
2. The breadth and depth of its skills and talent base
3. R&D/innovation specialisms/centres of excellence within our universities
4. Competitive operating costs in a European context

Potential wider impact on the region’s economy
Investments typically generate substantial volumes of high value added (i.e. highly skilled with high GVA per worker) jobs– making a significant contribution to improving regional productivity

<table>
<thead>
<tr>
<th>Job volume</th>
<th>Job value</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Key emerging technologies driving business growth and investment
- Electrification – the development of electrified, battery-powered, fuel cell and plug-in hybrid vehicles
- Connected and Autonomous Vehicles – driverless cars and advances in IoT and data analytics, changing mobility models
- New and advanced materials and their applications in reducing costs/raising productivity, light weight design/reducing fuel consumption
- Industry 4.0 – with the introduction of the Internet of Things and Services into the manufacturing environment businesses are establishing global networks that incorporate their machinery, warehousing systems and production facilities in the shape of Cyber-Physical Systems (CPS)

Key source markets
- Japan
- Germany
- United States
- China
- India
- Canada
- South Korea
- France
- UK

Key competitor locations:
- **UK**: London, Manchester, Leeds, Surrey, Derby, Liverpool, Cowley, Nottingham, Bristol, Sheffield, Bradford, Belfast
- **Europe**: Dublin, Berlin, Stuttgart, Munich
- **Global**: Detroit, California, Tokyo

Sources:
IBM-PLI
FDI Intelligence
WMGC Regional Observatory deep dive intelligence
Black Country Consortium Economic Intelligence Unit LIS analysis
Summary Statistics: Automotive

- Estimated £3.2bn GVA attributed to automotive manufacturing in WMCA. 2030 Ambition of £3.8bn

- **46,500 jobs** in the sub-sector locally. GBSLEP & CWLEP have the most automotive jobs of all English LEP areas

- The majority (67%) of jobs in transport and machinery manufacturing appear in automotive

- Automotive business growth has been faster in WMCA than the UK overall between 2011-2013 (3% growth) & 2014-2016 (12% growth)

- There is high location quotients across automotive SIC codes for the region, suggesting a significant cluster of activity compared to other parts of the UK.

Source: Oxford Economic Model, via Black Country Economic Intelligence Unit Analysis
Supporting Sector Evidence Base – Automotive

**Ideas**

Automotive Council dashboards
• Measuring R&D levels, and university-industry collaboration

KPMG & SMMT – Digitalisation report
• Examines the digitalisation of automotive manufacturing in the UK

Warwick Manufacturing Group

Vehicle Dynamics & Safety Research Group, Coventry University

Future Engines & Fuels Lab, University of Birmingham

**Business Environment**

Automotive Council dashboards - Quality of rail, road and energy infrastructure

**People**

Automotive Council dashboards
• Cost, flexibility and productivity of labour; availability of skills, levels of investment & productivity

SEMTA/Automotive Council Training Provision report
• Sets out recommendations to ensure the workforce is equipped with the skills required for a world class UK automotive industry

**Places**

Centres of Excellence
Rail
Defining the Rail Sector

Recent Oxford Economics (OE) study breaks the sector down into four industry groups:

- The railway system
- The railway supply sector
- Retailers and caterers at UK railway stations
- ‘Induced’ UK economic activity supported by the wage-funded spending of workers employed in these industries.

Industry **GVA of £36.4bn** and **600k jobs** in the UK based on this.

Source: Oxford Economics
Railway-related impact jobs as a share of regional jobs

- **1.72% of WM region jobs are railway-related (49,200 jobs)** according to a 2018 sector report by Oxford Economics. This is the joint second highest concentration of all UK regions outside of London.

- ‘Railway-related’ includes train operators and infrastructure providers (the ‘railway system’), and covers the entire UK supply chain to those businesses, exports of rail-specific goods and services, the activities of retailers and caterers at railway stations, and the supply chains behind those exporting and retailing activities.

- According to the report, rail contributes a total of **£2bn GVA impact & almost 40,000 jobs** in the WMCA. There are **17,000 WMCA jobs in the rail supply sector**, amounting to **£850m GVA**. Rail supply sector jobs account for more jobs in the West Midlands (0.75%) than the UK overall (0.72%)

- The railway system contributes **8,000 jobs in the WMCA**, amounting to **£650m GVA**. The rest of rail GVA and jobs comes through station retailers and wider induced impacts

Source: Oxford Economics
• Similarly to GVA, almost half of rail industry impact jobs are within the rail supply sub-activity reflecting the strength of manufacturing supply chains in the WMCA.

• A significantly less % of jobs (compared to GVA) are within the railway system (21%).

• Induced impacts make up a higher proportion of jobs than they do for GVA (29% compared to 22%) and station retailers have double the proportion of jobs than their proportion of sector GVA.

• With £850m, the WMCA has the most railway supply GVA of comparative areas, including other CA’s.

• It also has the second highest amount of GVA within the railway system behind the South East LEP area.

• Nearby Derby & Nottingham has a significant rail supply sector for its size, providing £650m GVA within this sub-sector. This is useful for cross-regional rail supply chains within the Midlands.

Source: Oxford Economics
• At the LEP level, the Black Country has the **highest % of railway related jobs (2.32%) as a share of total local jobs of all LEPs**. The case is the same for GVA. GBSLEP is also above the UK average when it comes to the share of rail jobs. The **Black Country also tops the LEP rankings when it comes to rail supply sector jobs as a share of all local jobs**.

![Graph of Railway-Related Jobs as a % of local jobs](chart1)

Source: Oxford Economics

• Mainly due to its comparative size, **GBSLEP has the largest number of jobs and GVA across rail sub-sectors** of the 3 LEP areas

• There's a significant cluster of activity within the Black Country for both the railway system and the supply chain.

• The railway system contributes a significant amount of GVA/jobs in BCLEP and GBSLEP, but **next to nothing in CWLEP**

Source: Oxford Economics
WMCA Rail Cluster

Super Strengths

HS2
- Will add £3bn GVA to the local economy
- Major contractors & consultancies setting up locally is contributing to a strong supply chain base
- WMCA is also home to HS2’s HQ, its network control centre, maintenance facilities and the National High Speed Rail College.

Next Generation Rail Technology
- University of Birmingham’s Centre for Railway Research is focusing on digital train technology through the UKRRIN (£92m industry-partnered investment) – new Digital Systems Centre.
- Birmingham will be the only university in the UK focusing on this digital aspect of train technology.
- Midland Metro will bring the country’s first battery-operated trams
- The region is leading the way on Very Light Rail (VLR) with the VLR Innovation Centre & rail line.

Source: Midlands Engine
Specialised University Landscape

- The Birmingham Centre for Railway Research and Education is a leading institution for railway science and education.
- The centre has over 130 academics, researchers and professional support staff, helping to deliver world class research and thought leadership within railways, and offering an expanding portfolio of high-quality education programmes.
- It recently announced £92 million industry-partnered investment in research on digital train technology through the UK Rail Research and Innovation Network (UKRRIN).
- As part of this investment, new centres of excellence will be created across UK universities. Specifically, centres will be created in Digital Systems, Rolling Stock and Infrastructure.
- The University of Birmingham led this consortium of universities, partnered by leading industry supply chain partners and major UK rail industry clients.

- The landscape also includes the National College for High Speed Rail and the Advanced Propulsion Centre.
- WMG at the University of Warwick is developing a very light rail concept, known as the Revolution VLR.
- WMG is a leading research institution for battery and energy storage and lightweighting.
- Quinton Rail Technology Centre is also the only private test track in the UK.
- Warwick and Birmingham are key universities internationally in the rail space.

What will Birmingham’s Digital Systems Centre do?

Source: UKRRIN
Industry Profile

Our Competitive Advantage

- **HS2** – 2 West Midlands stations will add £3bn GVA to the local economy.
- **OnTrackWM** – rail supply chain virtual procurement tool (a part of HVM City).
- High quality, sector focused science & research facilities and institutes, including very light rail research; battery and energy storage R&D.
- **Good connectivity** with well developed road and train network and international airport
- Cluster of rail construction specialists & consultancies (AECOM, TDI etc) & presence of international transport advisors (Arup, WSP, Atkins etc)
- The WM region has export expertise in machinery & transport goods (71% of all goods exports compared to 41% nationally).
- Heavy cross-over relationships with significant local automotive/aerospace/other manufacturing activity. WMCA cluster of all this manufacturing (particularly transport) activity has an agglomeration affect for the rail sector.
- The intertwined nature of these industries means that many firms won’t work explicitly in the rail sector. This ensures that the activity figures suggested using SIC code analysis often underestimates the size & impact of the sector locally
- Lightweighting and battery/energy storage expertise
- Rail creates high quality jobs within the region.

Products, Services & Brands

- **HS2 HQ** - based in Birmingham, for HS2 construction and supply chain, national control centre and rolling stock centre.
- **Wabtec AM Rail** - provide signalling services for the UK market and rail consultancy through out the UK and globally.
- **AECOM** – Rail construction specialists.
- **DK Rewinds** – Specialise providing parts and repairing traction motors that power Central line trains to London.
- **Wednesbury to Brierley Hill Metro Extension**
- **OnTrackWM**
- **Midland Metro** will see the country’s first battery-operated trams on the streets in 2019
- Between 2014-17 there was 2 major FDI projects, creating 70 jobs
- **HQ of Rail Alliance**
- **National High Speed Rail College** will be creating 300 engineers of the future every year.
- **VLR Innovation Centre & Rail Line**
- Major HS2 contractors setting up bases in and around the region (Balfour Beatty, VINCI etc).
- Light rail test facilities at the **QRTC (Quinton Rail Technology Centre)**, Long Marston

Centres of Excellence/Assets

Innovation:
- Birmingham Centre for Rail Research and Education
- UK Railway Research and Innovation Network (UKRRIN) led by University of Birmingham.
- WMG at the University of Warwick - very light rail; battery and energy storage
- Very Light Rail Innovation Centre & Test Track
- Quinton Rail Technology Centre - the only private test track in the UK.
- The National Transport Design Centre, Coventry
- MIRA Technology Park
- Advanced Propulsion Centre
- Wton Science, Technology & Prototyping Centre
- UKBIC (UK Battery Industrialisation Centre)

Production:
- Institute For Advanced Manufacturing and Engineering
- Manufacturing Technology Centre

Training:
- Network Rail Training Centre, Walsall
- National College for High Speed Rail, Aston
- EEF Technology Training Centre
- WMG Academy for Young Engineers

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Grand Challenges Context

Link to Industrial Strategy Grand Challenges

Clean Growth
- Batteries will address many of the short-medium term energy storage issues in transport and housing
- The West Midlands is geographically central – it’s a key transport hub for road and rail
- Very Light Rail
- Battery-operated trams in the WM (Midland Metro)

Future Mobility
- Autonomous condition monitoring and new communications control systems will allow convoying of trains with benefits for rail capacity
- The West Midlands is the centre of UK transport innovation, including significant R&D facilities, industrial capacity and transport demonstration expertise
- The region will benefit from HS2 investment

AI & Data
- Industry 4.0 opportunities and digital supply chains
- Optimising more productive travel in the WM
- Data sets are starting to grow around transport (e.g. TfWM and Swift card data)
- Smart cities
Estimated £32m GVA attributed to rail manufacturing in WMCA. The 2030 ambition for this sector is £38m

470 jobs in the sub-sector locally.

64% of jobs are in CWLEP (300).

Rail is small sub-sector of transport & machinery manufacturing, making up 0.8% of GVA in this sub-sector and 0.7% of jobs.

The number of businesses has grew 100% between 2014-16, more than double the growth rate for the UK overall.

Rail manufacturing has an LQ of 1.2 in the WMCA.

This data reflects the SIC code: 30.20 Manufacture of railway locomotives and rolling stock, which understates the extent of rail activity in the area. Wider evidence suggests a much broader rail sector locally, with a stronger cluster of activity in the WM region than suggested here (see earlier slide).
Supporting Sector Evidence Base – Rail

Idea:
- Birmingham Centre for Railway Research and Education at the University of Birmingham
- Oxford Economics Rail Industry Report
- UK Rail Research and Innovation Network (UKRRIN) • Including info on Birmingham’s Centre of Excellence for Digital Systems

Infrastructure:
- HS2
- The Midlands Prospectus: Opportunities in Rail

Business Environment:
- Midland Metro Alliance
- The UK Rail Alliance • Largest dedicated B2B networking organisation based in Warwickshire
- Engineering UK 2017 report • In-depth analysis of the engineering sector in UK
- Rail Industry Association

People:
- National Skills Academy Rail Sector Skills Research

Places:
Aerospace
WMCA Aerospace Cluster

- **25% of UK aerospace sector is based in the Midlands** (7% of Europe’s & 3% of the world’s), and WM is roughly half of this broad Midlands Engine-based cluster.

- Approx. 10% of UK aerospace activity is in the WM, with the EM being slightly larger at approx. 15%

- A cluster hub exists around Rolls-Royce Control Systems, Meggitt, Moog and UTC Aerospace in Birmingham, Wolverhampton and Coventry, which supply electro-mechanical systems to control aircraft moving parts.

- Up to 70 WM companies supply parts to the latest passenger planes of both Boeing & Airbus from wing components to engine and flight control systems.

- The SIA states that “feedback and further evidence provided by local partners in the development of the WM SIA indicates that the level of employment supported by aerospace is likely to be significantly higher in practice than the SIC data suggest.”

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**Core Technology Competencies that Define Midlands Aerospace**

1) systems that power aircraft: gas turbine engines and other aircraft propulsion systems

2) systems that control the moving parts of aircraft and engines: electrical, mechanical, electronic, hydraulic, pneumatic

3) specialist metal and composite materials for these systems

4) engineering design services, factory equipment and tooling

*Source: Midlands Aerospace Alliance*
WMCA Aerospace Cluster

- Midlands Aerospace Alliance reports that it has **160 members covered by the WMCA area**, over half of its 300 Midlands membership.
- England is recognised as having four aerospace clusters: North West, South West, the Midlands & South East. Each is represented by a business-led cluster organisation (like the MAA). The graphic above shows that WMCA companies make up over half of the MAA’s membership, and there are **more companies registered in the WMCA than the whole regions of other notable clusters (North West & South East)**. The average size of WMCA companies does tend to be smaller than elsewhere though, due to many of these operating lower down in the supply chain.
- Analysis of aerospace cluster bodies globally suggests that there are **more member organisations in the WMCA footprint than in the recognised aerospace centres Connecticut, Hamburg, Piemonte or Lombardy**.
- Analysis shows that **44 of the 99 innovation actions in the Midlands’ NATEP programme are in the 3 LEP area**. Across England, 44 of the 418 innovation actions are in the 3 LEP area (11%).

