

## Executive summary



# Diversity and room to grow

**I**t was in the summer of 2012 that Airbus announced it would build a \$600 million A320 final assembly line in Mobile, Ala. It will mean thousands of jobs and gives the European plane maker visibility in the United States, still the world's most vibrant aerospace market. That will help Airbus compete for a larger share of the U.S. commercial market, and for defense contracts as well.

For the Gulf Coast region the significance of the Airbus decision is still being assessed. Some point to what happened when Mercedes-Benz set up a plant in Vance, Ala. It was a watershed event for Alabama and the rest of the South's thriving automotive industry. The arrival of Airbus has all the promise of being just as big, and perhaps bigger. Having Airbus build A320s in Mobile puts the region in a select club of locations where large passenger jetliners are built - significant in itself.

U.S. aerospace industry	
Sales (est. 2013)	\$223.65 billion
Work force (2012)	629,400
<i>Source: Aerospace Industries Association</i>	

But the Gulf Coast region is already highly active in aerospace, and it's a member of two other unique aerospace clubs. It's one of the few places in the country with a NASA center, as well as the only place where pilots learn to fly fifth-generation F-35 and F-22 jet fighters. Unique capabilities like those are important if the region wants to expand its aerospace footprint and come out ahead of other areas trying to do the same.

Aerospace is a real economic jewel. It's a research intensive \$223 billion industry that uses a range of highly paid talent, from those who design aircraft and those who assemble them to

## Executive summary

those who fly or maintain them. The two sectors are military and civilian aviation, and a healthy aerospace footprint should include both. Alabama, Florida, Louisiana and Mississippi leaders are pursuing more aerospace activities, notably foreign investments. And that's important at a time when Pentagon belt-tightening brings uncertainty to the military, historically a pillar of the region's economy.

With many areas of the country competing for aerospace jobs, Alabama, Florida, Louisiana and Mississippi joined together in 2009 to form the Aerospace Alliance. That made sense because those states are packed with aerospace clusters, including Huntsville and Decatur, Ala., part of a large science and technology region called the Tennessee Valley Corridor; east central Mississippi's Golden Triangle, which includes Columbus, Starkville and West Point; Florida's Space Coast; and the I-10 region along the Gulf Coast, just to name a few.

The focus of this book is the I-10 corridor, the only cluster that includes a piece of all four states. It's an urbanized area with seven contiguous metropolitan areas, including the largest city in Louisiana, second largest in Mississippi and third largest in Alabama. It's a microcosm of the aerospace activities found in all four states, including space, military aviation, aircraft assembly, weapons development and more.

The idea behind this book wasn't to list the aerospace activities in the 19-county/parish corridor, but to put it in context. Among other things, the reporting team found a region with diverse military and civilian aerospace activities falling into several broad categories. Importantly, the reporters also found no single organization acting as a champion for the economic region highlighted in this book. That could become a problem in the future.

The reporting team found:

- Aircraft manufacturing, space, propulsion systems, military aviation, unmanned aerial vehicles and robotics, aerial weapons, high-

### Aerospace activities at a glance

- Rocket and jet engine testing
- Rocket engine, satellite production
- Piston engine assembly
- Unmanned aerial system plant
- Site of future jetliner assembly plant
- Areas approved for unmanned flights
- Military pilot training
- National Guard aerial combat training
- Aerial weapons RDT&E
- Land and water ranges
- National Guard helicopter repair depot
- Multiple MRO activities
- Applied geospatial technologies
- Military electronics/cyber training
- Human-machine cognition research
- Advanced manufacturing research
- 43-acre manufacturing plant
- Multiple aerospace parks

performance materials, advanced manufacturing and RDT&E are the region's strongest aerospace activities with the most potential for growth.

- Aerospace is a target industry for Alabama, Mississippi and Florida, and Louisiana has targeted advanced manufacturing. Local economic development groups have also targeted aerospace, and state and local leaders have joined in a mix of regional alliances to pursue the aerospace industry.
- While the I-10 corridor has the variety of aerospace activities that could attract major federal projects, such as the FAA drone test sites, there is no organization that specifically promotes or represents the region as a single economic entity.
- The decision of Airbus to establish an aircraft assembly plant at Brookley Aeroplex in Mobile, Ala., will lead to suppliers and vendors opting to move to the region to be closer to the plant. Some will want to be in close proximity, others will want some dis-

