

ALABAMA

2017 ECONOMIC DEVELOPMENT GUIDE

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INSIDE

- Development Incentives
- Workforce Solutions
- Development Agencies
- Foreign Direct Investment
- Regional Economies
- Technology Centers

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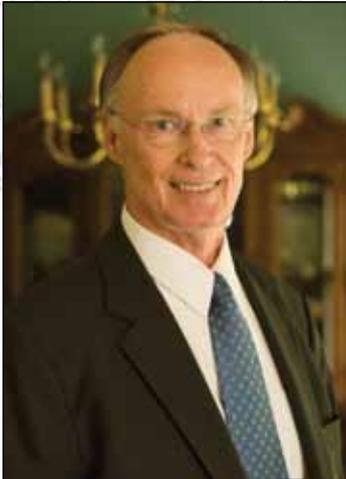
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ON THE COVER: At Fayette Fabrication, Justin Halbrook welds the bottom of an assembly parts rack custom made for Mercedes' plant in Tuscaloosa County. The company, an auto supplier in Fayette County, is an example of the most recent wave of suppliers filling in the state's automotive network, which began with the Tier 1 suppliers that flocked here when the first Mercedes rolled off an Alabama assembly line in 1997. More recent suppliers often settle in rural areas serving more than one assembly plant or, as did Fayette, find a niche that perfectly meets the needs of an OEM such as Mercedes. Story on page 38. *Photo by Cary Norton*

Opposite page: GulfQuest introduces the wonders of the waters. *Photo by Elizabeth Gelineau*
Opposite page, center: Rotary Trail spiffs up downtown Birmingham. *Photo courtesy of Goodwyn, Mills and Cawood*
Opposite page, right: Gabe Restrepo, sales manager for cast iron pipe maker American, that is helping revamp the Panama Canal. *Photo by Cary Norton*
Top: Spirit Airlines employee, on hand for delivery at Airbus in Mobile, is wowed by the brand new plane. *Photo by Dan Anderson*
Above, left: Finishing touches go on a new Hyundai at Hyundai Motor Manufacturing Alabama, in Montgomery.
Above, right: Huntsville-based Intergraph creates geospatial software for offshore industry.

GOVERNOR'S LETTER



Welcome to Alabama!

Alabama has more than national championship football teams — the state's economic development program continues to win titles of its own. Business Facilities magazine recently bestowed its State of the Year Award for 2015 to Alabama as the state continued to focus on strengthening its "Made in Alabama" brand. From automobile manufacturers to aircraft man-

ufacturers, our state is the location of choice for its infrastructure, workers, and worker training. Whether you are taking your first look at our state or Alabama is already your home, you will be amazed at all the advantages Alabama has to offer.

Consistently ranked by Area Development as one of the top five states for doing business, Alabama has seen capital investment of \$20.2 billion from 2012-2015, with 75,000 new and future jobs. We have sharpened our focus on high tech and knowledge-based jobs and proudly welcomed Google to the family in 2015. Partnering with our research universities, Alabama aims to imagine, develop, and design products to be Made in Alabama.

Companies quickly find that our hard-working people are our greatest asset. You won't find a more loyal, dedicated, and motivated workforce. These world-class workers have the advantage of a world-class training program called AIDT. Alabama Industrial Development Training is the envy of other states for its ability to help companies find the right employees — and then preparing each one for excellence.

Companies that choose Alabama quickly learn why we call our state "Sweet Home Alabama." It is a great place to work and live. From the beaches along the Gulf Coast to the mountains of North Alabama, to our gorgeous lakes and rivers, there are many reasons why your company will be glad to call us "Sweet Home Alabama." If you've not yet had a first-hand look at Alabama, I hope you will visit us soon and experience all our wonderful state has to offer.

Sincerely,

A handwritten signature in black ink that reads "Robert J Bentley". The signature is fluid and cursive.

Governor Robert Bentley

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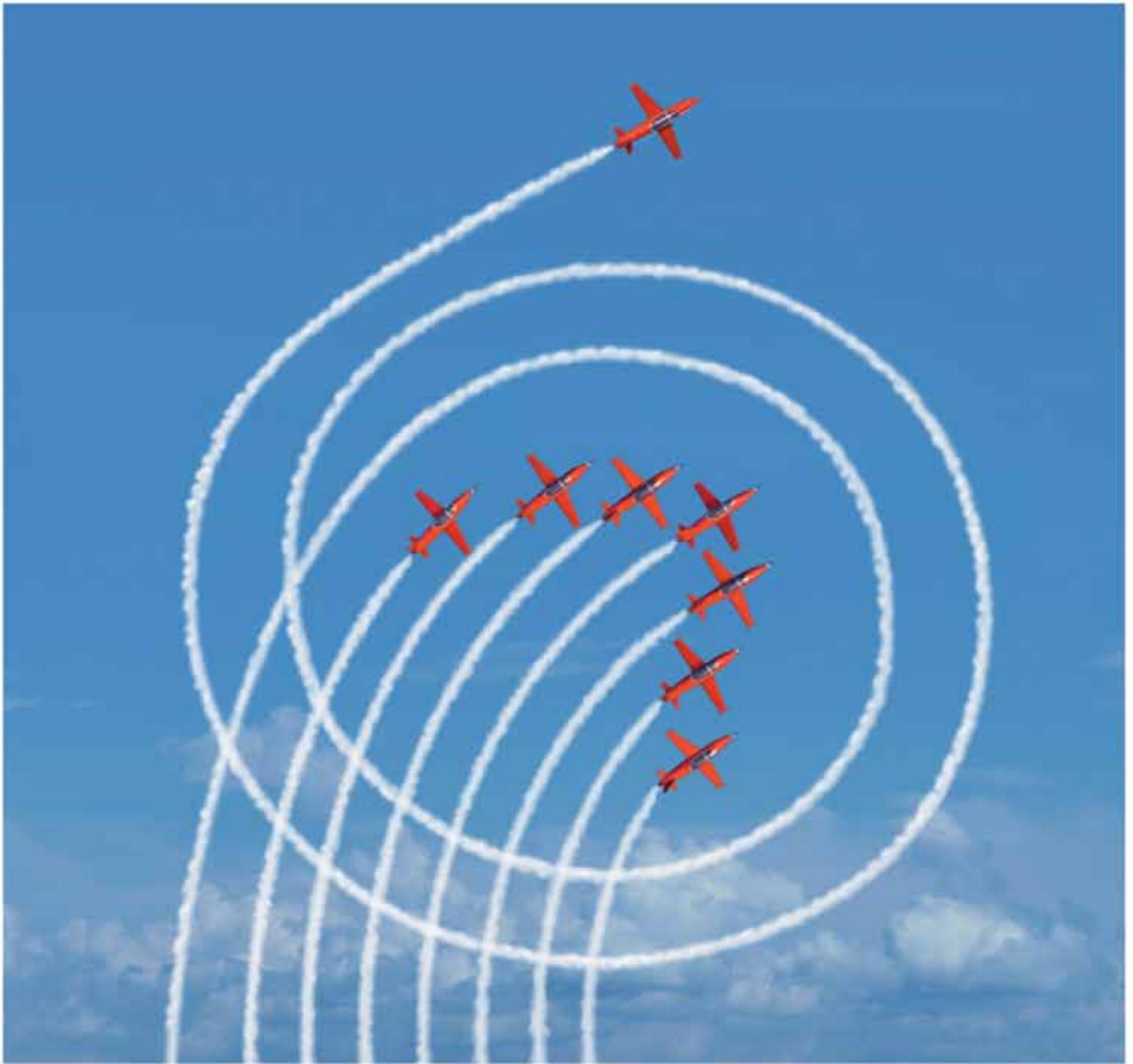
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STATEWIDE ECONOMIC OVERVIEW

From aerospace, automotive and agriculture to Zilkha biomass pellets, the ABCs of Alabama's economy are broader and more diverse than ever.

While some up north are designing rockets to take us to Mars and beyond, others around the state are busily building cars and trucks and SUVs.

NASA's new Space Launch System is taking shape at Marshall Space Flight Center in Huntsville. Team members plan the first test flight of this enormous system in 2018 and hope for a flight that takes humans back to space in the next decade.

Airplanes made headlines in the southern part of the state as the Airbus assembly facility in Mobile delivered its first plane to JetBlue and its second to American Airlines, while team members continue building planes and support businesses move in to locate near the plant.

Alabama automakers produced more than 1 million vehicles last year, the most ever, and that makes the state second in the Southeast for auto production. With three major manufacturers — Hyundai, Honda and Mercedes-Benz — plus a major Toyota engine factory, the industry has been growing stronger year by year, with supplier firms in virtually every one of the state's counties. In 2015, the state exported more than \$7 billion in automotive products.

Agriculture is the third A industry that keeps Alabama strong. Farms and forests and ponds grow trees and peanuts, row crops, chickens and catfish. These old standbys have new neighbors. Near Selma they're growing bamboo to turn into an array of household products and, along with others around the state, converting the leftovers of the wood-products industry into compressed pellets that serve as an alterna-

tive to coal.

B is for biotech. The University of Alabama at Birmingham and its long-time associate Southern Research have developed a significant reputation for developing drugs and medical devices, spinning off companies that bring their discoveries to the market place. Huntsville's HudsonAlpha Institute for Biotechnology is another major player, with researchers and entrepreneurs collaborating to find healthcare breakthroughs and make them available for those who need them. Farther south, the University of South Alabama Mitchell Cancer Institute provides facilities for cancer caregivers and cancer researchers to work side-by-side for the benefit of current and future patients.

C is for chemicals. Plants from the US and beyond dot the waterways of southern Alabama, and chemicals rank second

among all export categories.

D is for defense — another key segment of the state’s economy, with every one of the nation’s top 10 defense contractors represented in the state. Boeing opened a new research facility in Huntsville just last year, Lockheed Martin makes missiles in Pike County, United Launch Alliance still sends most of the nation’s satellites into space, and dozens of smaller companies dream, design and test next technology to support the country’s safety at home and abroad.

E is for education. The University of Alabama and Auburn University are standard bearers for a proud tradition of higher education. Other state universities, a strong community college system and several highly regarded private universities give students the opportunities for education they need, whether they choose a career in business, the arts, teaching, research or manufacturing.

F is for foreign direct investment. Ernst & Young ranked Alabama fifth in the nation for the amount of international money invested — \$5.3 billion last year. The state ranks fourth when the foreign direct investment is calculated as a percentage of the state GDP.

G is for Google, with plans to build a data center in Stevenson in northeast Alabama.

H is for healthcare — with the University of Alabama at Birmingham as flagship and an array of highly regarded hospitals offering care to Alabamians and residents of nearby states.

I is for information technology — dozens of companies working on projects from electronic medical records to cybersecurity.

And so on through the alphabet up to Zilkha biomass pellets. The Selma firm made its first commercial shipment of coal-substitute pellets — from forestry industry leftovers like sawdust, tree tops and shavings and converted into a coal substitute that’s prized in Europe.

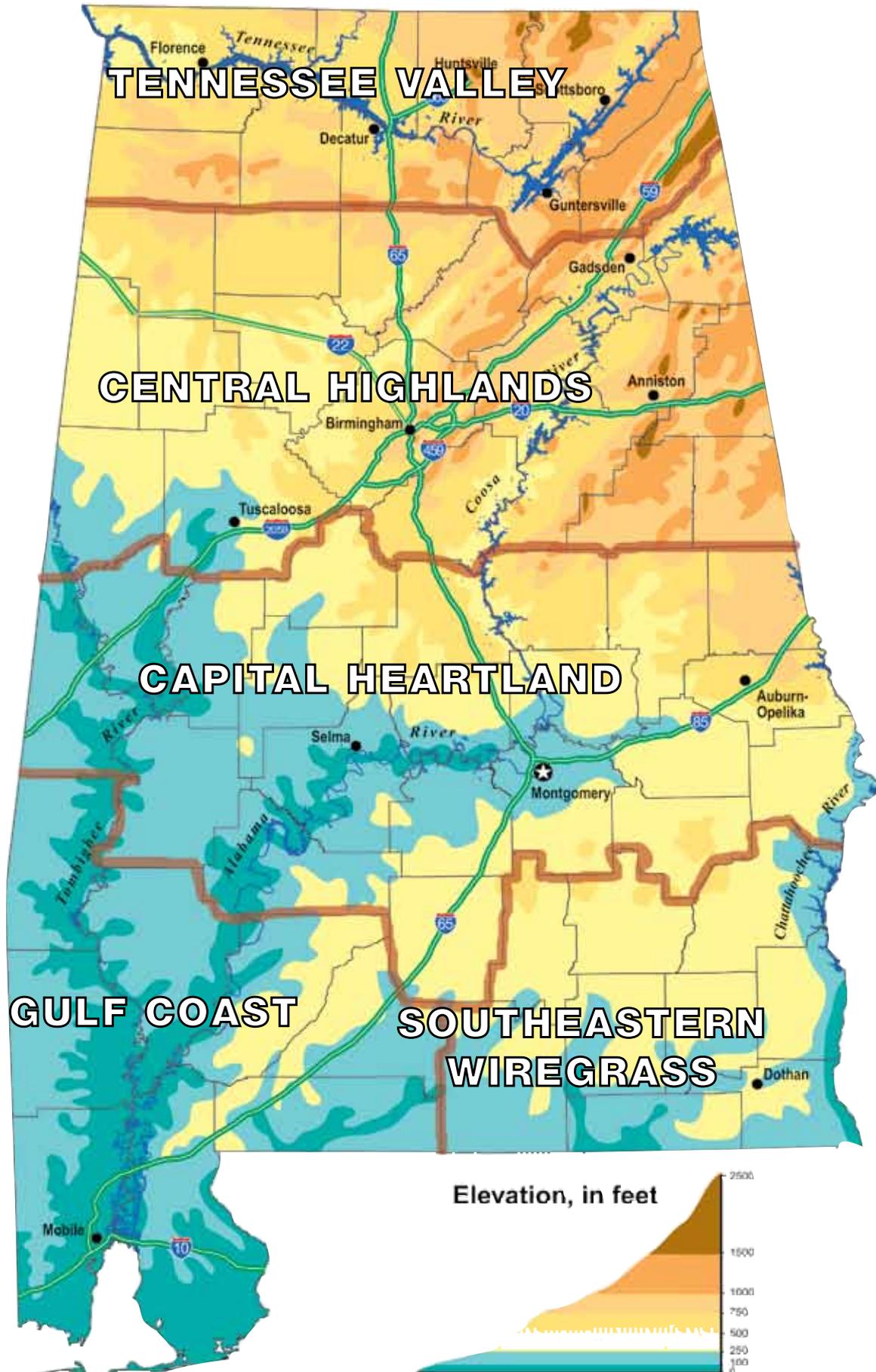


1. Marshall Space Flight Center in Huntsville manages the ongoing development of NASA’s Space Launch System, which will be the most powerful rocket ever built.

2. Recent initiatives at the Mitchell Cancer Institute, in Mobile, are investigating early detection of ovarian and pancreatic cancer.

3. Approximately half the peanuts grown in the U.S. are grown within 100 miles of Dothan.

ECONOMIC OVERVIEW



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TENNESSEE VALLEY

The Tennessee Valley is home to one of the fastest growing high tech and advanced manufacturing economies in the country.

For more than half a century, Huntsville and the surrounding Tennessee Valley have been a launching ground for the American leap toward the heavens.

In the mid 1950s, the federal government brought a team of former German rocket scientists to the nearly defunct Redstone Arsenal. From that quiet start, the U.S. plunged into the space race — an effort that continues today as NASA, Boeing and a host of smaller companies work to develop the Space Launch System, that will carry more people and more payload farther into space than ever before. Today’s space scientists look beyond Earth’s moon, working toward travel to Mars and beyond.

Alongside NASA, a coterie of the U.S. defense industry flour-

ishes, too. All of the top 10 defense firms have a presence in Alabama, and most of them are in Huntsville. Firms develop more accurate missiles, create simulations to help military personnel make good decisions in an instant, refine materials and technology for all types of aircraft and more.

In midsummer, Aerojet Rocketdyne announced plans to bring its defense operations headquarters to Huntsville.

Cummings Research Park, one of the largest in the nation, is home to dozens of firms engaged in research and development. The newer Redstone Gateway is paving the way for a cluster of defense firms like those that encircle the Pentagon.

The synergy of space science and defense engineering has attracted an array of scientific minds to Alabama’s northern tier — not limited to those original fields.

HudsonAlpha Institute for Biotechnology builds on that synergy, but focuses on encouraging biomedical researchers and entrepreneurs to work together so that new



Cummings Research Park in Huntsville is the second largest research and technology park in the U.S., a 3,800-acre complex that is home to 247 companies active in more than 40 separate technology fields.

developments can come efficiently to the marketplace.

Rocketry thrives in Decatur, in nearby Morgan County. United Launch Alliance, a partnership of Boeing and Lockheed Martin, builds the rockets that send most U.S. payloads into space. If you look for the thrill of the countdown and liftoff, check out the ULA website — ulalaunch.com — where there's nearly always a video of the most recent launch.

The economy of the state's northern counties is as varied as it is exciting.

Over in the northeastern corner of the state is the site — once a TVA electrical facility — that's earmarked for the newest Google data center.

Back in the center is Huntsville's chunk of the state's burgeoning auto industry — Toyota Motor Manufacturing Alabama, an \$850 million, 1 million-square-foot, 1,200-employee facility that's the only Toyota plant to make 4-cylinder, V6 and V8 engines under one roof.

Ground-based transport is the order of the day in the Shoals, too, where Freight Car America and Navistar craft rail cars in a modern, mile-long plant near the Tennessee River.

A pair of newcomers last year helped diversify the north Alabama economy even more. Polaris Industries has a new plant to make powersport vehicles like the side-by-side Ranger, and Remington Outdoor is crafting sporting rifles and semi-automatic pistols.

Constellium, an international firm, purchased Shoals stalwart Wise Metals about a year ago, continuing the tradition of making sheet metal for food and beverage containers. The new owners quickly announced a \$750 million upgrade to the 750-employee plant.

Keeping the workforce up to date, Alabama's new robotics center at Calhoun Community College trains workers in how to operate and maintain the high-tech machines, while offering space for industry to design and test robotic components.

And the northern counties offer fashion and fun, too — outdoor opportunities abound along the Tennessee River, music is nearly as fundamental to the Shoals as the water itself, there's a chance to snow ski up near Mentone, and fashionistas can enjoy the home-town spaces of designers Billy Reid and Alabama Chanin.

2016 BENCHMARKS

GE Aviation broke ground for two plants in Limestone County to make silicon carbide materials for jet engine and gas turbine components. The \$200 million plants will employ 300 people.

Boeing broke ground on an expansion of its missile facilities in Huntsville. The new plant is expected to employ 70 people in engineering and

manufacturing jobs.

Aerojet Rocketdyne announced plans to move the headquarters of its defense operations to Huntsville.

Sierra Nevada Corp. announce plans for a \$4 to \$6 million plant for fixed- and rotary-wing aircraft support. The plant will be at Madison County Executive Airport in Meridianville.

THE ALBERTVILLE ADVANTAGE











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CENTRAL HIGHLANDS

Banking thrives here. Insurance is a mainstay. Education is unparalleled.

Alabama automaking was born here. Commerce ranges from the coal and steel that first brought the region prosperity to the biotechnology and information-rich industries of the 21st century.



Birmingham, Alabama's largest city, is the heartbeat of the Central Highlands — a leader in banking and insurance, healthcare and education, manufacturing and the arts. The 19 counties that surround it are home to the state's flagship university and two of the automotive plants that revved up Alabama's economy just a quarter century ago.

Born in the steel industry, Birmingham still counts major manufacturers like American Cast Iron Pipe Co., U.S. Pipe and Foundry, McWane Inc., and O'Neal Industries — but boardrooms now vie with metal works for economic



The skyline of Birmingham, viewed from Railroad Park — a 19-acre downtown green space that celebrates the industrial and artistic heritage of the city. The park won the Urban Land Institute's Urban Open Space Award in 2012.

headlines.

Banking now dominates the Birmingham skyline, where the Wells Fargo Tower and Regions-Harbert Plaza are landmarks. Banking also gives Alabama its own home-grown Fortune 500 company — Regions Financial.

Downtown is also home to Infinity Property & Casualty and ProAssurance, as well as the former world headquarters of Protective Life, recently purchased as a U.S. foothold for Dai-Ichi Life of Japan.

Biotechnology is a major player here, too. Nurtured by the University of Alabama at Birmingham and Southern Research, medical care is offered for those in need today alongside teams of scientists searching for the causes and cures for ills still hard to treat today. New medicines and medical devices are always in development.

Arts, sports, entertainment and an array of eateries show Birmingham for the major city it is — among the largest in the Southeast. Celebrated chefs such as Frank Stitt and Chris Hastings offer fine and casual dining, and you'd be hard pressed to beat the barbecue.

Tuscaloosa is home to the University of Alabama. A highly ranked educational institution, Bama also fields one of the most recognizable football squads in the nation, repeatedly winning national championships while attracting crowds to the university city.

Moreover, the Tuscaloosa County city of Vance boasts another claim to fame as the wellspring of Alabama's auto making industry. More than 20 years ago, Mercedes-Benz U.S. International announced plans to launch a U.S. plant and Tuscaloosa beat out all rivals for the honors. MBUSI has grown and expanded repeatedly over the years, building the popular luxury SUVs and sedans.

Talladega County has a pair of auto-related success stories. Like Tuscaloosa, it's home to one of Alabama's major auto plants. Honda builds the Odyssey minivan, the Pilot SUV, the luxury Acura MDX in the city of Lincoln, and since the advent of the new Ridgeline, it's also the light truck leader for Honda.

And across the county, speed dominates the auto scene at the Talladega Superspeedway, famous for its sizzling speeds and challenging curves. If speed's your thing, don't miss the Barber Motorsport Museum, with hundreds of vintage motorcycles and a great view of the motorcycle races.

The Central Highlands are also home to the cities of Cullman, Anniston and Gadsden — all big contributors to the Alabama economy.

