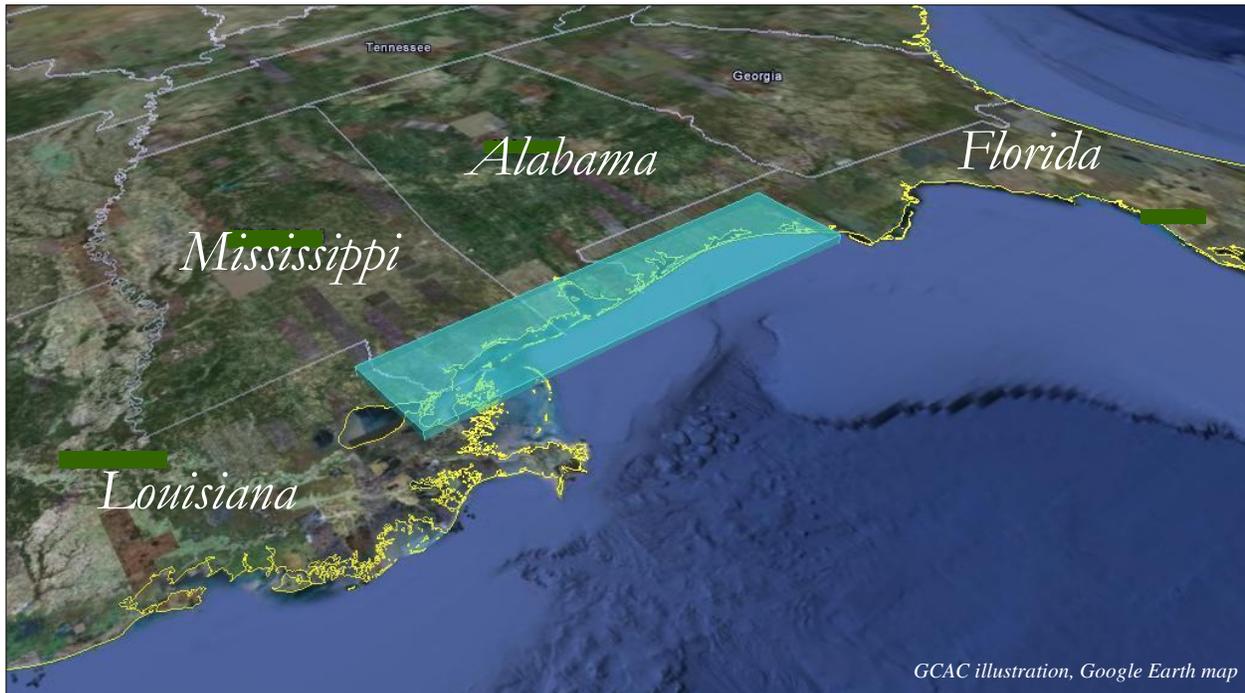


## Executive summary



# For corridor, the beat goes on

**T**he announcement in May 2017 was important enough that the governor of Mississippi, Phil Bryant, was given the honor.

It was at a lunch in South Mississippi that the governor told attendees that the Northrop Grumman Unmanned Systems Center in Moss Point, opened in 2006, would expand and work not only on the Fire Scout and Global Hawk unmanned systems, but add other work, including subsystems for the F-35.

The announcement followed just days after Aerojet Rocketdyne said it would assemble and test at Stennis Space Center, Miss., two AR-22 engines for the reusable DARPA/Boeing XS-1 hypersonic spacecraft.

Those announcements came two months after Continental Motors said it was expanding its operation in Mobile, Ala., into a larger building, and three months after aviation supply

### U.S. aerospace & defense industry

Sales (2015)	\$604.7 billion
Work force (2015)	1,700,000

Source: Aerospace Industries Association, *The State of the U.S. Aerospace & Defense Industry*, December 2016

company GKN Aerospace said it would open a manufacturing center in Panama City, Fla.

And the beat goes on.

**In the two years** since the last Gulf Coast Aerospace Corridor book was last published, new announcements and expansions have increased the aerospace and aviation footprint along the Gulf Coast Interstate 10 corridor.

