

Profile of Birmingham's Transport Technologies Sector



The Transport Technologies Sector

216
firms in the transport technologies sector

12,700
employed in the sector

45%
business birth rate between 2005 and 2010

Introduction

This profile is one of a suite of seven covering key High Growth Sectors in Birmingham. The profiles were compiled in 2011 and go beyond analysis of the available datasets, to enable us to understand how the sectors support the local economy now, and how we can develop their potential for the future. This has been achieved by integrating data analysis with intelligence from sector experts drawn from businesses, research institutions and networks.

Each of the profiles presents statistical information, along with case studies, an analysis of the sector today, and future challenges and opportunities.

The seven sectors are:

- Business and Professional Services
- Financial Services
- Creative, Media and Digital
- Medical Technology
- Transport Technologies
- Low Carbon
- Advanced Manufacturing



Sector overview

Birmingham and the wider West Midlands region has a powerful heritage in automotive, aerospace and rail; the three sub-sectors in our definition of Transport Technologies.

This heritage has been translated into one of the most significant manufacturing regions in the UK, alongside the East Midlands. Birmingham clearly has its role to play in this strength. The city provides top class companies in each of the three sub-sectors and a strong research base to support innovation. We try and capture some of this strength in our analysis of the business base, and go on to explore the three sub-sectors in more detail.

Largest employers in Birmingham's Transport Technology Industry

Jaguar Land Rover Ltd	2,000
Goodrich	1,200
TRW Automotive Holdings Corp.	483
GKN PLC	400
ATS (Associated Tyre Specialists)	400
Schaeffler Holdings Ltd	315
Dunlop Aircraft Tyres Ltd	306
Goodyear Tyre & Rubber Company	250
Dana UK Automotive Systems Ltd	230
JC Payne Truck Bodies Ltd	167

