

THE AEROSPACE INDUSTRY IN THE MIDLANDS

The economic power
of a Midlands supercluster



Contents

The Midlands’ aerospace cluster	5
Business and investment	6
Innovation	8
Talent	12
Growth and investment opportunities in the Midlands’ aerospace industry	13
Investor support	15
Strategic asks	15
Conclusion	18
Case studies	18
Appendix	21

Purpose

This report is the result of an extensive roundtable discussion involving more than 50 leaders from industry, academia and government involved in the aerospace industry. It aims to characterise the sector in the Midlands from an investment perspective, highlighting the region’s key strengths, opportunities and challenges. It builds upon the robust analysis of business and academic activity in these reports, especially the March 2024 *Aerospace in the Midlands* report.

By presenting this comprehensive analysis, this paper seeks to support policymakers, businesses and local growth entities in promoting the Midlands as a world-leading hub for aerospace research and manufacturing, and attracting investors. A list of the organisations involved in this exercise can be found in the *Appendix*.. This report is a distillation of their ideas and asks gathered at a workshop held in January 2024.

Executive summary

The Midlands aerospace supercluster is one of the world’s most significant aerospace hubs, with a century-long legacy in engine and aircraft systems development and production, and deep supply chains. Home to over 500 aerospace businesses across 595 sites, generating £5.3 billion in gross value added (GVA), the region is a global leader in aerospace innovation and manufacturing.

This paper, informed by insights from over 50 industry, academic and government leaders, highlights this supercluster’s strengths, opportunities and challenges, offering a roadmap for growth in the UK’s premier aerospace supercluster.

Key strengths

Established supply chain: The Midlands hosts **8** original equipment manufacturers (OEMs) and Tier 1s, **246** AS9100-accredited flying parts makers and **290** technical suppliers, forming a robust supply chain with ultimate customers such as Airbus and Boeing

Powering flight: The supercluster has specialisations including aircraft propulsion – from existing gas turbines and future flagships like the UltraFan, to new technologies in hydrogen and sustainable fuel, and a vast aircraft supply chain across the region covering control systems, metals manufacturing, composites, electronics and more

Innovation ecosystem: The region is home to Europe’s only university airport, thousands of researchers and major technology demonstrators, all in an established industry-academia ecosystem of research and development collaboration. The region attracted **41%** of Aerospace Technology Institute funding and **39%** of Innovate UK aerospace awards in the past decade, with most of this going directly to industry. There is a wider internationally leading university research ecosystem with centres at universities such as Cranfield, Nottingham, Loughborough, and Birmingham

Growth opportunities

Next-generation narrow body aircraft: The Midlands is well-positioned to secure a key role in the supply chain for the next generation of single-aisle Airbus and Boeing aircraft, expected to be 80% of the market over the next two decades with more than 30,000 aircraft to be produced, presenting an export opportunity worth billions of pounds

Export potential: Much emphasis is placed on encouraging UK-based primes, OEMs and Tier 1s to ‘buy British’, but Midlands aerospace supercluster’s high density of SMEs and reputation for producing high-quality, make-to-print and design-and-make parts for aerospace and related industries also presents a massive opportunity for export

Tier 2 market gap: To increase the resilience and industrialisation capability of the Midlands’ supply chain and fill a nascent gap, there is an opportunity for new entrants or existing businesses to grow into this key production role. The Freeports and Investment Zones in the region present an attractive entry route

University commercial partnerships: With established industry collaboration mechanisms and the *Invest in UK University R&D Midlands* campaign providing extra support, there are ample opportunities for businesses to commission and collaborate with Midlands universities and catapults to develop new technologies, products and capabilities

Commercialisation and industrialisation:

Investing in these new technologies, and, indeed, existing business capabilities, to produce new components at scale

Defence and dual-use technologies:

Growing global defence spending and dual-use applications present new opportunities for civilian aerospace suppliers to diversify into defence and space markets

New market expansion: Growth at Brazil's Embraer and China's COMAC aircraft makers could present new supply opportunities for Midlands manufacturers, as does the European market for greater exports

Challenges

Talent pipeline: While the Midlands has a strong pipeline of degree graduates, there is a growing need for PhD-level talent, as well as industry-relevant and viable apprenticeships, particularly for SMEs

Funding gaps: Smaller businesses in the supply chain often struggle to access funding for innovation and scaling, risking the loss of economic growth opportunities to overseas investors

Competitive pressures: The region faces increasing competition from Europe, as well as emerging aerospace players like China. Domestically, high energy costs and business rates impact local manufacturing competitiveness.

Decarbonisation pressure: While the Midlands' specialisation in propulsion places it at the forefront of ultra-efficient engines - hydrogen, electric and SAF - supply chains must be able to respond to these new technological requirements, whilst struggling to decarbonise high-energy-use manufacturing operations in an environment of high electricity prices

Strategic asks

Back the industry strategically through **funding commitments that support the entire supply chain and ensure international competitiveness**, noting the region's capability to direct support to the most impactful areas

Address local talent pipeline risks through PhD programmes and appropriate apprenticeships, with a renewed focus on industry experience for graduates of aerospace and related programmes, focusing on career opportunities with SMEs

Promote the significance of the Midlands aerospace cluster globally and to OEM and Tier 1 headquarters

Address competitiveness through **improved local business conditions for manufacturers**

The Midlands aerospace cluster is a vital part of the UK's aerospace industry, with significant strengths in manufacturing and innovation. By addressing the challenges and leveraging the opportunities outlined in this paper, the Midlands can grow its position as a global leader in aerospace, driving economic growth and technological advancement for decades to come. Strategic investment, and collaboration between government, industry and academia will be key to unlocking the full potential of this world-class cluster.

The Midlands' aerospace supercluster

For over 100 years, the Midlands has been home to one of Europe's largest aerospace clusters, with an established prime-to-component supply chain around propulsion, coatings and materials, and internationally significant research and development capabilities developing future power systems. The Midlands is home to a genuine aerospace supercluster – both through geographic concentration (*figure 1*) and breadth of activity – from research to major manufacturers.