Since the last book, Mobile began producing A320 series jetliners and continued to attract suppliers to the Mobile Aeroplex, including Messier-Bugatti-Dowty, Hutchinson, REEL,

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### Aerospace activities at a glance

- Rocket and jet engine testing
- Rocket engine, satellite assembly
- Piston engine assembly
- Unmanned aerial system plant
- Areas approved for unmanned flights
- Jetliner final assembly line
- Maintenance, repair and overhaul
- Military pilot training
- Military electronics/cyber training
- Aviation specialties training
- National Guard aerial combat center
- National Guard helicopter repair depot
- Restricted land and water ranges
- Aerial weapons RDT&E
- Applied geospatial technologies
- Human-machine cognition research
- Advanced manufacturing research
- 43-acre manufacturing plant
- Aerospace parks
- Technology transfer offices
- Business incubators

Vartan, Zodiac, Broetje, Recaro, Miller Transfer, Panasonic Aviation and Thales.

Other areas, too, saw growth. VTMAE, long-time tenant of the Mobile Aeroplex, expanded its operation and began building another MRO hangar in Pensacola, Fla. To the west at Stennis Space Center, Aerojet Rocketyne added the assembly and testing of the AR1 engine to its portfolio at the Center of Excellence for Large Liquid Rocket Engine Assembly and Test.

Many operations expanded, including MAAS and Star Aviation (later purchased by Carlisle) in Mobile, Boeing and Fort Walton Machining in Fort Walton Beach, Fla., Torch Technologies in Shalimar, Fla., and UTC in Foley, Ala. And at Northwest Florida's Eglin Air Force Base, site of the F-35 reprogramming lab, added a second lab for partner nations.

There also were openings just outside the immediate region, including Bell Helicopter Lafay-

ette Assembly Center in Lafayette, La., CAE Training Center in Dothan and Brown Precision in Atmore, Ala.

While all that was going on, education leaders across the region put in place the tools necessary to help the growing need for aerospace and aviation workers. It has, indeed, been a busy two years.

**Economic development** leaders have good reason to target aerospace. It's an economic jewel, a multibillion-dollar, research intense, innovative enterprise that produces technologically advanced aircraft, space and defense systems. It involves civilian and military activities and uses talent ranging from those who design aircraft and those who assemble them to those who fly and maintain them. Workers are highly skilled and the pay is better than average.

"The Gulf Coast aerospace corridor has all the right conditions for future growth," said Richard Aboulafia of the Teal Group. "A pro-business environment, strong political support for the industry, and great working conditions all mean good things for the future."

Neal Wade, chairman of the four-state Aerospace Alliance, takes an even broader view and sees the same thing happening throughout Alabama, Florida, Louisiana and Mississippi.

"The Gulf Coast region continues to enjoy excellent growth in aerospace projects and jobs as commercial and defense opportunities expand worldwide," he said. "As one of the largest aerospace corridors in the world, the Aerospace Alliance states are fully committed to enhancing their role in supporting such growth."

All four states have significant aerospace and defense activities, and combined they rank as the fourth largest aerospace region in the country, according to the Aerospace Alliance.

Florida is the No. 2 state in the nation for aerospace, aviation and space establishments, with more than 2,000 companies employing 82,000-plus workers. The state is also No. 2 in the 2016 PwC Aerospace Manufacturing At-

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tractiveness Rankings.

In Florida, the best-known aerospace and aviation activity is the Space Coast, home to Kennedy Space Center, Cape Canaveral and Patrick Air Force Base. Since the earliest days of the space race this is the location where Americans ventured into space. It's also where private space companies have set up operations to leverage idled NASA facilities.

Alabama is best known for north Alabama's Huntsville, home of the Army's Redstone Arsenal and NASA's Marshall Space Flight Center. It continues to attract operations. Aerojet Rocketdyne in April said it's setting up an AR1 manufacturing plant there, consolidating work from California and Virginia.