£360m
contribution to the
city's economy

9
firms have their
headquarters in
Birmingham

16%
of firms are foreign-
owned

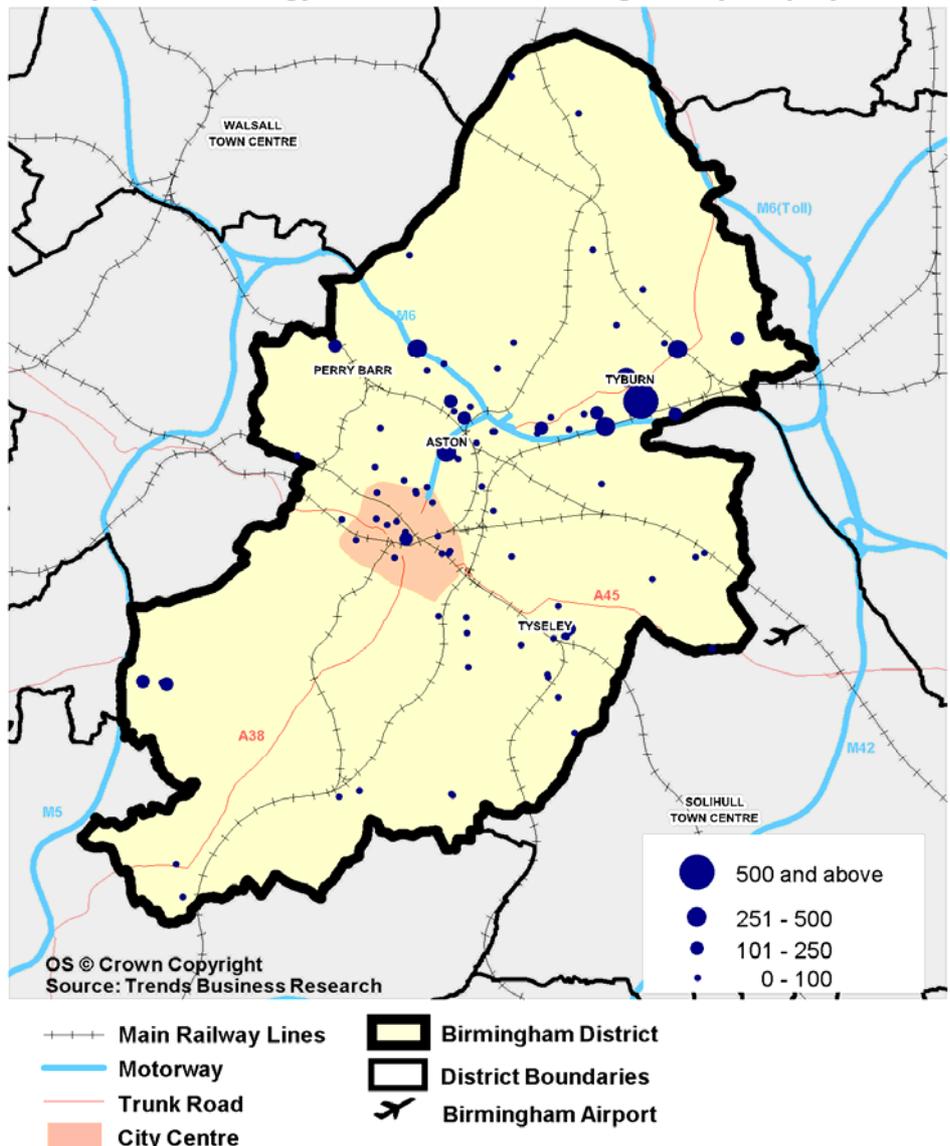
The business base

There were 216 sector companies located in Birmingham in 2010. As is the case in many other manufacturing industries, this has seen a decline of 11% over the previous five years. The city has a relatively high proportion of large and medium sized employers compared to the UK. This is due to the presence of several significant manufacturers and suppliers in the city, such as Jaguar Land Rover (JLR).

The sector employs around 12,700 people. While this has declined by 8% in five years, it still represents around a quarter of the regional transport technologies business base. This is significant for the city, contributing around £360m in Gross Value Added (GVA) to the local economy.

ONS data shows that around 80% of the Birmingham sector is automotive compared to 58% on average nationally. Meanwhile, aerospace accounts for 18% of transport manufacturing compared to 40% nationally. This is significant as productivity in aerospace is typically 37% higher than automotive (Source: Working Futures, 2007). Enterprise indicators for the sector show Birmingham has a net business birth rate of 17% compared to 25% nationally.

Transport Technology Businesses in Birmingham by Employment



In the automotive sector, employment is largely dominated by the presence of JLR with over 2,000 employees in Birmingham and many more in nearby Solihull. GKN is a West Midlands-based PLC with offices around the world. Its Birmingham operation manufactures drive shafts for many major car manufacturer, and also represents the largest employer in the aerospace sector (aerospace transparency systems, such as cockpits). Geographically, there is a distinct clustering effect in the transport technologies sector, with larger employers close to transport links including the motorway network and Birmingham Airport.

Automotive

Birmingham was a key city in the industrial revolution, earning titles such as 'Workshop of the World' and 'City of a thousand trades'. This early industrial heritage aided the development of the automotive sector, with many 19th century companies diversifying into the emerging sector beginning with bicycles and progressing to automobiles. For example, Reynolds Technology started life as a 19th Century nail manufacturer, and now produces advanced materials for transport technologies and a variety of other sectors.

In the 21st century, foreign-owned vehicle manufacturers are still producing at high volumes in the UK (e.g. Mini, Honda, Nissan & Toyota). But increasingly, high volume production is being shifted to new markets, such as low emissions and electric vehicles. For example, Nissan are producing the world's first affordable, mass produced zero emission car in Sunderland and Honda are producing a hybrid version of the Jazz in Swindon. The sector in Birmingham and the West Midlands has seen a strengthening of its position as a luxury car maker with the presence of Jaguar Land Rover producing and exporting successfully to developed and emerging markets. The presence of such a large player is strategically important for the sector locally; its success maintains strong local supply chains and drives innovation and collaboration with universities.