As noted in the [March 2024 Aerospace in the Midlands report](#), one fifth of UK aerospace is located in the Midlands. From a regional viewpoint, the aerospace sector is one strand of a Midlands engineering supercluster that weaves together several industries including automotive and rail. While there is significant defence aerospace work, the region specialises in the design and manufacture of complex technology systems and parts for the civil aerospace sector. More than 500 specialist Midlands companies operate in the supply chains of global passenger aircraft makers, especially Airbus and Boeing.

The Midlands aerospace cluster is characterised by:

- The **design and manufacture of aero-engines, advanced aircraft systems and aero-structures**, with important sites of a leading aerospace prime (OEM), aero-engine maker Rolls-Royce, and four global Tier 1 suppliers (Collins Aerospace, ITP Aero UK, Moog Aircraft Group and Parker-Meggitt) that design and make sophisticated systems that control the moving parts of aircraft and manage huge temperature extremes
- A **deep, high-value design and manufacturing supply chain** that is the core of the cluster. 250 companies make aircraft flying parts and are by no means dependent on UK primes and Tier 1s for their sales. Many have also diversified and export directly to overseas competitors of the leading Midlands customers (estimates suggest 40+% by value).
- An additional 290 **cross-sector businesses and indirect suppliers** of highly specialist services and equipment used in factories, R&D and testing facilities

The aerospace industry is largely based on long-term contracts for aircraft production runs which last decades. Innovation and product development is shaped by these cycles and the risks of securing a role in their supply chains; even in 2025, some Midlands businesses continue to supply parts for programmes that began in the 1980s. As such, a comprehensive understanding of the supply chain for aircraft systems (such as gas turbines and actuation systems) and the components and materials that feed into them is critical for presenting a compelling case to industry giants such as Airbus and Boeing.

The aerospace industry is as international as the aircraft it ultimately produces – supply chains stretch across countries and continents and are set to see major growth with 45,900 aircraft worth \$3.3tn expected to be produced between 2024 and 2043¹.

1. Cirium, Oct 2024 Aviation to Add 45,900 Aircraft Worth \$3.3T in 20 Years – Cirium

Business and investment

Since the first Rolls-Royce Eagle engine was produced in Derby in 1914 and Armstrong Siddeley's aero-engines at Ansty in 1920, the Midlands has had a thriving aerospace industry – one that has historically focused on propulsion.

Today, there are more than 500 aerospace businesses across the Midlands ², generating around £5.3bn in GVA and accounting for 2-2.3% of the Midlands' economy. These businesses include 8 OEM and Tier 1 manufacturers ³, 246 accredited AS9100 flying parts makers across 326 sites, and 290 further technical and specialist suppliers. This supply chain includes significant make-to-print as well as design-and-make capabilities – respectively offering reliable scale and creative solutions to manufacture. As much as 20% of the UK aerospace industry has a base in the Midlands.

Although most began as domestic companies, only Rolls-Royce remains UK-owned and publicly traded among the region's eight strategic firms. BAE Systems also fits this description, though its presence in the region is relatively small and linked mainly to the RAF.

The [Midlands Aerospace Alliance](#) is a core part of the Midlands' aerospace cluster and a key comparative advantage for the region. Established in 2003, it is one of the largest regional aerospace alliances in the world with 300 members, of which 60% make flying parts and 40% make equipment for design, testing, or manufacturing or provide specialist services. The Alliance exists to promote and support cooperation between industry customers, suppliers, the public sector and other partners in the Midlands and globally to improve the global competitiveness of all Midlands aerospace companies.

The Midlands aerospace supercluster already holds a significant share of the Airbus wide-body supply chain. Major upcoming market opportunities include both new generations of narrow-body Airbus and Boeing aircraft and growing defence demand, where sovereignty requirements reduce competition.

Across these lower tiers of the supply chain, there are common challenges in scaling production and finding appropriate funding or growth investment to do so, particularly as long-term contracts come to a close and future supply chain positions have not yet been confirmed. These smaller businesses – especially towards the end of major contracts – may have to carefully balance business requirements with securing new opportunities, which is made more challenging by a competitive labour market. This is especially pertinent as new manufacturing technologies are required to meet new decarbonisation and efficiency ambitions.

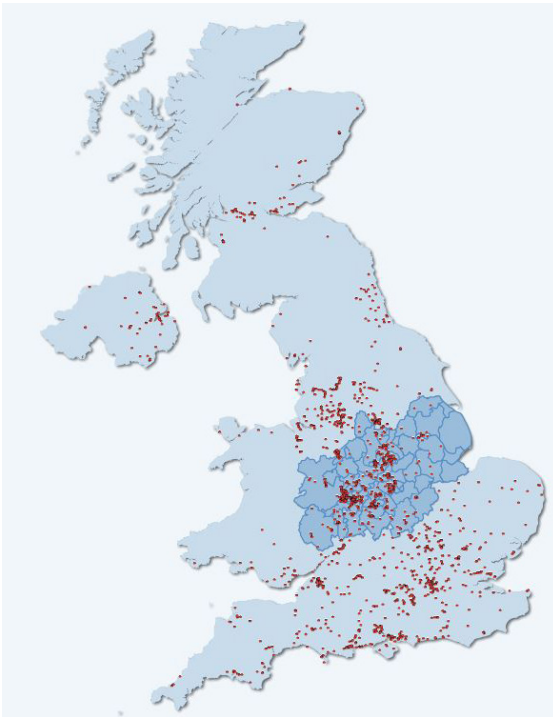


Figure 1 - The Midlands has 326 AS9100-/ AS9110-/ AS9120-accredited company sites – 21% of the UK total

(Source: Aerospace in the Midlands, MAA & Midlands Engine, March 2024)

2. This count includes businesses where a minority of their product/service feeds into aerospace supply chain/applications, but which nonetheless play a role. Such businesses demonstrate resilience in the supply chain as they have diversified their markets.
3. Original equipment manufacturers and Tier 1s in the Midlands include Rolls-Royce, Parker Meggitt, ITP Aero, Moog Aircraft Systems, Collins Actuation Systems and Collins HS Marston Aerospace

Within the Midlands, there has been a trend of domestic mergers and acquisition among groups of SMEs, allowing reinvestment and some supply chain security. There is now an established network of Tier 3 + small component and material companies and the OEMs, but like the rest of the UK, the Midlands has what some perceive as a lack of Tier 2 enterprises – characterised as businesses turning over between £10m-£250m with the associated production at scale capabilities.

