

AEROSPACE CLUSTERS | USA

CHANGING
STATES

Brought to you by the letter 'O' of Ohio and Oklahoma, Mike Richardson discovers how each state has become a US aerospace industry success story through the continued support of its resident aerospace clusters.

Along with the automobile industry, the US aerospace industry is considered to be the technological backbone of the country's manufacturing base and as the Obama Administration and Congress debate how to strengthen American manufacturing, aerospace will probably receive considerable attention.

Still a global leader, the US aerospace industry forms a vital part of the country's domestic and export economies. However, like many aerospace manufacturing regions around the world it faces some difficult challenges, namely continuing defence cuts, increasing international competition and a weak global economy.

As with other industries, the global recession has affected aerospace manufacturing, with both the defence and commercial sides of the industry facing difficult business conditions for the foreseeable future.

A 2009 Congressional Research Service report identified aerospace



Borne in the USA: Oklahoma's renown for its MRO capabilities, one of only seven major centres in the world

manufacturing as a key part of the US manufacturing base, comprising 2.8% of the nation's manufacturing workforce in 2008 and employing over 500,000 Americans in high-skilled and high-wage jobs. It also revealed that more than half of the nation's aerospace industry jobs are located in the six states of Washington State, California, Texas, Kansas, Connecticut and Arizona, with several smaller aerospace clusters established in states such as Florida, Georgia, Ohio, Missouri and Alabama.

Other aerospace hotspots are emerging in southern states, such as South Carolina, where Boeing has built a second production line to produce the 787 Dreamliner. With these aerospace

manufacturing clusters contributing significantly to the US economy, it's perhaps best to start by understanding the important role they play in the sector.

Based in Cincinnati, Lean manufacturing and aerospace specialist TechSolve is a leading research and consultancy firm and member of the Ohio Aerospace and Business Aviation Council. Ohio is not always thought of as frequently as some of the other regions leading in this industry and yet 17% of the aircraft engine manufacturing industry takes place in the state.

"The aerospace industry growth projections signal many opportunities for manufacturing and technology," begins TechSolve's president, Gary Conley.



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Leading light: Boeing has built a second production line in South Carolina to produce the 787 Dreamliner

“Segments of the industry are expected to increase at rates of 150% to 300% times that of the national economy. Manufacturers in Ohio have the skills to meet many of the industry’s growth needs and by working in an organised, united way - through the Ohio Aerospace and Business Aviation Council - Ohio can leverage this opportunity to support the industry and get ‘better than fair share’ of this growth.”

A pipeline for production

Oklahoma’s department of commerce claims its skilled and productive workforce is a hallmark of the state. With a talented existing aerospace workforce that is growing everyday due to Oklahoma’s training programmes and educational institutions, its department of commerce says the aerospace industry is assured a pipeline of proficient labour for years to come.

“Aerospace is one of the state’s largest sectors and Oklahoma has thriving aerospace clusters in both Tulsa and Oklahoma City,” explains Dave Lopez, secretary of the Oklahoma Department of Commerce. “While I am new in this position, I’ve learned clusters in growing industry sectors are important to the sustainability of regional economies. Aerospace is particularly significant because it is an industry driven by innovation, knowledge-driven work skills and a good fit for Oklahoma because we have the infrastructure to serve the industry. It is a growing and constantly advancing industry which makes it important to Oklahoma’s economy.”

In 2010, the State of Ohio and key industry leaders formed the Ohio Aerospace and Business Aviation Council. Working collaboratively, members from private industry, universities, not-for-profit organisations and federal/state installations developed a strategy to strengthen and grow Ohio’s aerospace and defence industry.

“Participation in the Ohio Aerospace and Business Aviation council is voluntary,” states Conley. “Membership includes top industry leaders, who through their participation will define key initiatives at a state-wide level that will drive Ohio’s economic growth and policy. The members benefit from their interaction through information sharing and ‘access’ to each other.” According to Lopez, any opportunity to participate in industry events and to network with industry professionals is important because it gives Oklahoma an opportunity to get the word out about our aerospace value proposition. “It also gives us the opportunity to learn more about how the industry is changing and what we have to do to keep pace with the rate of change,” he notes.