## Executive summary



*GCAC illustration, Google Earth map*

- tance so as not to compete for workers.
- Airbus in Mobile and the F-35 training center at Eglin Air Force Base, Fla., are both potential showcases for this region on the global stage. But there are others, including the region's airports, science and technology learning centers, manufacturing and research operations that should and could be promoted on the world stage.
- The region is served by six commercial airports and multiple non-commercial, long-runway airports. Many of the commercial airports include military aviation activities, and some of the non-commercial airports play key roles in military and non-military aviation activities. Some of the airports are acquiring the space in a bid to attract more aerospace companies.
- Moss Point, Miss., builds portions of the Global Hawk and Fire Scout unmanned aerial systems at the Northrop Grumman Unmanned Systems Center at the Jackson County Aviation Technology Park. The company is one of the leaders in building UAVs, and Moss Point has room to build other high-tech UAVs for the company.
- The combination of Brookley Aeroplex in Mobile and the Jackson County Aviation Technology Park in Moss Point, 35 miles away, forms a hub of aircraft manufacturing in the central portion of the Gulf Coast aerospace corridor.
- Stennis Space Center, Miss., and Michoud Assembly Facility, New Orleans, each plays a role in NASA's Space Launch System. SSC tests two engine types that will be used in the launch vehicle, and Michoud builds the Orion crew vehicle and will build the core stage. Both facilities also are involved in the growing commercial space field, and both have excess capabilities as well as technical expertise. Those capabilities are being marketed commercial space companies.
- The Department of Defense owns more than 700,000 acres and 47 sites in the I-10 region with a combined plant replacement value of \$20.3 billion. Three of the bases, all with aviation activities, are listed as among the most valuable in the nation.
- The region's military activities include the

## Executive summary

Navy Department of Defense Supercomputing Resource Center at Stennis Space Center, Miss. It added three supercomputers in 2012, more than tripling its computing power and placing it in the top 100 of the world's supercomputers.

- Military activities bring billions into the region through payroll, contracting and other activities. Between 2000 and 2012, 4,568 companies in 19 Gulf Coast counties/parishes were awarded 65,993 DoD contracts valued at more than \$71 billion.
- Most of the military activity in the region is aviation-related, and includes pilot and flight officer training, weapons developments, search and rescue, unmanned aerial system activities, logistics and a variety of combat missions.
- The military's huge complex in this region is a vast schoolhouse that trains tens of thousands of students each year who earn wings or learn technical skills, including cyber security training.
- The U.S. Coast Guard has port activities throughout the region, as well as the Aviation Training Center in Mobile, Ala., where all Coast Guard aviators train after initial training with the Navy.
- Major U.S. aerospace and defense companies have operations in the Gulf Coast region, including many with multiple sites. Foreign aerospace and defense companies and non-aerospace companies also have a sizeable footprint in the region.
- There are 16 universities, several with "very high" research activity, that operate or have interests in the I-10 region. One community college is among the top associate degree producers in science, technology, engineering and math in the United States.
- There are multiple technology transfer offices and incubators in the region, along with a patent association formed in 2010 to focus on intellectual property issues.
- Research and development activities in the region involve federal, state and corporate players. One base alone, Eglin Air Force Base, Fla., spends more in R&D each year than many of the nation's most prestigious universities, though in an age of Pentagon belt-tightening, weapons R&D has taken and will continue to take a big hit.
- Aerospace activities include many in growth sectors, including unmanned aerial systems, advanced materials and geospatial technologies. One university activity focuses on micro air vehicles that use nano-sensors. In addition to unmanned aerial systems, at least three federal operations are involved in some aspect of unmanned underwater vehicles. Okaloosa County, Fla., is also developing an indoor unmanned systems center that will include air, land and maritime.
- At least two areas in South Mississippi are authorized by the FAA to fly unmanned aerial vehicles. Unmanned systems are also flown at Eglin Air Force Base, Fla., in military air space, and at Camp Shelby, Miss.
- Aerospace and technology parks have been established or are developing across the region, including a 3,900-acre park at Stennis Space Center, Miss. In addition, NASA hopes to turn more than 800 acres around New Orleans' Michoud Assembly Facility into an advanced manufacturing park. Michoud is home to the National Center for Advanced Manufacturing.
- States and local areas have workforce programs to train blue and white collar workers for the aerospace and related industries. Many of the programs are company specific. Alabama, Louisiana, Mississippi and Florida are right-to-work states.
- According to a study, the Fort Walton Beach-Crestview-Destin MSA in Florida has the third highest concentration of aerospace engineers in the nation behind Huntsville, Ala., and Melbourne, Fla.
- High schools in the region have programs targeting aerospace, advanced materials and

## Executive summary

geospatial career fields. A career academy in Northwest Florida allows students to engage in real-world projects in science and math to achieve high school and college credit and industry-recognized certification. It's become a national model.

All of this has to be put in the context of the military drawdown, and the impact military aviation will have on the aerospace industry in general. Both civilian and military aerospace are needed for a robust industry.

That was brought to light when EADS and BAE Systems attempted to merge. The idea was to have a company with strength in both the military and civilian side of the industry. That effort fell through, but it still pointed out the importance of having activities in both sectors.

Changes in military aerospace are particularly important for this region. In an age of a tight Pentagon budget, new systems will be put aside in favor of maintaining and improving legacy systems. Proven legacy aircraft production lines are being extended beyond the Pentagon's original acquisition plans.

"Sustaining legacy aircraft has become progressively more expensive and time consuming for maintainers with many aircraft types operating beyond their original design life," the Pentagon said in its annual report to Congress on the state of the industrial base.