**Source: Midlands Aerospace Alliance**
Aerospace in the WMCA is mainly focused on the production of electro-mechanical systems.
- Control systems for engines (e.g. Rolls Royce & Meggitt), and aircraft wing controls (clustered in Wolverhampton with Moog & UTC Aerospace).

Highly-Technical Component Manufacturing
- 70 WM companies supply widely varying quality parts to latest passenger planes, from tyres and wing components to engine and flight control systems.
- Sector encompasses the supply chain down to the lowest level (metals/materials supply) through to OEM (Rolls Royce), ensuring a well-integrated supply chain.

Civil Aircraft Focus
- Aerospace in the Midlands is roughly 80% focused on civil aircraft (compared to 50/50 with military in UK).
- Civil sector is growing at a much faster rate which bodes well for future aerospace growth locally.
Over 70 Midlands businesses supplied the Airbus A380, including many from the WMCA area...

Source: Midlands Aerospace Alliance
Supply Chain Depth

Source: Midlands Aerospace Alliance
Supply Chain Depth

Source: Midlands Aerospace Alliance
Midlands Integrated Supply Chain

Source: Midlands Aerospace Alliance
Local Specialisms

Aerospace in the West Midlands is mainly focused on hydro-electro-mechanical systems:

Control systems for engines, particularly in Birmingham and Coventry

Aircraft wing controls, clustered in Wolverhampton

Aerospace in the West Midlands encompasses the supply chain down to the lowest level (metals/materials supply) through to OEM (Rolls Royce). The area has a significant strength in aerospace component manufacture (tiers 2,3,4) as well as high-level OEM/tier 1 production.

Source: Midlands Aerospace Alliance
Industry Profile

Our Competitive Advantage

- 25% of UK aerospace sector is based in the Midlands (7% of Europe’s & 3% of the world’s)
- Midlands Aerospace Alliance (over 300 members) represents the largest aerospace cluster in Europe
- WM represents around 10% all UK aerospace jobs
- High quality, sector focused science & research facilities and institutes, mainly used by OEMs.
- Unrivalled lead in component design and manufacture
- Base of aerospace companies throughout a well-integrated supply chain.
- Close proximity to Rolls Royce global HQ & production centre in Derby.
- Good connectivity with well developed road and train network and international airport
- The WM region has export expertise in machinery & transport goods (71% of all goods exports compared to 41% nationally)
- Strong position in aerospace’s growth sectors (e.g. strengths in supplying large civil aircraft).

Products, Services & Brands

- UTC Aerospace Systems – Specialise in wing and engine actuation and heat exchangers
- Meggitt – focus on wheel and brake, fluid conveyance and heat exchangers.
- Rolls Royce – Engine control systems and mechanical parts, defence engines repair and overhaul.
- Moog – wing actuation, helicopter rotor actuation.
- Timet – Titanium for aircraft engines.
- Arconic – aerostructures
- Local manufacturers are focused on the development of high technology systems, engines and motors, components and control systems.
- Between 2014-17 there was 5 major aerospace FDI projects, creating 191 jobs & safeguarding 97.
- Coventry & Warwickshire Aerospace Forum – a grouping of advanced engineering businesses collaborating with leading UK universities and associations
- Major new factory local moves/modernisations in recent years: Moog to i54, R-R to Birmingham Business Park, Meggitt to Ansty Park

Centres of Excellence/Assets

Innovation:
- The National Transport Design Centre, Coventry
- MIRA Technology Park (inc. Southern Extension with CWLEP investment)
- Advanced Propulsion Centre
- Wton Science, Technology & Prototyping Centre
- Rolls-Royce University Technology Centre, Birmingham
- National Battery Prototype Centre, Warwick
- Engineering and Computer Science Research Centre
- Centre for Manufacturing and Materials Engineering, Coventry
- High Temperature Research Centre, UoB/Ansty
- The Proving Factory, Coventry

Production:
- Institute For Advanced Manufacturing and Engineering
- Warwick Manufacturing Group
- Manufacturing Technology Centre

Training:
- EEF Technology Training Centre
- WMG Academy for Young Engineers
- Black Country Skills Factory
- The Aerospace Academy, Solihull College
- Centre for Advanced Aeronautical Provision
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

Clean Growth
• Batteries will address many of the short-medium term energy storage issues in transport and housing
• WM has significant innovation strengths – e.g. UK Battery Industrialisation Centre
• Energy Innovation Zones can help aerospace innovation

Future Mobility
• The West Midlands is the centre of UK transport innovation, including significant R&D facilities, industrial capacity and transport demonstration expertise
• Autonomous aircraft

AI & Data
• Industry 4.0 opportunities and digital supply chains
Growth

• The MAA surveys its membership yearly
• The results show a very fast growing industry in the region
• Growth generally follows OEM production so future growth expected (given Boeing and Airbus forecasts).
• This is backed up by aerospace in the Midlands being 80% focused on civil aircraft (compared to 50/50 with military in UK) – the civil sector is growing at a much faster rate.
• The drivers behind civil aerospace growth are:
  - Growth in passenger km (linked to world economy trends)
  - Export orientation of the industry (c. 90%)
  - Greening of aerospace and aviation
  - Duopolistic competition
  - Industry’s slow clock speed
  - Future technology opportunities

Source: Midlands Aerospace Alliance
Summary Statistics: Aerospace

- Estimated £305m GVA attributed to aerospace manufacturing in WMCA. The 2030 ambition for this sub-sector is £367m. There are 4,500 jobs in the sub-sector locally.

- However, this data understates the extent of aerospace activity in the WMCA, as it only reflects the SIC code: 30.30 Manufacture of air and spacecraft and related machinery. Wider evidence suggests a much broader aerospace sector locally, with a stronger cluster of activity in the WM region than suggested here (see earlier slides).

- National body ADS estimate UK aerospace turnover of £35bn. The West Midlands is roughly 10% of the sector nationally, thus representing approx. £3.5bn turnover. ADS estimate that GVA is 30% of turnover in aerospace so aerospace GVA in the WM is around £1bn.

- ADS estimate that there are 123,000 direct aerospace jobs in the UK, and double this when you include indirect jobs. This means that around 25,000 jobs in the WM are aerospace.

- Only measuring for SIC 30.30 ensures that much activity that is primarily for aerospace is not recorded. This aerospace activity is disguised as ‘metal working’ or ‘electro-mechanical equipment’.
Opportunities

- More widespread innovation & R&D
- CITEC proposal
- 33,070 new aircraft are expected to be required in next 20 years, doubling of fleet from 2016 to 2035 (Global Airbus Outlook)
- WM tracking the rapid expansion of the world's aerospace industry.

ATI Strategic Technology Themes

1) Aircraft of the future – e.g. demand for more fuel-efficient aircraft will drive integration of more efficient turbofan engines
2) Smart, Connected and more Electric Aircraft – e.g. beyond 2030, new propulsion architectures will require disruptive electrical power system technology
3) Aerostructures of the Future – e.g. wings
4) Propulsion of the Future – e.g. new engine options focused on fuel efficiency

Sources:
Midlands Aerospace Alliance
Aerospace Technology Institute (ATI)
Supporting Sector Evidence Base – Aerospace

Idea
- Aerospace Growth Partnership
- Aerospace Technology Institute
- Rolls-Royce University Technology Centre, University Birmingham (Materials)
- NATEP Directory

Business Environment
- Midlands Aerospace Alliance
  - In-depth industry expertise, including mapping and understanding of supply chains.
- MAS Company List
- Engineering UK 2017 report
  - In-depth analysis of the engineering sector in UK
- Sharing in Growth UK (9% beneficiaries in West Midlands)

People
- The Aerospace Academy, Solihull College

Places
Metals & Materials
WMCA Metals Cluster

- Location quotients (LQ) for WMCA 7MET - SIC24 Manufacture of basic metals: 2.9; SIC25 Manufacture of fabricated metal products, except machinery and equipment: 2.5. These are second & third highest of all sectors in WMCA and for SIC25 no other UK NUTS2 area has a higher LQ.

- Black Country local authorities have particularly high LQ’s in some more specific SIC codes, such as 36 in Sandwell for the manufacture of other products of first processing of steel, and 17.1 in Walsall for the casting of metals.

- The significant presence of automotive, aerospace and rail in the area ensures a strong number of metals firms, feeding into these industries’ supply chains. Future investment in these wider sectors present opportunities for the WM metals industries.

Source: WMEF Black Country Perspectives (2013)

Source: UK Metals Council
UK Foundry Concentration

Source: UK Castings

Source: UK Foundries
WMCA Materials Cluster

- Location quotients (LQ) for WMCA 7MET - SIC22 Manufacture of rubber & plastics products: 1.3; SIC23 23 : Manufacture of other non-metallic mineral products: 0.8. This puts the LQ for SIC 22 in the top 10 of all SIC codes for employment concentration in the WMCA.

- According to a recent West Midlands Growth Company report, the West Midlands has the largest concentration of materials related jobs in the UK.

- Leading innovation from the region’s universities is helping develop materials for industrial use and future applications. For example, the Automotive Composites Research Centre at University of Warwick builds on the universities experience within automotive to take advantage of new lightweight vehicle technology and application.

- The Rolls-Royce University Technology Centre, Birmingham is specifically focused on materials engineering. This is a key asset that reflects the research strengths in the WMCA in materials.

- Similar to metals, the area’s strong links to automotive, aerospace and rail ensure the local materials industry is well-placed to make the most of existing markets.

- Rubber & Plastics Research Association (RAPRA) based nearby in Shropshire (now run by Made in the Midlands)
WMCA Metals & Materials Cluster

**WMCA Super Strengths**

**Manufacture & Treatment of Metals**
- Particularly in the Black Country where some SIC code activities are ranked 1st out of all UK local authorities for LQ.

**Composites & Other Advanced Materials**
- An extensive cluster of this activity within universities in the private sector, especially in Coventry.
Industry Profile

Our Competitive Advantage

- **Historic presence** within metals & materials manufacturing & metals treatment, leading to a significant concentration of infrastructure like furnaces and foundries.
- **Leading innovation** from the region’s universities is helping develop materials for industrial use and future applications.
- The significant presence of automotive, aerospace and rail in the area ensures a strong number of metals & materials firms, feeding into these industries’ supply chains. There is widespread demand for these products locally.
- **Good connectivity** with well developed road and train network and international airport
- **Highly concentrated** industry in WM
- Major infrastructure investments in the region (HS2 etc).
- The West Midlands has the largest concentration of materials related jobs in the UK. (WMGC)
- The WM region has export expertise in machinery & transport goods (71% of all goods exports compared to 41% nationally)
- Representation from key industry bodies locally – e.g. UK Metals Council, RAPRA

Products, Services & Brands

- **Assa Abloy** - World’s largest lock manufacturer
- **Mitsubishi Chemical Carbon Fiber and Composites** – Key suppliers in manufacturing specialist materials.
- **Nord Composites** – Major composite material business, specialising in sealant and adhesive materials.
- **Precision Chains** make the chains for the London Underground escalators.
- **RMD Kwikform** helped install the roof of the Aquatics Centre for London 2012.
- **ZF Lemforder**’s Darlaston factory supplies suspension control arms to Jaguar,

Centres of Excellence/Assets

**Innovation:**
- The National Transport Design Centre, Coventry
- MIRA Technology Park
- Advanced Propulsion Centre
- Wton Science, Technology & Prototyping Centre
- Rolls-Royce University Technology Centre, Birmingham
- Engineering and Computer Science Research Centre
- Automotive Composites Research Centre

**Production:**
- Institute For Advanced Manufacturing and Engineering
- Warwick Manufacturing Group
- Manufacturing Technology Centre
- Advanced materials characterisation and simulation hub (AMCASH)
- Alternative Raw Materials with Low Impact

**Training:**
- EEF Technology Training Centre
- WMG Academy for Young Engineers
- Black Country Skills Factory
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

Ageing Society
• Manufacture of key parts within new innovative healthcare products (materials)

Clean Growth
• Regional expertise in circular economy, industrial synergy, waste as a value stream (e.g. recycling of metals)
• Energy Innovation Zones

Future Mobility
• Impact of EVs and CAVs on WM metals/materials supply chain

AI & Data
• Industry 4.0 opportunities and digital supply chains
Summary Statistics: Metals & Materials

- **£4bn GVA** attributed to Metals and Materials in WMCA. With a **2030 ambition of £6.1bn**
- **74,200 jobs** in the sub-sector locally.
- The majority (73%) of jobs and GVA (72%) in Metals and Materials appear in Metals and Fabricated metal goods.

LQ’s:
- SIC 24 : Manufacture of basic metals 2.9
- SIC 25 : Manufacture of fabricated metal products, except machinery and equipment 2.5

These are the 2nd & 3rd largest LQ’s in the WMCA (7MET) out of all SIC codes. The WMCA has the highest LQ of all areas for SIC 25 & the fourth largest for SIC 24.

- The 20% GVA growth within the WMCA in Metals & Materials since 2010 significantly surpasses the 6% figure for the whole of the UK.
- In the WMCA, Metals & Materials take up a much greater share of jobs and GVA to that of the UK overall (73% of overall sub-sector jobs, compared to 60% in the UK).

Source: Oxford Economic Model
Supporting Sector Evidence Base – Metals/Materials

**Ideas**
- Rolls-Royce University Technology Centre, University Birmingham (Materials)
- Automotive Composites Research Centre
- Advanced materials characterisation and simulation hub (AMCASH)

**People**
- UK Metals Council insight, including Vision 2030 report

**Infrastructure**
- Various local energy infrastructure report/intelligence, e.g. “Energy as an Enabler”

**Business Environment**
- UK Metals Council insight
- National Metalforming Centre
- Engineering UK 2017 report
  - In-depth analysis of the engineering sector in UK
- UK Castings
- West Midlands Economic Forum
- UK Foundries
- Composites UK

**Places**
- West Midlands Growth Company: “Make Your Mark”
Food & Drink
WMCA Food & Drink Cluster

**Super Strengths**

**Major Employers**
- Cadbury heritage, now including Mondelez’s global chocolate research and development centre
- Marston’s HQ
- Burton the home of UK brewing.
- These drive the sector locally & have an enabling effect on the visitor economy.