Jaguar Land Rover

An important manufacturing site for Spitfire aircraft during the war, the Castle Bromwich plant in Birmingham is now the key site for the production of Jaguar cars. JLR is one of the great Midlands success stories and a flagship manufacturing group for the UK economy. JLR, acquired by Tata Motors in 2008, posted a rise in global sales of 19% in 2010, attributed to the strength of demand for luxury vehicles in emerging markets, particularly China, where the company has recently signed a £1bn deal to supply cars to the Chinese domestic market.

This strong post-recession performance, which has seen JLR increase its market share at the expense of other premium brand manufacturers, has enabled the

company to reverse its previous decision to close plants. The investment of £5bn investment from owners Tata in October 2010 has secured the future of both the Castle Bromwich and Solihull facilities.

This investment signals the underlying strength of Birmingham and the wider region as a location for automotive manufacture, design and innovation. There is a large and experienced pool of skilled labour in Birmingham, Coventry and Solihull and the proximity of innovation assets such as Warwick Manufacturing Group all have important roles to play in this success. Further signs of the underlying strength in the automotive sector comes with JLR seeking 1,000 new engineers and looking to grow production in the coming years from 232,000 vehicles to more than 300,000.

- Low volume niche markets

While the presence of a successful high volume manufacturer is vitally important for the health of the sector in the Midlands, there is at the same time particularly high growth potential in low volume niche markets such as supercars and motorsports. Low volume manufacturers can take more risks, and innovate more freely than their larger high volume siblings, driving the commercialisation of new technologies.

A good example of this in the Midlands is that of Morgan Cars. Although not based in the city, it is an example of how Birmingham's knowledge base can significantly add value to design and manufacture in the wider sector. Morgan formed a knowledge

Walker-Adams

Birmingham owned manufacturer, Walker-Adams specialises in the design and manufacture of off-road vehicles for the entertainment and motorsport markets.

The business is based at the council owned Birmingham Wheels Park and has its own off-road track through which it runs a successful off-road karting experience. In addition to its workshop, Walker Adams offers corporate experiences and hospitality (including conference facilities) as well as stag and hen parties.

Steve Adams, the company's founder is a chartered engineer with experience at Daewoo, DaimlerChrysler and Jaguar Land Rover . At Walker Adams, he has established a unique relationship with Birmingham City

WALKER-ADAMS

Off-Road
Karting

University which means the business can significantly punch above its weight while offering a social return to the city.

BCU Students are offered placements at Walker-Adams to maintain, build and design vehicles. Students are also employed to staff the track facility and events. This arrangement helps students to gain practical engineering experience and has helped individuals to gain employment in firms such as Lotus. At the same time, it keeps costs low in order, enabling profits to be reinvested in the manufacturing business.

transfer partnership (KTP) with Birmingham City University (BCU) which led in part to the development of its fuel-cell powered LifeCar concept. BCU estimate that the KTP has led to more than £4.2m of additional turnover, the creation of innovative concept and production vehicles, and has attracted new customers to the 100-year-old brand. While the research assets of the city are benefiting established manufacturers, they are also valuable to smaller players in various niche markets. A prime example is the case of Walker-Adams.

The position of the Midlands as a premier location for low volume niche production and R&D has been strengthened by the relocation of production facilities for the Dutch Supercar maker 'Spyker' and for Birmingham, the revival of MG by new owners, Shanghai Automotive Industry Corporation (SAIC), at Longbridge. Longbridge is home to MG's Design Centre, European Engineering Technical Centre, a manufacturing facility and MG Motor headquarters. This investment has created 300 jobs in mechanical engineering, R&D and design as well as further jobs in assembly, management and marketing. The design work for the new MG6 was all undertaken in the city and the Longbridge facility will assemble the new vehicle for the home market, due to be released this year in the UK. The MG6 has already been released in China and has contributed to a growth in turnover of 32% in the parent company, SAIC, between 2009 and 2010.