While the UK has proven technical capability and delivers on quality, price competition from emerging supply markets like China presents a growing risk. In terms of foreign investment, there is increasing interest in Midlands businesses from European and US competitor regions, which have incentives to attract these core businesses into their own aerospace ecosystems. Of existing business stock, the US is the largest known source of foreign ownership, followed by Germany, France and China. Acquisition of these SMEs comes with unique challenges, with carefully secured flying parts and associated accreditations at

risk from new business practices implemented by new ownership given the strictness of regulations.

While international interest in acquiring thriving Midlands companies reinforces the value of the products and services made in the region, it can present a risk to future supply chain resilience should they move. UK venture capital is perceived as more risk-averse than US counterparts, wanting quicker returns on typically large investments and not recognising the risk/reward of failure and development. The [Aerospace Technology Institute](#) (ATI), the UK's primary public funder of aerospace research and development, is exploring how to more effectively attract private equity into businesses with high growth potential.

Despite these conditions, there are growing market opportunities through dual-use applications for defence projects, but also, potentially, through the alignment of defence funding to civil aerospace businesses where there could be dual-use applications.

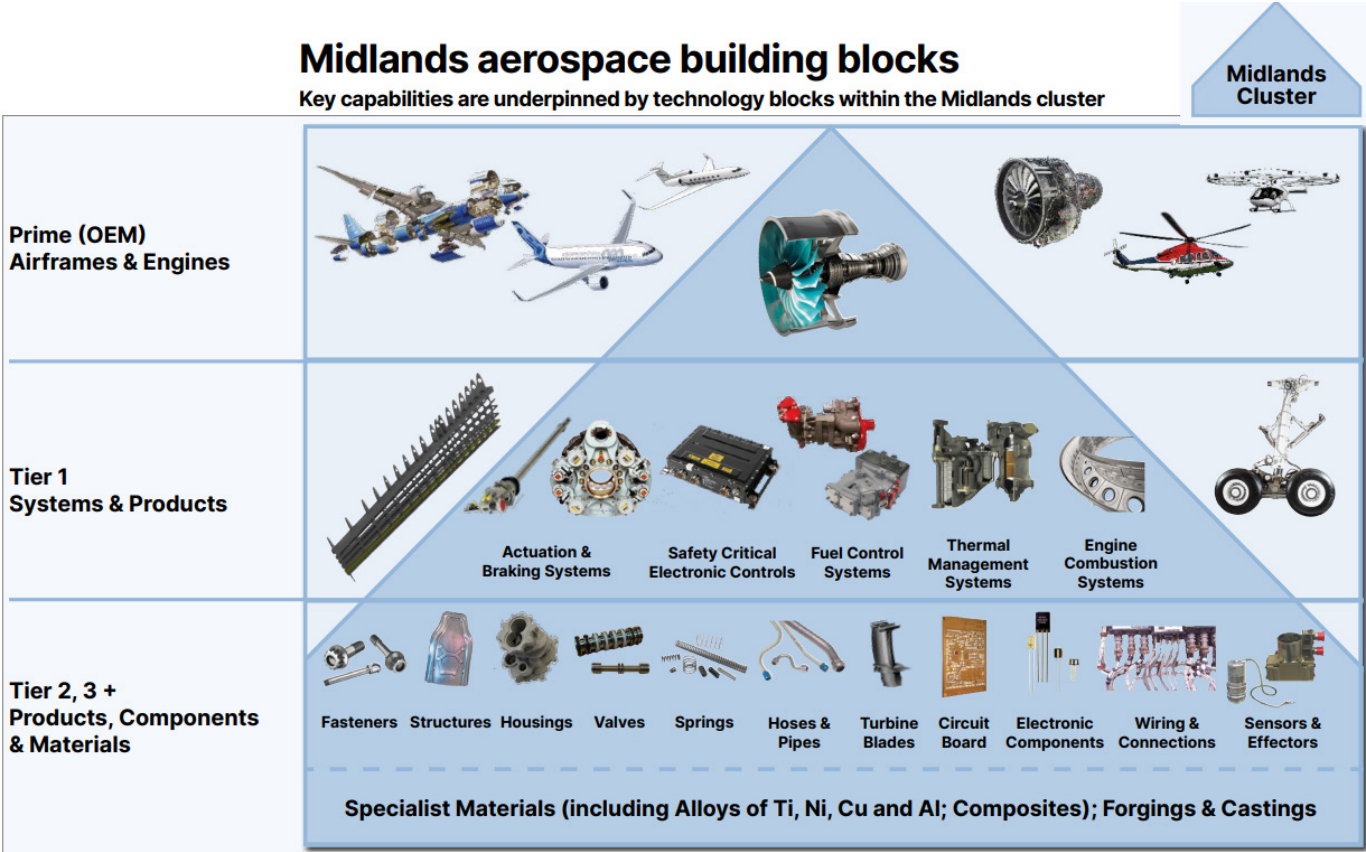


Figure 2 – Midlands Aerospace Alliance diagram demonstrating the core product capabilities in the Midlands's aerospace cluster – from Aerospace in the Midlands, March 2024

Innovation

The Midlands is at the centre of UK aerospace research and development, with a thriving network of industry innovation and new developments attracting significant funding, supported by significant university-based research and testing capabilities, with academic groups into the hundreds of researchers.