**Niche Strengths**
- Food and drink machinery
- Food and fluid control technology
- Photonics R&D
Industry Profile

Our Competitive Advantage

- Good access to supplier base
- Good connectivity with well-developed road and train network and international airport
- High quality, sector-focused science & research facilities and institutes
- Skills and experience in the food supply chain and processing.
- Strong tradition of photonics R&D
- Leader in food and drink machinery & equipment
- Access to a large domestic market, a long pedigree in production and R&D and a first-class logistical network
- A strong base of fast-growing SMEs and micro businesses which are driving growth and job creation.

Products, Services & Brands

- Birthplace of great British food and drink icons Cadbury, Typhoo Tea, Bird’s Custard & Marston’s.
- East End Foods alone produces 30,000 lines for more than 3,500 retailers and is one of the largest importers and suppliers of ethnic foods in Europe.
- Mondelez International houses its global chocolate research and development centre at Bournville.
- Healthy levels of inward investment, with 25 new food and drink FDI projects in the West Midlands since 2009
- Burton-on-Trent is the home of brewing in the UK

Centres of Excellence/Assets

**Innovation:**
- Wton Science, Technology & Prototyping Centre
- Engineering and Computer Science Research Centre
- Food Science research at University College Birmingham

**Production:**
- Institute For Advanced Manufacturing and Engineering
- Warwick Manufacturing Group
- Manufacturing Technology Centre

**Training:**
- EEF Technology Training Centre
- WMG Academy for Young Engineers
- Black Country Skills Factory
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

**Ageing Society**
- Food manufacturers have a key role to play in reducing obesity/diabetes etc (sugar content, nutrients etc)

**AI & Data**
- Industry 4.0 opportunities and digital supply chains
- Particular opportunities within automation of machinery, but threats of job replacement
- Health data

**Clean Growth**
- Resource management and waste to energy value chains
Inward investment prospects – Food and Drink

Typical investors

- Specialist food and drink manufacturers and processors
- Manufacturers and processors and with an interest in UK market
- Investors looking to leverage the research capabilities at local universities – some may seek to establish R&D centres as well as manufacturing centres

The region’s USPs

2. Niche and specialist Food & Drink expertise (e.g. machinery and equipment)
3. Supply chain centre with large cluster of logistics companies and major supermarkets distribution
3. Strong food and drink within local universities, notably Birmingham University’s Formulation Engineering Department and University College Birmingham’s UCB’s Food Innovation Facility
4. Central location with good connectivity and strong logistics network

Key emerging technologies driving business growth and investment

- Additive manufacturing (AM)
- Alternative protein sources
- Smart packaging
- Functional foods with specific health benefits
- IoT applications
- Synthetic biology

Potential wider impact on the region’s economy

While a significant number of jobs created are lower skilled, many (e.g. food scientists/technologists with degrees and higher degrees) are high value added (i.e. highly skilled with high GVA per worker), making an important contribution to improving regional productivity.

Sources:
IBM-PLI
FDI Intelligence
WMGC Regional Observatory deep dive intelligence
Black Country Consortium Economic Intelligence Unit LIS analysis

Main origin countries
United States
Switzerland
Germany
Ireland
Austria
Netherlands
Denmark
France
Brazil

Key competitor locations:
UK: West Yorkshire, Great Manchester
Europe: Flanders, Vienna, Sofia, South Moravia, Prague, Aarhus, Tampere, Berlin, North Rhine-Westphalia
Global: Chicago, Cleveland, Grand Rapids, Shanghai, Shenzhen

Main types of food and drink investment

<table>
<thead>
<tr>
<th>Job volume</th>
<th>Job value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>
DELIVERING INCLUSIVE GROWTH

Summary Statistics: Food & Drink Manufacturing (FDM)

- £1.04bn GVA attributed to food & drink manufacturing (FDM) in WMCA. The 2030 ambition for this sub-sector is £2.05bn.

- 21,000 jobs in the sub-sector locally, with an ambition to have 22,000 in 2030.

- FDM makes up 9% of AME GVA and 10% of AME jobs in the WMCA area.

FDM GVA and Jobs Growth Rates

- WMCA GVA in FDM has grown 9% since 2005 and 7% since 2010. In the UK the sub-sector grew by 4% since 2005 & has declined 7% since 2010

- For Jobs, whilst these have reduced since 2005 in WMCA, this was at a slower rate to that of the UK. Since 2010, jobs in FDM have grown at a faster rate in the region than they have in the UK overall (8% compared to 6%).

- At the UK overall level FDM takes up a greater share of both GVA & Jobs compared with the WMCA area (1.5% compared to 1.3% for GVA and 1.3% compared to 1.0% for jobs.

A 2017 report by the Food & Drink Federation suggests that the West Midlands region has had the greatest long-term growth in FDM of the 12 UK regions/

- The report finds that the West Midlands share of national FDM GVA rose from 6% in 1997 to 9% in 2015 – the largest percentage point rise of all regions.

Source: Food & Drink Federation

Source: Oxford Economic Model
Supporting Sector Evidence Base – Food/Drink

**Ideas**

**Midlands Engine Science & Innovation Audit**
- Scale & concentration of food & drink activity in the Midlands, description of supportive assets & academic output

**People**

**Business Environment**

**Engineering UK 2017 report**
- In-depth analysis of the engineering sector in UK

Birmingham Food Council Reports and Pares (produced a GBSLEP Briefing 2016)

**EEF sector analysis**
- Performance, supply chain, export trends etc

**Food & Drink Federation (FDF)**
- Including Grant Thornton in-depth review of the sector

**Places**

West Midlands Growth Company: “Make Your Mark”
Business, Professional & Financial Services (BPFS) and its sub-sectors

For further detail, see publication of BPFS sector deep-dive:

BPFS Summary Statistics (Current)

- **£24.5bn** WMCA GVA is attributed to BPFS, which is 28.2% of the whole economy. This makes BPFS the largest sector in the WMCA area. The 2030 GVA ambition for this sector is **£49bn**

- There are **406,000 jobs** attributed to BPFS in the WMCA area, 20% of overall employment. This ensures BPFS is the largest sector for employment also.

- Since 2010, Jobs in BPFS has grown **25%** in the WMCA, higher than the 16% growth for the sector in the UK overall.

- The WMCA has a similar reliance on more jobs in key BPFS sectors to the UK overall: financial services makes up 3.3% of jobs in the UK compared to 2.8% in the WMCA.

- The main BPFS sub-sectors included for the LIS (Financial Services & Legal & Accounting) make up 24% of both GVA (£5.8bn) and jobs (99,000).
Previous deep-dive analysis on the sector (2013 data)
DELIVERING INCLUSIVE GROWTH

Source: FAME Database

**SECTOR SCOREBOARD - Business, Professional and Financial Services**

**GVA Growth**
- GVA generated by the top 50 businesses has increased by 14.4% over 12m period
- 21 of the top 50 businesses have increased GVA by 2% per year over a 12m period
- 22 businesses have increased GVA by 10% and over
- 36 businesses have increased GVA by 20% and over

**Foreign Ownership & Listing**
- 44 businesses in the top 50 are foreign
- The largest foreign owned business is ranked 13th - Phoenix Life Assurance Limited
- Average GVA per employee for those businesses is £419,219
- 13 businesses are listed on the London Stock Exchange
- The Darwen Group of Companies PLC, Ealing Life PLC,
  Secure Trust Bank Public Limited Company, A&I
  Mucklow Group plc, and Midlands Co-operative PLC

**GVA Impact (£m)**

<table>
<thead>
<tr>
<th>Business Category</th>
<th>Number of Businesses</th>
<th>Total GVA (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>50</td>
<td>£136,049,830</td>
</tr>
<tr>
<td>High (1-12)</td>
<td>12</td>
<td>£71,798,130</td>
</tr>
<tr>
<td>Medium (13-30)</td>
<td>18</td>
<td>£47,382,600</td>
</tr>
<tr>
<td>Low (31-50)</td>
<td>20</td>
<td>£16,869,100</td>
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</tbody>
</table>

**Top Performing Businesses**

- **BAM Construction Limited**
  - GVA: £32,023,200
  - 12th in the top 50

- **Ealing Life Assurance Limited**
  - GVA: £28,434,000
  - 13th in the top 50

**Source:** FAME Database
BPFS: Spatial Focus
Key BPFS
Employers in the Midlands

Source: UKTI
Financial Services
Inward investment prospects – BPFS

Typical investors

- Start-ups and SMEs
- Units within larger multinational companies
- Outsourced services providers
- Companies setting up captive centres

The region’s USPs

1. Strong talent pool with Birmingham as one of the main clusters of finance professionals in the UK
2. High degree of specialisation in HR, insurance and law
3. Strong collaboration between large firms fostering the talent of for future employment in the sector
4. Birmingham hosts the largest regional financial and professional services hub in the UK, one of the largest legal services clusters in Europe and the largest accountancy clusters outside London
5. Located in the heart of England, the region has very well connected transport system
6. Well suited Grade A office developments in Birmingham at affordable prices
7. Lower cost alternative to London / South-East based companies and public sector organisations considering relocation
8. Opportunities arising from local and national infrastructure projects

Main types of BPFS investment

<table>
<thead>
<tr>
<th>Service</th>
<th>Job volume</th>
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<tr>
<td>Other</td>
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<td>Medium</td>
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<tr>
<td>Architectural &amp; Engineering</td>
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<td>Advertising</td>
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<td>Insurance &amp; Pension</td>
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<td>Consultancy</td>
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<tr>
<td>Security &amp; Fund</td>
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<td>Banking</td>
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<tr>
<td>Business Process Outsourcing</td>
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</tr>
</tbody>
</table>

Main origin countries

- United States
- France
- India
- Spain
- Australia
- Germany
- Canada
- Ireland
- Netherlands

Potential wider impact on the region’s economy

Investments typically generate significant numbers of jobs. While some (e.g. in Shared Service Business Process Outsourcing Centres) are lower value added many others (e.g. in front/middle office operations) are high value added (i.e. highly skilled with high GVA per worker) jobs, making an important contribution to improving regional productivity.

Key emerging technologies driving business growth and investment

Alongside challenges posed by complex regulation and new competition, new innovations in technology are creating both disruption and market opportunities. In particular:

- Blockchain technology, a public digital ledger shared among a network of computers worldwide, offers secure, fast and efficient transactions – doing away with cumbersome and expensive paper trails.
- Robo-advice, meanwhile, is an automated process of offering financial advice via computer, tablet or smartphone.

Sources:
- IBM-PLI
- FDI Intelligence
- WMGC Regional Observatory deep dive intelligence
- Black Country Consortium Economic Intelligence Unit LIS analysis

Key competitor locations:

UK: London, Manchester, Leeds, Newcastle

Europe: Paris, Frankfurt, Dublin, Zurich, Milan, Stockholm, Copenhagen, Amsterdam, Luxembourg, Warsaw, Brussels

WMCA Financial Services Cluster

**Super Strengths**

**Full-service Offering**
- Birmingham is the only full-service UK offering outside London.

**Talent Pool**
- Birmingham is one of the main clusters of finance professionals in the UK.
- Strong collaboration between large firms fostering the talent of for future employment in the sector.
- The West Midlands has a different distribution of occupations to the national picture, with a higher skilled, higher value profile of occupations in the sector.

**Services for Local Industry**
- Services match local specialisation and the local client base i.e. advanced manufacturing advice and guidance, exporting etc.
Industry Profile

**Our Competitive Advantage**

- Re-location of large firms (HSBC incoming)
- Birmingham is the only full-service UK offering outside London
- Strong talent pool & excellent links to London
- UK’s largest regional banking and professional services cluster.
- Readily available cutting-edge city centre office space in new developments across the region.
- City-Redi deep dive found that the West Midlands has a different distribution of occupations to the national picture, with a higher skilled, higher value profile of occupations.
- The recent growth in building offer such as Snowhill frees up other high quality offices and there is a movement up the value chain, this opens up better office accommodation for the growing mid tier (City – Redi deep dive)

**Products, Services & Brands**

- Home to HSBC’s new ring-fenced UK banking headquarters
- Deutsche Bank
- Major banking offices such as Lloyds Bank & Barclays
- Full-service offering
- Services match local specialisation and the local client base, i.e. advanced manufacturing advice and guidance, exporting etc.
- Islamic Finance - Britain’s first sharia compliant retail bank is headquartered in Birmingham

**Centres of Excellence/Assets**

**Business Schools**
- Warwick Business School
- Birmingham Business School
- Aston Business School
- Coventry Business School
- Wolverhampton Business School

**Colleges**
- Professional Services Academy, BMet

**Trade Representatives**
- BPS Birmingham

**LEP Programmes/Investment**
- Invest Black Country
- DY5 Enterprise Zone
- Black Country Growth Hub
- i9 Wolverhampton
- Black Country Transformational GOLD
- Friargate, Coventry
- Black Country Innovation Fund (pipeline)
- Wolverhampton City Council Broadband (pipeline)
AI & Data
- Technology enhancement the key agenda for large BPFS firms in the WMCA
- FinTech
- Connectivity – importance of broadband, 5G
- End-to-end customer journey
- Data-driven banking
- Automated services
Summary Statistics: Financial Services

Current size
- £4.5bn GVA in WMCA (18.5% of total BPFS)
- 56,256 Jobs (14% of total BPFS)
- £79,251 GVA per worker

Trends
- GVA increased sharply in WMCA by 12.3% from 2014-2015.
- This was post a big drop in the previous year but growth tracking higher.
- Jobs in BPFS (FS) increased by 13.5% in WMCA from 2014-2015, (but overall decrease of 9.4% since 2010)

2030 Ambition: £10bn
- This represents just under 70,000 jobs, and a GVA of £143k per worker

Source: Oxford Economic Model
Legal & Accounting
Super Strengths

Full-service Offering
- Birmingham is the only full-service UK offering outside London.

Office Space
- Birmingham is a top city for current occupied floorspace (e.g. for law), but the region also continues to create further high quality office space for all activity, at a cheaper cost to London.
CBRE’s ‘Law in the Regions’ report identifies Birmingham, Bristol and Manchester as primary UK legal centres outside of London.