Gadsden, lying along the Coosa River at the foot of the Appalachians, is home to a major Goodyear Tire & Rubber plant, two large poultry processing plants, and several new automotive suppliers. As the gateway to Alabama's mountains, it's a tourist attraction with a charming riverfront and a popular park that showcases Noccalula Falls.

A pacesetter city, Anniston was the first in Alabama to be wired for electricity in 1882 and added telephones in 1884. Its major employer is the Anniston Army Depot, the maintenance center for tracked vehicles. Nearby McClellan, a planned community growing from the former Fort McClellan, is the training center for the national Department of Homeland Security's anti-terrorism activities. Like its Central Highlands neighbors, Anniston and Calhoun County are also home to automotive supplier firms that have emerged in the past 20 years.

Cullman, not too far north of Birmingham nor too far south of Huntsville, along Interstate 65, has kept its agricultural roots strong but taken to the highways as well. One of the nation's top 60 counties for agricultural income, the county is also home to three relatively new Tier 1 auto suppliers and a host of smaller firms. And looking to the skies, Cullman is home to Axsys Technologies, which is working on the lenses for the James Webb Space Telescope, in design to replace the Hubble.

In fact, Cullman County was tops in the state for new industry just a few years back.

Not to be outdone by their bigger neighbors, three counties in the western reaches of the Central Highlands — Lamar, Marion and Fayette — teamed up to create a single economic development agency, the C3 of Northwest Alabama Economic Development Alliance, that is promoting location along new Interstate 22 and bringing new industry to the region. When a Wrangler jeans factory was destroyed by tornadoes in 2011, C3 convinced the company not only to rebuild, but to rebuild bigger and better.

A statue of Vulcan, the mythic god of the forge, overlooks the city of Birmingham, in tribute to the city's iron and steel industry. It is the world's largest cast iron statue and the centerpiece of Vulcan Park and Museum — located atop Red Mountain, the highest point in the city, named for the tawny color of its iron-laden composition.



2016 BENCHMARKS

Kronospan, Austrian wood panel products maker, announced plans to invest \$362 million to expand its Calhoun County plant and add 160 workers.

Voestalpine Automotive announced plans for an \$11 million plant in Birmingham to make hot-formed automotive parts.

Kobay Enstel-South LLC, a Canadian automotive supplier announced plans for a new plant in Oxford, expected to employ 75 people.

Lear Operations announced plans for a \$28 million expansion in Vance. The plant makes auto seats for Mercedes-Benz.

Automotive supplier **Flex-N-gate** announced a \$23.9 million expansion in Bessemer, to be operating in January 2018.

Eissman Automotive announced plans for a \$14.5 million expansion in Pell City in St. Clair County.



MORE MAGIC IN BIRMINGHAM

The most recent Birmingham magic turned an eyesore into an urban oasis.

BY CARY ESTES

Even the best facelift can be diminished by an ugly scar. That is what the city of Birmingham was dealing with in recent years, as a surge in downtown development took place all around a four-block-long eyesore known disparagingly as The Cut.

Central Birmingham is experiencing a widespread renovation not seen in more than a half-century, from the creation of the Railroad Park green space on the western edge of the city center to the revitalization of the historic Avondale neighborhood in the east to the establishment of the Uptown and Second Avenue North entertainment districts.

But in the middle of it all sat The Cut, a long-abandoned rail bed that ran underneath the bridges connecting Birmingham's north and south sides. Weeds and trash regularly filled the gully, and hard rain routinely provoked flooding. Most of the buildings on either side of the trench were abandoned or in a state of disrepair.

"We have all these amazing things happening around Birmingham, but to get to any of them you always had to go by this place of blight at the heart of our city," says architect and community planner Cheryl Morgan, former director of the Auburn Urban Studio and a member of the Birmingham Rotary Club. "It was like this stain in what's becoming a dynamic tapestry of development."

That is no longer the case, as The Cut has been transformed into a half-mile linear park called the Rotary Trail, which opened in April after two years of planning and construction. Funds for the \$3.5 million project were raised primarily by the Rotary Club of Birmingham, which had been looking for a legacy project to help celebrate its 100th anniversary, she says.

"We wanted a high-visibility project that continued the momentum of all the other good things that are happening in Birmingham," Morgan says. "We wanted

something that everyone could enjoy, that would create the potential for economic impact and would enhance the environment. This was a way to eliminate one of the most visible pieces of residual disinvestment in the city."

Montgomery-based architecture and engineering firm Goodwyn, Mills and Cawood led the project. Even before work began on the trail, the team needed to solve the drainage problem within The Cut, says GMC Regional Marketing Manager Brian Carey.

"It was originally 22 feet deep at the lowest point, and there's not very good natural drainage in that area, because of the soil. After heavy rains it would look like a narrow canal filled up with water," Carey says. "So we raised it six feet so the lowest point is now 16 feet, and there is a new drainage system that goes to the city's storm sewers. So it won't ever fill up with water.

"It's designed to be able to take a heavy

rain event and drain off quickly. We had a heavy rain not long after it opened and we did a tour at 7 a.m. the next day and it had already dried out. You could see where some pine straw had floated around a bit on the edges, but other than that it was totally fine.”

Before the development of the trail, the storm water run-off flowed directly into nearby Village Creek, carrying debris and other pollutants into the city’s water system. A new filtration system was put in place along the trail to solve the problem, earning the Governor’s Award for Water Conservationist of the Year at the 2015 Alabama Wildlife Federation meeting.

Another issue in the development of the Rotary Trail was the cramped size of the work site. The trail area is just 26 feet wide and when construction began the only access points were at either end of the four-block stretch at 20th Street and 24th Street South. Since then, stairways and ramps have been added at each of the three intersections in between, but access was very limited during the project.

“There was only so much equipment you could fit down there at one time coming from either end,” Carey says. “How do you stage that and move things from one end to the other without getting in each other’s way? That was a big challenge for the construction crew.”

As for the design of the park, Carey says it was quickly determined that the aesthetics should honor Birmingham’s heritage. “We could have made it more modern with lots of lights, but we wanted to tie it into the history of the city,” Carey says.

So at the 20th Street entrance there is a 46-foot-tall sign that reads, “Rotary Trail in the Magic City,” an homage to the iconic “Birmingham the Magic City” sign that stood outside the old Terminal Station from 1926 to 1952. There are also railroad ties buried into the ground at either end of the trail along with steel structures at each intersection, a nod to Birmingham’s iron-making history.

The Rotary Trail is an important link in the long-envisioned 30-mile Red Rock Ridge and Valley Trail that would extend from the western suburb of Bessemer all the way to Ruffner Mountain east of downtown. Several sections of the trail already exist, and the Rotary Trail connects directly to the Jones Valley Trail, which runs from 25th Street to 32nd Street near Sloss Furnace.

While the 30-mile trail will appeal primarily to serious hikers and cyclists, the Rotary Trail already is proving popular with downtown workers who simply want to get out of the office for a few minutes.

“Even though it’s been open only since April, we can already see the benefits,” Morgan says. “There have been properties that have been sold along the trail, and there have been really important cosmetic improvements to businesses that were already there.

“When we can encourage people to be out and about in our city as pedestrians and on bicycles, it’s good for business. It’s part of what helps the restaurants and cafés and bars and coffee shops thrive. Those are the ingredients of what we call quality of life, and that is significant and important for businesses to attract and retain the kind of employees they want. The Rotary Trail is an example that if we can provide good places for people to get out and about downtown, they’ll do it.”

For the full story, see September 2016 Business Alabama.

What started as a tapestry of blight has been transformed into a half-mile linear park that has greatly upgraded the urban landscape. *Photos courtesy of Goodwyn, Mills and Cawood*



BBA BIRMINGHAM BUSINESS ALLIANCE

The Birmingham Business Alliance is the lead economic development agency for the state's largest city and seven surrounding counties.



Gov. Robert Bentley cuts the ribbon on Oxford Pharmaceuticals' new \$29.3 million drug manufacturing facility in Birmingham.

Originally forged by the iron and steel industry, Birmingham has become the most diverse economy in the state of Alabama. With a \$62 billion gross domestic product — more than the state's other three major metros combined — Birmingham represents over a quarter of Alabama's total employment.

Birmingham is a global leader in medical technology and research, health care delivery, and finance and insurance. It boasts a superior quality of life as the cultural center of Alabama and consistently ranks as an affordable place to live with low cost of living.

The lead economic development organization is the Birmingham Business Alliance (BBA), which represents the seven-county region including Bibb, Blount, Chilton, Jefferson, St. Clair, Shelby and Walker counties. To create job growth and increased capital investment for the region, and attract and retain top talent from around the world, the BBA leverages Birmingham's greatest assets:

- A vibrant downtown Birmingham with nearly \$1 billion in investment in recently

completed, proposed or under construction city center projects, including apartments, condos, hotels, a Publix grocery store, retail and office space, entertainment venues, museums, a brewery, a new parking deck and new facilities at UAB.

- The state's largest employer, the University of Alabama at Birmingham (UAB), with 23,000 employees, 19,000 students, a \$5 billion impact on the community and \$272 million in National Institutes of Health funding.

- Southern Research, a contract research organization with nearly 500 scientists and engineers that focuses on drug discovery and drug development — it has seven FDA-approved cancer drugs on the market — as well as engineering, and energy and environment.

- Innovation Depot, the Southeast's largest technology incubator, which houses nearly 100 startups in its 140,000-square-foot facility in downtown Birmingham and has been named Technology Incubator of the Year and designated a Soft Landing for international companies by the National Business Incubation Association.

- Alabama's only Fortune 500 company, Regions Financial Corp., construction aggregates company Vulcan Materials Co., national retailers Hibbett Sporting Goods and Books-A-Million, mining giant Drummond Co. Inc., Blue Cross Blue Shield of Alabama and global life insurance provider Protective Life Corp.

- 75 international companies and most of the workforce for two of the premier automotive assembly plants in North America — Mercedes-Benz in Vance and Honda in Lincoln — as well as a growing base of automotive suppliers.

If you are considering relocating to or expanding your company within Birmingham, visit www.birminghambusinessalliance.com or contact the Birmingham Business Alliance.



KEY CONTACT

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CAPITAL HEARTLAND

The region that surrounds the state capital of Montgomery hosts major auto manufacturers alongside R&D enterprise and some of the richest agricultural regions in the state.

From catfish farms to Goat Hill, War Eagle campus to Hyundai plant, Alabama’s Capital Heartland is a rich and varied land.

This Alabama heartland lies in the famed Black Belt and once produced cotton to clothe the world. The sounds of agriculture still

fill the air, but the crops now sprout products undreamed of when plantation life was at its peak. Today you’ll find catfish ponds where the farmers raise fish for the eating and harvest the algae to make biodegradable plastic.

Down the road, former cotton fields now produce bamboo where Resource Fibers plans a harvest of flooring materials and other household products.

Trees grow here, too, for construction and paper and more. And the leftovers — the sawdust and chips and bits and pieces from tree trimming — are processed into pellets that substitute for coal.

There’s another new product growing here, too — popular Elantra and Sonata sedans and Santa Fe SUVs rolling off the line at Hyundai Motor Manufacturing Alabama. The \$1.7 billion, 2 million-square-foot plant opened in 2006 and today produces nearly 400,000 vehicles a year.

The plant has attracted 35 Tier 1 suppliers and another 43 Tier 2, bringing an added





2

\$650 million industrial investment and employing another 7,000 workers.

Montgomery is a living mix of history and trendy lifestyle options. The city centers on the Capitol complex and all the myriad offices that handle the public's business. But just down the street one way is Old Alabama Town, that celebrates the area's pioneer roots. Down the street another way are the remembrances of the hard times of the Civil Rights area.

But turn a different way and you find an array of nightspots, restaurants, riverfront parks and loft apartments.

Two German auto suppliers announced plans for new plants in Montgomery this year. Gerhardt Kuntstofftechnik plans a \$37.9 million plant and The Berghoff Group plans a \$30 million precision machining plant.

Education is a cornerstone of the Capital Heartland. Auburn University, the state's original land grant university, lies in the eastern edge of the region. Programs in engineering, architecture and veterinary medicine are hallmarks of the school. The state's newest medical school, a branch of the Virginia-based Edward Via College of Osteopathic Medicine, is now offering classes.

The campus region is also home to a variety of high tech businesses, including GE Aviation's new factory, which includes 3D printing to make jet engine components. Six of the top employers are auto suppliers, making components such as wheels, bumpers, springs, axles and drive shafts. Briggs and Stratton continues to make is industry-standard air-cooled gasoline engines that

power lawn equipment and more. New-comer Pharmavite makes vitamins, while Gambro Products makes kidney dialyzers.

Nearby Opelika recently made headlines by wiring the entire city with fiber optic cable to provide a city-owned Internet utility.

Opelika also got word this year of a new meat-processing plant from Golden State Foods. The \$63 million plant is expected to employ 173 people.

Smaller cities in the Capital Heartland are making their own headlines.

Phenix City, for example, is now home to a world-class whitewater course on the Chattahoochee River. The waterway attracted some 18,000 river runners in its first year, many more than expected, and Phenix City is spiffing up its downtown to give those visitors a good welcome. The whitewater course is a joint endeavor with Columbus, Georgia, on the opposite bank.

Selma, in Dallas County, is home to auto suppliers, new-fangled agricultural products, and Bush Hog — maker of agricultural and lawn care implements.

And you can get a close-up look at the history of the Civil Rights Movement by following U.S. Highway 80 from Selma to Montgomery, travelling in the footsteps of the Civil Rights marchers from the Edmund Pettus Bridge to the Capitol steps.

1. Alabama State Capitol, Montgomery
2. A rotary cutter and crop shredder made by Selma-based Bush Hog, the leading North American manufacturer of rotary cutters, finishing mowers, landscape tools, and tractor-mounted implements used in the agricultural market.

2016 BENCHMARKS

Golden State Foods Corp., based in California, started construction on a new \$63 million meat processing plant in Opelika. It's expected to create 173 jobs.

Gerhardt Kuntstofftechnik, based in Germany, announced plans for a \$37.9 million plant in Montgomery to make automotive parts.

The Berghoff Group, based in Germany, announced plans for a \$30 million precision machining plant in Auburn.

Mando America Corp. announced plans for a \$19 million expansion at its automotive parts plant in Opelika.

Merchants Foodservice finished an \$8 million expansion in Clanton, the fourth since the facility opened in 1999.

To Your Health Sprouted Flour in Bullock County announced a \$3 million expansion, its third since the company founding.

Late in 2015, **Koch Foods LLC**, announced plans for a \$16.6 million investment in its Fort Deposit poultry hatchery in Lowndes County.

Aguila Recovery Products LLC acquired the former Castle Rock Industries facility in the South Dallas Industrial Park late in 2015. Plans are to invest \$1.5 million and create 22 more jobs producing biodiesel fuel from cooking oil.



SOUTHEASTERN WIREGRASS

The Wiregrass region offers an abundance of variety in its enterprise, from agriculture and forest products to missiles, aircraft and medical education.

Agriculture is big business in Alabama's Wiregrass, the southeastern corner of the state nestled alongside Georgia and just north of the Florida Panhandle.

As the epicenter of the nation's peanut crop, with chickens galore, trees counted as a cash crop and a monument to the insect that forced

farmers to think beyond cotton, it's hard to imagine anything could rival agriculture.

But look up. Alabama's Wiregrass is also home to one of the state's aerospace clusters — military and civilian, repair and training — the area is abuzz with aircraft.

Southeast Alabama has long been an agricultural region, providing the state and its neighbors near and far with cotton, row crops and forest products, in addition to the mighty peanut.

More than half the peanuts grown in the U.S. are grown within 100 miles of Dothan, which celebrates the tasty legume with an annual festival. It's such an important crop that the city of Enterprise has a statue honoring the boll weevil, which forced farmers to find an alternative to cotton.

Chickens are part of the agricultural mix, too, with a poultry feed plant and several broiler-processing plants among the major employers.

And one more crop defines the agriculture of the Wiregrass — trees. Forests feed the lumber mills and provide the raw materials for a major Georgia-Pacific paper plant in Brewton and an International Paper sheet plant in Dothan.





While farmers and foresters have tended to their crops, a new realm of industry has flown into the Wiregrass in the contrail of Fort Rucker. The Army base opened in 1942 to train troops but in less than a decade was reimagined as the Army's aviation training facility. It continues to fill that role today, training Army and Air Force helicopter pilots as well as those of U.S. allies around the world.

A major fleet of helicopters at Fort Rucker has attracted its own cluster of supporters — L-3 Army Fleet Support is the largest employer in Coffee and Dale Counties, while Lockheed Martin, Sikorsky and Bell Helicopter all maintain a presence nearby.

Dothan had been nurturing a new MRO sector — companies that perform aircraft maintenance, repair and overhaul — when its major player abruptly moved out. In 2013, local officials lured Commercial Jet into the empty property and the sector is poised for renewal. That allows the region to take full advantage of the Alabama Aviation Center campus in nearby Ozark.

The Wiregrass is an important player in Alabama's higher education scene, too, as home to Troy University. Troy has built a reputation as an international campus, welcoming overseas students and offering Troy classes abroad. Now Dothan is home to one of the state's two new medical schools, the

Alabama College of Osteopathic Medicine. The school's first students are slated to complete their coursework in 2017.

Along with the staples of agriculture, aircraft, Army and medicine, the Wiregrass is also home to several of Alabama's most unusual businesses.

Lockheed Martin maintains its Pike County facility in Troy, building missiles to protect the world.

Eufaula is home to Humminbird-Johnson Outdoors, which makes fishfinders, depth sounders, marine radios and GPS systems for anglers, while a neighboring company, Strikezone Lures, makes fishing lures.

Also in Eufaula look for Southern Plastics, maker of wiggly plastic fishing worms for some of the nation's biggest retailers.

And over in Enterprise you'll find Enterprise Electronics. Lest you expect an appliance store, be assured that this is the home of a remarkable product — the Doppler weather radar used around the world to protect us all from approaching storms.

Opposite: Sikorsky's Troy plant manufactures MH-60R and MH-60S Seahawk helicopters for the U.S. Navy and Black Hawks for the U.S. Army.

Above: Eufaula-based Southern Plastics is the nation's largest manufacturer of soft bait fishing lures, with annual gross sales in excess of \$7 million. *Photo by Cary Norton*

2016 BENCHMARKS

Ameritex, a Eufaula latex plant that had sat idle for five years, reopened as a latex glove producer. Investors include comedian Steve Harvey.

Carbo Ceramics in Eufaula has completed an \$85 million plant to pilot a new process. The firm makes materials for oil and gas extraction.

Lockheed Martin's Pike County Operations opened a new Security Center.

Golden Boy Foods in Troy began a major expansion, adding about 50 jobs.

Hyundai Polytech in Eufaula invested \$6 million in an expansion and doubled its workforce from 47 to 96.

Ideal Graphics in Pike County announced a \$930,000 expansion and expects to add 21 jobs.

Molded Fiber Glass in Opp, Covington County, which makes aircraft nacelles, added 80 employees to its workforce.



GULF COAST

Home to some of the state's biggest foreign investments, the Gulf Coast economy includes the first U.S. assembly plant of European aircraft giant Airbus, a \$5 billion steel complex operated by three of the world's largest steel companies, and a thriving multi-national shipbuilding industry.



Mobile and environs along Alabama's Gulf Coast are still sky high over the aviation industry. When Airbus delivered its first U.S.-assembled plane to JetBlue in early 2016, people all over the area stepped outdoors and looked to the skies in hopes of catching a glimpse of its maiden flight.

As the number of planes delivered climbs ever higher, so does the surrounding cluster of Airbus suppliers. An inflight entertainment company and a cabin interior specialist are the newest in a growing list of companies.

It's sometimes hard to remember that aviation was big business in Mobile before Airbus came to town about five years ago.

One of the regions very first international firms was Singapore-based Mobile Aerospace Engineering — now VT MAE — repairing and overhauling planes from the world's fleets. It's still among the region's top three industrial employers.

Baldwin County, across the Bay, also boasts a major cluster of aerospace firms — UTC Aerospace making nacelles and more is that county's largest industrial employer, for example.

And the air over the city and the Gulf frequently thrums to the sound of Coast



Guard helicopters, taking off from their key training facility at Mobile's airport.

On the waterfront are modern variations of a centuries-old craft of shipbuilding. Austral USA, making ultramodern aluminum ships for the Navy, dominates the downtown waterfront and is the largest employer by far. Hidden farther from the public eye, along the bayous of south Mobile County, smaller shipyards rear above back-country roads crafting tugs boats, offshore platform tenders, shrimp boats and more.

Manufacturing is big business in Mobile. While the nation's economy in general lost thousands of manufacturing jobs in a single month, Mobile saw a robust 33 percent increase in jobs — and an 18.5 percent hike in wages — over the last five years.

And the Alabama State Port Authority operates Alabama's gateway to the world, where ships laden with coal, steel, chickens, chemicals and wood products head for ports around the world.

Steel and chemicals and timber are also big business along the Gulf Coast. Just a few years ago, German-based Thyssen-Krupp built a massive, \$5 billion steel mill at the Mobile-Washington County line. When the steel market nosedived and ThyssenKrupp backed away, the prospects looked bleak. But almost before you could say "fire up the furnace," world stainless

leader Outokumpu Oyj, a Finnish company, had purchased the stainless mill, and a partnership between the world's largest and second largest steel producers — ArcelorMittal and Sumitomo Metals — had the cold rolled steel mill up and running.

Chemical plants line the riverbanks, winding inland from the Bay — making products from herbicides to sugar substitutes. In fact, a Tate & Lyle plant in McIntosh is the only producer of Splenda sweetener.

Cooperation has been key for inland Gulf counties that have formed the Coastal Gateway partnership to recruit business.

But the glory of the Gulf Coast is the beach. Baldwin County thrives on an aviation cluster, established agriculture, suburban living and great schools. When Alabamians think of the sprawling county, however, they're more likely to think of the beach — white sand, clear water, exciting entertainment, sports venues, condos with a view and fabulous seafood. It's Alabama's playground.