According to the U.S. Department of Labor's Bureau of Labor Statistics from May 2016, Alabama had the nation's highest concentration of aerospace engineers, and the Huntsville MSA had the second highest concentration of jobs for aerospace engineers. Southeast Alabama had the second highest concentration of aerospace engineering jobs among non-metro areas.

Alabama has more than 300 companies engaged in the aerospace and defense sectors, according to the Alabama Aerospace Industry Association. The supply chain includes original equipment manufacturers, technical services, maintenance, repair and overhaul, and parts, suppliers and vendors.

Mississippi has become a key player in the growing field of unmanned aerial vehicles. Aurora Flight Sciences, Northrop Grumman Unmanned Systems and Stark Aerospace all build unmanned aerial systems in Mississippi. It's also home to the Raspet Flight Research Laboratory at Mississippi State University in Starkville, which in May 2015 was chosen by the Federal Aviation Administration to head a team of 16 universities as a center of excellence for UAS research. In 2016, the Department of Homeland Security picked MSU as a base of operation for drone research, much of the work will be in South Mississippi.

In addition, Pioneer Aerospace has made parachute systems in the state since the 1930s, and Eaton Aerospace makes commercial air-

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craft components. GE Aviation makes jet engine components at two locations in the state.

Louisiana's aerospace footprint may be best known for NASA's Michoud Assembly Facility in East New Orleans, but to the west there's the 82,300 square-foot Bell Helicopter assembly facility at Lafayette Regional Airport, which started making Bell 505 JetRanger X helicopters in 2016.

AAR Corp. and Northrop Grumman operate major maintenance, repair and overhaul facilities at Chennault International Airport in Lake Charles, and Aviation Exteriors provides aircraft painting solutions in New Iberia.

Northwest Louisiana is home of Barksdale Air Force Base and the 2nd Bomb Wing, the oldest in the Air Force, and its massive B-52H Stratofortress bombers.

**With all that** activity in the four states, the Interstate 10 region between Southeast Louisiana and Northwest Florida is the only location where the aerospace interests of all four intersect. It's a roughly 350-mile stretch along the northern Gulf of Mexico and something of a showcase for all four where growth in one area of the corridor can benefit all four.

The I-10 region has a long history of involvement in aviation. It's where the Navy established its first, and for a long time only, air station, and where NASA created major facilities in the earliest days of the space race. It's home to two NASA operations involved in building and testing the next generation of NASA spacecrafts, and where the new breed of private space companies builds and tests space hardware.

It has significant military aviation activities, including pilot training and aerial weapons development. It's where research is conducted not only in aerospace but in related fields like high-performance materials, artificial intelligence/robotics, geospatial applications and more.

Many of the region's aerospace activities put it in select "clubs." With an Airbus assembly line, it joins a group of sites where large passen-

ger jets are assembled, and having two NASA facilities puts it in the small spaceflight group. It's also the only region that trains pilots to fly the fifth-generation F-35 and F-22.

**If there's a key** message from this year's research, it's that the region must continue to focus on attracting aerospace while the interest is clearly there. To do that, it needs to continue to develop its aerospace worker pipeline. It's not enough to just ensure there are training facilities. That's certainly a part of it, and that has happened.

It's also a matter of creating a culture of learning where young people can get excited about a career in aerospace and aviation. Over the past few years there have been encouraging developments with the creation of learning centers designed to pique the interest of young people. Indeed, education and research are key to the development of the region, not just in aerospace, but other high-tech fields.

Here are the most recent findings and observations of this ongoing Gulf Coast Reporters' League study. The list includes new findings along with those from the League's past studies:

### General

- The I-10 region is involved in a range of aerospace and aviation-related activities, including aircraft manufacturing, space flight, propulsion systems, military aviation, unmanned aerial vehicles, robotics, aerial weapons, high-performance materials, advanced manufacturing and RDT&E.
- Aerospace is a target industry for Alabama, Florida, Mississippi and Louisiana. Multiple 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.
- The United States is a low-cost leader among developed nations when it comes to manufacturing, and reshoring is a growing trend. That bodes well for the region and

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each of the four states as it seeks more foreign investments and promotes its manufacturing capabilities.