Birmingham is in the top 3 cities (outside London) for both legal sector floorspace, number of legal offices and number of fee earners: the second largest by floor space (781,893 sq ft.), third largest for number of offices (28) and second for number of fee earners (1,831)

Source: CBRE
Industry Profile

Our Competitive Advantage

- Re-location of large firms (PWC investment)
- Only full-service UK offering outside London
- Strong talent pool & excellent links to London
- UK’s largest regional legal & insurance cluster and the largest accountancy cluster outside London.
- Readily available cutting-edge city centre office space in new developments across the region.
- Birmingham is in the top 3 cities (outside London) for both legal sector floorspace, number of legal offices and number of fee earners.

Products, Services & Brands

- PWC’s largest regional office is set to house 2,400 people
- Charter Court Financial Services owns Precise Mortgages, an intermediary mortgage lender and Charter Savings Bank, one of the UK’s leading challenger banks with over 40,000 savings accounts and balances in excess of £2billion since its launch in March 2015.
- All of the “big 4” with major operations in Birmingham

Centres of Excellence/Assets

Business Schools
- Warwick Business School
- Birmingham Business School
- Aston Business School

Colleges
- Professional Services Academy, BMet

Trade Representatives
- BPS Birmingham

LEP Programmes/Investment
- Invest Black Country
- DY5 Enterprise Zone
- Black Country Growth Hub
- i9 Wolverhampton
- Friargate, Coventry
- Black Country Transformational GOLD
- Black Country Innovation Fund (pipeline)
- Wolverhampton City Council Broadband (pipeline)
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

AI & Data
• Technology enhancement the key agenda for large BPFS firms in the WMCA
• Connectivity – importance of broadband, 5G
• End-to-end customer journey
• Data-driven legal and accounting services
• Automated services

Future Mobility
• Significant legal and insurance issues around connected and autonomous vehicles.
Summary Statistics: Legal & Accounting

- £1.3bn GVA in WMCA
- 5.5% of BFPS GVA
- 1.6% of WMCA GVA
- 43,142 Jobs, 10.6% of the sector in WMCA
- 2030 Ambition: £2.8bn GVA, 52k jobs and £54k GVA per employee

In the WMCA, GVA has increased 43% from 2010-2015, and 37.5% since 2005. At the UK average, growth has been slightly slower at 33% in the last decade and 29% since 2010.

Jobs growth has also been faster in WMCA compared with the UK over the last decade (28% compared to 24%) & the last 5 years (27% compared to 16%)

*WMCA GVA & jobs data points for 2013 smoothed through interpolation to address volatility*
Supporting Sector Evidence Base – Legal & Accounting

Ideas

City-Redi/BPS Birmingham West Midlands CA Sector Deep Dive

Business Environment

City-Redi/BPS Birmingham West Midlands CA Sector Deep Dive

PwC/CityUK Research

Deloitte Research

BPS Birmingham

TheCityUK regional report

The Midlands Engine Midlands Financial Centre of Excellence report

Places

CBRE – ‘Law in the Regions’ Report
Industry Profile

Our Competitive Advantage

- **Major infrastructure investment** in the region (i.e. HS2).
- Ambition to build **215,000 homes by 2031**, with backing from government through a Housing Deal.
- SIA identified “**Sustainable Construction**” as **one of four Market Strengths**.
- R&D and commercial deployment by industry of **energy efficient and lower carbon building technologies**.
- Opportunities of BIM technologies, building materials and technologies, and zero-carbon building and efficiency measures.
- **High LQ's** confirm presence of a construction sector in WMCA (see next slide)
- Links in well with significant presence of manufacturing sectors.

Products, Services & Brands

- **Homeserve PLC** provide home emergency and repair services to over 7 million homes worldwide.
- A **Balfour Beatty** joint venture has been awarded HS2 contracts valued at circa £2.5 billion.
- **Barhale** was awarded a £21 million contract by the ODA, to design and construct a primary foul sewer and pumping station, as part of the Olympic Park development.

Centres of Excellence/Assets

**University Centres**
- The Built Environment, Information Systems & Learning Technology Research Centre, University of Wolverhampton
- The Centre for Environment and Society Research (CESR), Birmingham City University.
- The Centre for Low Impact Buildings, Coventry University
- Institute for Future Transport and Cities, Coventry University
- Department of Civil Engineering at UoB

**Colleges**
- Stourbridge College Construction Centre
- University of Wolverhampton’s Springfield Campus, home to the West Midlands Construction UTC.

**Other**
- HS2’s national construction HQ
- Alternative Raw Materials with Low Impact

**LEP Programmes/Investment**
- School of Architecture and Built Environment (SOABE)
- Dudley Brownfield Land Improvement Phase 1
- Dudley Advance and Innovation Centre
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

**Clean Growth**
- 215,000 new homes planned in the next decade are a huge opportunity for clean growth and for building West Midlands construction.
- Design (and specifications and regulation) will greatly influence the way these support healthy living, ageing population, community engagement, urban spaces and infrastructure.
- Opportunities to improve housing stock and to reduce fuel poverty
- Energy efficient & low carbon construction, including through offsite techniques
- Regional expertise in circular economy, industrial synergy, waste as a value stream.

**AI & Data**
- BIM
- Smart buildings
- Automated construction
  links with potentially digital supply chains of manufacturing sector
For most of the construction SIC code descriptions shown above, the WMCA has a LQ of higher than 1, meaning the region’s employment share is higher than that of the national average.

There’s a considerable cluster within the large sub-sectors of ‘Construction of residential and non-residential buildings’ and ‘Other specialised construction activities n.e.c.’ (1.6 and 1.3 LQ’s respectively).

‘Demolition and site preparation’ has the largest cluster though, with 5,000 jobs representing an LQ of 3.4
WMCA Construction Cluster

WMCA Super Strengths

Modular Construction
- Rising demand due to the need for faster and more efficient housing construction.
- Estimated to be worth £2-3bn per year in UK, & its market share of construction is increasing 25% per year.
- WMCA area has innovative firms in this space - e.g. SIMCO and LoCaL Homes.
- Led by housing providers – first off-site manufactured Wolverhampton & Coventry council homes in 2018.

Brownfield Land Remediation
- Development of strategic sites of employment and housing land is a key WMCA priorities.
- Action around improving this includes: Brownfield Research & Innovation Centre (BRIC), Land Remediation Fund, Land Commission

Internal Structures
- Fabricating and mechanical moving structures
- Specialists – e.g. Wembley arch

Sector Skills Development
- Skills supply/demand mapping and gapping
- Focused use of provision data to compare with employer demand
- See next slides
Infrastructure is substantially underrepresented in the region compared to the UK average (15% of the industry in the UK compared to 8% in the West Midlands).

- Construction output in the West Midlands is forecast to grow at an annual average rate of 1.3% between 2017 and 2021, higher than all regions outside London except the North West and South East.
- Employment is projected to grow at an annual average rate of 0.4% a year between 2017 and 2021, compared to 0.6% at the national level.
- The infrastructure sector is forecast to grow at an annual average rate of 10.6% in the five years to 2021, driven by the impact of HS2.

Source: CITB Regional Analysis
Summary Statistics: Construction (Current)

- **£7.1bn GVA** attributed to construction in WMCA, with 2030 ambition of **£10.9bn**.

- **186,000 jobs** in the sector locally. In 2030, the ambition is to have 234,000 construction jobs in the WMCA area.

- The majority (70%) of jobs & GVA (84%) appear within the ‘Building Construction and Engineering’ SIC code category.

- Construction GVA has **grown faster in the UK overall than in the WMCA** over the past 5 and 10 years.

Source: Oxford Economic Model
Previous deep-dive analysis on the sector (2013 data)

Source: Oxford Economic Model
**SECTOR SCOREBOARD - Construction (Building Technologies)**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Business Name</th>
<th>Location</th>
<th>Yearly Turnover (K)</th>
<th>Number of Employees</th>
<th>GVA Growth</th>
<th>GVA Impact (£m)</th>
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**GVA Growth**
- WX generated by the top 50 businesses has increased by 32.4% over 1st period.
- All of the top 50 businesses have increased GVA over a 1st period.
- 24 businesses have increased GVA by 10% or more.
- 54 businesses have increased GVA by 10% or more.

**Foreign Ownership & Listing**
- 4 businesses in the top 50 are foreign-owned.
- The largest foreign-owned business is listed on the London Stock Exchange.
- Average size per employee for these businesses is £1.2m.
- 5 businesses are listed on the London Stock Exchange.

**GVA Impact (£m)**
- Almost 50% of the top 50 businesses generated under £30m.
- A business generates 5% of GVA, accounting for 5% of total GVA generated by the top 50 businesses.

**Sub Sector Analysis**
- 65% of GVA generated by the top 50 businesses is concentrated in 1 sub sector, Construction & Materials.
- Construction & Materials has the highest number of businesses in the top 50 (20).
- Construction & Materials has the highest average size per employee (£1.2m).
- All sub sectors have seen size growths over a one-year period. Mining and Construction & Materials experienced growth above 20%.

*Source: FAME Database*
Supporting Sector Evidence Base – Construction

Ikea
The Built Environment, Information Systems & Learning Technology Research Centre, University of Wolverhampton
The Centre for Environment and Society Research (CESR), Birmingham City University.
The Centre for Low Impact Buildings, Coventry University.

Business Environment
CITB research & analysis
• Including West Midlands report
Barbour ABI Intelligence
• Including Construction Award Data
Farmer Review

People
CITB Data Tool
• Occupational demand for priority projects
CITB research & analysis, including WMCA Skills Gap Analysis Report

Infrastructure
Glenigan’s Database
• Construction projects database across West Midlands region
National Centre for Brownfield Land, Wolverhampton

Places
Creative
Creative Industries Sector

£4bn+ GVA for Creative Industries across WMCA region (estimated BCC)
9,975 Creatives Enterprises across WMCA region and 48,800 jobs (2015), second only to Manchester
£224m GVA from West Midlands Games Industry – with over 80% from the ‘core’ of fifty firms clustered around Leamington Spa (BOP)
240% increase in design jobs (2010-2015) with 80% advertising, marketing & PR jobs outside creative industries
Creative Industries recognised as a catalyst of cross-sectoral innovation across all sectors
The region’s strong Digital & Tech sector further strengthens the regions advantage in enabling the development of new products and services across a wide range of industries
Birmingham recognised as a ‘Creative Challenger’ Cluster with strong collaborations, sector specialisms, a diverse ecosystem and on track to become a central node in the UK’s creative geography (NESTA)

£4.1bn GVA for Creative Economy across GBSLEP (9% of total) which employs 50,000 (5.6% of total)
£1.9bn, creative services value chain and £1.4bn creative content value chain across GBSLEP
WMCA targets adding £3bn in GVA and 18,000 jobs to the region’s Creative & Digital sector by 2021 and £7bn GVA, 29,000 jobs and 18,000 NVQ4+’s by 2030, https://www.wmca.org.uk/what-we-do/strategy page 40/41

Super Strengths

Games Production
10% of UK games industry, significant major games companies in region, strong connections into digital manufacturing

Next Generation Content Creation
Strengths in Innovative and Immersive Content Creation amplified by our Young, Digital and Diverse population and BBC3 moving its youth programming to the region

Creative Collaboration
Identified strengths in creative and cross-sectoral collaborations are driving growth across all sectors

Design
Substantial advertising and marketing sector with strengths including web, product and fashion design, PR and data analysis

Designer-Makers
Largest Jewellery, high-value ‘designer maker’ and crafts cluster in UK, including hand crafting within automotive production

Cultural Industries are a part of the creative industries and have significant economic activity across the region, including in Birmingham - arguably the most significant Cultural sector outside London with a focus on performance, theatre, dance and music. Stratford-Upon-Avon – with the Royal Shakespeare Company (RSC). Wolverhampton – with a wide-ranging cultural offer and Coventry – with City of Culture in 2021, alongside huge opportunities across the creative sector and the visitor economy through the Commonwealth Games 2022
Creative: Industry Profile

Our Competitive Advantage

- Nationally significant Games Cluster centred on Leamington Spa, more than 10% of UK gaming jobs
- Substantial strengths around Advertising & Marketing, Design ICT & Web-based services
- Strengths in Next Generation Content Creation amplified by our Young and Diverse population as creators of ‘content, experiences, services and originals’
- Largest high-value Designer-Maker, Jewellery and crafts cluster in UK, includes hand-crafting for automotive
- Strengths in Creative and Cross-sectoral Collaboration, with new creative specialisms and a diverse ecosystem, will drive product development and growth (NESTA 2018)
- 5G Test Bed gives first-mover advantages to region
- Strong Digital & Tech sector compliments our creatives
- Digbeth has one of the largest creative clusters in the UK
- Significant cultural cluster centred around ‘Performance’, theatre and dance
- Commonwealth Games and Coventry City of Culture will drive our region’s profile and investibility beyond 2022
- Start-ups and SMEs benefit from attractive business costs, expert professional advice and access to centres of academic excellence
- Emerging potential as a High-End Production Centre

Strengths
Games Production, Next-Generation Content Creation, Creative Collaboration, Design, Designer-Makers

Centres of Excellence/Assets

University Centres:
- STEAMhouse (BCU, Birmingham)
- International Centre of Excellence Serious Games Institute Centre of Disruptive Media (Coventry)
- National Institute of Coding (Coventry)
- With many other centres with strong industry links...

Other Centres:
- BBC Academy
- Digbeth Creative Quarter: 350+ businesses in Birmingham
- Birmingham Jewellery ‘designer maker’ Quarter, largest in UK
- Creative Quarter, Leamington Spa (pipeline)
- Performance Cluster centred on Royal Shakespeare Company
- International Dance Cluster, centred on Birmingham Royal Ballet and International Dance Festival
- Birmingham Ormiston Academy – regional centre for digital, creative & performing arts
- Birmingham Metropolitan College: Digital & Creative Career College
- 26HT Business Incubator
- Well-coordinated and creatively driven propositions around skills, both formal and informal: Creative Alliance, BOA, BMet Digital & Creative Career College, Quickcode Labs.