Opposite: European aircraft manufacturer Airbus delivered this A321, the tenth plane assembled at the Airbus plant in Mobile, to Spirit Airlines in the fall of 2016. Above: A ladle of molten steel in the melt shop of the \$3.6 billion factory of Outokumpu Oyj, the largest stainless steel producer in the world. *Photos by Dan Anderson*

2016 BENCHMARKS

UTC Aerospace broke ground for a major expansion in Foley, Baldwin County, with plans to add 260 workers.

Brown Precision Inc. announced plans for a \$7 million facility in Atmore, Escambia County, to perform CNC-based manufacturing, fabrication and coating.

Zodiac Aerospace announced plans for a new facility in Mobile, focusing on Airbus cabin interiors and seating.

Panasonic Avionics also announced plans for a new facility near Mobile's Airbus plant. The firm supplies in-flight entertainment and communication systems for passenger aircraft.

Morganton Pressure Vessels opened a new facility in Bay Minette, Baldwin County, to make vessels that tolerate extreme high pressure — for use in oil and gas exploration and other heavy industry.

Frontier Technologies, which makes aerospace, energy and architectural components, announced plans for a major expansion in Brewton in Escambia County.

Fayette - Franklin - Lamar - Marion - Walker - Winston



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AUTOMOTIVE



1

If any single event can change the face of an entire state's economy, consider this one — the day back in 1993 when Mercedes-Benz announced plans to build its first U.S. plant in Tuscaloosa County.

What started as a \$400 million plant to make a line of sport-utility vehicles is now the vibrant hub of a \$5.8 billion presence in Alabama, making SUVs and coupes, and winning the top ranking among Alabama exporters.

Last year, Mercedes shipped 136,000 cars and SUVs to international markets,

1. Mercedes' new, Alabama-made GLE Coupe has the power of an SUV surrounded by a sporty exterior.

2. The new, Alabama-made 2017 Honda Ridgeline truck, at its debut at the North American International Auto Show.



2



1



2

some 45 percent of the plant's production. The plant ships to customers in 135 countries, with its largest markets in China, Canada, Germany and Russia.

What started with a single company and a single plant is now an industry sector that drives the state forward. Joining Mercedes with OEM plants are Hyundai and Honda, and Toyota operates a major engine plant here.

Together, the firms represent the largest export sector in the state's array and make Alabama third in the nation for vehicle exports. The firms produced more than 1 million vehicles in 2015 and shipped \$7 billion worth to destinations around the world.

Each individual OEM has a remarkable effect on the state's economy. Hyundai Motor Manufacturing Alabama, for example, is credited with a \$5 billion impact on Alabama's economy. The \$1.7 billion Montgomery plant employs more than

1. An amazing array of robots assists Hyundai team members in assembling the Hyundai Sonata and Elantra, at Hyundai Motor Manufacturing Alabama, in Montgomery.

2. Toyota Motor Manufacturing Alabama workers in Huntsville on the new V6 engine line, producing engines for Tacoma trucks and Lexus RX crossovers.



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3,000 workers. It has attracted some 35 tier-one supplier firms, located in 17 counties across Alabama, and creating another 7,000 jobs. Hyundai has the capacity to produce nearly 400,000 vehicles a year.

Honda Manufacturing of Alabama is the company's largest light truck facility. In addition to the new Honda Ridgeline, it makes Odyssey minivans, Pilots and Acura MDX, as well as V6 engines. The \$2 billion plant employs more than 4,000 workers and has the capacity to produce 340,000 vehicles and V6 engines annually.

Alabama is third in the nation for vehicle exports

Toyota has the capacity to produce 750,000 engines annually in its 1,200-worker plant in Huntsville. It's the only U.S. Toyota plant with the capability to make 4-cylinder engines for Camry, Highlander, RAV4 and Venza models; V6 for Highlander, Tacoma and Tundra, and V8 for Sequoia and Tundra.

The strong automotive sector continues to attract new suppliers to the state.

Newest of the breed are Berghoff Group, a German firm investing \$30 million in a 100-employee precision machining plant in Auburn; Voestalpine Automotive, bringing an \$11.1 million components facility to Birmingham; Kunststofftechnik, another German firm, planning a \$37.9 million parts plant in Montgomery; and Canadian firm Kobay Enstel-South, new to Oxford. Also this year, Fehrer Automotive announced plans to add 150 jobs at its plant in Gadsden; Lear Operations announced plans for a \$28 million expansion that will add 500 jobs, and Mando America Corp. is set to launch a \$19 million expansion in Opelika.

Final inspections at Hyundai Motor Manufacturing Alabama, in Montgomery, where nearly 400,000 vehicles a year roll off the line.

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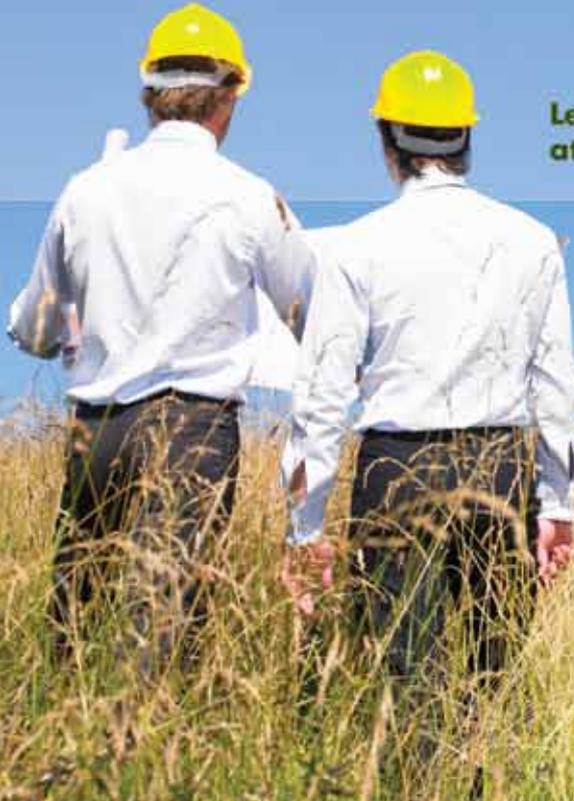
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AUTOMOTIVE'S ACCOMMODATING COUNTRY SIDE

Three Japanese-owned automotive
suppliers find a perfect location
in rural Walker County.

BY CARY ESTES // PHOTOS BY CARY NORTON

Sake is becoming the drink of choice for toasting economic success in Walker County, Alabama.

When parts manufacturer Yorozu Automotive began construction in January of a new production plant in Walker County, it marked the third Japanese-owned auto-supply company to set up shop in the rural county, along with Nitto Denko and HTNA. Sure enough, local and state officials joined Yorozu executives at the groundbreaking ceremony to celebrate the occasion by breaking open a sake barrel and making a good-luck toast.

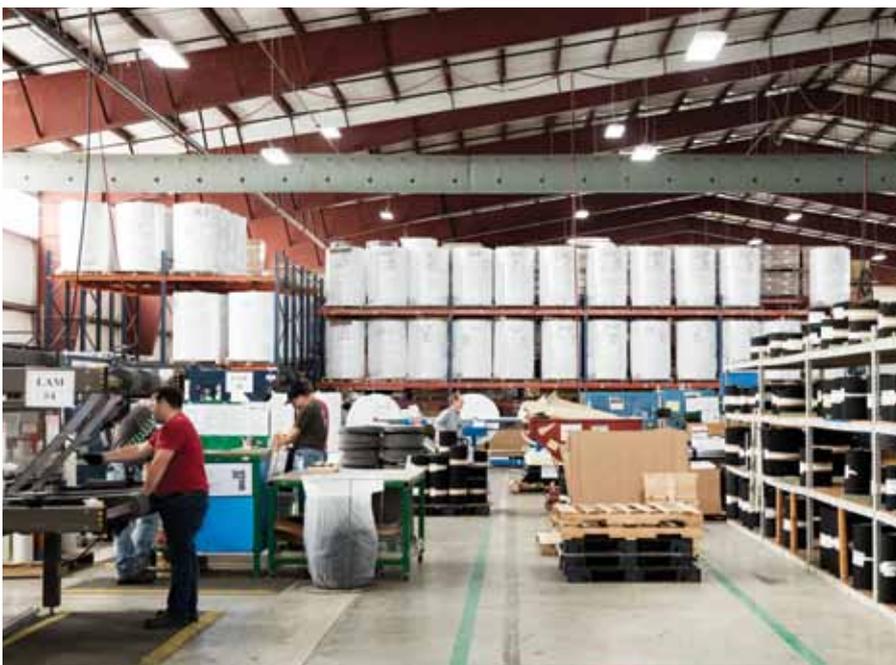
This connection between the Deep South and East Asia has proven to be extremely beneficial for Walker County, which has a population of approximately 70,000. Once the Yorozu plant is operational next year, the county's Japanese-owned automotive suppliers will combine to employ more than 550 people with total payroll topping \$20 million, according to David Knight, executive director of the Walker County Development Authority.

"The automotive sector has definitely been a big part of our strategic economic plans," Knight says. "There are 10 automotive plants less than 250 miles from Walker County (including four in Alabama), so locating here puts any supplier close to a lot of Southern facilities they need to reach. It just seems to be a really good fit for us."

But location alone was not necessarily going to be enough to lure major auto suppliers to rural Alabama. So in the early 2000s, the county began constructing a series of four spec buildings in Beville Industrial Park in Jasper, allowing companies to come in and immediately set up their production facility without facing a lengthy construction delay.

"It seemed like a lot of the auto suppliers were looking for existing buildings that had flexibility," Knight says. "So we started a program where we would build 50,000-square-foot spec buildings that had an office attached to them, with the ability to easily expand to more than

Above: Nitto Denko employees, from left, Soon Hui Roddy, Gerry Tuck and Deborah Banks discuss the finer points of a piece of foam used to reduce vibration and noise in various auto parts. "We can make any shape that a customer needs for anything that has a squeak, rattle or roll," says Banks, who has worked at the facility since it opened. Left: Nitto Denko employees at work in the Walker County plant.





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100,000 square feet. They're each on 15 to 20 acres of land, so it gives them plenty of room for maneuvering and distribution purposes. That's what helped us land Nitto Denko originally."

First of the Japanese-owned companies to establish a production plant in Walker County was Nitto Denko, opening in December 2003 under the name Piqua Technologies (the name changed to Nitto Denko Automotive in 2008). As a supplier for Honda, Nissan, Toyota, Hyundai and Ford, the company produces foams and felts that are used to reduce vibration and noise in various auto parts.

"We can make any shape that a customer needs for anything that has a squeak, rattle or roll," says Nitto Denko quality manager Deborah Banks, who has been with the company since the Walker County facility opened.

In 2011, HTNA followed Nitto Denko's lead and moved into one of the spec buildings in Bevill Industrial Park. But it didn't take long for the company — which manufactures carpet and interior trim components for Honda, Nissan and Toyota — to outgrow its initial surroundings. Barely a year after arriving in Walker County, HTNA purchased 60 acres in Bevill Industrial Park and constructed a new, \$27-million, 145,000-square-foot manufacturing center. The expansion allowed HTNA to add approximately 100 employees and increase total annual payroll by more than \$4 million.

"The spec building was one of the ways we got them here," Knight says of HTNA. "Those buildings have really been a big help to our economic development efforts, which is why we're completing construction on our fifth one."

Walker County's latest catch is its biggest so far. Yorozu is investing approximately \$115 million in the construction of an advanced metal-stamping facility on a 50-acre site in Jasper Industrial Park. The plant will employ at least 300 people, with a total payroll of more than \$12 million. Jasper mayor Sonny Posey called it "the biggest economic development announcement this county has ever had."

The 290,000-square-foot plant, which is expected to begin production next July, will produce suspension components for several auto assembly plants, including Honda, Toyota, Nissan and Volkswagen.

"We surveyed several locations, but the

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Nitto Denko supplies foams and felts to Honda, Nissan, Toyota, Hyundai and Ford.

per year.

“Those are direct impacts from that project,” Knight says. “Then you start taking into account the indirect impact, and it just skyrockets from there. You have a lot of support industries that will enhance those numbers significantly.”

Like many rural areas throughout the nation, Walker County is facing a workforce issue, as people who used to be employed in such industries as coal mining and garment manufacturing try to make the transition to more high-tech jobs. Knight says that transition is “critical” with the introduction of so many new employment opportunities in the automotive industry.

“It’s part of our diversification plan,” Knight says. “Walker County has a strong history tied to the coal industry, and that industry is hurting right now. So we continue to push for diversification of our industrial base. That way if one particular industry sector takes a hit, it doesn’t wipe

organizers in Walker County were the most cooperative for our efforts, and we felt very strongly that we would be able to work together,” says Toshiyuki Yago, the head of Yorozu in Alabama. “The Walker County members have been nothing but cooperative. I am hoping and expecting

to have good employees at this plant and expecting to have large prosperity in this community.”

Knight says the sales tax on the construction project alone will top \$875,000 and that the facility’s city and county tax impact is estimated to be about \$768,000



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out the local economy.

“A lot of the coal miners did cross-training, so they have electrical skills and maintenance skills that transfer pretty easily to the automotive sector. We also have two campuses of Beville State Community College in the county that work hand-in-hand with us on a lot of these projects to provide long-term training benefits for these suppliers. And we work closely with the AIDT (Alabama Industrial Development Training) program. They usually come in on the ground floor with any of these new projects and structure hiring and training programs.”

Banks says she has seen a change over the years in the job skills of potential employees at Nitto Denko. “In the early days there was no problem getting workforce, but it was always unskilled,” she says. “When I came in, they picked the best candidates and then trained us to fit where we seemed to be best suited. They trained us to learn the processes and understand what kind of product we were going to make. But now we’re seeing more people come in who already have experience from

other automotive companies.”

That’s partly because it no longer is unusual for major auto manufacturers and parts suppliers to be located in rural communities such as Walker County. There were definitely a few eyebrows raised in surprise back in 1993 when Mercedes-Benz announced it was building its first U.S. manufacturing plant in Vance, Alabama. Now a Japanese-owned company builds a parts-production facility in Jasper, and the only thing that is raised are the sake glasses.

“When Nitto first located here, it was a bit of a curiosity,” Knight says. “But now with the tremendous growth in the automotive sector, it seems like every year or so you hear about somebody increasing the size of their plant. And every time they do that, the suppliers are picking up new contracts, and it makes sense for them to be closer to those OEMs. So it just enhances our opportunities to recruit those companies.”

For more, see the Fall 2016 issue of our sister publication, Southern Automotive Alliance.



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Fayette Fabrication racks up success as Tier 2 auto supplier by listening to OEMs' needs.

BY CARY ESTES // PHOTOS BY CARY NORTON



Mark McClanahan looked at the growing automotive industry in Alabama and saw a window of opportunity. And a door. And a hood.

A native of Decatur, McClanahan was living in Chicago in 2013 when he and his wife decided they were ready to move back to Alabama. Though he was running a food-service equipment business at the time, McClanahan had more than 20 years of automotive experience working for parts manufacturer Delphi-Saginaw (now known as Nexteer Automotive). And he noted that since leaving the state in 1998, the automotive industry “had gone nuts” with the influx of several international manufacturers.

“I knew there would be opportunities. So I looked around for the need. I was trying to find out what was missing,” McClanahan says. “I talked to a lot of people, including people with Mercedes, to find out what area of need wasn’t being met.”

Opposite: Mark McClanahan designed his company Fayette Fabrication to queue up parts on the assembly line at Mercedes’ plant in Tuscaloosa County.

Left: Randall Turner aligns a flat sheet of metal in the press brake before bending it to the project specifications.



The answer, he discovered, was the creation of steel container racks that are custom-made for large automotive parts such as windows, hoods, instrument panels and exhaust pipes. These racks have to fit specific model sizes and cannot be off by even an inch, in order to prevent damage during transport to and within the manufacturing plants.

McClanahan says it is the type of work that most automobile manufacturers would prefer not to handle internally. “They want to use their maintenance people on higher-level things, like repairing and installing machines,” he says. “The people at Mercedes said there was a need for this type of rack manufacturing in the state.”

So, with an initial investment of \$1.5 million in equipment and inventory, McClanahan opened Fayette Fabrication

Left: Justin Halbrook welds the bottom of an auto parts rack.

Opposite: Ray Beede shows off Made in USA steel before it’s transformed into Made in Alabama racks for the auto industry.



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한국어 서비스 및 에이전트 상주

in January 2014 in the rural town of Fayette, located approximately 60 miles northwest of the Mercedes plant in Vance. The company began by simply repairing existing racks but quickly moved into custom manufacturing.

Two years later, Fayette Fabrication has grown from six employees to 35, and McClanahan says plans are under way to expand the facility from 50,000 square feet to 90,000. The company does work for major auto manufacturers such as Mercedes and Honda, as well as for parts suppliers such as Eberspacher and Kamtek.

“Fayette Fabrication is a perfect example of the entrepreneurial opportunities that exist in Alabama within the automotive industry,” says Ron Davis, president of the Alabama Automotive Manufacturers Association. “It’s a wonderful opportunity for rural Alabama to be adding businesses. A lot of times a larger community is looking for new businesses that will bring in 500 jobs. But in some of these rural communities, a business that has 35 jobs is a huge contribution for



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Fayette Fabrication's racks are custom made for large parts such as windows, hoods, instrument panels and exhaust pipes.

the area.

“So it all begs the question of what other support do the OEMs and the suppliers in the state need that they don't currently have? I think there are many more opportunities like this out there,” says Davis.

Of course, finding the need and meeting it are two different things. McClanahan says the work his company does is not easy, mainly because of the precision required in the creation of the racks. It is considerably easier to build a container for a refrigerator door, for example, than for a specific part to a specific model of a high-performance vehicle.

“The rack has to hold the part in a precise orientation so it doesn't get damaged,” McClanahan says. “If it's going to be holding a hood or a door or a roof — something that is going to be painted and you can see — then that surface cannot be scratched. It has to be held exactly right for the contours and size of that part. You can only touch certain surfaces without damaging the surface. That surface on a Kia hood is different than it is on a C-Class hood. So that C-Class

hood rack has touch points that are very different.

“Mercedes will have different hood racks for different models, and the racks have to change when the models change. So when Mercedes makes a design change, they probably can’t use their old racks. The new part might be just an inch wider or shorter. You can’t just design a rack for an axle. It has to be for a certain type of axle. You don’t design a rack just for a Hyundai shock absorber, but for a Hyundai model AN shock absorber. The quantity and design of each rack is different. It’s a very custom business.”

All of which can lead to a variety of challenges. For example, exhaust pipe-manufacturer Eberspacher requires container racks that are 12 feet long. And, while some companies provide the dimensions that are needed for a specific container, others hire Fayette Fabrication to both design and produce the racks.

“These relationships are all over the map,” McClanahan says. “In some cases they won’t even have a drawing. They just show me the part and say they need 50 racks. So we kind of reverse engineer it and do the design and the prototype. Everybody has a different process. The need is totally different for each company and each part.”

The one thing that is the same throughout the state’s automotive industry, McClanahan says, is the need for additional support companies such as Fayette Fabrication. The state of Alabama is encouraging the creation of new businesses in rural counties by offering tax credits for a company that moves or expands into a county that has a population of fewer than 25,000 people. With those incentives in place, McClanahan says the key is simply discovering what the auto industry requires for continued growth in the state.

“Yogi Berra said you can hear a lot just by listening,” McClanahan says. “There are other opportunities like this that people don’t look for. People are looking into high tech. They want to invent something, find a factory to build it and then sell it to the automotive companies. But that is such a long, long cycle — where this is just filling a need.”

For the full story, see February 2016 Business Alabama.

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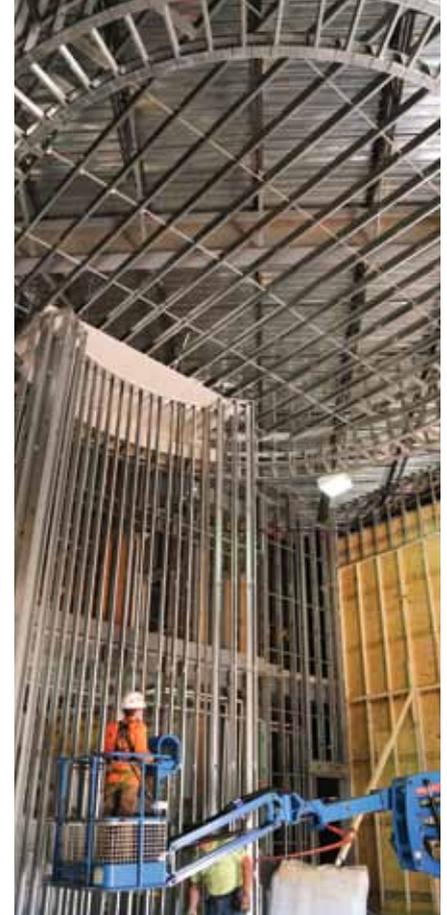
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BIGGER, BETTER, BOLDER EXHIBITS

New and expanded museums introduce the Gulf and its commerce, vintage motorcycles and the world of nature.

BY EMMETT BURNETT, JESSICA ARMSTRONG

AND WENDY REEVES // PHOTO BY ELIZABETH GELINEAU

The rich and varied tapestry of Alabama life is showcased in two new museums and a major museum expansion.

On the Gulf Coast, the new GulfQuest National Maritime Museum of the Gulf of Mexico showcases the waters and its commerce.

Up north in Decatur, the soon-to-open Cook Museum of Natural Science is a tribute to the natural world around us.

And in the middle of the state, Birmingham's expanded Barber Vintage Motorsports Museum showcases the zest of raw speed.

GULFQUEST

She is 14, frightened, packed in a tiny ship, voyaging from France to Mobile. In 1704 the teenage Parisian set sail to take a husband she had never met. Today the transatlantic bride is a ghostly apparition, shimmering in a mirror, and telling her story at GulfQuest National Maritime Museum of the Gulf of Mexico. "Don't be frightened," she says, assuring startled guests. But be amazed.

Joining the exhibit Pelican Girls are 90 full-feature exhibits, with rooms, dens,

nooks and crannies chocked with nautical chronicles, interactive exhibits, stories of wave-lapping commerce that transformed the world. GulfQuest believes the world should know.