In fact, Midlands businesses and researchers secured 41% (£640m) of Aerospace Technology Institute funding from 2013-2022, and 39% (£763m) of all Innovate UK aerospace awards from 2013-2022, despite only accounting for 21% of core UK aerospace sites. As highlighted in the [March 2024 Aerospace in the Midlands](#) report, the majority of this funding was secured by the primes, raising questions around accessibility and targets of these grants to the wider supply chain and the potential benefits that could bring for innovation.

As well as the flagship Rolls-Royce [Ultrafan](#) (Rolls-Royce's new demonstrator aero-engine, capable of 25% greater efficiency than the first-generation Trent engine), the region is home to world-leading research and innovation centres such as Cranfield University's Global Research Airport, University of Nottingham's Institute of Aerospace Technology, University of Loughborough's National Centre for Combustion and Aerothermal Technology and three Rolls-Royce University Technology Centres ⁴.

Collectively, these and other sites offer expertise across key areas including:

- Clean gas turbine technologies
- Electrification and electric control systems, with major roles in European CleanSky initiatives
- Specialist fuel cells
- High temperature and lightweight materials
- Innovative tooling and manufacturing techniques
- Extensive testing capabilities and new demonstrators such as for hydrogen

4. UTCs in the Midlands include Gas Turbine Transmission Systems and Manufacturing and On-Wing Technology with the University of Nottingham, and Combustion System Aerothermal Processes at the University of Loughborough

There are 15 distinct aerospace centres and research groups at Cranfield University including:

1. Global Research Airport

Cranfield University's own airport offers a unique environment for transformational research at the forefront of aerospace technology, working to address the challenges of digital aviation and rethink the airports, airlines, airspace management and aircraft of the future.

2. Aerospace Integration Research Centre

The **AIRC** fosters collaboration between industry and academia, and provides world-leading capabilities. Focus on integration, where new aerospace technologies are rapidly developed and tested for current and future aircraft concepts.

3. Digital Aviation Research and Technology Centre

£35 million flagship facility for digital research and technology. Equipped with the latest cutting-edge technology. Researchers investigate ways of integrating new technologies to reduce the time from innovation to application.

9. MTC (Manufacturing Technology Centre) 10. WMG (Warwick Manufacturing Group)

4. Centre for Aeronautics

Wind tunnels, including for general purpose and atmospheric boundary layer conditions. Laboratories for indoor autonomous flying vehicles and a fully instrumented flying aircraft. Flight simulator. One of the world's largest centres for postgraduate education and research in aircraft design, aerodynamics, advanced modelling and simulation tools and methods.

5. University of Nottingham's Institute for Aerospace Technology

A 400-strong team of researchers with specialisms in aerospace manufacturing; materials and structures; aerospace operations; whole aircraft; space, and future propulsion systems. The IAT also leads Nottingham's participation in the €5.6bn CleanSky and CleanSky 2 programmes, involved in more than 30 projects to develop and demonstrate new technologies for low-emission/emission-free aviation.

6. University of Nottingham's Power Electronic and Machine Centre

The £40 million Power Electronics and Machines Centre (PEMC) offers purpose-built laboratories for the Power Electronics, Machines and Control research group - the largest such group of researchers in the world. It hosts the UK government-funded Driving the Electric Revolution Industrialisation Centre - Midlands, which is developing technology and manufacturing processes for advanced electrical machines and drives.

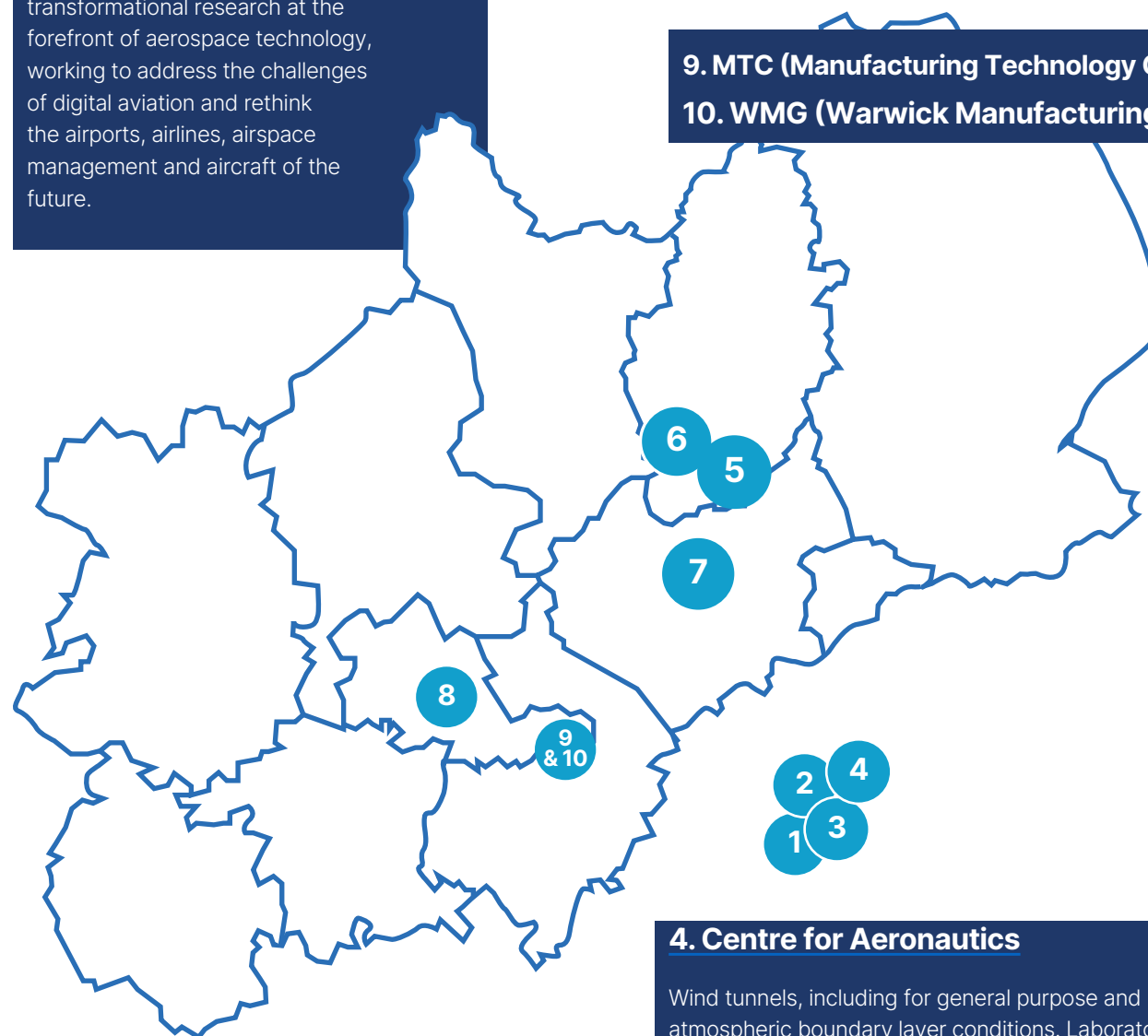
The building also houses the 20MW UK Electrification of Aerospace Propulsion Facility (UKEAPF) which will offer large-scale industry testing, the likes of which no other research institute in the world can offer. In 2026, the PEMC's new £70m Hydrogen Propulsion Laboratory will be operational, testing novel powertrains, including cryogenic electrical machines and power electronics, systems fuelled by liquid hydrogen and other green fuels.