Ohio’s breadth and depth of its aerospace assets includes federal facilities, industry, academic institutions and industry support organisations. Through the Aerospace Council’s work, it has developed a strategic plan with

specific initiatives defined. Oklahoma meanwhile is home to over 300 aerospace companies and another 200 companies that support aerospace/aviation. Oklahoma’s aerospace industry employs more than 143,000 people, representing an industrial output that exceeds \$12 billion and \$60.6 million in state sales tax revenue annually.

In terms of each cluster and its member’s active engagement in key aerospace programmes, the strategic plan developed by the Ohio Aerospace and Business Aviation Council hasn’t focused on specific programmes, but rather five key areas of focus: unmanned systems, advanced materials research and manufacturing; R&D and testing; aircraft maintenance, repair & overhaul (MRO); and infrastructure and environment.

Oklahoma’s cluster is best known for its MRO capabilities and is one of only seven major centres in the world. For engine manufacturing, the city of Tulsa is ranked eighth in the US, whilst Oklahoma City’s Air Logistics Centre at Tinker Air Force Base is said to be the largest depot in the US Department of Defence. The state’s exploits in unmanned aircraft systems (UAS) has resulted in the first graduate degree in UAS at Oklahoma State University. In addition, Oklahoma has facilities and airspace for testing, and the University Multispectral lab for feasibility analysis. Finally, Oklahoma is the location of



Dave Lopez: Oklahoma Department of Commerce

central support and training for the Federal Aviation Administration and the US Department of Transportation.

A finger on the pulse

Responding to the OEMs' demand signals for new and advanced technological innovations in the future, Conley claims that the Ohio Aerospace Council has defined a plan with specific short- and long-term initiatives that are designed to meet the future needs of the OEMs and industry in total.

"Ohio has industry leading federal institutions, NASA Glenn Research Centre, Wright-Patterson Air Force Base and Air Force Research Laboratories, which serve as industry magnets for innovation and technology," he affirms. "A significant part of the plan focuses on commercialising technologies from these innovators.

"One of the key areas of focus going forward is advanced materials. Manufacturers will be required to meet the material needs of the industry and will need the knowledge and skills to produce parts with materials they have not yet worked with. It will be critical that the industry unites in support of manufacturing."

Oklahoma's department of commerce sees large aircraft builders increasing the amount of components they outsource, making OEMs even more integral to the manufacturing process.

"We're meeting the challenges of the future by providing training and up-skilling programmes and by working with our universities to ensure we meet the needs of the industry," Lopez confirms. "We have even launched a public service campaign encouraging children to pursue engineering; we're preparing for the future by recruiting the engineers of the future.

"We're also supporting innovation by continuing to grow the industry in Oklahoma and recruit foreign and domestic companies to do business here. We think if we have a diverse industry with an international flow of ideas,



Oklahoma's UAS developments: Have resulted in the first UAS graduate degree at Oklahoma State University

innovation and talent, our market will be in a better position to serve the industry."

The smart way to play

In an increasingly challenging industry where civil aviation has become a duopoly shared by Boeing and Airbus, regional jet manufacturing is dominated by Brazil's Embraer and Canada's Bombardier – both of which employ high levels of US-produced content in their products, and general aviation, which includes companies such as Cessna and Gulfstream, what kinds of hurdles can both the cluster and its member companies expect to encounter this year?

"The Aerospace Council has picked up significant momentum and will continue to focus its efforts on deployment of the strategy," concludes TechSolve's Conley. "The strategic workforce development and marketing plan for the state will help build global interest in Ohio as an industry leader. The global landscape of the industry makes it very competitive and we must find smart ways to play."

For Oklahoma's aerospace industry, the rate with which technology is expanding will need to be matched by new and

focused training programmes that will prepare its workforce for the kinds of skills it will require in moving forward.

"One of the challenges we see for the industry is the need to adapt to new technologies as the industry moves to replace aging fleets," Lopez ends. "Through training and constant up-skilling, we're partnering with our state industry to ensure Oklahoma's workforce keeps pace with the changes." |

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