Commanding Mobile's Water Street, the 120,000-square-foot facility educates

GulfQuest (left) shows visitors the wonders of the waters surrounding Alabama's port city, while Cook Museum of Natural Science showcases the world around us.

Photo by Juergen Beck, Freedom Light Productions, courtesy of Cook Museum of Natural Science

and dazzles landlubbers who had no idea.

“The Gulf of Mexico is America’s forgotten coast,” says the museum’s executive director, Tony Zodrow. “Our children’s history books feature the Cuban missile crisis, the BP oil spill, and that’s about it.”

But, says Zodrow, “The Gulf is as rich in history as the East Coast.”

Breathing life into that history has been the goal since the early 1990s, when the museum founders first began to dream of the riverfront project. Their mission: “To inspire people of all ages and backgrounds to understand and appreciate the Gulf Coast’s rich maritime heritage through exhibits, programs and activities.”

GulfQuest’s immersive displays range from small portholes that give a glimpse of history, to movie theaters to hands-on nautical navigation instruments. And what adventure would be complete without a nautical map? GulfQuest has one. It’s two stories tall and shows the routes of historic voyages.

In Take the Helm Theater visitors do just that — pilot one of six types of boats up the Mobile or Tombigbee rivers or out to Mobile Bay — using the same simulator tugboat pilots use for their training.

Ocean Planet Theater features a model of Planet Earth, 6 feet in diameter, floating over the audience. The technology could be from “Star Wars.” Using real satellite data and imagery, current weather forecasts, earthquakes, aircraft in flight charts are displayed on the giant orb, suspended from the ceiling by almost invisible, fishing-line thin wire. Visitors view many paths, including hurricanes, cloud formations, current earth weather, shipping lane traffic and airline flight routes, sprawling over the Big Blue Marble.

A signature attraction, Container Ship, is a towering full-sized ship replica, complete with stacked simulated garage-sized cargo containers. The vessel rests in real life water — all inside the museum. After touring all the exhibits and trying all the hands-on features at the museum, visitors can step out on the museum’s observation decks to see the theater of maritime life in real time — as boats and ships of every size and description ply the waters before them.

For the complete stories, see March 2016 Business Alabama for Gulf Quest and September Business Alabama for Barber Museum and Cook Museum.

COOK MUSEUM OF NATURAL SCIENCE

Getting rid of bugs has been a Cook family passion for three generations. Now the family has endowed a museum to put those little critters where they belong — on display among the many wonders of the north Alabama ecosystem.

Construction is well under way on the \$17 million facility that will house the new Cook Museum of Natural Science, aiming to open in 2017.

“It’s all going to be focused on natural sciences — not history, dealing with origins or Native Americans — but the observable world around us,” says Brian Cook, museum board president and grandson of its founder, John R. Cook Sr.

The museum will feature the ecology, biology and chemistry of the Tennessee Valley.

There will be a live animal component, featuring a 15,000-gallon saltwater tank and another 500-gallon freshwater tank in the Rivers and Streams Exhibit Hall. Visitors will see a variety of live animal terrariums, even a live beehive.

A concrete-and-steel structure that will look and feel like a cave will showcase formations and the wildlife that lives in and around caves. The forests of the Southeast will be featured, including “furry friends” of the forest. A Feathers and Flight Exhibit will include bald eagle and golden eagle exhibits, which were a rare find at the original museum.

And don’t miss the insect display, which shows “the beautiful and diverse insects around the world.” That’s where it all started, after all.

Cook’s grandfather founded a private museum connected to the family business, Cook’s Pest Control, showing off his insect collection to scouts and other groups.

Cook says the collection grew to include other items like rock and mineral collections, and in 1980, a 5,000-square-foot warehouse became the Cook Natural Science Museum, a private museum. It had more than 750,000 visitors over the years.

Cook’s grandfather died in 2009. Nearly five years ago, the family sat down to discuss what to do about the museum’s future.

“It is too special and meaningful,” Cook says. “We were entrusted with too much to let anything go or to do it halfway.”

Now, the museum is a nonprofit organization with donations from all over Alabama and outside the state.

What would his grandfather think?

“He would be wearing a huge grin and he would have absolutely loved it to the point he would not have been able to sleep,” Cook says. “He loved seeing dirt turned over in construction sites, beautification projects and building a new office. He loved this community, giving back and being involved and this whole project encompasses so much of who he was and what he was about.”

BARBER VINTAGE MOTORSPORTS MUSEUM

Maybe it’s the Harley-riding freedom on the open road, or channeling Marlon Brando and his gang of biker misfits in “The Wild One.” Whatever the reason, people love motorcycles and it doesn’t matter if they’ve never actually ridden one.

No need to leave Alabama to visit the Mecca of motorcycles. According to Guinness World Records, the Barber Vintage Motorsports Museum in Birmingham contains the world’s largest collection of motorcycles. It’s been described as “overwhelming, but in a really good way.”

It’s about to get even more overwhelming, in a good way. It’s undergoing a \$15 million expansion slated to open this fall.

The museum displays more than 600 vintage motorcycles that span more than 100 years of production from 200 different manufacturers. That’s less than half of

the collection. Many more are in storage awaiting public view.

The museum is part of the 740-acre Barber Motorsports Park founded by George Barber, a former racecar driver and former owner of Barber’s Dairy. The park also includes a racetrack that hosts motorcycle and car racing events yearlong and is home to the Porsche Sport Driving School.

The addition will allow for more descriptive, multidimensional exhibits, such as a hill for mountain bikes. “It’s going to be spectacular,” says Barber, who raced Porsches in the 1960s and holds 63 first place wins.

New pedestrian bridges over the race-track are also part of the expansion. Members can use the bridges during races to get an unprecedented view right on top of the action.



TRACTORS FOR CUBA

This Alabama company developed a tractor sized for Cuba's 40-acre farms.

BY WENDY REEVES // PHOTO BY TYLER BROWN

An Alabama firm is poised to be the first American firm doing business in Cuba — making small tractors that are well-suited to Cuba's typical small farm and are easily repairable in the field.

Business partners Horace Clemmons and Saul Berenthal have been working through the paperwork — both in the U.S. and in Cuba — since 2015, but the project continues to move toward reality.

When Business Alabama first talked with Clemmons and Berenthal, in November of 2015, they were headed for a trade show in Havana, where they had won initial approvals from the Cuban government. In early 2016 they received a crucial approval from the U.S. Department of the Treasury. And at midyear, they began production in Alabama, at the Liberty Steel Fabrication Inc. plant in Fyffe, so they could begin supplying the small tractors while the last few hurdles

are cleared to facilitate Cuban production.

CleBer LLC, based in Jackson County where Clemmons lives, is the first U.S. company approved by the Cuban government to do business there since the U.S. and Cuba restored diplomatic relations in 2015.

Building their hopes on warming relationships between the U.S. and Cuba, the two have marched forward with their plans.

"There's no reason trade cannot be reestablished, and there's no reason why Alabama cannot be one of the largest trading partners with Cuba," Berenthal says. "The products exist, the facilities exist, and there are people willing to invest. All we want is public opinion to let the people in government know that this is in the best interest of Alabama and the rest of the U.S."

What they've proposed to Cuba is a change to an open source manufacturing business model, starting with their CleBer tractor, named Oggun, after a powerful

warrior and spirit of metal.

Their tractor is based on one introduced by Allis-Chalmers back in the late 1940s, but dropped when American farms began to grow.

It's a good fit for CleBer, targeting Cuba's smaller farms.

"It's a tractor that can be fixed in the field; you don't have to come back to us to fix it," he says. "It can create businesses to do repairs, and we will compete in that area as long as we can do it better and cheaper than anyone else. But the important thing is that the tractor includes all parts that are standard, off-the-shelf parts to help create something to help them in the evolution of farming."

Clemmons says once all the government regulations are worked out, their

Saul Berenthal (left) and Horace Clemmons with the tractor they hope will reinvigorate both farming and manufacturing in Cuba.

plan is to build a small assembly plant in the Mariel Special Economic Zone near Havana. For the first three years, the parts will be manufactured in Alabama and shipped from Mobile to a new \$1 billion port the Cuban government built in the Mariel district to attract foreign investment.

“We will determine how much they can source there. Then after year three, we will begin to manufacture parts in Cuba and import only the pieces they can’t build,” Clemmons says. “We’ve clearly told them it will be an open source manufacturing process, and we will keep our margins as low as possible. We will make money, but this is more about doing the right thing and giving them the ability to make decisions in other arenas.”

It’s a business model, he says, that can be used for other types of equipment. “They have a need for growth, and by having all open source manufacturing, it will allow them to become self-sufficient.”

There are still a lot of ifs and whens in the business equation for two countries that are physically just 99 miles apart.

For these two history makers, the Cuban tractor project also takes them both back to their family roots.

Born and raised in Florence, Clemmons comes from a long line of farmers. “My grandfather on my father’s side farmed 40 acres. He had eight kids and two mules,” he says. “I walked behind that mule, and I carried an 8-foot cotton sack and picked cotton by hand, so I am a product of Alabama.”

Berenthal is a Cuban-born Jew who left the island for the U.S. to attend college not long after Fidel Castro took over. His parents, who had already fled the Holocaust in Europe, followed him to the U.S. a year later.

The pair met in North Carolina working for IBM and eventually became business partners to start Post Software International, which they sold in 1997.

This new venture has special appeal.

First, it’s an opportunity to help the country where he was born and raised. Second, he believes it’s a chance to help heal relations between Cuba and the U.S., the country he’s called home for more than 50 years. Third, it’s a good business opportunity.

When President Barack Obama and Raul Castro struck a deal in 2015 to im-

prove relations, Clemmons says, his long-time friend and business partner called to tell him they were starting a new business.

“I asked him, ‘What are we going to do?’”

So they started looking at what’s happening in Cuba.

Clemmons says Cuba imports 80 percent of its food, and that struck a chord in him. He thought of his grandfather and things he taught him as he was growing up.

“The Cuban government doesn’t want

agribusiness, but does want small, family farms of about 40 acres,” Clemmons says. It didn’t take long for the tractor idea to materialize.

“I told him it will be very difficult,” Berenthal says. “But we always say, anything worthwhile is always worth doing.”

For the full story, see November 2015 Business Alabama, plus updates in March, June and July 2016.

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ALABAMA PLUMBS THE PANAMA CANAL

American Cast Iron Pipe Co., the largest ductile iron pipe plant in the U.S., helps refit the Panama Canal.

BY CHARLIE INGRAM // PHOTO BY CARY NORTON

Hailed as an engineering and construction miracle when completed in 1914, the historic Panama Canal operated largely unchanged for almost a hundred years. But when recent upgrades were undertaken there, a Birmingham company even older than the venerable canal was called on to supply more than 15 miles of needed water pipe and related products.

The annual volume of ships at the Panama Canal has increased from 1,000 to 14,000 since its opening. But it became more than obvious that changes were needed, as the world's trading vessels got increasingly larger and became too big to pass through the canal's existing locks.

To correct that shortcoming and ensure the canal's important role in ocean trade, the Panama Canal Authority began a mammoth \$5.25 billion expansion in 2009. Completed in 2016, the construction centers on massive new locks running parallel to the existing locks on both the Pacific and Atlantic Ocean sides. The new locks, along with other improvements along the 50-mile canal route, accommodate longer, taller and wider ships and double the waterway's cargo capacity.

The scope of the expansion is immense. Each set of new locks contains three chambers where ships are raised or lowered 85 feet during the canal crossing. Each of those three chambers is 110 feet high, 180 feet wide and 1,400 feet long — longer than the Empire State Building is tall. Lying next to the locks are huge water basins that regulate the amount of water added to or removed from the lock chambers.

The amount of concrete required to build the locks is enough to pave a road from St. Louis to New York, and the amount of steel needed would build 26 Eiffel Towers. Sixteen massive steel gates for the locks are as tall as 11 stories.

Less noticed in the project's big picture but essential to its success is 80,000 feet of water pipe, fittings, valves and fire hydrants supplied by Birmingham-based American Cast Iron Pipe Co. Long known by the acronym ACIPCO, the firm now prefers to call itself American.

The pipe and accessories — installed under, near and within the new locks — will provide drinking water and fire protection at the locks and for nearby communities impacted by the expansion. They also are part of the dewatering process at

the locks.

Founded in 1905, when Teddy Roosevelt was president of the United States, American is one of the nation's largest manufacturers of ductile iron pipe for the waterworks industry. Just as the Panama Canal facilitates ship transportation, American's products facilitate the flow and transport of water.

The company has long done business in domestic and overseas markets. It first exported pipe in 1915, to Chile. Its headquarters facility includes the largest manufacturing facility of ductile iron pipe in the United States, and the American Flow Control division makes water valves and fire hydrants in Texas and Minnesota. Other divisions make steel pipe for the water, oil and natural gas industries.

The Panama Canal Authority contracted with a consortium of builders and designers, Grupo Unidos por el Canal, to carry out the expansion. The multinational consortium includes contractors from Panama, Spain, Italy and Belgium and subcontractors from the United States and Holland.

American pursued its Panama Canal contract for two years, communicating with MWH Global, the lead designer of the new locks. "MWH decided to use ductile iron pipe because of its longevity and to continue using material that the Canal Authority has in its system," says Gabe Restrepo, American's sales manager for Latin America.

"We also were invited to quote on a valve package for the customer, and one of the components for that was a fire hydrant. Ours was a good fit. And we got American gate valves approved. They liked the fact that all these products were coming from the same company, and they liked our reliability and reputation. What we sold them was a small part of the overall project, but it was still an important part of it."

Roughly half of the pipe American supplied was in diameters ranging from 16 to 30 inches, and most of that will provide drinking water and fire protection for communities near the canal impacted by the expansion.

On the Pacific side of the canal, 30- and 24-inch pipe for water mains was installed in a "cross-under" beneath the towering new locks. A 16-inch water main was installed in a cross-under on the Atlantic



Opposite: Everybody moves back when the big bucket pours at American Cast Iron Pipe Co., formerly known as ACIPCO.

Above: Workers install American pipe in a cross-under beneath the Panama Canal, during its expansion to handle much larger ships. *Photo courtesy of American*

side, too, and a 20-inch fire protection main also was installed in the cross-under at both locations.

One of the more stringent requirements for American was a strenuous pressure test of the 30-inch water line in the Pacific cross-under. "The deeper you go, the higher the pressure," Restrepo says. "At ground level, the 30-inch line would run at 250 psi (pounds per square inch), but the line dips down 125 feet to where the operating pressure is 300 psi.

"The owner required a hydro-test after installation 50 percent higher than that, at 450 psi. That was a special caveat to the application for our product, but the pipe tested fine."

Roughly 90 percent of the contract, about 6.6 million pounds of material, was shipped to the Panama Canal through the Port of Mobile.

For the full story, see October 2015 *Business Alabama*.



AEROSPACE

See the Saturn V rocket looming on the skyline of Huntsville? It's a symbol of an industry that began quietly and now roars to the heavens, reaching ever farther aloft. And while the northern tier of the state reaches for space, the southern tier is home to the more conventional — but very rare — industry of commercial jet building.

Completing the aerospace package that's headlined with NASA and Airbus, the state boasts a host of aerospace firms that search for solutions to complex problems, develop materials to make flight safer, analyze their way to more accurate guidance systems for missiles, train the world's helicopter pilots and keep the nation's aircraft shipshape.

Alabama's links to the heavens started

more than 60 years ago with the post-World War II rocketry of Redstone Arsenal. As the space race developed, along came NASA and its Marshall Space Flight Center. And its Huntsville home began attracting the immense variety of science and engineering firms that support the nation's defense and space programs. Virtually all the biggest names are represented in Huntsville, including all of 2015's top five defense contractors — Boeing, Lockheed Martin, General Dynamics, Raytheon and Northrop Grumman.

The Alabama Department of Commerce counts more than 400 state firms in the aerospace field, with 83,000 employees among them.

In nearby Decatur, the Atlas and Delta

rockets developed by Boeing and Lockheed Martin are still under construction, built now by United Launch Alliance, which is a joint venture of the two companies. Most of the payloads going to space today are powered by ULA rockets, and each launch gets a video showcase on the ULA website.

Alabama experts do more than build rockets, though. They continue to solve the problems for the next generations of the space program. Boeing recently opened a new research and development facility in

Looming large on the Huntsville night skyline is Rocket Park, at the U.S. Space and Rocket Center. Only one of the museum's exhibits, the Rocket Center includes 27 missiles and rockets from America's space program and NASA's Marshall Space Flight Center.



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the Redstone Gateway center. And it's hard at work on the massive engines that will carry the U.S. space program farther into space — with its sights set on Mars by 2025.

Closer to earth, Airbus began building commercial jets in Mobile in 2015. Since 2012, when it announced plans for its first U.S. assembly line, the firm has built a massive plant, hired hundreds of workers, many of whom have trained in Europe alongside the experienced Airbus teams, selected subcontractors, and begun assembling aircraft. The first of its planes have already taken to the skies, sporting the bright colors and logos of JetBlue, American Airlines and Spirit Airlines.

Meanwhile, nearly a dozen Airbus suppliers have either started work in Alabama or announced their intention to do so. Most recently, the array broadened to include a company that designs cabin interiors and another that make inflight entertainment systems.

NASA's Marshall Space Flight Center is superintending the new space launch project and counts some 150 Alabama companies as participants in the project. Other major NASA projects in Huntsville include work on the Chandra X-ray Observatory, solar system exploration, International Space Station and more.

Lockheed Martin also builds missiles in Pike County — the Long Range Strike Systems cruise missile and the Joint Air-to-Surface Standoff Missiles.

Newer aerospace-focused companies include Carpenter Technology, which opened in 2014 near Athens to create premium steel alloys — nearly half of which go into aerospace and defense projects. The Pennsylvania-based company traces its heritage to the early days of flight and space flight, noting that its products were part of the Wright Brothers planes, Charles Lindbergh's Spirit of St. Louis and the rockets that took Neil Armstrong to the moon.

General Electric Aviation is also new to the Alabama mix, opening a \$75 million plant in Auburn in 2015 and starting work on a new \$200 million facility in Huntsville in 2016. The Auburn plant produces precision, super-alloy engine parts. Early on the firm invested an additional \$50 million to begin 3D printing of jet fuel nozzles. The twin Huntsville plants will make silicon carbide materials for jet engines and gas turbines.

The state's MRO cluster — performing maintenance, repair and overhaul for many kinds of planes and helicopters — continues to thrive. VT Mobile Aerospace Engineering, which sparked the South Alabama aerospace cluster, celebrated a quarter century in Mobile in 2015. UTC specializes in nacelles and other systems in Baldwin County, Star Aviation adds specialty systems like Wi-Fi and advanced avionics at its site in Mobile, and Commercial Jet just moved to Dothan, where it specializes in modifications.

And as the industry gears up, so have the state's airports — a completely renovated terminal in Birmingham, a new airline providing commercial flights in the Shoals, terminal expansions in Montgomery, upgraded terminal amenities in Mobile, upgraded amenities and a new hotel in Huntsville, and a variety of upgrades in Dothan from runway and security improvements to upgrades of on-premises industrial sites.

1. Lift off for a Delta rocket built by United Launch Alliance in Decatur. Most U.S. payloads take to the skies on ULA rockets.

2. A Bell 206-L4, one of the helicopters used at the Army flight training school at Fort Rucker and serviced by the Bell Helicopter maintenance repair facility in Ozark.



A constellation of Alabama’s aerospace companies — contracted with NASA’s Marshall Space Flight Center — enters the manufacturing stage of creating the Space Launch System that will return the U.S. to human space exploration.

BY NANCY MANN JACKSON

NASA is building the most powerful rocket in the world to fulfill its “Journey to Mars” mission. And the space agency is relying on the people of Alabama to get it done.

The Space Launch System (SLS) rocket is being designed, tested and built at NASA’s Marshall Space Flight Center in Huntsville, and a number of companies from throughout the state are playing important roles.

“Exploring space is imperative to addressing the fundamental questions about our place in the universe and the history of our solar system,” says Jerry Cook, deputy director of the NASA Space Launch System. “As demonstrated by the numerous inventions created because of America’s space exploration efforts, we expand technology and create new industries that make Earth a better place, and SLS is the vehicle that is going to allow us to explore like never before.”

BUILDING A BETTER ROCKET

Like the Saturn V rocket that first took humans to the moon and the space shuttle that helped build the International Space Station and inspired generations, the SLS

A qualification test article for the liquid hydrogen tank on NASA’s new rocket, the Space Launch System, is lifted off the Vertical Assembly Center after final welding at Michoud Assembly Facility in New Orleans.



AIMING BEYOND THE MOON



will have strong ties to Huntsville and Alabama. Its technology builds on those earlier programs and promises a more powerful result that can travel farther than any other space vehicle before it. "From the start, NASA designed SLS to take advantage of five decades of investments in technology, facilities and a skilled workforce," Cook says.

A powerful rocket is needed to send both humans and cargo to deep space destinations such as Mars. For instance, the first human travelers to Mars will need to take

many things such as support equipment, habitats, food, water, tools and experiments. "The SLS design makes it easier to transport astronauts and the necessary equipment and payloads with fewer launches, reducing planetary trip time because of its unprecedented capability," Cook says. "SLS is the only rocket capable of taking humans and the huge payloads required for deep space exploration, and it will carry more than any launch vehicle ever made."

To overcome the challenge, NASA has

worked to combine new technology and engineering with successful pieces of the past. "While NASA is taking advantage of proven launch vehicle components, such as the RS-25 engines that flew on 135 Space Shuttle missions, we have adapted those engines to the new loads and environments that this bigger, more powerful vehicle will experience, plus added a new controller (computer) to power the engine," Cook says.

During 2017, NASA will integrate those engines into a brand new Core Stage that will hold the liquid hydrogen and liquid oxygen fuel, flight computers and most of the avionics to control the rocket's flight. Similarly, there are numerous other components that must be integrated across the entire rocket — and all must ultimately come together to create a new vehicle, ready for its first flight in 2018.

FUNDING THE PROJECT

In 2010, President Barack Obama and Congress established a space exploration plan that "continues to have broad consensus and aligns all of NASA's work in support of the goal to send American astronauts farther into space than ever before," Cook says.