7. University of Loughborough's National Centre for Combustion and Aerothermal Technology

The National Centre for Combustion and Aerothermal Technology acts as the UK's primary hub for research and development of future low-emission aero-gas turbine combustion technologies. NCCAT will enable industrial problem-owners to visit and work closely with academic researchers to accelerate the translation of new technologies from theory to practice.

8. University of Birmingham's High Temperature Research Centre

The High Temperature Research Centre (HTRC) is a collaboration between the University of Birmingham and Rolls-Royce to enable production-scale research and experimentation. The Centre is a self-contained investment casting foundry with the following processes: Core, Wax, Shell, Cast, Chemical Leach and Etch, Finish (abrasive blast, emery dress), Measurement and Inspection and Laboratories.



Wider capability in advanced manufacturing is underpinned through the internationally significant Manufacturing Technology Centre (also notable for the quality of its apprenticeship programme) and Warwick Manufacturing Group. The Satellite Applications Catapult Centre of Excellence at the University of Leicester also has many aerospace connections. Notably, the UK Aerospace Technology Institute headquarters is at Cranfield University.

Despite this vibrant hotbed of innovation, some believe that many of the Midlands' developments are acquired or commercialised elsewhere – often overseas – losing the regional economic growth opportunity. Cranfield's hydrogen propulsion programme could be one such example, acquired by US investors, although it is hoped that development will continue in the Midlands.

Similarly, the industry is on the precipice of future technologies, with uncertainty over which will be successful and which will fail, causing something of short-term loss of direction and investment indecision – although this can be addressed by government commitments and regulatory decisions.

The concentration of grant funding – critical in an industry where R&D is needed to retain a competitive edge – to primes could leave smaller innovations in Tiers 3 and 4 of supply chains untapped, particularly where such SMEs face strong competition and so may not promote developments (or capacity for new development) widely. Equally, such SMEs would benefit from grant funding to support necessary investments in machinery (typically higher-risk investments) to deliver new product and ensure reliability, which isn't currently available in the UK.

The impact of funding aimed directly at SMEs is demonstrated by the extraordinary success of the Aerospace Unlocking Potential (Aerospace UP) funding programme administered by University of Nottingham and Midlands Aerospace Alliance. Aerospace UP supported more than 270 Midlands aerospace SMEs, funding 128 RDI projects, with return on investment to the public sector estimated at 12.78 after three years⁵.

Despite targeted calls through the Aerospace Technology Institute (ATI), many smaller companies struggle to apply for their funding opportunities, lacking capacity to do so. Notably, over 270 Midlands SMEs received

funding through Aerospace UP, but many of these would benefit from support to further commercialise their projects – an untapped opportunity for low-risk, high-impact investment given these companies have already demonstrated the investment potential of their innovations.

There are examples of Midlands SMEs grouping together to develop new IP, but this can be a double-edged sword with their collective size then making them ineligible relevant SME-focused funding opportunities. This belies a wider need for patient capital and support across supply chains and from OEMs for new technology development – particularly in Tiers 3 and 4 and adjacent sectors that could feed into aerospace.

There is a cross-cutting opportunity for greater industrialisation of innovation – a gap that could be filled by more Tier 2 and 3 businesses. As primes have shifted more of their basic research and development into their university partnerships, the resulting outputs can be developed to higher technology readiness levels, as with disruptive technology developments not fitting existing supply chain iterative development – such as in jet zero

where new suppliers are required, for example cryogenics for hydrogen applications.

The industrialisation gap (and opportunity) comes from the need for capacity to develop production runs of these new technologies, especially when much of the existing Tier 3-4 supply chain is committed in long-term make-to-print contracts and lack capacity and risk appetite for new developments.

This demonstrates a possible market opportunity for Tier 2 manufacturers with the capability to industrialise new developments, who could also play a role in commercialising the disruptive IP created in the Midlands. Such businesses in the Midlands cluster could also increase resilience within the supply chain, providing a middle ground between overstretched SMEs and major OEMs, potentially freeing capacity for business and funding development at lower tiers.

Opportunities for such businesses may already be in the region, with adjacent manufacturing sectors having production capabilities with the potential to be brought to bear in industrialising new aerospace technologies.



Talent

Across 524 identified aerospace firms in the Midlands, there are 36,540 employees whose jobs are supported by aerospace revenues (and with spinoffs, 105,300 jobs are supported by aerospace directly and indirectly)¹. Core skills cover general engineering, machining, technologists, design and professional service support. With much of the manufacturing supply chain focused on make-to-print delivery, retraining and new skills will be required with expected growth in the application of new technologies such as in additive manufacturing for new components.