Digital Infrastructure:
- Region-wide 5G Test Bed, 1-10Gb Fibre across parts of region

Products, Services & Brands

- DCA Design one of the world’s leading product design and development consultancies
- Codemasters one of the UK’s most successful games developers with global success for McCrae, F1 and Forza
- SEGA Hardlight – for all of SEGA’s mobile game products
- Ubisoft – games developer, including the DJ Hero game
- Virtual Reality (VR) and Augmented reality (AR) Market Leaders - including Holosphere and Daden
- BBC3 bases production of its youth channel in the region
- Father Brown, produced at BBC Birmingham, now sells to an extraordinary 220 territories worldwide
- Major Performance Organisations - including Royal Shakespeare Company and Birmingham Royal Ballet
- Film Birmingham, Studio facilities, Location Services for high-end production and a 700 strong freelance database
WMCA Creative Cluster

- **Creative GVA growth rate** has been faster in WMCA than the UK between 2013-2016 (16% growth)
- **Shared understanding amongst LEPs** and other partners that this sector plays a key role in catalysing the aspiration of the region’s ‘young, diverse and digital’ population
- **BBC3 in region** is a magnet for young content makers across a variety of genres, including comedy and factual programming
- **WMCA targets a £7bn increase** in Creative & Digital Sectors GVA along with 29,000 more creative jobs (2031)
- Creative Industries recognised as a **catalyst of cross-sectoral innovation** across all sectors, e.g. AR and VR have many emerging applications, such as within advanced manufacturing. Within 10 years VR/AR will be a $100bn global industry
- **Potential of product and service innovation** across sectors is enhanced by being the **Largest Digital & Tech sector outside London**
- **86% of Creative jobs cannot be automated**, they also tend to be high-value, e.g., Advertising/Marketing Jobs achieve £112,600 GVA per worker, making the industry worth backing for the future
- Birmingham has a **nationally significant cluster of major arts organisations** – the strongest of any English core city outside London
- **Design and Design Thinking** is a key regional strength with **240% average growth of design jobs** across region (2010-2015), 80% in non-creative industries, represents unfulfilled cross-sectoral growth opportunities, e.g., in manufacturing
- The region has strengths around ‘**performance**’ within the **creative experiences value chain**, especially in theatre, dance and music
- West Midlands is the **youngest region in Europe**, 40% of Birmingham’s population is under 25 and 46% of Coventry’s is under 30
- West Midlands is the region with **the most ethnically diverse population** outside the capital
- The region’s **Diverse** population is a great enabler to be a **leader in new and innovative creative ‘content, experiences, services and originals’**
- Birmingham City University (BCU) is the largest provider of graduates in creative disciplines of any university outside London and the South East
- Coventry is the **top ranked university nationally for Film Production & Photography**
- The WMCA offers **much lower business premises costs** than other competitor creative cities
WMCA Creative Statistics

**Definition of Creative Industries:** ‘Those industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property’ (DCMS 2001). Intensity of creative occupations determines the included sub-sectors which are: Advertising & Marketing, Architecture, Crafts (Designer-Makers), Design & Designer Fashion, Film, TV, Video, Radio & Photography, IT software & computer services, Publishing, Museums, Galleries and libraries, Music, performing and visual arts. It includes a large part of the cultural industries.

**Definition of Cultural Sector:** ‘Those industries with a cultural object at the centre of the industry’. (DCMS 2016) This includes the sub-sectors of: Arts (performing arts, artistic creation), Film, TV and Music, Radio, Photography, Crafts, Museums & Galleries, Libraries and Archives, Cultural Education and Heritage.

DCMS also covers the Digital Sector, Gambling, Sport, Telecoms and Tourism


There is a well understood link between a strong cultural offer in any given place and increased economic value by making the region more desirable to study, work and live in due to an improved quality of life for citizens. https://ahrc.ukri.org/documents/project-reports-and-reviews/measuringeconomicvalue/ (p2-9)

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**Across WMCA:**
- 9,975 Creatives Enterprises across WMCA region (second only to Manchester in CA’s across UK)
- 48,800 Creative Jobs within creative industries across WMCA (BOP) with a further 40,000 creative jobs in other industries (extrapolated)
- £4bn+ GVA estimated for creative industries across the West Midlands (extrapolated, but considered an under-estimate)
- £224m GVA for Games industry across the West Midlands (2015) – of which £188 million was from the ‘core’ of fifty firms clustered around Leamington, Southam and Warwick
- Around 50% of creative jobs our freelance

**Across GBSLEP:**
- 50,000 employed across Creative Economy, 27,500 employed across Creative Industries
- £2.1bn GVA for Creative Industries, £1.9bn GVA, 18,400 employed in Creative Services
- £1.4bn GVA, 16,850 in Creative Content Production, 6,150 Digital/Creative Businesses in 2015, 32,000 Across Advertising & Marketing & ICT, Software & Computer Services
- Unfulfilled potential to add 3,965 new enterprises and 30,000 new jobs (from 5.6% to 9% of workforce)

**Across CWLEP:**
- 9.45% annual growth in Digital Creative Cluster enterprises (2012-2016) to 1138

**Across BCLEP:**
- £944m Black Country visitor economy from 28 million visitors (2016)
- a 4.5% increase from 2014. It provided 9,700 jobs in 2015
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

AI & Data

• Key cross overs with the digital sector
• Visitor services around the Commonwealth Games and City of Culture
• Potential impact of Channel 4 re-location
• Creative technologies in addressing isolation: This is both a community and a technology space. Coventry’s City of Culture has a focus of wellbeing and community which may be an opportunity to look at digital and creative approaches to engaging with older people. Coventry is a recognised ‘living lab’ and the City of Culture could support testbed activity.
Supporting Sector Evidence Base: Creative Industries

**Ideas**

- Creative Industries: A Toolkit for Cities & Regions (CIC 2017)
- Creative Nation Report (NESTA 2018)
- GBSLEP Creative Industries Delivery Plan / CI Steering Group
- West Midlands Screen Bureau (CA/BFI)
- WMCA Creative, Culture & Tourism Group

**Business Environment**

- GBSLEP Creative Economy Mapping Study (BOP/GBSLEP)
- Games Industry in Coventry & Warwickshire Report (CWLEP/UKIE)
- WMCA Culture, Creative & Tourism Study (Tom Fleming/WMCA Creative Group)
- Independent review of Creative Industries (Sector Deal/Sir Peter Bazalgette)
- WMGC ‘Deep Dive Reports (around Creative & Digital)
- Creative England Reports on screen and tech
- Creative Industry Federation Reports on many subjects, including brexit
- Chamber Quarterly Economic Survey (QES)
  - Local business confidence survey
  - Chamber export documents
- Local Research (inc. Black Country LEP & BCC Ltd. EIU, West Midlands Growth Company, GBSLEP, Coventry & Warwickshire LEP etc.)

**Places**

- Spatial analysis of companies and assets - Mapping of companies across sectors
- Centres of Excellence, Strong Cultural Offer across Region

**People**

- Creative Skillset Reports on Creative Workers, Freelancers, job trends
- British Film Industry 2022 – Strategy for the UK
- Create Together: Creative Industries Council strategy for Cross Industry Collaboration (CIC 2014)
- Skills & Employment Boards (GBSLEP/CWLEP/BCLEP)
- WMCA Diversity
- ESFA Data cube - FE provision data (inc. apprenticeships) across subjects/sectors
- HESA data - HE provision data across subjects/sectors
- NOMIS analysis - Jobs, qualifications, earning, business counts etc
- Oxford Economic Model - Jobs by sub-sectors, occupations by sub-sectors & geographies

**Infrastructure**

- Significant Maker & 3d Design Engineering Cluster in Jewellery Quarter
- Significant Creative & Digital Cluster in Digbeth, Birmingham
- Significant Games Cluster focused around Coventry & Leamington Spa
- Arguably the leading cultural sector outside London
- Birmingham emerging Challenger Creative Cluster (NESTA 2018)
- 5G Test Bed to be built across region
Life Sciences & Healthcare
Life Sciences – Regional profile

• 5th largest UK concentration of life sciences employment – after the ‘golden triangle’ (London-Cambridge-Oxford) and the North West (HMG, 2016)

• Established medical technologies cluster, covering the R&D, design and production of devices, diagnostics and software as a medical device (SQW, 2017)

• Established clinical trials capability including cost effective access to a integrated clinical and genomic data sets for a diverse patient population and trials networks for accelerated trials (IBM-PLI, 2017)

• Competitiveness for FDI in high value medical technologies R&D and manufacture drawing on regional strengths advanced manufacturing and digital (source: IBM-PLI, 2017)
WMCA Life Sciences Cluster

• The Government’s yearly Strength & Opportunity publication provides the most robust measure of life sciences activity in the UK.

• According to this data there are 400 life sciences businesses in the WMCA 3-LEP area, employing around 11,000 and generating approx. £4bn turnover (‘Strength & Opportunity’, 2017).

• The core Medical Technologies sector is the largest sub-activity of life sciences in the WM, employing over 7,000 people and making up 8% of the UK’s total core Med Tech employment.
WMCA Life Sciences Cluster

**Super Strengths**

**Medical Devices & Diagnostics**
- Industry R&D, design and production of high tech medical devices and diagnostics including global players - The Binding Site, Salts Healthcare and Kimal and a fast-growing base of digital tech companies in healthcare
- Specialist industry support offer and facilities for med tech companies including the MD-TEC Medical Devices Testing and Evaluation Centre, the Manufacturing Technology Centre and the Serendip® Digital Health incubator
- Strong translational partnerships for med tech innovations e.g. the NHR Trauma Management Med Tech Cooperative

**Clinical Trials & Data Testing**
- Largest clinical trials base in Europe outside Oxford, including Cancer Trials Unit
- Advanced Electronic Healthcare systems support access to integrated genomic data for large, diverse, stable, patient population
- Accelerated trials network offer to industry for rapid, cost-effective trials
Industry Profile

Our Competitive Advantage

- Industry strengths and global competitiveness for **FDI** in high tech medical devices R&D and manufacture drawing on region’s innovative and high tech manufacturing capabilities (IBM-PLI, 2017)
- **Clinical trials and data capabilities** – largest clinical trials base in Europe outside Oxford including Cancer Trials Unit and accelerated trials networks and access to large, integrated patient data sets for a diverse, stable population – drawing on leading capabilities and track record in health data collection and testing generating novel data types
- **Strength of our clinical and academic centres of excellence including the Queen Elizabeth hospital site which is one of the largest in Europe and includes Europe’s largest organ transplant centre, the world’s largest single-site critical care unit and a world-class burns and defence medicine centre**
- **Strong innovation ecosystem** including translational partnerships and facilities and a network of science parks, specialist incubations and innovation support
- **Strong supply of graduate talent** with three medical schools in the region at Universities of Birmingham, Warwick and Aston

Products, Services & Brands

Largest regional concentration of life sciences companies in the UK (WMGC), offering wide array of products/services:

- **Clinical trials** – largest clinical trials base in Europe outside Oxford
- **Precision medicine** including expertise in genetic/genomic testing and patient stratification
- **Specialist diagnostics** e.g. immunodiagnostics (The Binding Site), cancer diagnostics, Alzheimers
- **Medical devices** – e.g. stoma care (Salts Healthcare), procedure packs (Kimal), orthopaedic
- **Software as a medical device/digital health** e.g. Safe Patient Systems, Evolyst, CCBT Ltd

Centres of Excellence/Assets

In addition to numerous clinical and academic centres of excellence and translational facilities covering a wide range of disease areas:

**Medical Devices**
- MD-TEC Medical Devices Testing and Evaluation Centre
- NIHR Trauma Management Med Tech Cooperative Manufacturing Technology Centre

**Digital & Data**
- Institute of Translational Medicine
- Health Data Research UK site (HDR-UK)
- Four NHS Global Digital Exemplars
- West Midlands Genomic Medicine Centre
- Digital Health West Midlands
- Institute of Digital Healthcare

**Clinical Trials**
- No. of academic centres of excellence, e.g. Aston Brain Centre Trials Acceleration Programme - Centre for Clinical Haematology

**Graduate/College Base**
- 3 Medical Schools (UoB, Warwick and Aston)
- Advanced Life Sciences, Solihull College

**Specialist incubation, innovation support and clusters**
- Life Sciences Park in Edgbaston, Birmingham
- The BioHub Birmingham
- Serendip® Digital Health Incubator and Innovation Engine @ Innovation Birmingham
- Edgbaston Medical Quarter
- WMAHSN Meridian Innovation & Adoption Service
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

AI & Data
• WM is a recognised data leader at acute, primary and public healthcare University Hospital Birmingham has 1.2 million patients – all have electronic records. Birmingham Health Partners are one of 4 Health Data Research Centres
• Technology both for closed data sets (clinical data) and open, anonymised data (data analytics) is developing

Ageing Society
• Unique opportunity in the West Midlands to create an environment for new industries in healthcare based on the richness of the population data and the integration of service provision to better articulate the challenges and opportunities
• Significant health challenges (obesity, diet, diabetes) which are not restricted to older patients but will have significant impact in later life
• The impacts of an ageing population on mobility and productivity are significant
• WM’s diverse population is a USP in terms of becoming a testbed for research and industry
• Enabling people to continue to work and ensuring older people become regional assets (mentoring etc)
Competitive Advantage

**Patient data** - access to large, integrated clinical and genomic patient data sets for a **large, stable and diverse** patient population of over 5 million with a high prevalence of cancer and rare diseases that is being deployed by clinical and academic partnerships to generate and harness novel data types to deliver clinical gains –:

- West Midlands Genomics Medicine Centre (WMGMC) is delivering up to 13,000 of the nationwide 100,000 Genomes Project across 17 Trusts and has recruited 79% of the rare disease conditions (more than any other)
- UHB Global Digital Exemplar has one of the most advanced Electronic Healthcare Record (EHR) systems globally
- Genomics Networked Information Exchange (GeNIE) platform integrates clinical and genomic data across 17 Trusts
- Midlands Health Data Research UK (HDR-UK) site

**Trials capability** - expertise in genetic/genomic testing and patient stratification and accelerated trials models developed in blood cancers and being extended to other diseases and therapies

**Advanced Manufacturing & Engineering** – regional expertise including AI, automation and robotics, sensor technologies, big data analytics, simulation and modelling supporting the design, development, manufacture, testing and prototyping of complex medical device products and services - supports industry strengths and global competitiveness for **FDI in high tech medical devices R&D and manufacture** (IBM-PLI, 2017)
Future Growth Opportunities

- Match between region’s patient data offer and trials capability and growing industry requirements for faster, more effective trials and access to large, real-world evidence for stratified patient populations

- Leverage regional academic, NHS and industry expertise in advanced manufacturing & engineering technologies, digital and data to develop innovative technologies and treatments