Earlier this year, the U.S. Senate appropriations subcommittee overseeing space flight announced that it would fund NASA's 2017 budget at more than \$19 billion, a \$21 million increase from the previous year. In addition to allocating funding for the first SLS launch in 2018, Congress has also committed funding for NASA to begin working toward the more powerful Block 1B version of the rocket, which will fly on the second mission in 2021. That second mission is planned to send the first astronauts farther away from Earth than any humans have ever ventured before.

Congressional funding for SLS allows opportunities for numerous private companies to contribute their skills and expertise to the project. For instance, Huntsville-based businesses Radiance Technologies and Dynetics are partnering to fabricate, assemble and transport the Space Launch System Core Stage Pathfinder Vehicle. When complete, SLS will represent work that is taking place at more than 800 companies in 43 states around the country. "This is truly America's rocket," Cook says.

For the full story, see October 2016 Business Alabama

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INFORMATION TECHNOLOGY

From hardware to software, from city-operated fiber optics to head-in-the-cloud imagination, from hospital record keeping to military modeling and simulation, from the smallest specialty company to the 2,500 professional staffers at the Air Force's Gunter Complex, information technology is a strong and growing sector in the Alabama economy. And the state boasts, also, a couple of very high-powered teams working to keep all that information safe.

Adtran is the premier IT hardware and software developer in Alabama, one of the

state's few publicly traded companies and a trendsetter in connectivity and in helping bring cloud computing in reach of small businesses as well as big.

Also in Huntsville, Intergraph continues to develop new software that feeds the world market for geospatial data to help keep governments and businesses on target.

In the south, Computer Programs and Systems Inc. has created record-keeping systems targeted at smaller hospitals, helping them keep their data accessible and meet mandates the federal govern-

ment has placed on all healthcare providers. CPSI is another of the state's publicly traded IT companies.

A host of smaller companies have joined the mix in the past few years, creating software to help doctors and hospitals meet federal mandates for electronic

Intergraph Process, Power & Marine, headquartered in Huntsville, developed Intergraph Smart™ 3D, a design solution specifically tailored for plant, offshore, shipbuilding, and the metals and mining industries.



medical records.

Some areas of the state have taken extraordinary steps to provide high-speed connectivity. Three years ago, Opelika, unable to get the quality of service its citizens wanted from commercial providers, built its own fiber optic network, available to every home and business. Huntsville soon announced plans to join the ranks of “gig” cities, teaming with Google to bring the speeds needed for the city’s bevy of tech-rich industries.

Along the Gulf Coast, Southern Light created a business to provide fiber optic



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Mobile-based Southern Light Fiber continues to build on its reputation as the most extensive network of fiber optics in the South, with 6,058 route miles of fiber optic cable.

services and has been so successful it has earned a place on the Inc. 5000 list for rapid growth. Southern Light was chosen to provide fiber optic options even in the far northern end of the state, in Florence.

Alabama's military presence also contributes to its IT prowess, both from within the military and from the hundreds of

defense contractors nearby.

At Gunter Annex, associated with Maxwell Air Force Base in Montgomery, the Air Force maintains the majority of its professional IT services. Some 2,500 IT professionals are based there. The Business and Enterprise Systems Directorate provides IT services and superintends

contracting and acquisition of additional services.

In Huntsville, contractors specializing in modeling and simulation support the nation's defense capabilities. So strong is the presence here that the annual modeling & simulation conference, AlaSim, attracts experts and exhibitors from around the world.

Aegis Technologies is one of the modeling & simulation industry leaders, developers of a new program that acts like a video game but helps troops learn to differentiate quickly between friend and foe.

Keeping all that data safe is the primary concern for several companies and agencies, and seven of the state's colleges and universities have been designated as centers of excellence for information systems security education at various levels of expertise.



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GOOGLE & ALABAMA



Google will build its 14th data center — a \$600 million capital investment — in north Alabama.

BY NANCY MANN JACKSON

Google will break ground this year on a new, \$600 million data center in rural Jackson County near Scottsboro on the site of a recently retired coal-fired power plant. The project, which is predicted to employ about 100 people to start, has attracted attention for its economic development potential as well as its environmental implications.

“For more than 50 years, the Widows Creek plant has generated electricity for the region,” says Gary Demasi, director of Global Infrastructure at Google. “Now the site will be used to bring Internet services and information to people around the world, powered by 100 percent renewable energy. We see a lot of potential in redeveloping large industrial sites like former coal plants, and we’re excited to bring a data center to Alabama.”

WHY HERE?

Google already has 13 data centers around the world, and the options were endless for locating its 14th. The company selected Alabama — and specifically, the Tennessee Valley Authority’s (TVA) Widows Creek site — for a number of reasons. Not only does the location offer an opportunity to redevelop an industrial site into a model of renewable energy but it also provides a great deal of infrastructure needed to power a high-tech data center.

“The decision was very site-specific,” says Dus Rogers, president and CEO of the Jackson County Economic Development Authority. “There is a lot of electrical infrastructure in that location, because it was formerly a power plant. There is

also access to a robust water system in the nearby city of Bridgeport.”

Not only does the existing plant offer good power lines but TVA power plants also offer access to plenty of water. The energy provider needs water to power electricity, but Google needs water to use in cooling its computers.

There are also existing rail lines into the Widows Creek site, so Google will likely be able to access buried conduits along the tracks to run fiber optic cable. And because the site has plenty of space available, Google will be able to build a campus site with multiple buildings.

“We see a lot of value in redeveloping coal plants and other industrial sites.

Google’s 14th data center will rise on the site of the old TVA Widows Creek power plant.

Decades of investment in infrastructure shouldn't go to waste just because a site has shut down," Demasi says. "We can use the electricity transmission lines to bring lots of renewable energy to our data center, and TVA has been a great partner in helping us meet our goal of using as much renewable energy as possible."

As the region's electric power operator, TVA is working with Google to scout for new renewable power projects and put them online. In other locations, Google is using wind power and solar power to reduce its energy usage significantly. Google's ultimate goal is to be powered by 100 percent renewable energy, Demasi says.

While the site was a good fit for Google, company leaders also were impressed by local and state officials' willingness to work with them and meet their needs. For instance, the Google data center is the first project recruited under Alabama's specialized data center incentives, passed in 2012, and the Alabama Jobs Act, an overhaul of the state's economic development incentives platform passed in 2015.

"Overall, Jackson County had the right

combination of energy infrastructure and developable land," Demasi says. "More importantly, Jackson County and the state of Alabama worked incredibly hard to make this site work for one of our data centers. We are looking forward to being a part of this community for many years to come."

WHAT HAPPENS AT A DATA CENTER?

Google's successful service — which is supported by ad revenue — is based on the search engine's ability to rank search results. This capacity requires lots of servers, which send out "crawlers" to collect live data from the Web. These crawler programs come back with fully loaded pages and dump all that information into a huge database. When an Internet user types in a search term, a different set of Google computers dips into that database, pulling out millions of results. These results are filtered, sorted and distributed to the user — all within seconds — using a sophisticated set of algorithms.

All that high-tech work is made possi-

ble by the computer equipment stored and used in Google's data centers. "Our employees at the Jackson County data center will work to keep Google Search, Gmail, YouTube and many other Google applications operational, enabling Google to provide fast and reliable services around the clock to millions of people," Demasi says.

Employees who work at Google data centers "focus on ensuring that the facilities' computers are running at optimum speed and efficiency," Demasi continues. Positions will vary from Linux administrator to computer technician to mechanical facility operator.

The Alabama data center is part of Google's long-term growth strategy. "We invest in capacity both for our current and future needs," Demasi says. "Our expansions are part of the gradual process of growing our capacity for the future and will allow us to better serve our users around the world."

While Google users across the globe will benefit from the work that happens in the Jackson County data center, by having ensured access to ongoing quick, reliable search results, residents of Jackson County and Alabama will also reap large rewards.

For instance, the data center represents the first high-tech employer in Jackson County, and local leaders expect it to be a trendsetter. "While a lot of our residents work in high-tech industries in Huntsville and Chattanooga, we've never been known for high-tech jobs here," Rogers says. "But Google is often a leading indicator. We have a certified data center site, and we expect to develop a data corridor here."

"Google has established itself as the world leader in efficient data center technology," said Greg Canfield, secretary of the Alabama Department of Commerce, at the time of the announcement. "With the growing reliance on cloud computing projected to continue boosting the growth of data center operations, we think our relationship with Google will yield other opportunities in the future."

Site work has been completed and a 100-acre building pad has been poured at the Widows Creek site. Construction will begin this year, with hundreds of construction jobs to be filled, and the data center is expected to open in 2017.

For the full story, see February 2016 Business Alabama.

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Mercedes-Benz U.S. International, in Tuscaloosa County, in 1993, was the first of four automotive OEMs to locate in Alabama.

INCENTIVES RETOOLED

**New incentives freshen Alabama's array
of economic development tools**

BY CARY ESTES // PHOTO BY CARY NORTON

When Alabama reached into its economic incentive toolbox in the early 1990s, the state pulled out a hammer. On the strength of an incentives package worth nearly \$240 million, Alabama surprised most observers by becoming the site of the first Mercedes-Benz automobile assembly plant in the United States.

Two decades later, however, Alabama's incentive toolbox looked largely the same, while many of the neighboring states in the Southeast had come up with bigger and stronger hammers. So after several years of planning, the 2015 state Legislature approved new economic development

incentives designed to keep Alabama competitive when it comes to attracting and maintaining businesses.

"For years, Alabama was one of the most competitive states in the country, particularly in the Southeast," says Rick Davis, senior vice president of economic development for the Birmingham Business Alliance. "What's happened is, our sister states haven't been sitting back watching us win without doing something about it. They've gotten more competitive as the years have gone along. So we had to get stronger."

Alabama Commerce Secretary Greg

Canfield says his office began evaluating the situation nearly three years ago, and then started working with the Legislature to craft changes to the incentive packages being offered by the state.

"We found there were some shortcomings in our incentives and the structure of those incentives relative to many of our competitors in the Southeast," Canfield says. "So we entered into this process with three goals in mind: to create a set of incentives that were competitive, were sustainable and would help us achieve certain strategic objectives."

The changes passed in the 2015 Legislature primarily involve job credits, investment credits and abatements. For the most part, this legislation merely updated and improved many of the economic incentives the state has been using for years, Davis says.

"What this law did was tweak those incentives that were already on the books and made them more competitive," Davis says. "It gave us another way to leverage those incentives so we could compete on a more level playing field. It wasn't a significant overhaul of what we already had. It was more of a fine-tuning of some plans that were already good. We just made them better."

Here is a quick look at the new incentives, and what officials hope the changes will accomplish:

JOBS CREDIT

One thing Alabama was missing, says Canfield, was an incentive based strictly on the creation of jobs. Most of the incentives were based upon capital investment, and without that the state was having a hard time offering competitive incentives, even if the project included substantial job creation.

"And after all, one of our primary goals is to create jobs in the state of Alabama," Canfield says. "So with the Jobs Credit, we have for the first time an incentive that rewards pure job creation."

Under this incentive, a company that moves or expands into Alabama will receive a cash refund of up to 3 percent of the previous year's gross payroll. This refund can be paid annually for up to 10

years, but only after the company has been doing business in the state for 12 months.

“It’s competitive because, while there are other states offering similar types of job-creation tax credits, not all of them are doing so in cash. Some are just tax credits,” Canfield says. “And it’s sustainable because it is pay as you go. New jobs are created, and we collect and benefit from the economic impact of the payroll for 12 months before we pay that first incentive payment.”

INVESTMENT CREDIT

This is a reformulation of an older credit called the Capital Credit. Canfield says that program had so many limitations and regulations that site consultants began to refer to it as “the phantom credit.”

“On paper it looked like a company could achieve a very powerful tax credit for their new capital investment in a project,” Canfield says. “But in reality there were so many restrictions that most com-

panies were able to recover less than 5 percent over a 20-year period. So it had no real value in making the deal.”

The new Investment Credit improves those numbers to 15 percent over 10 years (1.5 percent per year). Credit can be taken against the Alabama income tax liability and/or the utility tax liability.

“We removed all those restrictions that the old Capital Credit had, giving it more value and making us more competitive,” Canfield said. “And it’s also sustainable, because prior to giving that credit, the company has to make the investment and formulate new capital in the state of Alabama.”

It includes an extra incentive for investment in very small counties.

REINVESTMENT AND ABATEMENTS ACT

While it is important to attract new business to Alabama, Canfield says the state cannot overlook the companies already here. Those companies need incentives to encourage capital improvements, he says, to prevent existing plants and facilities from becoming obsolete and eventually closing.

Under this act, the state will abate the non-educational sales and use taxes on construction materials and equipment used to upgrade an existing facility. In addition, property tax increases associated with the improvement can be abated for up to 20 years. For example, if a company makes a capital investment in an existing facility that increases the property valuation by \$10 million, that increase will not be part of the property valuation for 20 years. And any increase in utility taxes can be abated for 10 years.

“This is our first ever opportunity to incentivize existing industry in the state and provide them with an inducement to make new capital investment that is not tied necessarily to job creation,” Canfield says. “The goal is to make them more viable in the long term, and reduce the number of plant closures.”

Bill Taylor, former president of the Economic Development Partnership of Alabama, says these new incentives are essential for Alabama’s ability to offer packages specifically tailored to a company, rather than a one-size-fits-all approach.

For the full story, see February 2016 Business Alabama

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BIOTECHNOLOGY

Cancer research, plant genetics, medical devices, drug discovery and all the variations on those themes make up the fabric of a strong bioscience sector throughout Alabama.

Industry association BioAlabama counts some 660 bioscience firms and centers around the state, “spanning all sub-sectors of the biotech industry including agriculture, pharmaceuticals, medical devices, hospitals, research testing & medical labs.”

Those companies employ more than 13,000 people and are recognized for a host of achievements — including those at Southern Research, credited with discovery of seven cancer-fighting drugs in use today and six more in advanced testing.

Just since 2009, Alabama companies in the industry have been awarded more than 600 patents.

Researchers at the state’s universities, specialty labs, the massive Cummings Re-

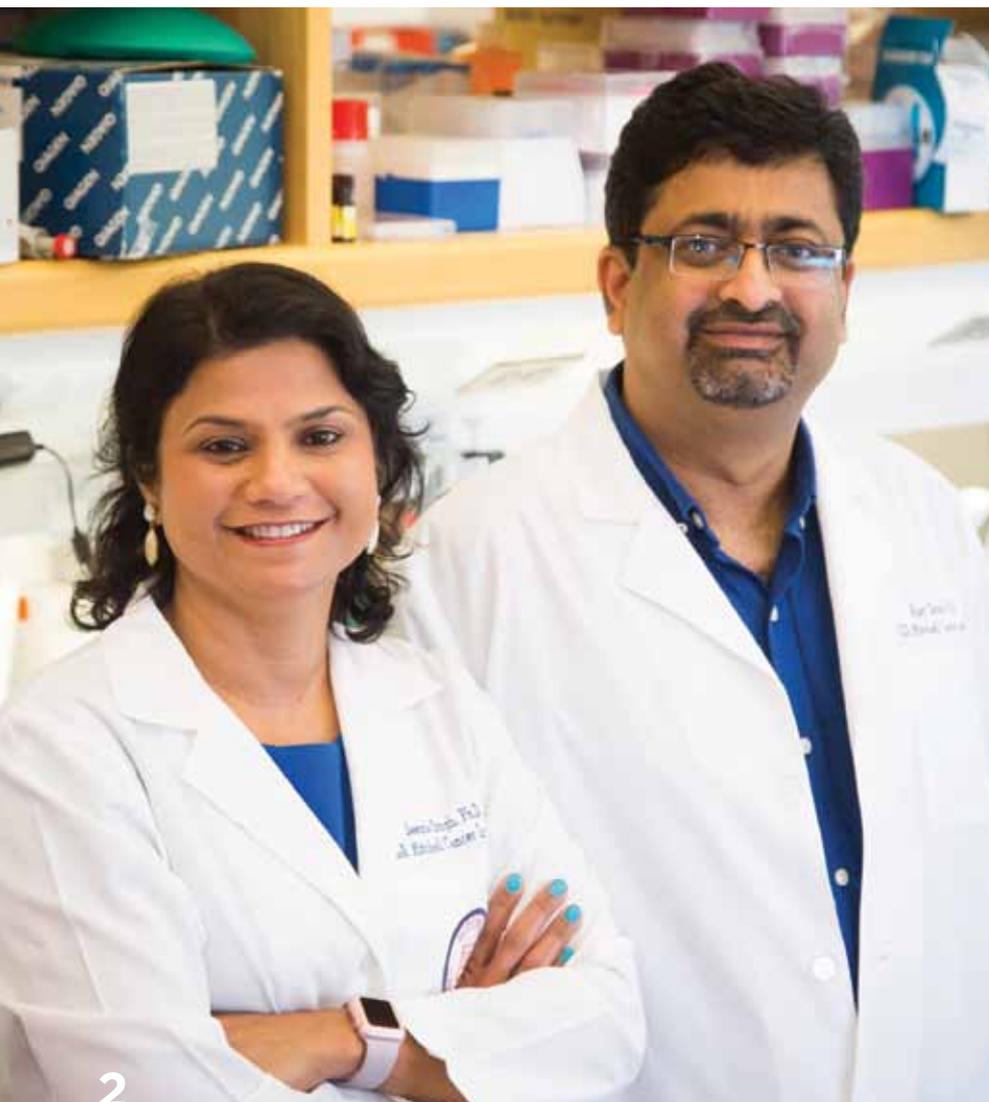
search Park and premier research centers — the HudsonAlpha Institute and Southern Research — continue to pursue some of the most advanced medical research in the world.

University of Alabama at Birmingham is the state’s premier biomedical research

HudsonAlpha Institute, in Huntsville, is a national leader in medical genomics, including work related to cancer, childhood genetic disorders and immunogenomics.



1



2

facility, winning more than \$270 million in funding from the National Institutes of Health, plus more from other sources.

Founded in 1941, Southern Research specializes in a wide spectrum of biomedical research in its own right, and it partners with the University of Alabama at Birmingham to research new drugs and bring medical devices to market. Among its most recent biomedical projects is a major effort to fight the Zika virus.

HudsonAlpha Institute, in Huntsville, is actively working on genomic research related to “cancer, neurological and psychological disorders, childhood genetics disorders, immunogenomics, and agriculture and bioenergy.” Founded in 2008, the nonprofit Institute fosters research and education, individual research and collaboration, academia and business. Researchers work on esoteric problems and practical solutions, applying the science of genetics to personalized, gene-based treatment of human disease, as well as developing crop plants that are stronger and more useful. From the inception, the institute has sought to not only study problems but also bring solutions to the marketplace.

Other top news in the sector included NIH funding for researchers at Mobile’s Mitchell Cancer Institute, working to prevent skin cancer. Scientists there also work to uncover the ways to detect the often-hidden cancers — ovarian and pancreatic — while they are easier to treat.

Evonik Corp. is creating a new research and development facility in Birmingham that will focus on medical devices and technology. It’s the German firm’s first R&D facility in the U.S.

Oxford Pharmaceuticals began work at its \$29.4 million manufacturing plant in Birmingham. The firm, based in the U.K, makes generic drugs in the new facility.

In Mobile, Bayer CropScience is building a new plant to produce components for the company’s herbicide Liberty, in partnership with Evonik’s Mobile plant.

1. A University of Alabama at Birmingham surgical team performed one of the first surgeries using a virtual augmented reality technology from VIPAAR.

2. Researchers Seema and Ajay Singh, Ph.D.s, at Mobile’s Mitchell Cancer Institute study biological factors that cause some cancers to attack minorities more aggressively.



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SETTING A NEW STANDARD IN HEALTH I/T

UAB's new Informatics Institute works to put the power
of big data into patients' medical records.

BY CHARLIE INGRAM // PHOTO BY ART MERIPOL



Dr. James Cimino grew up with computers, using them through high school, college and medical school. So imagine the exasperation when he started his medical residency at a New York hospital and discovered he had no computer at hand.

“I didn’t have a computer when I was doing my residency, and there were a lot of times when I thought I could do so much better if I had one.”

The 62-year-old Cimino got his wish and then some. He is now both a physician and a leading figure in computer applications in the health care field. As such, he is the inaugural director of UAB’s Informatics Institute, part of the university’s medical school.

At its core, the Informatics Institute is working to find better ways of organizing data — lots of data — in a way that is beneficial to patients, caregivers, researchers and other health industry professionals. It is also involved with teaching informatics and training the next generation of informatics experts.

“My definition of informatics is the art and science of capturing, representing, storing and reusing information,” Cimino says. “There is an art to it, maybe not an art as much as an instinctive application of domain knowledge.”

A major goal of UAB’s Informatics Institute is to improve the electronic health care record at UAB and, ultimately, everywhere. It’s a record that Cimino says is “a big commercial system, a multimillion-dollar system, very complex, and one that does a lot of good.”

But it isn’t perfect. “The electronic health record we have is really just the electronic form of the old paper record we had before,” Cimino says. “We’ve made some things better. The electronic record is easier to read than paper, and it’s easier to find the record than it was with paper.”

“But as we’ve developed these electronic systems, we’ve seen this huge influx of data from all these different sources, and we’re trying to make sense of that. We mostly have put it in folders like we did with the paper record and then give it to a doctor or nurse and say, ‘OK, here’s everything we know about the patient. Make sure you read everything and don’t miss anything important.’”

So, electronic paper records often give a physician tons of information but might not point out what the doctor or nurse re-

ally needs to know. That can be especially frustrating.

“If the computer knows what the physicians are trying to do, it can bring knowledge to the point of care,” Cimino says. “It can say, ‘Oh, I see where you think this fever is due to pneumonia and you are ordering this antibiotic. Well, here is the latest literature on the best antibiotic to use for community-acquired pneumonia.’ Computers can do that. They just don’t know when they’re supposed to.”

**If the computer knows
what the physicians are
trying to do, it can bring
knowledge to the
point of care.**
— Dr. James Cimino

“If we can tell them enough about what we’re thinking, they’ll go, ‘Oh, you must want this.’ We can do this in medicine. People have built programs to do this, but electronic health records just don’t know how to invoke this.”