Complementing the established workforce of engineers and technologists, there are several training centres offering apprenticeship partnerships (and graduates) along with aerospace university programmes at all levels. Key sites include the [Newark Air and Space Institute](#) (which offers travel bursaries for students up to 90 minutes away) along with programmes at 4 other further education providers²; undergraduate aerospace degrees at 9 Midlands universities³, and the UK's largest accredited postgraduate aerospace programme offering at Cranfield University.

However, there are concerns over a diminishing talent pool and increasing competition between businesses for what labour there is. This is particularly pertinent at the higher qualification levels, with a reduction in aerospace-associated PhDs completed across the UK, despite a strong pipeline of graduates at bachelors and masters levels. This creates a need for experienced senior talent, especially as the overall workforce ages and approaches retirement.

There are also industry perceptions of an aspirational gap among the region's youth. Industry is increasingly calling for more robust pipelines from school into general engineering, technician and other roles that support the aerospace sector – especially across Tier 3 and 4 suppliers, for which there is less awareness of opportunities, and for graduates as a bridge between academia and industrial work. Apprenticeships across the region provide a critical pipeline of talent, but many of the schemes are not relevant to aerospace industry requirements and, where they are, the further education providers often struggle to recruit the right teaching staff.



6. Midlands Aerospace Alliance and Midlands Engine, *Aerospace in the Midlands*, March 2024

7. Further education providers offering aerospace-specific programmes (some with university accreditation) include Leicester College, Lincoln College, Nottingham College, and Solihull College

8. The Universities of Nottingham, Birmingham, De Montfort, Leicester, Coventry, Loughborough, Staffordshire, Nottingham Trent and Wolverhampton all offer aerospace degrees and variations thereof

Growth and investment opportunities

The Midlands aerospace supercluster has a generational growth opportunity to secure key positions in the propulsion supply chain for the next generation of narrow-body Airbus and Boeing aircraft. Underpinning this opportunity is a thriving, connected ecosystem of OEMs and Tier 1s, component and other suppliers and world-leading aerospace research and development groups at universities – including Europe's only university airport. Opportunities extend beyond this with new material, propulsion and fuel technologies being developed in the region, and new market opportunities elsewhere.

Looking forwards, there are a number of specific investment opportunities – for businesses themselves and financial institutions within the Midlands:

Next-generation narrow-body aircraft

With narrow-body passenger aircraft expected to make up 80% (33,510) of new aircraft deliveries between 2024 and 2043⁹, the next generation of these from Airbus and Boeing presents a huge opportunity for the Midlands aerospace cluster, especially given the significant portion of the region's cluster currently supplying the wide-body market.

There is an opportunity for UK plc to back the Midlands' primes and supply chain in securing major roles in future aircraft supply chains – both supplying engines and other sophisticated aircraft technologies. Work is already underway on this, but the upcoming Industrial Strategy should recognise the significance of the aerospace industry and potential economic impact of securing these contracts, with production runs into the decades.

9. Airbus Global Market Forecast 2024

10. Mindforge is a new patient capital investment company established by 8 research-intensive universities in the Midlands to invest in spinouts and start-ups in the Midlands

Tier 2 market gap

With a significant long-term OEM and Tier 1 footprint in the Midlands, there is an opportunity for domestic and international businesses to expand or locate into the region for proximity to supply chains and access to the leading industry-academic collaboration centres. In particular, there is a gap for Tier 2 and assembly-focused enterprises, and opportunities to capitalise on alternative propulsion and other aircraft technologies.

This opportunity is enhanced through initiatives such as the East Midlands Freeport (with sites neighbouring Rolls-Royce's Derby headquarters) and Investment Zones, with a selection of tax and customs incentives.

University commercial partnerships and European Framework Programme¹⁰

The Midlands is a proven cluster of expertise, with wide-ranging aerospace capabilities, including particular strengths in propulsion (including alternative fuels) and control systems, testing and demonstrators. Universities across the Midlands are open to partnerships and contracts with global aerospace businesses. This could include product development and demonstration, foundational and applied research, or even industrial PhD partnerships.

The European Union's Framework Programme 10 (FP10), the successor to Horizon running from 2028 to 2034, will likely feature a major aerospace component – building on successes like the CleanSky programmes, and underpinning Airbus's supply chain. The UK is expected to associate to FP10, opening Midlands universities (and businesses) to collaboration with European partners in this new funding scheme. It is likely that

new programmes will have an interest in demonstrator technologies – with new UltraFan, hydrogen and other demonstrators likely to be proposed in the Midlands (notably in Derby and Nottingham).

Commercialisation and industrialisation

The Midlands aerospace cluster has witnessed many partnerships, mergers and acquisitions in recent decades, with significant private equity involvement. The rate of new intellectual property production and variety of potential ‘future winners’, but often lack of capacity/funding in SMEs to capitalise on their new developments, demonstrates an opportunity for funds and corporate investors to support such businesses with the capital investment they need to scale and grow. As seen in other markets such as the USA, new IP-rich start-ups and SMEs are often acquired by larger businesses early on.

The region is also home to other major manufacturing clusters, with OEMs through to components across adjacent industries such as automotive, rail and nuclear. There is a mutually beneficial opportunity for greater cross-sector engagement to utilise wider manufacturing capabilities to support the growth of the aerospace cluster.

The Midlands innovation ecosystem is a rich source of new ideas and technologies which can complement the wider aerospace cluster. Patient capital, such as that to be provided by [Midlands Mindforge⁵](#), can give these new businesses the security to commercialise and industrialise in the Midlands.

Other funds and asset owners – such as pension funds seeking local investment in line with the Mansion House reforms – could look to support such innovation in the Midlands.

Defence

With US-led pressure on NATO members to spend at least 2% of their gross domestic product on defence and an increasingly fraught global geopolitical context, the defence sector is a growing market opportunity for traditionally civil aerospace suppliers. New dual-use opportunities across the supply chain can generate new income streams and innovation.