- Research assets

Birmingham and the wider Midlands has nationally important research capabilities in automotive technologies. Collaboration is a key component of the research strategy with many programmes given crucial applied and tacit knowledge wound up in the day to day design and manufacture of automobiles by the private sector. For example, BCU are just completing some important work with Rolls-Royce on knowledge based engineering.

Birmingham City University's School of Technology Engineering & Environment houses a leading automotive research centre with a long running interest in the control of automotive power trains, with a particular focus on emissions reduction in vehicles. The school offers specialist courses in Automotive Calibration and control (MSc), Motorsports Technology (BSc), alongside more traditional Automotive Engineering courses (BEng, MEng). These specialist courses mean a steady flow of highly qualified graduates enter the workforce with the right blend of skills and practical experience to add value to the local business base. The University has comprehensive test-cell facilities at Millennium Point and is involved in a collaborative project around heavy diesel engines and the control of emissions.

The University of Birmingham has expertise in two broad research areas related to the automotive sector: Vehicle Technology and Advanced Materials. Within the School of Mechanical Engineering, the Vehicle Technology Research Centre undertakes leading research into future power systems and vehicle dynamics. The Interdisciplinary Research Centre in Materials Processing focussing on high performance applications. The programme is the development of materials, processes and manufacturing applications to fully exploit the potential of materials. Key to the programmes success is collaboration with industry. For example, the centre hosts a titanium alloy Research Centre on behalf of Rolls Royce who have in effect outsourced this research on aero engine components. A further area is in the field of Nano and Micro technologies and engineering. Another research programme is vitally important for the industry in the future. Part of the Science City Research Alliance, the Centre for Hydrogen and Fuel Cell Research conducts leading edge research into the new technology including the UK's first hydrogen filling station.

Aston University's School of Engineering & Applied Science offers courses in mechanical engineering, electromechanical engineering, design engineering as well as automotive product design.

An important initiative for Birmingham and the region is 'Plugged in Places'. Delivered through Birmingham Science City, the project is a pilot that makes Ultra Low Carbon Vehicles available to a wide cross section of real world drivers and collects data on their everyday use. This has important implications for research and development of the market for zero emissions vehicles, including establishing enabling infrastructure (i.e. charging points). Partners include Aston University, Arup, Birmingham City Council, University of Birmingham, EON and JLR.

Birmingham Science City and it's associated Research Alliance also drive other initiatives related to or with applications in the automotive sector, for example research into hydrogen power generation and intelligent zero emissions vehicles.

Rail

Following the privatisation of the Railways in the 1980s, a thriving rail sector has quietly been going about its business in Birmingham and the West Midlands. This

"Birmingham has latent talent in the rail sector that it is not showing off enough, an unappreciated sibling its big brother the automotive industry"

Colin Flack, CEO, Rail Alliance

relative invisibility of the sector is a function of the prominence of automotive sector in the region, as well as serious definitional problems, meaning it is very difficult to get a good 'handle' on the scale, scope and significance of the sector.

The assets of the sector in Birmingham are significant. Birmingham is home to a world renowned centre of research into railway engineering and technology at the University of Birmingham, and several of the world's major engineering consultancies such as Amey, Atkins and WSP have bases in the city. Arup is the world leader in the design of High Speed Rail systems (including HS2 in the UK).

Although Arup are based in Solihull, they draw widely from Birmingham's labour market and knowledge assets. Network Rail, who own and operate Britain's railway infrastructure, are based in the city and are a key procurer of rail goods and services, as well as a driver of innovation in the sector. Many train operating companies are also located in the city including Virgin Trains, London Midland and Cross-Country. These provide employment in the city as well as collaboration opportunities for the local research base.

A key characteristic of the rail sector is that of knowledge intensity. The UK in general no longer manufactures vehicles for the railway. Instead the UK rail sector specialises in design, R&D, as well as development and manufacture of specialist components exported for use in manufacturing processes and civil engineering applications across the world. The sector sells this expertise all over the world, with exports being a core component of the sector's business model. Another important component of the rail sector arises from the maintenance of Britain's railway network. While there is also a focus on research and innovation in this context, there are also opportunities in skilled and semi-skilled professions allied to engineering.