The Informatics Institute is partnering with several other groups and universities. That includes Dr. Lucio Miele, a professor and head of the Department of Genetics at Louisiana State University’s School of Medicine, who points out that different kinds of electronic health records “don’t talk well with each other. So if you have multiple hospitals each using a different system, it is not straightforward to compare notes between hospitals.”

Together with different partners, UAB’s Informatics Institute is striving, in effect, to standardize data sets among different institutions and research groups to better pinpoint possible solutions.

Says Miele: “Once you identify, for example, how many cases of a certain type of cancer you have for a given region, you can then run clinical tests, both large cooperative clinical trials that include multiple academic institutions, as well as industry clinical trials.”

“The pharmaceutical industry wants to know before a clinical trial at a given site

or groups of sites how many people (cases) are out there that could be potentially enrolled in that trial to determine if it’s feasible. The only way to find that out with reasonable speed is to mine data in this manner. The data have to be collected, validated and stored in a standardized format, and Dr. Cimino is leading that effort.”

Prior to coming to UAB, Cimino was the chief of the Laboratory for Informatics Development at the National Institutes of Health’s Clinical Center and a senior scientist at the National Library of Medicine. He co-edited an influential textbook on informatics, *Biomedical Informatics: Computer Applications in Health Care and Biomedicine*.

That he wears two hats is a good thing. “When you put a physician with an understanding of how computers work in a position of trying to solve some of these problems, they solve in a different way than a physician with no computer background or a computer scientist would,” Cimino says.

“You have Information Technology people, and they can write computer programs, but if they don’t understand what’s happening in the real medical world, it’s going to be hard for them.”

Cimino and Miele agree that informatics bodes well for business. “There will be a lot of business opportunities to work with UAB in general and the Informatics Institute in particular as we develop new ideas that can be developed into new technologies,” he says.

Says Miele: “There are several business possibilities. One, it attracts industry-sponsored clinical trials. Second, it improves the effects of medicine, so it attracts higher-quality medical professionals to the region.”

“And, of course, developing better electronic health records is something that can eventually and possibly produce a template that can be used for electronic health records of the future, and that’s a very large business possibility,” says Miele. “So there are large implications for clinical research, clinical practice and for the informatics industry.”

For the full story, see September 2016 Business Alabama.

Dr. James Cimino, director of UAB’s new Informatics Institute, hopes to make health care records deliver information to the point of care.





ROBOTICS COMPLETE

Alabama's \$73 million Robotics Technology Park opens its third and final phase.

BY WENDY REEVES

PHOTOS BY DENNIS KEIM

Alabama's new Robotics Technology Park (RTP), which opened in 2016, is one of a kind, says Rick Maroney, project manager.

"It's a benchmark for every state in the U.S.," Maroney says. "All of our vendors tell us there's nothing else like it in the world."

The RTP is a collaboration among the state of Alabama, Alabama Community College System, AIDT and robotics industry leaders across the nation and world. The RTP consists of three training facilities, each targeted to a specific industry need. Located across the highway from the Calhoun Community College campus in Limestone County, the three buildings and the equipment they house represent an investment of approximately \$73 million.

"It is 100 percent industry driven," Maroney says. "What our industries here in Alabama need is what they get."

The RTP's mission is to provide a technically trained and highly skilled workforce for automation and robotics. It assists public and private entities in developing new robotics systems and technologies and promotes the creation, growth or expansion of companies through innovative technology solutions.

The RTP offers basic, intermediate and advanced training sought by the state's original equipment manufacturers, or OEMs, in fields like material handling, welding and more, says Ed Castile, executive director of the state's workforce training program, AIDT.

The third and final phase of the park is the 51,000-square-foot integration/entrepreneurial and paint/dispense training center — at a projected total cost of \$10 million.

The final, entrepreneurial phase of Robotics Technology Park offers a workshop to build and adapt automation for new and existing manufacturing processes.

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The integration/entrepreneurial section will provide Alabama businesses with floor space to build and adapt automation for new and existing manufacturing processes, then train staff on equipment processes before moving equipment into a plant.

The paint/dispense training part of the facility offers opportunities for Alabama businesses to train in manual paint spraying techniques, as well as training in robotic systems that dispense sealants and adhesives onto parts that are being assembled. It also can be used for dispense process research and testing.

Even before the final unit was complete, the state was getting queries about using it, says Castile. "We had two inquiries for the integration and entrepreneurial areas and we get weekly requests on dispense training."

The RTP also includes a robotic maintenance training center and a research and development center.

The research and development center houses four client suites. Each suite includes Internet access, phones, restrooms and environmental controls, along with raised access flooring in sectional panels, and a common high bay with two large

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Then there's the robotic maintenance training center, a 60,000-square-foot facility where technicians are trained in automation and robotics. Maroney says trainees get "hands-on" experience with the latest automation equipment.

It is staffed with trainers certified by OEM automation vendors and is also a southeastern U.S.-based training facility for several robotics manufacturers.

Castile says the park currently offers training on eight brands of robots and three brands of programmable logic controllers (PLCs) along with industrial safety.

In addition to the individual automation training, the RTP has developed an advanced automation line for advanced training in networking the various devices and automated equipment into one coordinated manufacturing line.

The 80-foot line includes seven robots, three PLCs, four Visions and automatic tools for calibrating, training and testing.

The automated manufacturing line can be used for material handling, welding and paint/dispense, overhead crane use and forklift safety.

When showcasing the facility to visitors, "Sweet Home Alabama" plays when the line completes a cart of product.

Even though he's been there from the initial site work in 2008, Maroney still uses the phrase "very cool" when guiding visitors through the facility, noting that every area is unique.

Most of the major automation equipment vendors that are used by Alabama industries are partners with the RTP and have provided about \$40 million in new automation and robotic technologies.

Maroney says he has a waiting list of vendors who want to put their technology in the center. "We've had welding companies premiere new products here before it ever goes on the market," he says.

Maroney says a lot of people have the misconception that robots are taking jobs from people.

"It's just not true," Maroney says. "Most people don't recognize that it takes a per-

son to program and a person to maintain the robots for the automated system to work," he says. "It's a more advanced process and is making billions of dollars in this state. If not for the robotics at the Mercedes plant in Tuscaloosa, it would not be expanding right now."

Castile says businesses have been responsive and reported that the park's training has been above their expectations.

"The successful training provided to Alabama's workforce makes it one of the best skilled workforces (in industrial automation) in the world," Castile says. "The economic impact has been great for new and expanding companies in all types of industry using industrial automation and not just the automotive sector."

"I see RTP continuing to evolve and focus on meeting the needs of Alabama businesses in the next five years," Castile says. "Any future expansion will be driven by the demands and needs of Alabama businesses."

For the complete story, see April 2016 Business Alabama.

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THE WORKFORCE OF TOMORROW

Dual enrollment programs place accomplished students in the workforce while they earn a degree.

BY CHARLIE INGRAM // PHOTOS BY ART MERIPOL



Benton Tice works with machine shop instructor Pat Murphy at Sylacauga High School.



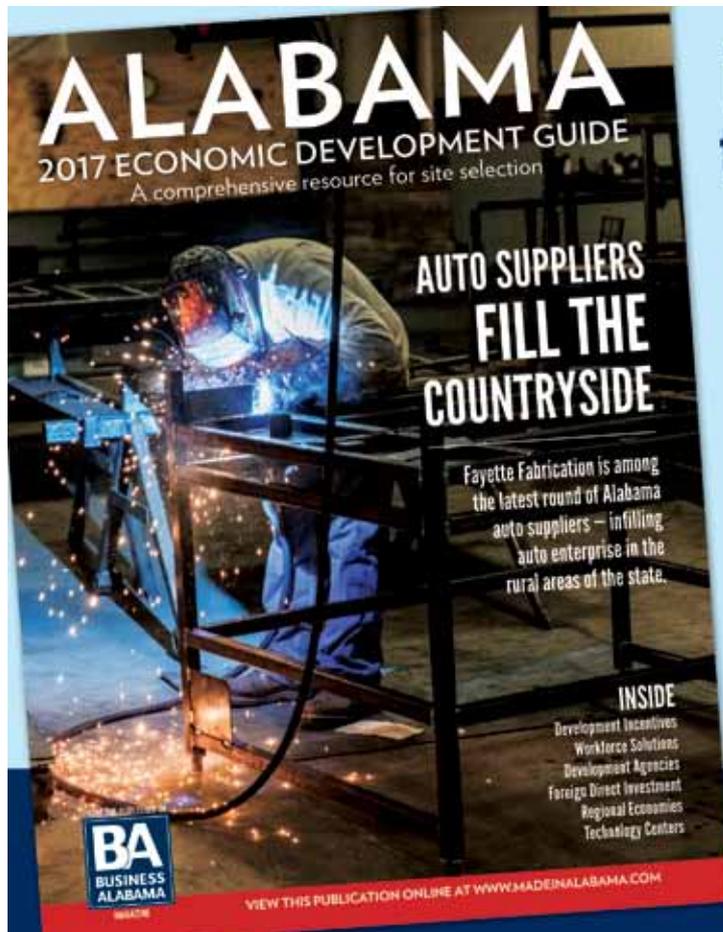
Honor student Benton Tice saw dual-enrollment machine shop classes as “a golden opportunity” to check out options in the workforce.

Going to a four-year university used to be an option for Benton Tice, a 17-year-old junior at Sylacauga High School. Instead, Tice has chosen a different career path that puts him on track for a good job, right out of high school.

Tice is in the Alabama Department of Postsecondary Education’s career-technical dual enrollment program, a partnership between high schools and the state’s community colleges, that allows eligible students to take college courses while still in high school. The courses are offered for free, so they are basically mini scholarships.

In addition to advanced placement English, history, chemistry and honors pre-calculus, Tice is currently taking a college-credit machining course. By taking two more college-credit courses this summer and another one in 2017, he will have earned a short certificate that would enable him to enter the work force upon graduation with expectations of making as much as \$15 an hour.

For now, Tice is uncertain exactly what his career goals are, but he is leaning toward machining work. “I had a golden



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Calhoun's economic impact to the region is significant. A report from the Alabama Community College System indicated that the College's local economic impact is \$279, 284,280, for a return on \$1 investment (ROI) of 12:1, the highest among the state's 25 two-year colleges.

As an institution on the cutting edge of providing excellence in teaching and service, Calhoun is home to many of the state's most innovative, cutting-edge programs which include the Alabama Center for the Arts, a project in partnership with Athens State University; and the Alabama Center for Excellence in Clean Energy Technology (ACECET).

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opportunity to take these classes and get credit for them,” he says. “It’s still early in the program for me, but I thought this would be a good way to look at my options and see what I wanted to do.”

A major purpose of the dual enrollment program is to provide Alabama companies with qualified candidates for jobs in manufacturing, construction, health sciences and other fields. These are positions that require some training and certain skills but not necessarily a four-year degree.

“I know it’s a cliché, but this really is the key to the future — for structuring our workforce in Alabama to meet the needs of the 21st century,” says Tim Alford, executive director of workforce development, a division of the Alabama Community College System. “This program is aimed at filling the so-called middle skills jobs because that’s where most of the job growth is expected.”

The program received a \$10 million appropriation for the current fiscal year, up from \$5 million the year before. In addition, tax credits are now available for donations to the program.

“We had \$10 million allocated in the

last legislative session, and we’re still in the process of seeing how much is enough,” Alford says. “I don’t think we’ve reached the saturation point with \$10 million; most of that has already been allocated for the current year. We’ll be looking at

“I always knew I wanted to go to college. I figured this was something I could do to get ahead.”

**— Logan Harrell,
nursing student**

this throughout the year, evaluating and adapting, (but) I see the tax credit not so much as a replacement as much as it’s something that will supplement and expand the program.”

More than 9,000 Alabama students are currently in the dual enrollment program.

“The appropriation has increased over the past three years because of the success and popularity of the program,” Alford says. “It’s a great thing for students and parents. It offers good career counseling and coaching, but there are entrance requirements and teacher recommendations and all those things involved. Not just anybody can sign up.”

Wyatt Wright, 19, spent two years in dual enrollment evening classes at Evergreen’s Reid State Technical College while attending McKenzie High School, which straddles Butler and Conecuh counties. He now works for McBurney Construction, a Georgia-based manufacturing, engineering and construction firm.

“I knew by the time I was a sophomore in high school, I wanted to learn how to weld, and the fastest way for me to learn and make a living was with the dual enrollment program,” Wright says. “I learned about all you could think of. When I was a senior in high school, as soon as I graduated, I went straight to work.”

Like others in the program, Wright says it isn’t for just anyone. “If you aren’t willing to actually bear down and do the work,

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there's no reason to go through this program," he says. "It isn't easy. If it was easy, anybody could do it."

Logan Harrell, 19, saw the dual enrollment program as a stepping stone to an eventual four-year degree. She recalls being sold on the program immediately after learning about it from representatives at Reid State and Greenville High School. "I was a junior in high school, about to be a senior, and they came to us that summer and asked if we wanted to participate," Harrell recalls. "I said, 'Heck yes.' The program was something different, and I always knew I wanted to go to college. I figured this was something I could do to get ahead."

“This job, this program, is really a job opener for people and can be a way for them to make it out and make a life for themselves.”
— Zachary Burt, Fort Dale Academy Student

Harrell enrolled in college courses her senior year. "We didn't have to pay for anything," she says. "The school got a grant, and they drove us back and forth every single day to Reid State from Greenville High School. From a financial standpoint, it was a big boost to take those college-credit courses I didn't have to pay for."

Harrell completed the practical nursing program at Reid State last spring and was salutatorian of her graduating class. She is working at L.V. Stabler Hospital in Greenville and plans to pursue an associate degree in nursing beginning this spring at Lurleen B. Wallace Community College in Greenville. She then plans to pursue a B.S. degree in nursing from the University of South Alabama.

She has high praise for the dual enrollment program and its instructors. "We kind of became our instructors' kids," she says. "They wanted to take care of us. They would wait for us to get off the bus at Reid

State, and they basically transitioned us from high school to college students.

"They really cared. They didn't force you to do anything. They kind of expected you to want to do it, but they didn't make it easy. They made you work for it."

Greenville's Zachary Burt, 16, is getting college credits for welding classes as a junior at Fort Dale Academy. He and a friend, also enrolled in the program, have already brainstormed about setting up their own shop, and they've also talked

about doing welding work needed on oil and natural gas pipelines.

"I think the area that I live in, well, it's kind of hard for people to make it out," Burt says. "This job, this program, is really a job opener for people and can be a way for them to make it out and make a life for themselves. It's a huge opportunity, and I think more people should be involved with it."

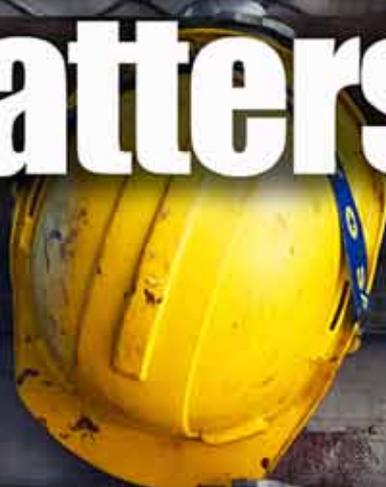
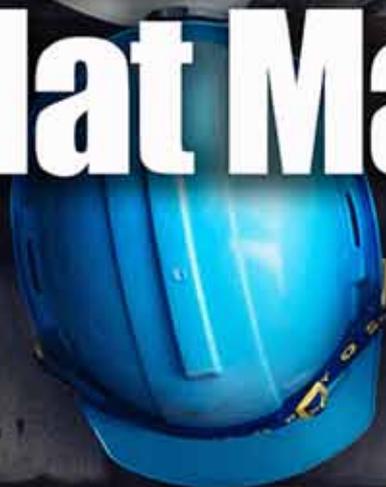
For the complete story, see January 2016 Business Alabama.

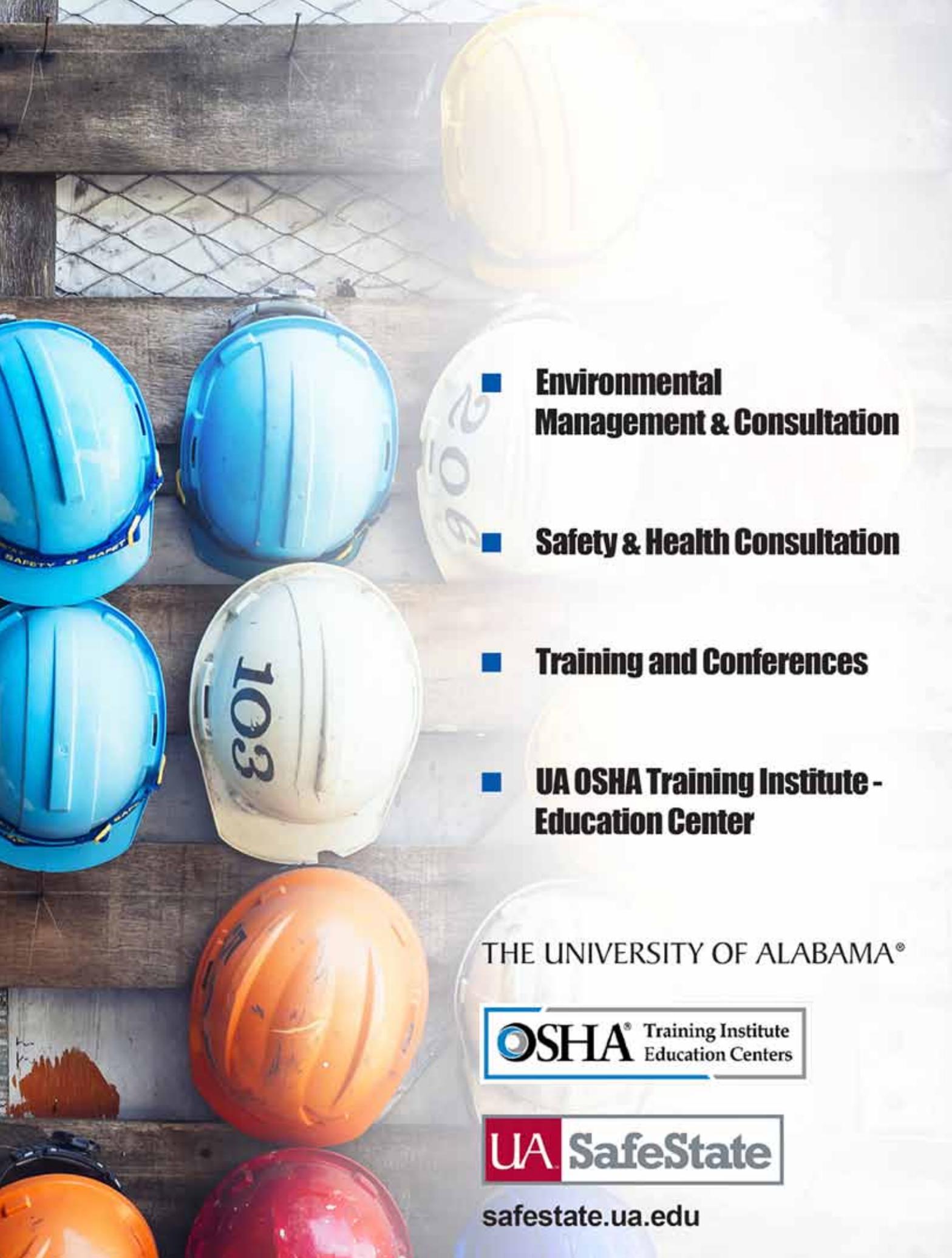
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With a major deepwater seaport plus planes, trains, barges and trucks, Alabama has long enjoyed strong trade connections with the world.

Vehicles led the parade of exports from Alabama again in 2015. Alabama-made vehicles accounted for some \$7 billion in exports — up 5.8 percent — and keeping international trade robust even though coal shipments, long a staple of the state's trade, were at record lows.

The Port of Mobile has long been the state's link to the world, and it continues that role today. And as international shipping changes, so does the Port. When the Panama Canal opened to newer, bigger ships this year, the port was already upgraded to handle the new post-Panamax ships.

The port connects to inland waterways criss-crossing the state and offering connections to the Midwest and beyond. Interstate highways serve the trucking industry. And international freight forwarder Panalpina makes direct connections to the world from Huntsville.

In 2015, Alabama exports totaled \$19.37 billion, despite a downturn in the global market for coal. But chemicals, paper, machinery, plastics, wood products and chicken parts are other key exports. Aerospace products and parts showed a 16 percent export gain to \$868 million.

“While Alabama exports held steady in 2015, U.S. exports overall were down 7.5 percent from the prior year,” the Alabama Department of Commerce reports.

Where does it all go?

Alabama has more than 200 export destinations. But Canada tops the list, taking \$4.1 billion in in goods, followed by China at \$3.2 billion, and Mexico at \$2.9 billion. Germany and the United Kingdom round out the top five destinations for Alabama's exports, with \$2.5 billion and \$610 million respectively. All top destinations had a gain for 2015 except Canada, which was down slightly.

“Alabama's exports remained vital last year in spite of turbulence in the global economy, which included a collapse in oil prices and a slow-down in China,” according to Alabama Secretary of Commerce Greg Canfield. “Exports of Alabama-made vehicles and parts continue to expand, underscoring the state's status as a major player in this international industry, while there were also meaningful gains in exports of aerospace parts, machinery and paper.”

To bolster international trade, the Department of Commerce sponsored trade missions, taking state officials and business owners abroad for face-to-face business exchanges. This year the state took part in the Farnborough Air Show, winning top honors for its stand, and also sponsored trade meetings in Mexico, South America and Japan.

FOREIGN DIRECT INVESTMENT

Alabama is also home to multitudes of international firms or foreign direct investment. International consulting firm Ernst & Young ranked Alabama in the top five states last year for new investment



Breakbulk poultry is loaded at the Alabama State Port Authority's Pier A Refrigerator/Freezer terminal operated by Seaonus. Eight to 10 ships a year, each laden with some 4,000 tons of poultry, leave the Docks headed for Cuba. *Photo courtesy of Alabama State Port Authority*

dollars — calculated at \$5.3 billion.