Integration established and emerging supply chains

The Midlands aerospace cluster primarily supplies Airbus and Boeing. With Embraer in Brazil seeing growth (33% in 2024⁶) and huge investment in the Commercial Aircraft Corporation of China for a domestic aircraft, new opportunities could be developed across the Midlands’ supply chain businesses to access these new markets alongside the region’s traditional aerospace industry growth markets in other European aerospace clusters.

11. [Embraer: news - Embraer recorded a 33% year-on-year increase in deliveries and reached a new US\\$ 22.7 billion backlog record](#)

Investor support

The *Invest in UK University Research & Development Midlands* campaign, promoting the collective capabilities of 20 universities in the region, [profiles aerospace R&D facilities and expertise](#). The concierge service behind this campaign can connect businesses and funds looking to partner with researchers to commission research, development products and technology, commercialise IP and co-locate business activities in this thriving ecosystem.

There are many investment promotion agencies and local initiatives such as Investment Zones and Freeports which can support prospective investors and businesses in navigating the Midlands and finding the right location to grow their business. A breakdown of these services is provided [here](#).

Strategic asks

There is already a leading international aerospace cluster in the Midlands. However, there are opportunities to catalyse and secure further industry growth through government action, cementing the importance of the cluster for decades to come:

1.

Back the industry strategically through funding and regulatory commitments that support the entire supply chain and ensure international competitiveness

While grants are required to support new commercialisation and proof-of-concept, they are also required to support established manufacturers across supply chain tiers with innovation. As highlighted in the *Aerospace in the Midlands* March 2024 report, aerospace is “a high-R&D-investment sector that governments subsidise to retain their countries’ competitive edge and high-value manufacturing jobs and to accelerate the advent of more sustainable aerospace and aviation”.

This competitive edge can be further protected through wider distribution of funding opportunities targeting supply chains while continuing support for current recipients. This is critical to demonstrating a comprehensive supply chain offer for major opportunities such as next-generation narrow-body aircraft. This can also be driven through renewed support for successful continuous improvement schemes such as industry’s own Supply Chains for the 21st Century ([SC21](#)).

Some businesses are calling for a review of grant funding arrangements and decision-making, arguing that more local insight (e.g. from industry associations) can support more impactful funding awards, and that more funding should be directed towards established businesses that are already revenue-generating to facilitate quicker growth, as well as start-ups. The Midlands already has successful example in the Aerospace UP ERDF funding programme and NATEP.

While catapults such as the Manufacturing Technology Centre and Satellite Applications Catapult are effective interventions to support industrialisation of new technologies, they do not cover all technology areas and can present less attractive offers for SMEs due to their business models and cost structures.

Beyond this, government can set a direction for the industry and its investors through commitment to regulatory plans such as

on fuel, emissions and adoption of new technologies, and within the industrial strategy. This is particularly important now as the next generation of narrow-body aircraft are being designed in the late 2020s.

This government support and interest is critical to ensure the UK aerospace manufacturing base remains world-leading and competitive and avoid missed opportunities such as in the case of China's growing dominance of the electric vehicle market.

The value proposition and significance of the aerospace industry in the Midlands is not fully appreciated, particularly by international parent companies, even of existing owners. Promoting the extent of this cluster, the connectivity and the opportunities, as this paper aims to

do, is critical to avoiding misconceptions and securing continued support for OEMs and Tier 1s in the region, especially with many major decisions made in boardrooms overseas. There is a role for government to play with senior relationships from the Office for Investment and Department for Business and Trade given the majority of primes are foreign-owned.

This paper highlights the importance of collaborative efforts between government, industry, and academia to unlock the full potential of the Midlands aerospace sector. With the right support and investment, the Midlands will continue to be a beacon of aerospace excellence, attracting global investors and solidifying its role in the future of aviation.

2.

Address local talent pipeline risks through PhD programmes and appropriate apprenticeships with a renewed focus on industry experience for graduates of aerospace (and related) programmes, focusing on career opportunities with SMEs

While there is a strong pipeline of graduates, there is a growing need to ensure a reliable pipeline of PhD-qualified workers, and for local apprenticeship provision to meet local business demand. Existing talent in the labour market is often drawn to OEMs and Tier 1s, weakening the capacity of SMEs through attrition without a sufficient replacement pipeline.

Meanwhile, some businesses state that the structure of apprenticeships is unattractive to SMEs as it requires business commitment which is not rewarded with sufficient apprentice working time on-site. Underpinning all study levels – but particularly in further education – there is a challenge to recruit and retain teachers with the right skills to deliver technical programmes.

3.

Promote the significance of the Midlands aerospace cluster globally and to overseas HQs

The value proposition and significance of the aerospace industry in the Midlands is not fully appreciated, particularly by international parent companies, even of existing owners. Promoting the extent of this cluster, the connectivity and the opportunities, as this paper aims to do, is critical to avoiding misconceptions and securing continued

support for OEMs and Tier 1s in the region, especially with many major decisions made in boardrooms overseas. There is a role for government to play with senior relationships from the Office for Investment and Department for Business and Trade given the majority of primes are foreign-owned.

4.

Address competitiveness through improved local business conditions for manufacturers

Aerospace is a competitive industry dependent on manufacturing capability and requiring continued high investment in research and development. State funding is critical and is seen across other major aerospace countries such as Germany, France, Spain, the US and China. Current UK provision struggles to compete beyond research and development for large

companies, compounded further by high energy costs and taxes. Some manufacturers call for a business rates review and for increasing local retention or control of taxes that are raised through devolution, such as reductions for manufacturing sites – not just for Freeports and Investment Zones, which largely target new businesses and not the existing industrial base.



Conclusion

The Midlands aerospace cluster is a cornerstone of the UK's aerospace industry, boasting a rich history, a robust supply chain and world-leading research and development capabilities.