- Research assets

The high knowledge intensity of the sector means that research assets are vitally important. The Birmingham Centre for Railway Engineering and Teaching at the University of Birmingham is the leading research centre in its field in the UK if not Europe. The centre has 14 research staff and 22 PhD students and collaborates with many private and public bodies across the industry. The centre conducts leading edge research across the whole sphere of the sector. Research areas with particularly valuable commercial applications or being developed in partnership with the private sector include track condition monitoring, aerodynamics, and hybrid systems. Important wider research politically includes a large project on behalf of EPSRC and DfT on the impact of climate change on the transport network.

- Cluster policy

The rail sector was a priority sector during the lifetime of the Regional Development Agency, Advantage West Midlands. The rail cluster programme, a mixture of coordination and funding, was relatively successful in developing and promoting the

TRail indicates the health of the local business base

TRail consulted, supported and collaborated with a host of Birmingham Based companies during the three years of the programme. These included Birse Rail, VTG Rail, Alstom, WSP, and Comply Serve.

This snapshot of involvement shows the diversity in the industry with businesses involved in a range of activities including design, signalling, IT compliance systems, drainage maintenance, wagon fleet hire, civil engineering and construction.

cluster. Key achievements included the inception of the Midlands Rail Alliance, which has since become an independent, national membership organisation for the sector. Other programmes included the Rail Supply Programme delivered by the Manufacturing Advisory Service, and TRail a technology translation programme delivered by the University of Birmingham. These initiatives have been successful in raising awareness of the sector, promoting stronger links between business and academia, as well as directly applying new techniques and processes.

- Future opportunities in rail

The cluster policy highlighted a number of key target markets that both capitalise on the sector's strengths and offer a wide range of global supply opportunities. These include infrastructure services, vehicle services and intelligent / infrastructure transport systems. These priorities still have traction post recession and in the context of austerity , with the one addition of the huge opportunity presented by HS2.

There are currently plans to develop a high speed rail network in the UK (HS2) with the first phase of the project connecting London and Birmingham. The further development of high speed rail in the UK would mean significant numbers of jobs for



Design for Birmingham Gateway

local and other UK based businesses in the rail sector. Construction costs alone are estimated at between £15.8 and £17.4 billion , although some report this figure could reach over £30bn. Further operating expenditure and design work has the potential to add further significance to this business opportunity.

Birmingham is undertaking a massive programme of transport improvement through its Birmingham Gateway project and the Midland Metro extension. This includes the redevelopment of New Street Station into a world class railway hub and the Midland Metro extension which will link the city's two main stations by tram, and improve links to North West Birmingham, Sandwell and Wolverhampton. Another scheme recently given the go-ahead is investment in a public transport smartcard scheme similar to that of the Oyster Card in London. These schemes will create further opportunities for the sector locally, and in many cases are already doing so.

Aerospace

In 2009, UK Aerospace grew sales by 5 per cent according to ADS, an aerospace trade organisation; the one engineering and manufacturing sector that largely escaped the effects of the recession. Demand for new aircraft grows unabated in China (where the country is developing new regional airports and routes) and other s emerging markets, which is increasingly important for the future health of the UK sector.

The UK aerospace sector accounts for 17 per cent of the global market with an annual turnover of around £20.5bn. The sector directly employs around 101,000 people, supporting a total of 230,000 jobs across the UK economy (ADS, 2011). The workforce is also highly skilled with over one third of all employees having university degrees or equivalent.

Aerospace is a globally integrated industry with a handful of successful manufacturers drawing on a large web of suppliers from across the world. The sector covers military as well as civil applications. The UK's largest engineering firm, BAE Systems, is a major manufacturer for military applications while the UK has many Tier 1 suppliers in civil aviation including Rolls-Royce and GKN. In civil aerospace, Airbus has a presence in the UK with its Bristol Design Office and Centre for Excellence in Wing / Pylon technology. US manufacturer Boeing also has a presence in the UK.