A 2014 study by the Global Cities Initiative, a joint project of Brookings and JPMorgan Chase, identifies 87,050 jobs in Alabama with firms that are headquartered overseas. In the previous 20 years, Alabama has moved up only one place in the rankings, from 24th to 23rd, but the number of jobs increased from 51,980 to more than 87,000.

Alabama Power counts 411 international firms from 30 countries doing business in Alabama. Thanks to the automotive industry, businesses headquartered in Germany, Japan, South Korea and Canada have the biggest presence.

But newcomers are power players.

The steel mills built by German firm ThyssenKrupp have been sold to Finnish firm Outokumpu Oyj, the world's leading producer of stainless steel, and to a joint venture of world's largest steel company ArcelorMittal, based in Luxembourg, and Japanese steel giant Nippon Steel and Sumitomo Metal.

Chinese firm Golden Dragon Precise Copper Tubing has opened in Wilcox County, the first major new industry there in decades.

Automotive and aerospace brought millions in international investment again in 2015, with the biggest investments from Germany, Canada, South Korea, France and Japan.



PORT OF HUNTSVILLE



Huntsville has historically been the hub of Alabama aerospace enterprise — the builders of spacecraft — but Huntsville also sets the pace for using aircraft to get things and people from one place to the other in record time.

Huntsville International features two parallel runways — 12,600 feet, which is the second-longest runway in the Southeast U.S., and 10,000 feet. It recently added 492,516 square feet of air cargo ramp space, increasing total air cargo ramp space to 2.3 million.

It is the 17th largest air cargo airport in the United States.

The Port of Huntsville opened in its current location in 1967. Since its inception, it has grown to more than 7,000 acres of land and three key units — the Huntsville International Airport (HSV), International Intermodal Center and Jetplex Industrial Park, which is the north Alabama home to a number of international aerospace companies.

Passenger service is provided by four commercial airlines, with more than 65 flights per day and ten nonstop destinations. More than 1 million customers are served annually.

Air cargo service at the Port of Huntsville exceeds expectations.

The Huntsville Airport Authority began promoting its cargo capacities in the early 1980s, with an air cargo ramp that had 50,000 square feet of cargo space. Those efforts culminated in a rail intermodal facility in 1986. The Port of Huntsville now has more than 300,000 square feet of cargo space.

Huntsville International Airport is the U.S. hub of Swiss-based international cargo carrier Panalpina. Since the arrival of Panalpina in Huntsville in 1990, the Port of Huntsville has invested \$146 million in infrastructure that directly relates to cargo operations. *Photos by Tyler Brown*

In 1990, Swiss-based international carrier Panalpina opened operations in Huntsville with one 747 flight a week, gradually adding flights over the years.

In 2010, its 20th anniversary in Huntsville, Panalpina announced the start of a Hong Kong-to-Huntsville service. Shortly after that, the carrier announced it was also adding Sao Paulo, Brazil, and shortly after that it announced a second Hong Kong flight, adding an outbound flight, making the service round trip. All that was on top of what Panalpina already had — five flights to and from Europe and two to and from Mexico.

Now Panalpina provides fully integrated and customizable supply chain solutions, and HSV is its hub in the United States. Panalpina's Huntsville Logistics Center serves many of the company's largest hi-tech customers in healthcare and the chemicals industries with temperature-controlled storage and transport capabilities. Advanced warehouse services, customizable IT enhancements and direct access to its road feeder service in Huntsville allow Panalpina to also provide last-minute solutions for needs of all customers.

Since the arrival of Panalpina, the port has invested — in FAA funding and its own financing — about \$146 million in infrastructure that directly relates to cargo operations. That figure includes a 2013 grant from the Federal Aviation Administration of more than \$15 million in discretionary funds to Huntsville International for improvements to its east runway — the largest grant HSV has ever received.

In recent years, the Port of Huntsville completed upgrades that make it operational for Group VI aircraft. Both the 12,600-foot west runway and 10,000-foot east runway meet requirements set for the 747-8s.

While the 747-8 has a payload increase of 16 percent over the 747-400 model, it has substantial reductions in fuel burn, noise and CO2 emissions. This Group VI aircraft boasts a 224-foot, seven-inch wingspan and measures 250 feet, 2 inches from nose to tail. The new model is 18.3 feet longer and 13 feet wider than the earlier 747 models.

The International Intermodal Center provides a single-hub location that delivers world-class multi-modal (rail, air and highway) services and facilities. Nationwide rail service is provided by Norfolk

Southern. The air cargo operations are handled by Panalpina, which has the only non-stop 747-8 freighter international air cargo service in the State of Alabama to Europe, Mexico, Asia and South America. These markets are currently served with 7 to 10 flights weekly.

This service helped elevate HSV to the 17th largest international air cargo airport in the U.S.

"Huntsville International Airport is part of a small group of U.S. airports

that have been FAA-certified to support these 747-8s," said Dr. Carl Gessler Jr., Huntsville-Madison County Airport Authority board member. "We share this distinction with cities like Miami, New York, L.A. and Chicago. Considering the size of our community as compared to the others on the list, this truly is an accomplishment for our region."

For more information, visit the port's website at www.hsvairport.org.



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*2015 New and Expanded Report, Alabama Department of Commerce



FOREIGN TRADE ZONES

Like an airport duty-free shop, Foreign Trade Zones offer businesses a place for international trade without the encumbrance of tariffs — a level playing field with international competitors.

The U.S. Department of Commerce designates FTZs, mostly near ports and major industrial sites. The designation allows companies within the zones to import foreign goods without paying any duty, store them, mix them with domestic parts, and convert them into new products for sale here or abroad.

The National Association of Foreign Trade Zones estimates in its 2016 annual report that some \$99.2 billion worth of goods were exported from FTZs in 2014, an increase of nearly 25 percent from the previous year.

“On the import side, FTZs have also continued to grow in their importance for U.S. production and distribution operations that rely on global supply chains to remain competitive. Foreign-status inputs to FTZs totaled \$288.3 billion in 2014, accounting for 12.1 percent of all foreign goods imported to

the United States. FTZ imports have tripled as a share of U.S. imports over the past two decades,” according to the NAFTAZ annual report.

“Foreign-trade zones continue to be hubs of manufacturing activity where domestic and foreign-sourced inputs are combined by American workers on U.S. soil to produce value-added final products for export and domestic consumption,” says Daniel Griswold, president of NAFTAZ until 2016.

Each of Alabama’s major cities — Mobile, Huntsville, Birmingham, Montgomery and Dothan — has an FTZ. State economic development officials estimate that 12,000 workers are employed in FTZ companies, making \$1 billion worth of products that are later sold overseas. Autos, ships, oil and chemicals are among the key products.

Several additional FTZs were added in 2015, including sites for Airbus Americas in Mobile, MH Wirth Inc. in Theodore, Toyota Motor Manufacturing Alabama in Huntsville and Outokumpu Stainless in Calvert.

Mercedes-Benz U.S. International’s site in Vance is highlighted in the NAFTAZ annual report, noting that: “The plant produces the M-Class, R-Class, GL-Class, C-Class and the GLE Coupe vehicles for 135 worldwide export markets. The FTZ operation employs 3,200 people producing approximately 232,000 vehicles in 2014. More than half the vehicles manufactured at the plant are exported to markets outside the United States, Canada, and Mexico.”

QUICK FACTS ABOUT ALABAMA'S FIVE MAJOR FTZs

Mobile. Administered by the City of Mobile, the southernmost FTZ covers 9,848 acres in several locations. Several international firms are located within the FTZ, while Evonik Degussa, Austal USA and Shell all benefit from smaller business-based subzones. The Mobile zone also has four sites in Baldwin County.

Huntsville. FTZ facilities are clustered on 1,700 acres around the intermodal center, plus another 1,000-acre complex at Mallard Fox Creek Industrial Park and the Port of Decatur. DaimlerChrysler has its own subzone in the Huntsville group, as do VF Jeanswear, General Electric and Toyota Motor Manufacturing Alabama.

Birmingham. Birmingham’s FTZ is scattered over seven sites including parts of AirportNorth/Northeast Industrial Park, Shaw Warehouse facilities, ACIPCO industrial area, Oxmoor Industrial Park, Birmingham International Airport’s air cargo facility, and Munger/Valley East. Industrial giant Mercedes-Benz has its own subzone in Vance, as do ZF Industries, JVC America and NACCO Materials Handling Group Inc.

Montgomery. Montgomery has more than 5,000 acres in four sites — near the airport and I-65, along the northern and eastern bypass, at the Airport Industrial Commercial Park and at Montgomery County Technology Park. Montgomery also has subzones for Hyundai Motor and Quantegy Inc.

Dothan. Dothan has six sites in its FTZ, with no industry-specific subzones. Dothan’s international commerce is handled by the airport and the port of Panama City, Florida.

The foreign trade zone at the Jetplex Industrial Park, in Huntsville, links industries and distribution centers with the air cargo port at Huntsville International Airport. North Alabama’s aerospace and electronics companies thrive on the connection.

ALABAMA STATE PORT AUTHORITY



Alabama's deepwater seaport, at the Port of Mobile, is located just 32 miles from the Gulf of Mexico and handled more than 64 million tons of cargo in 2014, making it the 9th largest U.S. seaport in total trade (U.S. Army Corps of Engineers Waterborne Commerce Statistics). The full-service public seaport terminals are owned by the Alabama State Port Authority and are served by major ocean carriers transiting Asian, European, Mediterranean, and Latin American trade lanes. In 2014 the tonnage handled by the Port Authority increased to more than 29 million tons of containerized, general cargo, dry and liquid bulk, frozen poultry, and oversized and heavy-lift cargo freight.

Since 2002, the Alabama State Port Authority has invested more than \$800 million in a capital expansion program that established new facilities at the Port of Mobile, including a new container terminal,

two new steel terminals, and a new Intermodal Container Transfer Facility (railed container intermodal). Expanding on the container intermodal investments, APM Terminals, the Port Authority's partner in container intermodal facilities has launched a \$48 million expansion at its marine terminal, adding two Super Post-Panamax cranes and new carrier calls at the facility.

The Port Authority's \$467 million capital program to expand facilities and services at the port include a new Ro/Ro Automotive Terminal, a logistics park at the container intermodal complex, and the rail interchange expansion. The public terminals are connected to two interstate systems (I-10 and I-65) and five Class 1 railroads — CSX, Canadian National, Burlington Northern Santa Fe (Alabama & Gulf Coast Railroad), Norfolk Southern and Kansas City Southern. The C.G. Railway offers shippers every four days waterborne connectivity to Southern Mexico's national railroad system between Mobile and Coatzacoalcos, Mexico (Veracruz Region).

WATER

The seaport is supported by a 45-foot draft ship channel currently serving New-Panamax traffic and two 40-foot draft channels serving the upper harbor and the Theodore Industrial Complex. Extending north from the port are more than 1,200 miles of navigable waterways in Alabama, among the most of any state in the nation, with lock and dam structures along the Tennessee-Tombigbee Waterway, Black Warrior, Coosa-Alabama and Tennessee rivers that provide access to not only Alabama's heartland but also to the Tennessee and Ohio valleys and the Great Lakes. The Port of Mobile is also accessible to the Gulf Intracoastal Waterway, providing shippers coastal connections from Texas to Florida.

RAIL, AIR AND HIGHWAY ACCESS

Five Class 1 railroads access the port — Burlington Northern/Santa Fe/ Alabama & Gulf Coast Railroad, CSX Transportation, Canadian National, Norfolk Southern and Kansas City Southern. Port linkage is provided by the Alabama State Port Authority's

The Alabama Port Authority's steel handling facility, the Pinto Terminal, applies innovation and technology to meet its 5 million-ton annual throughput capacity.

Photo by Todd Douglas



The Alabama Port Authority's 135-acre container terminal has 2,000 feet of berth at 45-foot draft, state-of-the-art container cranes. *Photo by Todd Douglas*

GENERAL CARGO

The Alabama State Port Authority offers 31 general cargo berths, with approximately 2.4 million square feet of open yards adjacent to piers and railroad tracks, and more than 2.6 million square feet are under roof. The general cargo facilities also feature heavy-lift terminals, along with a heavy-lift crane capable of lifting cargo up to 400 tons from ship to barge, rail, truck or specialized carrier. Other facilities include a freezer terminal, a cement terminal, a grain terminal and three RO/RO berths, all of which can accommodate vessels up to 40-foot draft.

STEEL

Investments in the Authority's steel handling facilities are contributing to Alabama's rapid growth in the steel market. The highly automated Pinto Terminal applies innovation and technology to meet its 5 million-ton annual throughput capacity. The termi-

nal has a 45-foot draft, a 1,050-foot-long ship berth, an automated barge handling system and a slab storage yard. The terminal is equipped with three post-Panamax gantry cranes, which are the first in North America to use magnet technology in a ship-to-shore cargo handling operation. In addition, the Port Authority in early 2015 opened a new steel coil handling facility. The \$36 million, 178,200-square-foot steel coil handling warehouse and 168,000-square-foot open yard are served by rail, truck, barge on a 40-foot-draft ship dock and four 50 ton bridge cranes. Other steel terminal investments include an \$18 million enhancement program at its Pier C North terminal to handle both inbound and outbound carbon and stainless steel articles.

COAL

The McDuffie Coal Terminal is the most versatile facility in the nation, with import/export handling capability to ship, barge and rail transportation. More than \$120 million has been invested in new ship and yard equipment, automation and new rail facilities to increase export throughput to 16 million tons annually. Overall investments at McDuffie have generated annual import and export throughput capacity to 30 million tons.

APM TERMINALS MOBILE / CONTAINER INTERMODAL INVESTMENTS

Phase 1 of the new, 135-acre container terminal has 2,000 feet of berth at 45-foot draft, state-of-the-art container cranes and fully automated gates providing an annual throughput capacity of 350,000 TEUs (20-foot equivalent units). APM Terminals has announced that its \$48 million Phase II expansion program will begin in 2016 to increase the capacity to 800,000 TEUs. Ocean carrier services on most trade lanes are provided by Maersk, CMA CGM, COSCO, Evergreen, China Shipping (CSCL), Mediterranean Shipping Company (MSC), and ZIM. APM Terminals Mobile represents the first leg in the Authority's 380-acre Choctaw Point intermodal project, which includes an intermodal rail transfer facility and development land for logistics. The Port Authority completed its \$36 million, Phase I intermodal container transfer facility (ICTF) in April 2016. The Canadian

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ECONOMIC IMPACT
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THE PORT
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INTERNATIONAL TRADE

National provides container intermodal rail service for containerized cargo shippers to the Midwest and Canada. The new ICTF is accessible to all five Class I railroads serving the Port of Mobile.

RAIL FERRY TERMINAL

The Authority's Terminal Railway operates a rail ferry terminal that provides rail shippers twice weekly sailings into the Veracruz region of Mexico. The CG Rail Terminal is the first of its kind, with a twin-deck design for quicker loading. The ships can haul 120 standard rail cars per voyage without loading and unloading cargo, shaving nearly two weeks off the typical rail services into Mexico. The service provides four-day rail service between Mobile and Coatzacoalcas, Mexico.

TERMINAL RAILWAY

The Port Authority's Terminal Railway provides service between the five Class 1 railroads serving Mobile and the port authority's terminals. It handles more than 150,000 revenue-producing rail cars annu-

ally and maintains more than 75 miles of track and eight locomotives. The Terminal Railway is the largest port authority owned and operated railroad in the nation, providing direct access to seaport terminals, including general cargo and container berths, McDuffie Terminals, the Bulk Handling Plant and private industries located as far north as the Port of Chickasaw and as far south as the Alabama State Port Authority's Intermodal Container Transfer Facility (ICTF).

INLAND PORT FACILITIES

To take full advantage of Alabama's waterway system, which comprises nearly 1,500 navigable inland barge miles, the Alabama State Port Authority owns 11 inland dock facilities that can be served by either barge or rail. The facilities are located throughout the state's river systems — at Bridgeport on the Tennessee River; Demopolis, Tuscaloosa/Northport and Cordova on the Warrior River; Claiborne, Selma and Montgomery on the Coosa Alabama River; Columbia, Eufaula and Phenix City on the Chattahoochee River, and at Axis on the Mobile River.

PORT FACTS - 2015

Acreage: 4,000

Number of Berths: 41

Channel Depth: 45 Feet on the lower harbor; 40 Foot in the upper river harbor

Warehousing and Open Yards: 4.8 million square feet

Number of vessel calls: 1,446

Revenue Producing Rail Car Movements: 151,231

Tonnage: 25.3 million

Containers: 231,408 TEUs

Revenue: \$144.8 million

Imports: heavy lift and oversized cargo, containerized cargoes, coal, aluminum, iron, steel, copper, lumber, woodpulp, plywood, fence posts, veneers, roll and cut paper, cement and chemicals

Exports: heavy lift and oversized cargo, containerized cargoes, coal, lumber, plywood, woodpulp, OSB, laminate, flooring, roll and cut paper, iron, steel, frozen poultry, soybeans and chemicals



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ALABAMA ECONOMIC DEVELOPMENT INCENTIVES

“Alabama has one of the most competitive business climates in the nation,” says the Alabama Department of Commerce. And the fact that tax incentives are statutory — part of the state’s Constitution and Codes — “gives industry a stable framework for long-term investment.”

Citing Alabama’s tax burden as among the lowest in the nation, the Economic Development Partnership of Alabama says, “Alabama is one of a small number of states that allow a full deduction of federal taxes paid from state income tax liability.” That provision drops an actual 6.5 percent corporate tax rate to an effective rate of 4.5 percent, lower even than any of its Southern neighbors.

Here’s a quick look at major tax incentives and credits:

JOBS ACT INCENTIVES

- **Jobs Credit.** Annual cash refund up to 3% of the previous year’s gross payroll for up to 10 years.
- **Investment Credit.** Credit of up to 1.5% of the qualified capital investment costs for up to 10 years. Credit can be taken against the Alabama income tax liability and/or utility tax liability. Credit is available for up to 15 years for companies in targeted counties selling their output nearby.

ALABAMA REINVESTMENT AND ABATEMENTS ACT

- **New Facility and Expansion.** (1) Abatement of non-educational portion of sales and use taxes on construction materials, and (2) Abatement of non-educational portion of property tax for up to 20 years. May also qualify for Jobs Act Incentives.
- **Existing Facility: Refurbishments, Upgrades, or Placed Back in Service.** (1) Abatement of non-educational sales and use taxes on construction materials and equipment, (2) Abatement of non-educational property taxes for up to 20 years of

the incremental property tax increases, (3) Exemption from taxes for increased utility services for up to 10 years, and (4) AIDT worker training. May not apply for Jobs Act Incentives.

- **Property Tax Abatement.** New and expanding businesses can abate all of the state and local non-educational portion of the property taxes on all real and personal property incorporated into a qualifying project, for up to 20 years. Data processing center projects can receive an extended abatement up to 30 years, contingent on total capital investment in a project.
- **Sales and Use Tax Abatements.** Companies can abate all state and the local non-educational portion of the sales and use taxes on the acquisition, construction and equipping of a qualifying project. Data processing center projects can receive an extended abatement associated with constructing and equipping a project, including refresh, for up to 30 years, contingent on total capital investment in a project.
- **Full Employment Act Credit.** Employers with less than 50 employees are eligible for a \$1,000 nonrefundable income tax or financial institution excise tax credit for each qualifying job created.
- **Heroes for Hire Credit.** Employers meeting the requirements for the Full Employment Act are eligible for an additional \$1,000 nonrefundable income tax or financial institution excise tax credit if the employee is a qualifying veteran.
- **Net Operating Loss Carryforward.** Companies may carry forward any operating losses for up to 15 years.
- **Alabama Enterprise Zone Credit.** Credits and exemptions based on numbers of employees for businesses locating in depressed areas of the state.
- **Income Tax Education Credit.** Allows an employer to take a tax credit for 20 percent of the cost of an employer-sponsored program to improve basic skills through high school level.

Here’s a quick look at financing incentives:



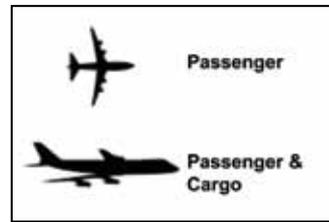
State incentives helped leverage Mercedes-Benz’s September, 2015 announcement of Project Gateway — a \$1.3 billion expansion of its Alabama plant that created 300 new jobs.

- **Industrial Development Grants.** Local governments and authorities can receive state grants to help businesses with the cost of site preparation. These grants are available to industrial, warehousing and research firms or headquarters facilities for other types of firms.
- **Industrial Revenue Bonds.** Tax-exempt bonds up to \$10 million can be issued covering all or part of the cost of land and building acquisition, construction, furnishings and some soft costs.
- **Alabama Infrastructure Grant Program.** Helps finance water, sewer and road facilities.
- **Alabama Industrial Access Road and Bridge Program.** Helps finance the roads and bridges needed to connect public roads to industrial projects.
- **Certified Capital Company Program.** Provides financing for projects considered to be too risky for conventional financing options.

More Information: Alabama Department of Revenue, Alabama Department of Commerce and other state agencies.