- Strong translational partnerships across HE-NHS-industry

- Strong innovation ecosystem and asset base which is being continually developed – particular opportunity is Life Sciences Park in Edgbaston, Birmingham offering a opportunity for attracting and developing a strong cluster of innovative life sciences companies drawing on the strengths and capabilities assets in Edgbaston and the wider region including access to patient data and clinical trials and testing capabilities
The West Midlands Science & Innovation Audit identified a market strength in ‘Technologies for Better Health’ including:

- **Medical technologies**, covering the R&D, design and production of devices, diagnostics, and software as a medical devices
- Economic growth opportunity from the **application and commercialisation of research strengths in translational medicine** from our clinical and research base, and the accelerated access to new drugs, treatments and health technologies
- Cluster of assets in **Edgbaston** linked to wider assets across the 3-LEP geography

**Growth Opportunities**

- High tech medical devices R&D and manufacture
- Digital health
- Artificial intelligence
- Precision medicine
- Clinical trials
- Birmingham Life Sciences Park
- Harnessing the region’s strengths and capabilities in digital and data and its engineering and manufacturing expertise to attract investment and grow the indigenous business base in medical technologies R&D manufacture and digital health.
- **Establishing the region internationally as one of Europe’s premier medical, research and healthcare districts, with world-class expertise and quality care to choose from.**

**Challenges in growing the regional industry include:**

- Increasing awareness and profile of the region’s strengths and opportunities
- Strengthening existing collaboration to create clear and seamless pathways for innovators, industry and investors including cross-sector
- Developing education and training pathways through cross-sector collaboration between industry, NHS and education
- Access to finance to support SME growth
- Supporting industry to access NHS and export markets
- Increasing region’s supply of specialist facilities for industry including incubation and grow-on facilities
Inward investment prospects – Medical devices/Med tech

Typical investors

- Larger medical equipment manufacturers looking to establish or expand capacity for the UK and European market
- Investors looking to tap into the region’s strong advanced manufacturing capabilities

The region’s USPs

1. The UK has one of the largest company bases in electro-medical and control instruments manufacturing in the world
2. The West Midlands has the highest regional concentration of Medtech companies within the UK
3. Strong Medtech focused science & research activities
4. Strengths in testing and speed to clinical trials key as assets to support further growth
5. Favourable regulatory environment in the UK

Potential wider impact on the region’s economy

A significant number of jobs (e.g. scientists/technologists with degrees and higher degrees) are high value added (i.e. highly skilled with high GVA per worker) jobs, making an important contribution to improving regional productivity.

Key emerging technologies driving business growth and investment

- Cloud computing and virtualisation technologies to monitor and utilise capacity within vehicle fleets to accommodate peaks and troughs in demand
- Integrated delivery systems for shopping centres to increase transportation efficiencies and reduce traffic and bottlenecks
- Automated Guided Vehicles (AGV) in warehousing
- Drone transportation technologies

Key competitor locations:

UK: Manchester, Liverpool, Sheffield, Leeds, Glasgow

Europe: Dublin, Paris, Berlin, Dusseldorf

Global: Austin

Main origin countries

- United States
- Sweden
- Japan
- Germany
- Switzerland
- Spain
- Netherlands
- Israel
- India
- China

Sources:
- IBM-PLI
- FDI Intelligence
- WMGC Regional Observatory deep dive intelligence
- Black Country Consortium Economic Intelligence Unit LIS analysis
Summary Statistics: Life Sciences & Healthcare (Current)

- Data on this slide (& the following 2) uses the WMCA's initial SIC definition of Life Sciences & Healthcare: this misses out a lot of life sciences activity that is scattered across other sector SIC codes and is therefore less robust than the S&O data for measuring life sciences in the region. Most of the data included here reflects health & social care activity rather than Life Sciences.

- £6.2bn GVA attributed to life sciences & healthcare in WMCA. The 2030 ambition for this sector is £12.1bn.

- 228,300 jobs in the sector locally, with an ambition of 323,800 for 2030.

- Life Sciences & Healthcare GVA has grown faster in the UK overall than in the WMCA over the past 5 and 10 years.

Source: Oxford Economic Model
Previous deep-dive analysis on the sector (2013 data)

Source: Oxford Economic Model
### SECTOR SCOREBOARD - Life Sciences and Healthcare

#### QVA Growth
- QVA generated by the top 50 businesses has increased by 28.4% over 3yr period
- 17 of the top 50 businesses have increased their QVA over a 3yr period
- 14 businesses have increased their QVA by 10% and over
- 11 businesses have increased their QVA by 40% and over

#### Foreign Ownership & Listing
- 5 businesses in the top 50 are foreign owned
- The largest foreign-owned company in the top 50 is ranked 6th - Uppsala Pharmaceutical
- The largest number of global owners are in the USA (5 businesses)
- £4.57bn per employee for these businesses
- £1.72bn

#### QVA Impact (gwh)
- QVA generated by the top 50 businesses is concentrated in 1 sub-sector
- Pharmaceuticals & Biotechnology has the highest average QVA per employee
- Pharmaceutical & Biotechnology has the highest growth rate (33.4%)
## Supporting Sector Evidence Base – Life Sciences & Healthcare

### Ideas
- West Midlands Academic Health Science Network
- Medical Devices Testing and Evaluation Centre
- Institute of Translational Medicine
- West Midlands Science & Innovation Audit
- Industry engagement

### Business Environment
- Government Bioscience and Health Technology database: annual report 2016
  - Listing of West Midlands companies including sector, activity, turnover and employment band (note Medilink WM supply the West Midlands data and will have more recent figures)
- Greater Birmingham Life Sciences Commission, July 2015
  - Strengths, assets and opportunities
  - Areas and recommendations for improvement
- Medilink WM
  - Company database (supplies the Bioscience and Health Technology database)
  - Inward investment research for the West Midlands Growth Company, IBM-PLI, 2017
- Industry engagement

### Infrastructure
- Midlands Health Data Records UK site
- West Midlands Growth Company
- Partner case studies

### Places

### People
- WMCA Productivity & Skills Commission
- Industry engagement
Logistics & Transport
DELIVERING INCLUSIVE GROWTH

Super Strengths

Central Location
• Central location with good connectivity and strong logistics network, underpinned by excellent access to the motorway network
• 90% of the UK population is within four hours’ drive to the West Midlands. London is commutable in under 70 minutes and from just 45 minutes by 2026 due to HS2.

Courier Activity
• At 1.7, for Postal and Couriers, WMCA (7MET) has the highest location quotient of all UK NUTS2 areas, meaning the region has the largest share of employment in this sub-sector in the country.
• Key players present including the HQ’s of DPD and Interlink Express, as well as a large number of logistics SME’s

New Technology Application
• Such as automation, cloud computing, fleet management—all including cross-overs with manufacturing.
• The region’s digital clusters to provide basis for this.
Industry Profile

Our Competitive Advantage

• Central location with good connectivity and strong logistics network, underpinned by excellent access to the motorway network.

• 90% of the UK population is within four hours’ drive to the West Midlands. London is commutable in under 70 minutes and from just 45 minutes by 2026 due to HS2.

• Established transport manufacturing industries (automotive, aerospace, rail) provide useful sector cross-overs and collaboration opportunities.

• Key location in the development of next generation transport, as identified in the SIA (electric vehicles, CAV). These are disruptive technologies within logistics & transport.

• Digital cluster (particularly in Birmingham & Leamington) has the potential to apply AR/VR technologies etc to logistics.

• In WMCA (7MET), Transportation and storage has the third largest location quotient of all broad sectors ((1.2).

• At 1.7, for Postal and Couriers, WMCA (7MET) has the highest location quotient of all UK NUTS2 areas, meaning the region has the largest share of employment in this sub-sector in the country.

Products, Services & Brands

• Birmingham Airport is the country’s fastest growing airport, handling 13 million passengers a year flying to 150 destinations.

• UK HQ of DPD in Smethwick.

• Rotala’s registered bus services carry more than 29,000,000 passengers every year.

• National Express, HQ’d in Birmingham, carries out more than 882 million journeys worldwide each year with its fleet of over 29,000 vehicles.

Centres of Excellence/Assets

Innovation:
• The National Transport Design Centre, Coventry
• Very Light Rail Innovation Centre
• Advanced Propulsion Centre, University of Warwick
• Birmingham Centre for Rail Research and Education
• Wton Science, Technology & Prototyping Centre
• Rolls-Royce University Technology Centre, Birmingham
• National Battery Prototype Centre, Warwick
• The Digital Media Technology Lab, BCU

Training:
• Network Rail Training Centre, Walsall
• National College for High Speed Rail, Aston

Production Processes:
• Manufacturing Technology Centre (MTC)
• Warwick Manufacturing Group (WMG)
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

**Clean Growth**
- Electric and low emission logistics & transport vehicles, e.g. clean alternatives to diesel vans
- Cross-overs with automotive, rail and aerospace

**Future Mobility**
- CAV vehicles for logistics and public transport
- Understanding why people travel (and ‘trip-chains’ of different destinations) and how to create a transport system with an understanding of affordability, experience and productivity
- Improving the passenger experience through connectivity
- Maximising the impact of HS2
- Solving the perception that travel in the WM is problematic

**AI/Data**
- The WM has severe congestion which is affecting productivity, health (air quality and stress) and restricting clean growth of key logistics supply chains. The construction of HS2 will add to this in the short term. What data/system solutions may there be to optimise travel within the region?
- Customer/passenger data through TfWM and Swift card
Inward Investment Prospects – Transport and Logistics

Typical investors

• Major retail chains looking to establish distribution centres
• Specialist global transport and logistics providers

The region’s USPs

1. Strong and growing regional logistics sector (66% growth in the number of businesses in past 5 years)
2. Substantial workforce with relevant skills and experience
3. Central location with good connectivity and strong logistics network,
4. Access to large regional and UK market

Potential wider impact on the region’s economy

While a significant number of jobs are created by investments, a significant proportion are relatively lower skilled (e.g. drivers, warehouse operatives). As a result investments in this sector make only a limited contribution to improving regional productivity.

Main types of transport and logistics investment

- Distribution center
- Freight transport
- Passenger transport

Key emerging technologies driving business growth and investment

• Automated Guided Vehicles (AGV) in warehousing
• Drone transportation technologies
• Cloud computing and virtualisation technologies to monitor and utilise capacity within vehicle fleets to accommodate peaks and troughs in demand
• Integrated delivery systems for shopping centres to increase transportation efficiencies and reduce traffic and bottlenecks

Key competitor locations:

UK: London, Manchester, Liverpool, North East, Sheffield, Tees Valley, West Yorkshire
Europe: Antwerp, Rotterdam, Dusseldorf
Global: Chicago, Atlanta

Typical investors

• Major retail chains looking to establish distribution centres
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• Integrated delivery systems for shopping centres to increase transportation efficiencies and reduce traffic and bottlenecks

Potential wider impact on the region’s economy

While a significant number of jobs are created by investments, a significant proportion are relatively lower skilled (e.g. drivers, warehouse operatives). As a result investments in this sector make only a limited contribution to improving regional productivity.
Summary Statistics: Logistics & Transport (Current)

- £4.7bn GVA attributed to logistics & transport in WMCA, with a 2030 ambition of £7.1bn.

- **123,000 jobs** in the sector locally. In 2030, the ambition is that 125,000 jobs will exist in logistics & transport.

- Jobs & GVA is quite evenly spread across the three sub-sectors, though the largest is ‘Land, Air & Water Transportation’ (42% of jobs & 40% of GVA).

- Logistics & Transport GVA has grown faster in the WMCA than it has in the UK overall WMCA over the past 5 and 10 years (30% growth compared to 11% since 2010).

Source: Oxford Economic Model
Previous deep-dive analysis on the sector (2013 data)

Source: Oxford Economic Model
DELIVERING INCLUSIVE GROWTH

SECTOR SCORECARD - LOGISTICS

GVA
Current GVA: £3.5bn
4.3% of total WMCA GVA
Growth Ambition: £5.0bn
+£1.5bn GVA
Growth Rates 2010 – 2013
WMCA: 3.8% (+£128m) UK: +1.1%
Most Important sector: Land Transport and transport via pipelines (50.6%)

Source: Oxford Economic Model

JOBS
Current Jobs: 93,800
4.9% of total jobs
Growth Ambition: 125,500
+31,700 jobs
Growth Rates 2010 - 2013
WMCA: +7.6% (+4,200 Jobs) UK: +3.6%
Most Important sector: Land Transport and transport via pipelines (40.9%)

Source: Oxford Economic Model
### Logistics & Transport Technologies: Top 10 Businesses by CVK

<table>
<thead>
<tr>
<th>Business Name</th>
<th>Industry</th>
<th>CVK Score</th>
<th>CVK Rank</th>
<th>CVK Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>Sector A</td>
<td>100</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>Company B</td>
<td>Sector B</td>
<td>95</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>Company C</td>
<td>Sector C</td>
<td>90</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Company D</td>
<td>Sector D</td>
<td>85</td>
<td>4</td>
<td>0%</td>
</tr>
<tr>
<td>Company E</td>
<td>Sector E</td>
<td>80</td>
<td>5</td>
<td>-5%</td>
</tr>
<tr>
<td>Company F</td>
<td>Sector F</td>
<td>75</td>
<td>6</td>
<td>-10%</td>
</tr>
<tr>
<td>Company G</td>
<td>Sector G</td>
<td>70</td>
<td>7</td>
<td>-15%</td>
</tr>
<tr>
<td>Company H</td>
<td>Sector H</td>
<td>65</td>
<td>8</td>
<td>-20%</td>
</tr>
<tr>
<td>Company I</td>
<td>Sector I</td>
<td>60</td>
<td>9</td>
<td>-25%</td>
</tr>
<tr>
<td>Company J</td>
<td>Sector J</td>
<td>55</td>
<td>10</td>
<td>-30%</td>
</tr>
</tbody>
</table>

#### CVK Growth
- CVK generated by the top 50 businesses has increased by 5.7% over a 2-year period
- 15 of the top 50 businesses have increased CVK over a 2-year period
- 12 businesses have increased CVK by 10% or more and over

#### Foreign Ownership & Listing
- 20 companies in the top 50 are foreign owned
- The largest foreign-owned company in the top 50 is ranked 4th, Jaguar Land Rover Limited
- The largest number of global systems are in the UK (3 businesses)
- Average tax per employee for these businesses is £13,587

#### Industry Profile
- 22 businesses are located in the London Stock Exchange
- 4 in aerospace & defence, 3 in automotive & parts, 2 in industrial construction, 1 in logistics & transport technologies

Source: FAME Database
Supporting Sector Evidence Base – Logistics & Transport

**Ideas**
- West Midlands Science & Innovation Audit

**Infrastructure**
- West Midlands Freight Strategy
- West Midlands Strategic Transport Plan, ‘Movement for Growth’

**Business Environment**
- West Midlands Growth Company IBM Research

**People**

**Places**
- West Midlands Growth Company: “Make Your Mark”
Low Carbon & Environmental Technologies
WMCA Low Carbon & Environment Cluster

• CWLEP ranks 2\textsuperscript{nd}, and BCLEP 4\textsuperscript{th}, out of all LEPs for \textbf{\% of total GVA attributed to Energy & Environmental Tech} (6.6\% and 4.65\%).\textsuperscript{1}

• West Midlands (7MET) has the \textbf{highest GVA of all UK NUTS2 regions in this sector}, and the 2nd highest employment (behind South Western Scotland). This is driven by a high GVA in both sub-sectors, in different areas of the region (Water/Waste in CWLEP, and Energy in BCLEP).\textsuperscript{1}

• CWLEP is 2nd only to Thames Valley for the \textbf{lowest \% of workers who have no qualifications across Energy & Environmental Tech} (11\%). The area is also second on \% of workers in these sectors Level 4 qualifications and above (40\%).\textsuperscript{2}

• The West Midlands Science & Innovation Audit identifies ‘Energy Storage and Systems’ as one of the four key Market Strengths, pointing to \textbf{major academic assets} (e.g. Energy Systems Catapult, Energy Research Accelerator) and \textbf{the scale and significant concentration of industry} (see table 2).