- The Aerospace Alliance was formed in 2009 to promote aerospace activities in the four states, and continues its work, including hosting pre-show events in Farnborough, England, and Paris, France.
- Despite the high level of aerospace activity in the I-10 region, there is no “go-to” organization that focuses on the aerospace interests of the entire four-state I-10 aerospace region.

### Airbus

- The Airbus A320 final assembly plant at the Mobile Aeroplex, which delivered its first jetliner in April 2016, will be producing four planes per month before the end of 2017.
- The Airbus plant has continued to attract suppliers to the Mobile Aeroplex since it was first announced. Over time, some will want to be close to the plant and others will want to be further away to keep from competing for workers.
- Additional aerospace activities directly or indirectly caused by the Airbus plant will take years to develop. Potential newcomers will keep an eye on progress of the plant before making what could be an expensive investment in the region.
- Airbus in Mobile, the F-35 training center at Eglin Air Force Base, Fla., and Stennis Space Center, Miss., all attract international interest in the region.

### Military

- Military activities bring billions into the region through payroll, contracting and other activities. Between 2000 and 2015, 4,939 companies in 19 I-10 counties/parishes were awarded 88,130 DoD contracts valued at more than \$84.7 billion.
- The military’s huge complex in this region is a vast schoolhouse that trains tens of thou-

sands of students each year who earn wings, hone combat skills or learn technical fields, including avionics and aircraft maintenance.

- Military aviation activities in the region include pilot and flight officer training, weapons development, search and rescue, unmanned aerial systems, logistics and a variety of combat missions.
- The U.S. Coast Guard has port activities and air operations throughout the region, including the Aviation Training Center in Mobile, Ala., where all Coast Guard aviators learn to fly a particular aircraft type.
- The region has 10 bases with aviation-related missions, and between them more than three dozen aircraft types, ranging from high-tech \$145 million fighters all the way down to relatively low-cost, ubiquitous, orange and white Navy trainers and drones.
- Aviation-focused military bases in the Gulf Coast aerospace corridor had a replacement value in 2015 of more than \$17.6 billion. If outlying fields and other aviation annexes are included, it goes up another \$1 billion.
- The Marine Corps declared the F-35 operational, and the Air Force declared its variant combat ready. Eglin Air Force Base, Fla., is home of the F-35 integrated training center and reprogramming lab. In addition, the QF-16 target drone at Tyndall Air Force Base, Fla., is now operational.

### Corporate

- 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 multiple technology transfer offices and incubators in the region, along with a patent association formed in 2010 to focus on intellectual property issues. Two major hot spots for technology transfer are Stennis Space Center, Miss., and Eglin Air

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- Force Base, Fla.
- Aerospace activities in the region are in growth sectors, including unmanned aerial systems, advanced materials and geospatial technologies. In addition to unmanned aerial systems, three federal operations are involved in some aspect of unmanned underwater vehicles. Okaloosa County, Fla., has expressed interest in developing an indoor unmanned systems center that will include air, land and maritime.
- Subsystem work for the F-35 will be done at the Northrop Grumman Unmanned Systems Center in Moss Point, Miss., in an expansion of the operation.
- Selex Galileo's operation at Stennis International Airport is purchased by Tyonek Services Group. Leonardo still has operations in the region even with the sale.
- partners in the F-35 program.
- The Mobile Airport Authority is creating a \$25 million aviation-focused research center with offices and collaboration space for at least six Alabama universities.
- Commercial space company SpaceX is currently doing R&D on its next generation rocket engine at Stennis Space Center, Miss. Called Raptor, it will power a space that will power a space vehicle to an eventual trip to Mars.
- Stennis Space Center, Miss., is where Aerojet Rocketdyne is developing its AR1 engine that is designed to replace the Russian-built RD-180. It's also going to assemble and test the AR-22.
- SSC and Michoud each plays a role in federal and commercial space ventures. Each has under-utilized equipment.
- The GE Aviation plant in Auburn, Ala., is the site where the company is mass producing 3D printed parts for its LEAP engine.