With over 500 aerospace businesses generating £5.3 billion GVA, the region is a global hub for the design and manufacture of aero-engines, advanced aircraft systems and aero-structures, and production of flying parts.

The Midlands' thriving ecosystem, with a concentration of major OEMs and Tier 1s, accredited suppliers and unique innovation assets demonstrating strong industry-academic collaborations, positions it as a prime location for investment for the next generation of aerospace production.

However, to fully capitalise on its potential and drive the investment opportunities outlined in this paper, the Midlands aerospace sector requires commitment from government and industry stakeholders. UK plc should promote the Midlands aerospace cluster as the heart of the UK industry, focusing on securing contracts in the next generation of aircraft supply chains, with comprehensive support across the existing UK and Midlands supply chain.

Critical to this support is talent – addressing the decline in aerospace-relevant doctoral students and supporting apprenticeship programmes with SMEs and businesses with the right teaching talent. Public funding is also fundamental to maintain a competitive edge in the global aerospace market, and with a need for more support for industrialisation and investment in core manufacturing capabilities, as well as talent pipelines.



Case studies



Midlands-based PGM Reball manufacture smaller, lighter, more compact precision miniature ballscrews. Ballscrews are essential for converting hydraulic to electric actuation in flight, playing a crucial role in decarbonisation.

After a student placement, PGM Reball developed a novel ballscrew concept design unifying two components. Midlands Aerospace Alliance and Innovate UK Edge supported the company to secure a collaboration with University of Leicester, which provided free access to metal 3D printing facilities at Space Park Leicester, enabling development of a working prototype. Further funding from the Intellectual Property Office through Innovate UK Edge facilitated an IP audit and patent application for the new design.

Midlands Aerospace Alliance connected PGM Reball with a major Midlands-based Tier 1 actuation specialist, leading to a collaboration on electric actuation for aircraft braking systems. This project is now advancing to its second iteration.

This demonstrates how fairly modest funding, and support from academia and government, can help launch projects, prototype innovations and commercialise SMEs' expertise.



Zero Carbon Innovation Centre

The University of Nottingham, in partnership with East Midlands Freeport, Research England and Loughborough University, has opened the Zero Carbon Innovation Centre (ZCIC). The ZCIC will deepen the university's R&D and manufacturing partnerships with industry across sectors, including aerospace.

Claire Ward, Mayor of the East Midlands, said: "This centre will not only drive the development of sustainable, zero-carbon technologies but also create significant economic opportunities – including new jobs and business growth across the region."

The ZCIC joins a lineup of zero-carbon R&D and manufacturing capabilities at University of Nottingham, including the Power Electronics and Machines Centre and Omnifactory®. The Hydrogen Propulsion Systems Lab will soon join these, funded through £70 million of investments, primarily secured with Research England and industry co-investment partners.



Advanced Innovative Engineering (AIE) exemplifies innovation in aerospace propulsion technology within the Midlands' aerospace cluster. Specialising in lightweight rotary engines, AIE provides cutting-edge propulsion solutions suitable for UAVs, hybrid power systems, and defence applications. Leveraging the region's robust innovation ecosystem and strategic industry-academia collaborations, the company has successfully secured multiple partnerships and investments to enhance its global market presence.

AIE's commitment to sustainable technologies and lightweight engine designs has positioned it strategically within emerging aerospace markets, contributing significantly to regional growth opportunities. AIE demonstrates how targeted support for advanced aerospace engineering SMEs can drive sectoral innovation and international competitiveness. (www.aieuk.com)



Aerospace UP

Aerospace UP was a £20 million three-year funding programme designed to help smaller companies develop innovative solutions to make aviation greener. The programme ran between 2020 and 2023, supported by the European Regional Development Fund (ERDF) and Midlands Engine and funded by a coalition of eight Midlands Local Enterprise Partnerships, with Midlands Aerospace Alliance and University of Nottingham leading delivery.

The programme’s emphasis on leveraging on the potential of the region’s dense SME ecosystem to foster innovation in the supply chain and develop the region’s capacity to capitalise on the emerging market for green aviation solutions contributed to the supply chain’s long-term capacity to generate value, leading to high returns on investment (£12.78 for every £1 invested). Additionally, its delivery by regional bodies familiar with the SME ecosystem allowed support to be tailored to the needs of the supply chain.

Aerospace Technology Exploitation Programme

Midlands Aerospace Alliance’s Aerospace Technology Exploitation Programme (ATEP) was set up to encourage the development and exploitation of new technologies by companies in the West Midlands’ aerospace supply chain. Part-funded by ERDF and regional development agency Advantage West Midlands, its two iterations provided consortia of SMEs with grant funding averaging £80,000 in its first iteration and £120,000 in the second iteration. ATEP funded 11 projects and produced wide-ranging benefits in market-ready technology development.

Its success was such that its model was built upon by the UK’s national aerospace strategy body, the Aerospace Growth Partnership, who implemented it in four other English aerospace clusters through the £40 million National Aerospace Technology Exploitation Programme (NATEP). NATEP was designed to help mature more than 100 novel aerospace technologies by assisting small partnerships of SMEs with projects in the middle technology readiness levels (TRLs) with a clear route to the aerospace market.

Appendix

Roundtable attendees

Aerospace businesses

- Advanced Innovative Engineering UK Limited
- AqGas Group Limited
- Bloc Digital
- iCOMAT
- IFA Limited
- ITP Aero UK
- Optima UK Inc. Limited
- PGM Reball Limited
- Rolls-Royce
- TT Electronics PLC

Industry bodies

- Aerospace Technology Institute
- Midlands Aerospace Alliance

Consultants and data providers

- Midlands Engine Observatory
- Beauhurst
- CBI Economics
- Inner Circle Consulting
- The Data City
- Wavteq

Universities

- Cranfield University
- University of Derby
- University of Nottingham
- University of Warwick

Growth entities and government

- Department for Business and Trade
- East Midlands Combined County Authority
- Invest in Coventry & Warwickshire
- Midlands Engine
- West Midlands Combined Authority