• WMCA’s \textbf{central location} makes it attractive for infrastructural and logistical purposes

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|}
\hline
\textbf{Core Energy Industries} & \textbf{Employment} & \textbf{LQ} & \textbf{Enterprises} \\
\hline
Electricity, gas, steam and air conditioning supply & 11,000 & 1.4 & 5 \\
Water collection, treatment and supply & 3,500 & 1.7 & 10 \\
Waste collection, treatment and disposal activities; materials recovery & 7,000 & 0.9 & 60 \\
Remediation activities and other waste management services & 900 & 2.5 & - \\
\hline
\end{tabular}
\caption{Scale and concentration of activity in Energy & Environmental Tech SIC codes}
\end{table}

\textsuperscript{1}ONS Regional Accounts (2015 data)

\textsuperscript{2}2011 Census data

Table 2 shows all the SIC codes included in our sector definition except for Sewerage. The ‘LQ’ column, meaning location quotient shows that \textbf{in three out of the four sector SIC codes, the WMCA is above the UK average for employment concentration.}

The high LQ for ‘Electricity, gas, steam and air conditioning supply’ reflects the presence in the area of \textbf{some of the largest and most important energy firms in the UK}, including National Grid, E.ON UK, and npower.
WMCA Low Carbon & Environment Cluster

Super Strengths

**Battery Development**
- Key players locally, both private sector and innovation/research assets (ERA, Catapult)
- Links in well with automotive manufacturing cluster

**Organised Partnerships**
- E.g. Energy Capital

**Major HQs**
- E.g. National Grid, E.on, Severn Trent, South Staffs, Cadent
Industry Profile

Our Competitive Advantage

- **WM has an inbuilt natural global competitive advantage** in its energy infrastructure, energy sector skills, diversity of local markers and innovation asset base in energy systems.

- Home to the **UK headquarters of some of the most significant energy and water businesses** in the country (for example National Grid, Cadent, E.ON, Severn Trent).

- Hosts a **significant portion of the UK’s energy innovation and research and deployment capacity** in the Energy Systems Catapult, our universities and various technology consultancies.

- WMCA’s (7MET) LQ in Electricity, gas, steam & air conditioning supply of 1.4 is the **joint highest for all broad sectors (with manufacturing)** in the area.

Products, Services & Brands

- **South Staffordshire Water** supplies high quality drinking water to approximately 1.3m people and approximately 35,000 commercial customers.

- **Alutrade** was involved in the recycling of materials from the opening ceremony of the London Olympic Games - specifically the Olympic Rings and the mock-up of Big Ben. The aluminium recycler was involved in the removal of seating from the water polo venue too.

- **ELG Carbon Fibre** have developed the CARBISO™ product range, an innovative line of reclaimed carbon fibre products. CARBISO™ stands for high quality isotropic reclaimed carbon fibre products.

Centres of Excellence/Assets

Research Centres

- Energy Systems Catapult, Birmingham
- Energy Research Accelerator
- European Bioenergy Research Institute, University of Aston
- Energy Innovation Centre, Warwick Manufacturing Group
- Centre for Cryogenic Energy Storage, University of Birmingham
- Centre for Fuel Cell Research, University of Birmingham
- Brownfield Research & Innovation Centre (BRIC), Wolverhampton

Training

- EPSRC Centres for Doctoral Training, University of Birmingham

Programmes

- Climate-KIC Accelerator programme
- Energy Capital
- Tyseley Energy Park access to road (to unlock site for pipeline below)
- Hydrogen Buses
- European Bioenergy Research Institute
- Low Carbon SMEs
- Accelerating Thermal Energy Technology Adoption

LEP Programmes/Investments

- Built Environment Climate Change Innovations (BECCI)
- Environmental Technologies Resource Efficiency Support Service (ENTRESS)
- Low Carbon Growth Support
Grand Challenges Context

Link to Industrial Strategy Grand Challenges

Clean Growth
• Batteries will address many of the short-medium term energy storage issues in transport and housing. Longer-term, there will be a need to improve the energy density of storage – either through improving battery technology or through other storage technologies such as hydrogen.
• Energy Innovation Zones (under Energy Capital) will facilitate place-based approaches to energy innovation and infrastructure in constrained zones.
• Air quality is a major concern across the region - Clean Air Zones will be established in Birmingham and Coventry and are a significant political driver for clean growth.
• Value from waste - building on strong supply chains to generate further value through clean growth.

Future Mobility
• Electric Vehicles & other commercialised opportunities
• Significant innovation strengths in the WM (UK Battery Industrialisation Centre, Energy Research Accelerator etc).

AI/Data
• Smart energy
• Energy storage
• Cross-overs with energy efficient construction technologies
Inward investment prospects – Low Carbon & Environment

Typical investors
- Energy service providers and utility companies
- Engineering and technology companies with battery and energy storage businesses
- Automotive companies looking to develop new cleaner car propulsion solutions.

The region’s USPs
1. High demand for electric cars and associated energy storage market due to mature regional automotive cluster
2. Good pool of professionals with expertise in batteries, energy storage or electric vehicles
3. The region’s universities are the most active in Europe in research on lithium ion batteries – and have the most patents granted in climate change mitigation technologies related to transportation
4. Strong regulatory support framework to stimulate the sales of electric vehicles in the UK
5. Cost saving potential compared to other strong quality location candidates

Main types of investment
- Production
- Warehouse
- Laboratory
- Office

Potential wider impact on the region’s economy
Investments tend to be capital intensive and typically generate relatively limited numbers of jobs. Nevertheless a significant number (e.g. engineers and scientists/technologists with degrees and higher degrees) are high value added (i.e. highly skilled with high GVA per worker) jobs, making an important contribution to improving regional productivity.

Key emerging technologies driving business growth and investment
Development of cheaper, longer life nanowire, solid state, nickel metal hydride, graphene and hydrogen based battery technologies for:
- Electric vehicles
- Smart phones
- Smart homes
- Smart wearable technologies

Sources:
IBM-PLI
FDI Intelligence
WMGC Regional Observatory deep dive intelligence
Black Country Consortium Economic Intelligence Unit LIS analysis

Key competitor locations:
UK: Manchester, Liverpool,
Global: USA (e.g. Austin), China

Main origin countries
| United States  |
| South Korea   |
| Italy         |
| China         |
| Japan         |
| France        |

Job volume | Job value
Low | High
The core Low Carbon & Environmental Tech sector contributes £3.3bn GVA in WMCA, 4% of the region’s total (the smallest of the 10 sectors). In the UK overall, the sector only takes up 2.5% of total GVA. Within the WMCA...

- The Energy sub-sector contributes £2.1bn (63.7% of the sector)
- Water & Waste Activities takes up the remaining £1.2bn (36.3%)

There are 24,500 jobs in this sector in WMCA, with the Energy and Water & Waste Activities sub-sectors having an almost equal share of these.

At the UK level, the share of jobs in this sector is more sided towards Water & Waste Activities - 60% of sector jobs - than Energy: 40% of sector jobs.

Identifying the exact amount of activity outside our narrow sector definition is difficult, but it’s likely that additional activity takes the number of jobs associated with Low Carbon & Environmental Tech to above 50,000 in the WMCA area. Employment figures below give examples of the type of additional sub-sectors we are talking about; of course not all of the jobs in these sub-sectors will be related to Energy & Environment (particularly engineering activities), but it allows us to estimate.

```
<table>
<thead>
<tr>
<th>Supporting Industry</th>
<th>Employment (2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of coke and refined petroleum products</td>
<td>225</td>
</tr>
<tr>
<td>Manufacture of other organic basic chemicals</td>
<td>500</td>
</tr>
<tr>
<td>Manufacture of electric lighting equipment</td>
<td>1,250</td>
</tr>
<tr>
<td>Other professional, scientific and technical activities n.e.c</td>
<td>8,000</td>
</tr>
<tr>
<td>Engineering activities and related technical consultancy</td>
<td>23,000</td>
</tr>
<tr>
<td>Technical testing and analysis</td>
<td>5,000</td>
</tr>
</tbody>
</table>
```

Source: Business Register and Employment Survey (BRES)

The graph above shows that substantially high growth in jobs over the last decade hasn’t been converted into equally as substantial high growth in GVA. This is the case for both the WMCA and UK overall.

- In WMCA, jobs have increased from 16k in 2005 to 24.5k in 2015 but GVA has only risen from £2.8bn to £3.3bn. The disparities in GVA & Jobs growth overtime can mostly be attributed to the Energy sub-sector – this has had 14% growth in jobs since 2010 but a 3.6% decline in GVA.
- A possible reason for the contrasting levels of GVA and jobs growth in this sector is a decrease in economic activity since the financial crisis due to softening demand, with fixed costs remaining the same.
Low Carbon & Environmental Tech is the **most productive of our sector definitions** both in the UK and WMCA by a considerable amount (measured by GVA per employee). Additionally, this is the **only sector in which the WMCA has a higher GVA per employee than the UK overall**, reflecting the considerable cluster of Energy & Environmental companies that are present in the region. As shown by Table 1, the WMCA has a **higher productivity than the UK across both of the sector’s sub-sectors**, with Energy being the sub-sector which mostly drives the high GVA per employee figures.

- Our ambitions shouldn’t be scaled back due to good performance within this sector locally; we should look to **build on successes and ensure the region is the UK’s core area for energy production**.

Jobs growing faster than GVA has resulted in a **decline of GVA per employee**, in both the WMCA and UK (displayed in Figure 2).

In 2007, WMCA GVA per employee was at a decade high of £190k; it is now £136k & the **gap between WMCA and the UK has narrowed since 2010**.

Nevertheless, all 3 LEP areas have a higher GVA per employee in the sector than the UK overall:

- **CWLEP: £148,000**
- **BCLEP: £130,000**
- **GBSLEP: £132,000**

And **CWLEP has the highest productivity of all LEPs in this sector**.

![Low Carbon & Environmental Tech GVA per employee over time](Source: Oxford Economic Model)
Previous deep-dive analysis on the sector (2013 data)

Source: Oxford Economic Model
SECTOR SCOREBOARD - Low Carbon and Environmental Technologies

Source: FAME Database
Supporting Sector Evidence Base – Low Carbon & Environment

Ideas
- Energy Capital
- Climate-KIC
- EBRI (Aston University)
- West Midlands Science & Innovation Audit

Infrastructure
- Aecom Powering Growth Report
- Productivity & Skills Commission Infrastructure Report
- West Midlands Regional Energy Policy Commission

Business Environment
- Sustainability West Midlands
- Midlands Environmental Business Company (MEBC) members surveys

People

Places
Tourism
Industry Profile

**Centres of Excellence/Assets**

**Centres:**
- Digbeth Creative Quarter: 350+ businesses in Birmingham
- Birmingham Jewellery ‘designer maker’ Quarter, largest in UK
- Performance Cluster centred on Royal Shakespeare Company
- International Dance Cluster, centred on Birmingham Royal Ballet and International Dance Festival
- Birmingham Ormiston Academy – regional centre for digital, creative & performing arts
- Birmingham Metropolitan College: Digital & Creative Career College

**Digital Infrastructure:**
- Region-wide 5G Test Bed, 1-10Gb Fibre across parts of region

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**Our Competitive Advantage**

- The **West Midlands is the UK's fastest growing region for international visitors** – attracting a record 2.3 million overseas visits in 2017, up by nearly 50% over the last six years.
- **Business, conference and exhibition tourism** is a particular strength. Stratford is one of the UK’s largest cultural tourism draws, with **around 4.9 million people visiting Shakespeare’s England every year**.
- WM has unique chance to capitalise on role as host of two global sporting and cultural events (Coventry City of Culture in 2021 and the Commonwealth Games in 2022) – with the opportunity to drive economic growth and leave lasting community legacies.
- Opportunity to generate economic benefits by growing numbers of overnight stays through leveraging cultural and heritage assets of the region, as well as increasing GVA and job creation by strengthening region’s images through developing business tourism via high profile events and conferences.
- The sector employs the **youngest and most diverse workforce** of any sector in the region.