### Unmanned/robotics

- Fuselage work on the Global Hawk and final assembly of the Fire Scout unmanned aerial systems is done in Moss Point, Miss., by Northrop Grumman. The company has room to expand at that location, and in May announced additional work in Moss Point.
- Unmanned systems are flown in military/federal air space at Eglin Air Force Base, Fla., iCamp Shelby, Miss., and Stennis Space Center, Miss., and other locations. The restricted air space at SSC was recently expanded.
- The Institute for Human and Machine Cognition in Pensacola, Fla., is a premiere research center in robotics and human/machine interaction.

### R&D/innovation

- R&D activities in the region involve federal, state and corporate players. Eglin Air Force Base, Fla., spends more in R&D each year than many prestigious universities.
- Eglin Air Force Base, Fla., now has a second reprogramming lab, this one for foreign
- Aerospace and aviation-focused technology parks have been established or are developing across the region.
- Many of the non-commercial and commercial airports in the region have land and buildings available for new tenants.
- The close proximity of Mobile Aeroplex in Mobile, Ala., and the Jackson County Aviation Technology Park in Moss Point, Miss., forms a hub of aircraft manufacturing in the central portion of the corridor.
- The close proximity of Stennis Space Center, Miss., and Michoud Assembly Facility, New Orleans, forms a hub of spacecraft manufacturing and testing in the west portion of the I-10 corridor.
- SSC has a 3,900-acre park ready for development, and at Michoud NASA hopes to turn 300 surrounding acres into an advanced manufacturing park. The National Center for Advanced Manufacturing is at Michoud.

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- Multiple sites in Northwest Florida, many aerospace-focused, have been certified as ready for development by Gulf Power's First Sites program. Mississippi Power also has a similar program called Project Ready.
- NASA is seeking companies interested in using four underutilized rocket engine test stands at Stennis Space Center, Miss.

### Space

- At Stennis Space Center, Miss., work is finished on the B-2 test stand that will be used to test the Space Launch System.
- The New Orleans-built Orion Multipurpose Crew Vehicle was finished and shipped to Kennedy Space Center, Fla.
- Infinity Science Center in Mississippi now has a Saturn V first stage for display.

### Education/workers

- There are 16 universities, several with "very high" research activity, with interests in the Interstate 10 region.
- Mississippi Gulf Coast Community College is among the nation's top associate degree producers in science, technology, engineering and math.
- The National Security Agency and Department of Homeland Security designated the University of West Florida's Center for Cybersecurity a national center of academic excellence in cyber defense education.
- 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.
- High schools in the region have programs targeting aerospace, advanced materials and geospatial career fields.
- Hancock County, Miss., is considering establishing an aerospace academy.
- Alabama planning creation of the Alabama Aviation Education Center for Mobile, Ala.

The authors hope this study will provide the public, development officials and politicians with a better understanding of the capabilities of this region in a range of science, technology, engineering and math fields. The Gulf Coast Reporters' League believes the general public lacks an appreciation of the capabilities available in the region. Understanding what's here and working together can benefit the region.

While each of the states and local communities have economic development groups that pursue aerospace, the I-10 corridor does not have an organization acting as its champion for its interests as a region. True, there are multiple economic development groups that sometimes work together, but there's no single go-to group with a broad understanding of the I-10 region's capabilities and potential.

Airbus has been a wakeup call, certainly for Northwest Florida. During the 2013 Gulf Power Economic Symposium, the vision of a region on the cusp of change was a compelling message.

"Northwest Florida, you have an opportunity to completely redefine yourself," said Will Weatherford, who at the time was speaker of the Florida House.

Stan Connally, president and CEO of Gulf Power, said a transformation was already underway in Mobile, thanks to Airbus.

"That town is reinventing itself," Connally said. "We have a real opportunity right here ... to be a partner in that redefinition," he said.

Certainly many outsiders seem to understand the strength of this region, and have thought enough to establish a presence in the region.

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