The tactical aircraft R&D budget is projected to decline with the end of the F-35 development and an absence of new fighter requirements, the report said. That will have an impact on the current design and engineering teams. And the impact on future teams will be severe.

"This challenge is compounded by an aging aerospace workforce and dwindling interest from younger engineers in the aerospace domain," said the report. Critical design capabilities unique to tactical aircraft, such as hypersonic aerodynamics, high angle of attack, carrier operations, target acquisition and more "face current shortages and risk atrophy or erosion."

Existing capabilities are the result of the Pentagon's investment in and development of unique technologies and capabilities over the past 60 years. So cutbacks are bound to have an impact on future capabilities.

A key area of growth in military aerospace is in unmanned aerial systems, which continue to evolve as technologies mature, operational lessons are analyzed and long-term strategies are developed. The unmanned aerial system industrial base is "large, robust and continues to grow driven by the ever-expanding UAS demand," according to the report.

"As evidenced by their extensive use in operations in Afghanistan and Iraq, UASs have proven themselves an effective tool for the warfighter," said the report. "The capabilities they bring – from providing constant imagery to serving as strike platforms – are now virtually indispensable to combatant commanders and have resulted in demand exceeding the supply."

The Pentagon said the evolution of unmanned aerial systems, including greater computing power, a boost in UAV capabilities and their ability to operate with each other and interact with humans, "has the potential to provide alternative solutions to meeting operational requirements in the future.

The glowing review of the role of UAVs in the future of the military was written before an event in May that some consider a watershed event for naval aviation. A Northrop Grumman X-47B successfully catapulted from the deck of the USS George H.W. Bush and landed at Naval Air Station Patuxent River, Md., after a one-hour sortie. The same week, the X-47B performed touch and go maneuvers on the deck of the carrier.

One area of interest to this region, aerial weapons development, is expected to take a hit under an increasingly constrained budget. As far back as October 2011, an Air Force weapons chief at Eglin Air Force Base, Fla., said that in an age of austerity, there was a target painted on aerial weapons development. The Pentagon in

## Executive summary

the 2012 affirmed that investments in munitions and missile R&D/procurement may be reduced.

For the Gulf Coast region, those factors are significant. There are plenty of smaller companies that can benefit from providing more capability to legacy systems that will remain in operation for years to come. And the growing use of UAVs provides yet another opportunity for this region, which is already heavily involved in the booming field. Even aerial weapons development will take a hit, but it won't go away and improvements will be sought.

The region along the Interstate 10 corridor is positioned quite well. It has built its aviation infrastructure over the past 100 years, and owes much to military and space flight endeavors of the federal government. Those federal activities in turn played a role in the creation of a strong research, development, test and evaluation community in the region.

The diversity of aerospace activities across the corridor provides opportunity for those already skilled in the field and those considering entering the field. While a particular aerospace activity may not be located in one area, it's likely to be in another. And that's important for the workforce because it affords a chance to stay in this region.

To protect the lucrative activities, local officials make it a priority to protect their bases and the NASA facilities from encroachment. While it's clear that one reason is the value of the bases to the economy, another factor may be the pro-military population itself. Counties and parishes in the region have a higher proportion of veterans than the nation as a whole.

The business-friendly region offers tax breaks and other incentives to new and established businesses alike. They promote their generally lower cost of living and lower cost of doing business. While there are unions, Alabama, Florida, Louisiana and Mississippi are all right-to-work states. Those factors may be partly responsible for the influx of foreign-owned companies looking to establish a foothold in the United States. This "insourcing" of companies and jobs

has clearly benefited the Gulf Coast.

The Gulf Coast Aerospace Corridor along the I-10 corridor isn't the largest in the nation or the Southeast. But its range of activities, multiple seaports and airports, road and rail systems allow easy access from within the United States and abroad, and may give it competitive advantage.

Richard Aboulafia, vice president of analysis at the Teal Group, has said the region is one of the most varied aerospace clusters he's seen, and he said a regional approach is "absolutely essential."

Others see the same diverse mix.

"There is a collection of industries including aviation, space, military and logistical infrastructure that is unparalleled on the Gulf Coast," said Gray Swoope, Florida Secretary of Commerce and president and CEO of Enterprise Florida. "Thanks to our premier location and proximity to these assets, Florida has emerged as a super-state in the aviation and aerospace sector."

While the military will continue to be a pillar of the region's economy, at least one public official sees that as both good and bad. Florida Senate President Don Gaetz, R-Niceville, is concerned that there's too much reliance on tourism and the military. He and others want to see more diversity, through attracting a range of high-tech and mid-tech industries that can take advantage of the trained workforce.

It's possible this book may provide the public, economic development officials and politicians with a better understanding of the considerable capabilities of this region, not only in aerospace, but in other science, technology, engineering and math and medical fields. The reporters who compiled this study believe there's a lack of appreciation, even in the region itself, of the level of capabilities in the Gulf Coast region. The tools are there, and we believe it's just a matter of understanding how to leverage them, and working together in a manner that will benefit the entire region.

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