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**Products, Services & Brands**

- **Coventry: UK City of Culture 2021**
- **Birmingham: Commonwealth Games 2022**
- **Birmingham Royal Ballet**
- **City of Birmingham Symphony Orchestra**
- **Shakespeare’s England**
- **Black Country Living Museum**
- Home to the UK’s most popular theatre, the **Birmingham Hippodrome**
- An array of art venues with leading collections and varied programmes, such as the **New Art Gallery in Walsall, the Herbert Art Gallery & Museum in Coventry and Ikon Gallery in Birmingham**
- **Birmingham has more green open space than any other city in the country.**
**Grand Challenges Context**

**Link to Industrial Strategy Grand Challenges**

**AI & Data**
- Visitor services around the Commonwealth Games and City of Culture
- Potential impact of Channel 4 re-location
- Creative technologies in addressing isolation: This is both a community and a technology space. Coventry’s City of Culture has a focus of wellbeing and community which may be an opportunity to look at digital and creative approaches to engaging with older people. Coventry is a recognised ‘living lab’ and the City of Culture could support testbed activity.
2016 was a particularly good year for tourism as the fall in the value of Sterling after the EU referendum made the UK a very cost competitive destination for domestic and international tourists alike. International Passenger Survey data released by the Office for National Statistics on 20th July reveals that 2017 was even better – and a record year for UK tourism:

- There were 39.2 million overseas visits to the UK, up by 4% on 2016
- International visitors spent £24.5 billion, up by 9% on 2016
- 284.8 million nights were spent in the UK by in-bound visitors, up by 3% on 2016
- Holiday visits rose by 11% to 15.4 million
- Holiday spending rocketed by 22% to £10.6 billion

The WMCA region has shared in this growth – and there are signs that the area’s visitor economy has continued to thrive in the first half of 2018. After matching or exceeding 2016 figures for most of 2017, hotel occupancy rates have been higher still in all of the first 6 months of 2018.

Sources:
ONS International Passenger Survey
Visit Britain
STR Global
The West Midlands attracted a record **2.3 million international overnight visits** in 2017, a 6% increase on 2016. This is the **second highest growth of all UK regions**, with the longer term growth of 49% between 2012 and 2017 being the fastest of all regions.

While at 21% the proportion of international overnight visits for leisure purposes is half the UK average, the proportion of visits for business purposes is nearly **double at 39%**. Indeed the proportion of visits of business purposes is the highest in the country, reflecting the West Midlands’ growing status as a conference location.

**Source:** West Midlands Inbound Tourism Analysis – West Midlands Growth Company
In the WM region, the **strongest growth in numbers of international overnight visits overall has been in Warwickshire**, where numbers have risen by nearly 165,000 (more than 70%) over the last 5 years. **Growth has also been strong in the WMCA 7-MET area where numbers have risen by more than half a million (more than 50%).**

In 2017, **international overnight visitors spent more than £800 million in the region**, which was up nearly £330 million (40%) on five years ago. Of this more than £500 million (more than 60%) was spent in the 7-MET WMCA, and nearly £150 million in Warwickshire.

**Source:** West Midlands Inbound Tourism Analysis – West Midlands Growth Company
WMCA Tourism Profile

West Midlands Tourism Key Source Markets

Super Strengths

**Wide-Ranging Offer**
- Shakespeare, major sporting events, theatre, art and the uniqueness of the Black Country Living Museum.

**Business Tourism**
- The proportion of visits of business purposes in the West Midlands is the highest in the country, reflecting the region’s growing status as a conference location.

**Major Events on the Horizon**
- Commonwealth Games and City of Culture provide the whole region with the opportunity to drive economic growth and leave lasting community legacies.

**Young & Diverse Workforce**
- The sector employs the youngest and most diverse workforce of any sector in the region.
- Tourism can lead the way in promoting inclusivity within the regional workforce.

Source: West Midlands Inbound Tourism Analysis – West Midlands Growth Company
Summary Statistics: Tourism

- **£3.5bn GVA** attributed to tourism in the WMCA, with a 2030 ambition of £6.0bn.

- **163,000 jobs** in the sector locally. In 2030, the ambition is that 213,000 jobs will exist in tourism, an increase of 50,000.

- The **Food & Accommodation sub-sector** dominates in terms of GVA and jobs, making up almost three-quarters of activity in both the WMCA and the UK.

- This data reflects the initial tourism (cultural economy including sports) WMCA sector definition. Using the ONS definition of tourism adds approximately **46,000 more WMCA jobs** in the sector and around **£1bn extra GVA**.

Source: Oxford Economic Model
Previous Analysis of the ‘Cultural, Creative Industries and Tourism’ Sector in the WMCA

Source: Oxford Economic Model
### SECTOR SCORECARD – Culture, Creative Industries & Tourism

#### GVA Growth
- 29% of the top 50 businesses have increased GVA over a 1 year period
- 7 businesses have increased GVA by 20% and over
- 26 businesses have increased GVA by 10% and over

#### GVA Per Employees
- Top 50 businesses GVA per employee is £23,078
- 25% (13) of the 50 businesses are above average

#### Foreign Ownership
- 9 businesses in the top 50 are foreign owned
- The largest foreign owned business is Mitchell’s & Butlers
- Average 4.6% per employee for these businesses (£22,295)

#### GVA Impact
- 14% of the top 50 businesses (£7 businesses) generate over 50% GVA
- 4 businesses generate 74% of the top 50 businesses in this sector

### Sub Sector Scorecard

<table>
<thead>
<tr>
<th>Sub Sector</th>
<th>Industry Classification</th>
<th>No. of Businesses</th>
<th>GVA</th>
<th>Industry</th>
<th>No. of Businesses</th>
<th>GVA</th>
<th>Total</th>
<th>Total GVA</th>
<th>% of total GVA</th>
<th>Average GVA per employee</th>
<th>Average Deviation</th>
<th>Change %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotels &amp; Restaurants</td>
<td>Arts, entertainment and sports</td>
<td>100</td>
<td>4,830</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>54,514</td>
<td>9</td>
<td>58,344</td>
<td>6.9%</td>
<td>30.6%</td>
<td>30.6%</td>
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<tr>
<td>Food &amp; Accommodation Services</td>
<td>Arts, entertainment and sports</td>
<td>130</td>
<td>2,800</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>302,820</td>
<td>27</td>
<td>2,430,820</td>
<td>37.9%</td>
<td>233,468</td>
<td>185.1%</td>
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<tr>
<td>Total</td>
<td></td>
<td>230</td>
<td>7,630</td>
<td>0</td>
<td>0</td>
<td>36</td>
<td>355,334</td>
<td>36</td>
<td>3,213,668</td>
<td>45.8%</td>
<td>257,468</td>
<td>175.2%</td>
</tr>
</tbody>
</table>

### Source: FAME Database
Supporting Sector Evidence Base - Tourism

Ideas
- West Midlands Science & Innovation Audit

Business Environment
- West Midlands Quarterly Economic Digest (Summer 2018)
- West Midlands Growth Company: WMCA Monthly Hotel Market Monitor
- West Midlands Inbound Tourism Analysis
- Visit Britain
- STR Global

Places
- West Midlands Growth Company: “Make Your Mark”
Appendix: SIC codes by Sector
<table>
<thead>
<tr>
<th>SIC code</th>
<th>Description</th>
<th>SEP Sector</th>
<th>WMCA LIS Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-03</td>
<td>Agriculture</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Not selected directly – part of wider Advanced Manufacturing sector</td>
</tr>
<tr>
<td>05-09</td>
<td>Mining and Quarrying</td>
<td>Construction (Building Technologies)</td>
<td>Construction (Building Technologies)</td>
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<tr>
<td>10-12</td>
<td>Food, beverages and tobacco products</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Food and Drink Manufacturing</td>
</tr>
<tr>
<td>13-15</td>
<td>Textiles, leather and clothing</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Creative</td>
</tr>
<tr>
<td>16-18</td>
<td>Wood products, paper products printing</td>
<td>Digital and Creative</td>
<td>Creative</td>
</tr>
<tr>
<td>19-21</td>
<td>Coke, chemicals, pharmaceuticals</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Not selected directly – part of wider Advanced Manufacturing sector</td>
</tr>
<tr>
<td>22-23</td>
<td>Rubber, plastic other non-metallic goods</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Metals &amp; Materials</td>
</tr>
<tr>
<td>24-25</td>
<td>Metals and fabricated metal goods</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Metals &amp; Materials</td>
</tr>
<tr>
<td>26-27</td>
<td>Computers and electronic goods</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Not selected directly – part of wider Advanced Manufacturing sector</td>
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<tr>
<td>28-30</td>
<td>Machinery, motor vehicles and other transport</td>
<td>Logistics and Transport Technologies</td>
<td>Parts of this split up into automotive, aerospace &amp; rail sub-sectors</td>
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<tr>
<td>31-33</td>
<td>Furniture, other manufacturing &amp; repair and installation of machinery</td>
<td>Advanced Manufacturing and Engineering</td>
<td>Not selected directly – part of wider Advanced Manufacturing sector</td>
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<tr>
<td>35</td>
<td>Electricity, gas, steam and air conditioning</td>
<td>Low Carbon and Environmental Technologies</td>
<td>Energy and Environmental Technologies</td>
</tr>
<tr>
<td>36-39</td>
<td>Water supply, sewerage and other remediation activities</td>
<td>Low Carbon and Environmental Technologies</td>
<td>Energy and Environmental Technologies</td>
</tr>
<tr>
<td>41-43</td>
<td>Buildings construction, engineering &amp; specialised construction activities</td>
<td>Construction (Building Technologies)</td>
<td>Construction (Building Technologies)</td>
</tr>
<tr>
<td>SIC code</td>
<td>Description</td>
<td>SEP Sector</td>
<td>WMCA LIS Sector</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>SIC 45-46</td>
<td>Wholesale and motor vehicles trade</td>
<td>Retail</td>
<td>N/A (Retail not included)</td>
</tr>
<tr>
<td>SIC 47</td>
<td>Retailing</td>
<td>Retail</td>
<td>N/A (Retail not included)</td>
</tr>
<tr>
<td>SIC 49</td>
<td>Land transport and transport via pipelines</td>
<td>Logistics and Transport Technologies</td>
<td>Logistics and Transport</td>
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<tr>
<td>SIC 50-51</td>
<td>Water and air transport</td>
<td>Logistics and Transport Technologies</td>
<td>Logistics and Transport</td>
</tr>
<tr>
<td>SIC 52</td>
<td>Warehousing and support activities</td>
<td>Logistics and Transport Technologies</td>
<td>Logistics and Transport</td>
</tr>
<tr>
<td>SIC 53</td>
<td>Postal and courier activities</td>
<td>Logistics and Transport Technologies</td>
<td>Logistics and Transport</td>
</tr>
<tr>
<td>SIC 55</td>
<td>Accommodation</td>
<td>Cultural Economy inc Sports</td>
<td>N/A (Cultural Economy not included)</td>
</tr>
<tr>
<td>SIC 56</td>
<td>Food and beverage service activities</td>
<td>Cultural Economy inc Sports</td>
<td>N/A (Cultural Economy not included)</td>
</tr>
<tr>
<td>SIC 58-60</td>
<td>Publishing, motion picture and broadcasting activities</td>
<td>Digital and Creative</td>
<td>Creative</td>
</tr>
<tr>
<td>SIC 61</td>
<td>Telecommunications</td>
<td>Digital and Creative</td>
<td>Digital</td>
</tr>
<tr>
<td>SIC 62-63</td>
<td>Computer programming and information services activities</td>
<td>Digital and Creative</td>
<td>Digital</td>
</tr>
<tr>
<td>SIC 64</td>
<td>Financial service activities</td>
<td>Business, Professional and Financial Services</td>
<td>Financial Services</td>
</tr>
<tr>
<td>SIC 65</td>
<td>Insurance, reinsurance and pension funds</td>
<td>Business, Professional and Financial Services</td>
<td>Financial Services</td>
</tr>
<tr>
<td>SIC 66</td>
<td>Activities auxiliary to financial services</td>
<td>Business, Professional and Financial Services</td>
<td>Financial Services</td>
</tr>
<tr>
<td>SIC 68</td>
<td>Real estate activities</td>
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<tr>
<td>SIC 69</td>
<td>Legal and accounting activities</td>
<td>Business, Professional and Financial Services</td>
<td>Legal and Accounting</td>
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<tr>
<td>SIC 70</td>
<td>Activities of head offices</td>
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<tr>
<td>SIC 71</td>
<td>Architectural and engineering activities</td>
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</tr>
<tr>
<td>SIC 72</td>
<td>Scientific research and development</td>
<td>Life Sciences and Healthcare</td>
<td>Life Sciences and Healthcare</td>
</tr>
<tr>
<td>SIC code</td>
<td>Description</td>
<td>SEP Sector</td>
<td>WMCA LIS Sector</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>SIC 73</td>
<td>Advertising and market research</td>
<td>Business, Professional and Financial Services</td>
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</tr>
<tr>
<td>SIC 74</td>
<td>Other professional, scientific</td>
<td>Digital and Creative</td>
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<tr>
<td>SIC 75</td>
<td>Veterinary activities</td>
<td>Life Sciences and Healthcare</td>
<td>Life Sciences and Healthcare</td>
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<tr>
<td>SIC 77</td>
<td>Rental and leasing activities</td>
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<td>SIC 78</td>
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<tr>
<td>SIC 79</td>
<td>Travel agency, tour operator and other</td>
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<tr>
<td>SIC 80</td>
<td>Security and investigation activities</td>
<td>Public Sector Inc Education</td>
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<tr>
<td>SIC 81</td>
<td>Services to buildings and landscape</td>
<td>Public Sector Inc Education</td>
<td>N/A (Public Sector not included)</td>
</tr>
<tr>
<td>SIC 82</td>
<td>Office administrative, office support</td>
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</tr>
<tr>
<td>SIC 84</td>
<td>Public administration and defence</td>
<td>Public Sector Inc Education</td>
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<tr>
<td>SIC 85</td>
<td>Education</td>
<td>Public Sector Inc Education</td>
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<tr>
<td>SIC 86</td>
<td>Human health activities</td>
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<td>Life Sciences and Healthcare</td>
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<tr>
<td>SIC 87</td>
<td>Residential care activities</td>
<td>Life Sciences and Healthcare</td>
<td>Life Sciences and Healthcare</td>
</tr>
<tr>
<td>SIC 88</td>
<td>Social work activities</td>
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<td>Life Sciences and Healthcare</td>
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<tr>
<td>SIC 90-92</td>
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<tr>
<td>SIC 93</td>
<td>Sports activities and amusement</td>
<td>Cultural Economy Inc Sports</td>
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</tr>
<tr>
<td>SIC 94-96</td>
<td>Activities of membership, repair of computers &amp; Other personal service activities</td>
<td>Business, Professional and Financial Services</td>
<td>Not selected – a part of wider BPF5 sector</td>
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</table>