- Birmingham's aerospace sector

There are two significant Tier 1 suppliers with operations in the city: GKN (transparency systems) and Goodrich. These suppliers themselves support a range of Tier 2 and 3 suppliers. Rolls-Royce, a nationally important Tier 1 supplier, has a presence in the region (at Coventry) and the West Midlands in general makes up a



quarter of the firm's supply chain in the manufacture and servicing of its aero engines—which is important given that Birmingham is likely to make up a good proportion of this supply chain.

There is significant collaboration within the supply chain. For example, Rolls-Royce and Goodrich have undertaken a joint venture - Aero Engine Controls - with an engineering

and manufacturing base in Birmingham.

GKN Aerospace, which is based in the city, has recently signed a £235m deal with Pratt & Whitney to make titanium engine ducts for the F135 Joint Strike Fighter. The Birmingham base of GKN manufactures transparency systems.

Other companies in the aerospace supply chain based in the city include Timet UK, the world's largest supplier of titanium products, with applications in aerospace and automotive manufacture. Bromford Industries have a manufacturing plant in Birmingham and specialise in gas turbine and cooling components, and landing gear, directly supplying firms such as Messier Dowty and the Airbus A380 programme.

- Future of the aerospace sector

The global recession, while not affecting the sector immediately, is starting to make an impact. In particular aerospace may be constrained by austerity measures pursued by Western Governments. In the domestic market, the UK is seeking to reduce defence spending by 8 per cent while the US, the largest purchaser of military equipment in the world, announced a \$78bn cut in defence spending over five years. This trend is already having implications for the sector with BAE Systems seeing its share price falling in recent months. There are also increased concerns over safety, adding additional cost and compliance pressures to businesses.

Trends are better in civil aviation. There is a significant backlog resulting from delayed orders as well as huge prospects for growth in China and emerging markets who are expected to grow their economies significantly over the next decade. Recently, Airbus announced its intention to increase production of the A330 from 8 to 10 per month by early 2013, while the A320 will rise from 34 to 40 per month for the same period. Boeing has also revised its production numbers: the 737 will increase from 31.5 to 38 on a monthly basis by the second quarter in 2013. Boeing 777 production will increase by mid-2011 from 5 to 7. The leading manufacturers therefore seem to be signalling a strengthening market.

Future opportunities

The transport technologies market has a healthy outlook for the future, despite slow economic growth in western economies. The industry is highly export focused, meaning there are significant benefits in terms of an improving UK trade position.

Birmingham is an established centre for transport technologies, a reflection of its manufacturing past and its current economic strengths. Birmingham has great potential in this field, driven by:

- Research and innovation in newly emerging aspects of the sector, such as low carbon vehicles, intelligent transport, and high speed rail
- Strength and depth in its labour market, right through to a range of relevant qualifications through the city's universities
- Long supply chains into major manufacturers such as Rolls Royce, GKN, JLR, JCB, Toyota and Airbus
- Positions in niche markets, such as supercars and motorsports

Further Information

Reporting and analysis by Consulting Inplace. Unless otherwise specified, the statistical data in this profile relates to 2010 figures, based on a bespoke sector definition determined by Birmingham City Council for the purposes of this research. Data comes from [TBR](#) and may therefore differ from ONS and other business datasets.

Copies of all seven High Growth Sector profiles can be downloaded from: www.birmingham.gov.uk/birminghameconomy

Further information about this profile can be obtained from:

Economic Strategy
Birmingham City Council
PO Box 14439
Birmingham B2 2JE

T +44 (0) 121 464 2114
E birminghameconomy@birmingham.gov.uk

Get in touch with Business Birmingham's specialist inward investment team to find out more about the opportunities Birmingham offers:

T +44 (0) 121 202 5022
E invest@marketingbirmingham.com
W www.businessbirmingham.com



**BUSINESS
BIRMINGHAM**