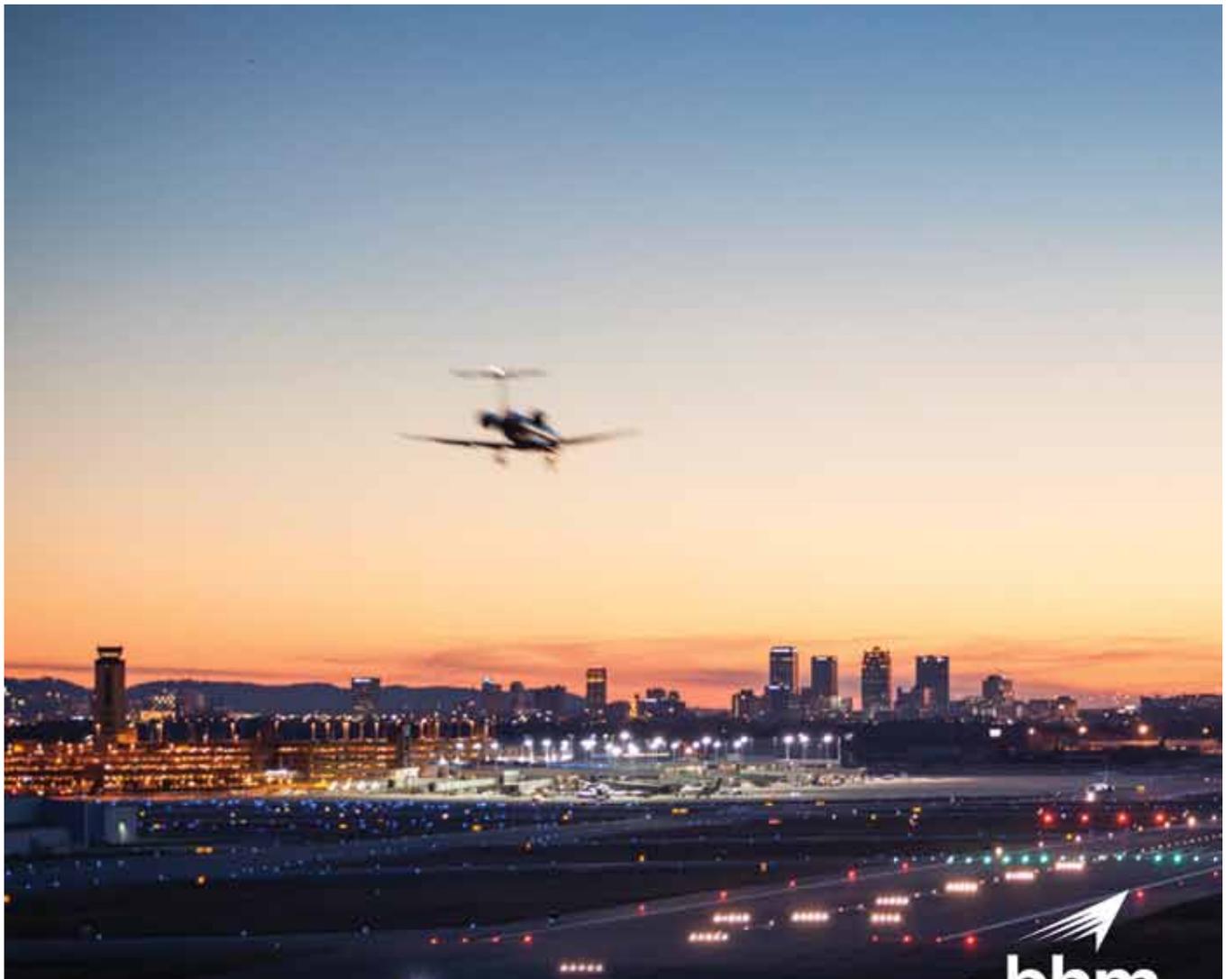
ALABAMA COMMERCIAL AIRPORTS



MAJOR ALABAMA HIGHWAYS



Source: Center for Business and Economic Research,
The University of Alabama



\$1,000,000,000 in Annual Economic Impact

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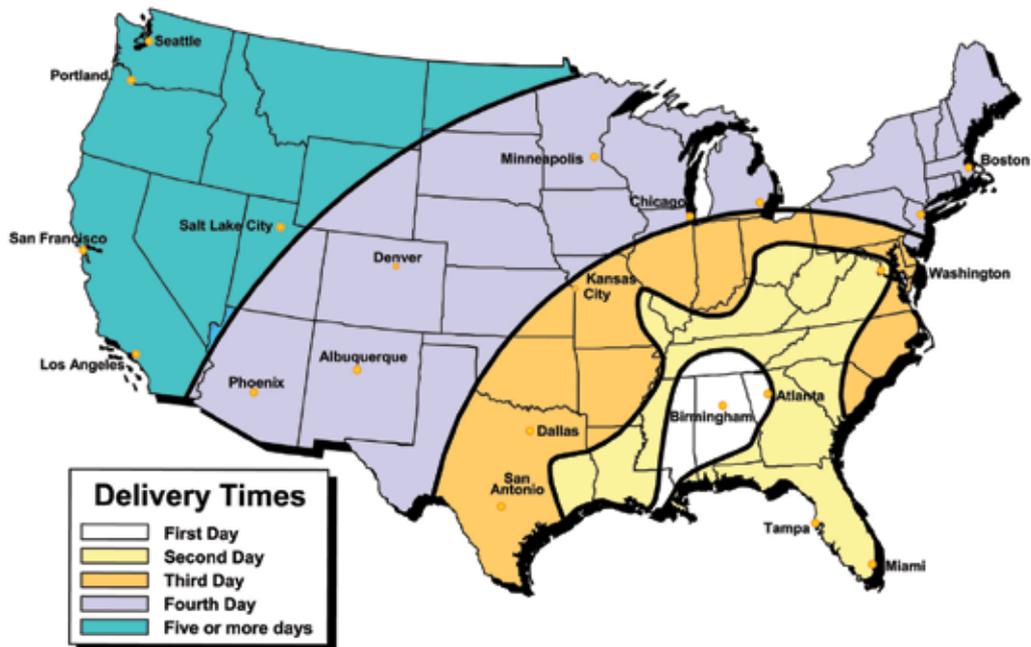
ALABAMA MAJOR RAIL SERVICE



Alabama offers
4,728 miles ~ 7,608 kilometers
of railroad track serviced by
five Class I railroads

- Federal Interstate Highway System
- Burlington Northern
- CSX Transportation
- Kansas City Southern
- Norfolk Southern
- Canadian National

RAIL DELIVERY TIMES



ALABAMA'S WATERWAY SYSTEM



ALABAMA DEPARTMENT OF COMMERCE

Alabama's lead economic development agency



Left: Hyundai Alabama President and CEO J.H. Kim and Gov. Robert Bentley tour the Hyundai plant in Montgomery. Below left: At work in Montgomery's Hyundai plant. Photos by Jamie Martin, courtesy of the Governor's Office



In Alabama, economic development is a team sport, and the Alabama Department of Commerce is the quarterback. As the state's lead economic development agency, Commerce coordinates and supports the strategic efforts of its allies across Alabama to secure new investment and jobs. Commerce's project managers travel the world to make connections and pursue projects in

key sectors such as aerospace, automotive, and bioscience. Its expanded Workforce Development Division is playing a vital role in ensuring businesses in Alabama have the skilled workers they need.

Commerce and Alabama's economic development team have built a winning record. During 2015, economic development activity in the state yielded projects involving more than \$7 billion in new capital investment and 19,200 new and future jobs. Mercedes-Benz, Google, Polaris, Equifax, GE Aviation, and Lockheed-Martin were among the industry leaders announcing projects in Alabama last year. Consulting firm Ernst & Young's "U.S. Investment Monitor" ranked Alabama among the Top 5 states for new capital investment and foreign direct investment in 2015.

Under the direction of Commerce Secretary Greg Canfield, the department works with economic development partners across the state to achieve the objectives of Accelerate Alabama, the state's first strategic economic development growth plan. Since 2012, when Governor Rob-

ert Bentley adopted Accelerate Alabama, activity has been strong across the state, with companies from around the globe announcing projects with nearly 75,000 jobs and more than \$20 billion in new capital investment.

Accelerate Alabama identifies key industry clusters whose growth prospects and characteristics make them ripe targets for recruitment by the state's economic development team. These sectors include aerospace/aviation, agricultural products/food products, automotive, chemicals, forest products, primary metals/advanced materials, and bioscience. An update of Accelerate Alabama is now in the works that will include a more robust focus on knowledge-based jobs in fields such as R&D, engineering, and design.

Commerce's economic development activities today are tightly aligned with the state's key workforce development initiatives, enhancing the state's competitiveness by streamlining the process for prospects. AIDT, the state's highly regarded job-training agency, represents the core of Commerce's new Workforce Development Division. Other primary state workforce programs are also part of the division, whose goal is to act as a sort of one-stop shop for worker recruitment and training needs.

Commerce's overall objectives are to identify prospects that can broaden Alabama's economic base and create jobs for its citizens, attract domestic and foreign investment, expand international trade and Alabama exports, facilitate small business growth, and attract film projects to the state.

KEY CONTACT

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Managing economic incentives and community development grants

Alabama Department of Economic and Community Affairs was created by the Legislature in 1983. Under the leadership of former Prattville Mayor Jim Byard Jr., ADECA distributes hundreds of millions of dollars each year to Alabama cities, counties, non-profit organizations and others to support economic development projects, infrastructure improvements, job training, energy conservation, law enforcement, traffic safety, recreation development and assistance to low-income families. All ADECA investments support the agency's mission to "Build Better Alabama Communities."

Three ADECA grant programs are often used to help Alabama communities with economic development projects:

- **Community Development Block Grants** are funded through the U.S. Department of Housing and Urban Development and support local efforts to attract and prepare for new or expanding industries, rehabilitate neighborhoods, provide water and sewer service or fund other infrastructure improvements that support business development or enhance the quality of life. The majority of the funds are awarded annually on a competitive basis, but a portion of the allocation is kept in reserve for economic development projects that help industries and businesses locate and expand in communities and provide jobs. In 2015, ADECA received a total of 123 competitive applications from small cities, large cities and county, community enhancement and planning organizations across Alabama. ADECA awarded a total of 57 projects totaling \$18,862,839.

- Grants from the **Appalachian Regional Commission** are awarded to encourage economic development and improve the quality of life of Alabamians living within 37 north Alabama counties considered part of the Appalachian mountain region. Sixty-eight projects were funded in fiscal year



Gov. Robert Bentley joined members of the town of Hackleburg in July 2015 to cut the ribbon on the newly restored Hackleburg Market, the Marion County community's grocery store, which was destroyed by tornadoes that struck central Alabama in 2011.

2015 for a total of \$13,184,371 invested in ARC counties.

- **Delta Regional Authority** is another state-federal partnership that encourages the development of new jobs and helps with basic community improvements in a rural region that includes 20 counties primarily in the Black Belt region of south Alabama. ADECA partnered with DRA in 2015 to fund nine projects totaling \$1,109,082. In 2017, Governor Robert Bentley will serve as the DRA States' Co-Chairman. Since being elected in 2011, he has served twice in this position and worked with ADECA to highlight needs and opportunities for the region.

ADECA also manages two recreational programs, the Land and Water Conservation Fund and the Recreational Trails Program, to fund parks and recreational facilities that attract tourists who boost local economies by patronizing hotels, restaurants and shops. Ten projects were funded in 2015 with the Land and Water Conservation

Fund, representing almost \$1 million. The RTP invested \$1.6 million for 15 projects in Alabama.

Launched in 2012, the department administers a \$31.3 million State Small Business Credit Initiative program designed to increase access to capital for small businesses at financial institutions participating in the program. Businesses with up to 500 employees are eligible to participate. More than 550 businesses have taken advantage of the program to help finance projects ranging from a coal mining operation to a coin-operated laundry.

Other ADECA programs support state and local law enforcement, traffic safety, juvenile justice, victim services, home weatherization and energy conservation. The department also helps manage the state's water resources and distributes state and federal surplus property. All of these programs combined make ADECA a vital partner in maintaining and improving the quality of life in Alabama.

KEY CONTACTS

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AIDT ALABAMA'S WORKFORCE TRAINING AGENCY

Workforce development provided by AIDT is among the strongest incentives for businesses choosing to locate or expand in Alabama.

Alabama has one of the strongest workforce training programs in the world, in support of Alabama's commitment to new and expanding industries.

AIDT has long been recognized among the nation's top workforce training programs by industry observers. AIDT's pre-employment training program holds an ISO 9001:2015 certification for quality and continuous improvement.

AIDT has assisted new and expanding companies in recruiting, selecting and training more than 700,000 job seekers. AIDT training typically produces a workforce that employers recognize for high performance achievement — a result of both the technical assessment and training AIDT trainees receive and the process by which they are selected.

From automotive to aerospace and logistics and warehousing to biomedical, AIDT researches and identifies the needs of each company served and uses that information to develop a full range of technical pre-employment selection programs uniquely customized to each company.

In a continued effort to meet the needs of industry, Alabama has embarked on an aggressive plan to open regionalized Workforce Centers of Excellence, managed and operated by AIDT. The Alabama Workforce Training Center in Birmingham is designed to meet the growing needs of companies engaged in the manufacturing and construction industries in north and central Alabama. And the Montgomery Regional Workforce Training Center provides entry-level training, employee



upgrade training, two-year technical college level training, and K-12 career training to adequately supply businesses with a trained workforce for the Montgomery region.

AIDT SERVICES INCLUDE:

- Identification of needed employee skills and knowledge, training criteria and curricula content definition, and required behavior and performance criteria the company expects of employees.
- Recruitment of trainee candidates for potential employment. AIDT interviews and enrolls applicants in training that are acceptable to the company.
- Provides program development, instructors, equipment, consumable supplies, and training aids such as manuals, workbooks and videos. All AIDT services are provided at no cost to trainees or employers.
- Job seekers who meet the selection criteria designed by AIDT and the employer are enrolled in job specific, pre-employment training for detailed as-

AIDT opened the 3rd phase of the Alabama Robotics Technology Park last April. The Integration/Entrepreneurial and Paint Dispense Training Center provides space and training that promotes economic growth through either training and/or space for manufacturing process integration.

assessment of attitude, character, work ethic, literacy, teamwork and technical learning ability.

A division of the Alabama Department of Commerce, AIDT also provides leadership development, on-the-job training, industrial maintenance assessment and industrial safety assessment. Leadership development conducted by AIDT is designed to develop and retain quality leaders, improve retention and create loyal and dedicated employees. Industrial maintenance and safety assessment services help identify candidates best qualified for effective and efficient operations through corrective and preventive maintenance of equipment and processes.

KEY CONTACT

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ATN ALABAMA TECHNOLOGY NETWORK

Experts in technical assistance and innovation work directly with Alabama's existing industry to increase productivity, profitability and competitiveness.



The Alabama Technology Network provides the most innovative technical assistance and training to continually improve Alabama's businesses and industries.

As part of the Alabama Community College System, the network's 19 sites are located at 15 community colleges and the state's three research universities — Auburn University, the University of Alabama and the University of Alabama in Huntsville. ATN's team of experts helps solve the needs of industry and business through innovative, sustainable, cost-effective solutions. ATN can conduct de-

tailed needs assessments, outline potential solutions based on the results, and then provide technical assistance to help you solve those problems or identify those who can. Services include lean enterprise, quality services training, continual improvement methods, environmental health and safety training, industrial maintenance training, sustainability in manufacturing, and innovation engineering.

According to 2015 independently conducted customer surveys, ATN helped retain and create 1,852 jobs, helped increase and retain sales totaling more than \$267

million, generated workforce investments and saved costs totaling over \$40.9 million.

ATN is an affiliate of the National Institute of Standards and Technology's Manufacturing Extension Partnership, which provides hands-on assistance and training to smaller manufacturers.

In addition to its training services, ATN partners in presenting the Alabama Manufacturer of the Year awards. These awards recognize the state's top manufacturers, in three size categories, for their accomplishments.

KEY CONTACT

Keith Phillips, Interim President || Alabama Technology Network || PO Box 302130 || Montgomery, AL 36130-2130
1-877-428-6457 toll free || www.ATN.org

EDAA ECONOMIC DEVELOPMENT ASSOCIATION OF ALABAMA

An association of professionals committed to Alabama’s economic development



Jim Searcy, executive director of EDAA, and Regina Pickron, executive assistant, work to foster the collaboration that attracts and supports business. *Photo by Robert Fouts*

Economic development can have a multitude of meanings, but at its core, it is a collaborative effort between businesses, communities, organizations and government agencies. Since 1968, the Economic Development Association of Alabama (EDAA) has facilitated that collaboration in an effort to both attract new investment to the state and work to expand those companies that are located here. EDAA provides a forum for discussion of specific issues affecting economic development and

provides programs, training and expertise to create successful development programs. The EDAA membership of 450 consists of individuals involved in economic development from many different areas and disciplines. EDAA members are economic development professionals, attorneys, engineers, architects, state agency personnel, utility employees, bankers, contractors, real estate agents and educators, municipal and county officials.

A voluntary member association, EDAA conducts workshops and seminars covering the ideas, principles, practices and ethics of economic development. Most of the EDAA educational programs focus on enhancing the skills of economic development professionals by providing them with new tools to address the challenge of remaining one of the nation’s top states in economic development. Additionally, EDAA works with other organizations in the state to improve Alabama’s economic development environment. Strategic alliances with the Alabama Department

of Commerce, Alabama Department of Economic and Community Affairs and the Economic Development Partnership of Alabama enable EDAA to provide its membership with substantive skills.

EDAA is diligent in addressing state and federal legislation and regulatory issues impacting economic development in Alabama. With a full-time lobbying presence when the Alabama Legislature is in session, EDAA is a leader in forming economic development policy and legislation for its members. Legislative efforts on the state level in recent years have seen EDAA lobby for competitive and sustainable economic development incentives, adequate funding for state recruitment efforts and worker training programs and to defeat legislation that would pose a threat to Alabama’s economic development effort. EDAA actively seeks innovative solutions to challenges that could negatively impact the state’s economic development efforts.

EDAA holds multiple networking opportunities, provides members with a quarterly Economic Development Journal, publishes a membership directory, conducts two major conferences each year, and holds quarterly workshops. EDAA is also a partner with Auburn University’s Government and Economic Development Institute (GEDI) in conducting the Economic Development Leadership Institute. Additionally, EDAA is working with the University of Alabama’s Economic Development Academy to offer an Applied Economic Development Honors program.

The EDAA Leadership Institute represents a partnership between EDAA and GEDI to educate and engage elected officials, ED board members and other community leaders about key issues in economic and community development.

For more information contact:
EDAA (334) 676-2085

KEY CONTACT

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Montgomery, AL 36104 || (334) 676-2085 || Fax: (334) 676-2087 || info@edaa.org || www.edaa.org

EDPA ECONOMIC DEVELOPMENT PARTNERSHIP OF ALABAMA

A private, non-profit organization, EDPA works with companies looking to locate or expand within the state and assists companies and communities within the state to improve their competitiveness.

For more than 20 years, the Economic Development Partnership of Alabama has been a catalyst for economic growth in the state. During that time, the Partnership has been involved in Alabama's greatest economic development successes. A totally private, non-profit organization, EDPA is uniquely positioned to partner with state, local and private entities involved in Alabama's economic development efforts. In 1993, EDPA assisted in the effort to attract Mercedes-Benz.

EDPA provides services to businesses looking to locate in the state, encourages emerging business development and assists companies and communities that want to improve their competitive edge.

EDPA is supported by more than 60 leading companies from various sectors that are committed to the state's long-term economic growth. The organization's board of directors is comprised of top business leaders in Alabama.

By aligning its resources with the Governor's Office, the Alabama Department of Commerce and key state agencies and institutions of higher learning, EDPA works to market Alabama and to provide prospective companies a smooth site selection process and tools for a sustainable operation in Alabama.

EDPA actively assists companies searching for a location.

Equally as important, EDPA works to provide resources and networks for existing industries and communities in Alabama.

To encourage innovation, commercialization and emerging business develop-



ment, EDPA works closely with institutions of higher learning in the state. The Partnership joined with state research universities to create Alabama Launchpad, which hosts competitions to fuel the development of high-growth companies in Alabama and an annual conference that celebrates the achievements of innovation and entrepreneurship in the state.

By participating in collaborative efforts in Alabama, EDPA works to foster a co-

Steve Spencer, president of the Economic Development Partnership of Alabama.
Photo by Gary Tramontina

operative spirit among the diverse organizations involved in the many areas that affect the state's growth.

In April 2016, after a successful 37-year career with Alabama Power Company, Steve R. Spencer became the new president of EDPA.

KEY CONTACT

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NAIDA NORTH ALABAMA INDUSTRIAL DEVELOPMENT ASSOCIATION

The North Alabama Industrial Development Association (NAIDA) is a 66-year-old regional economic development organization formed to assist in the creation of quality jobs in the thirteen counties that are served by the distributors of TVA electric power.



The North Alabama region has a highly diversified industrial economy. Since the 1950s when chemical companies began to locate in North Alabama to the 1960s when the Saturn V rocket was designed, built, managed and tested here, the region has continued to grow with more and more advanced manufacturing. The North Alabama region now has over 2,000 manufacturing companies from various industry sectors. Of course, chemicals and aerospace/defense continue to be strong in the region. Over 70 chemical companies include 3M, Ascend, Daikin, Hexcel, OCI, Occidental Chemical and Toray. The aerospace companies include Boeing, Lockheed Martin, Raytheon and ULA (United Launch Alliance). ULA continues the tradition of building rockets in North Alabama with the Delta II and IV, the Atlas V and soon, the new Vulcan rocket platform.

The automotive sector is strong in North Alabama with over 100 automotive companies centrally located to the Southern OEMs. Rehau, a Mercedes supplier, has recently

opened an R&D facility here, their first outside of Germany. Toyota Motor Manufacturing produces almost 3,000 engines per day and will soon surpass the 5 million engine mark. This is the only Toyota facility in the world producing four-cylinder, V6 and V8 engines under one roof. TS Tech has completed a 125,000-square-foot expansion. Polaris is now in production, manufacturing their popular Ranger side-by-side and their radical new 3-wheeled Slingshot.

More than 65 plastics companies operate in North Alabama. Polyplex and Asahi Kasei recently completed construction on their new facilities and North American Lighting (NAL), after several expansions, is employing 1,500.

Alloys/Metalworking companies such as Carpenter Technology, Constellation, Freight-Car America, Nucor Steel, and Progress Rail also find success in North Alabama.

The HudsonAlpha Institute for Biotechnology and its 30 associate companies are the shining stars for the Life Sciences sector.

HudsonAlpha has added \$1.7 billion to the economy in eight years.

Other new additions to our diverse economy include a \$600 million Google datacenter and a \$200 million GE investment producing unique SiC and CMC materials for the aviation industry.

Following are some of the reasons companies here in North Alabama flourish:

- Twelve institutions of higher education (5 four year, 7 technical/community colleges).
- The Robotics Technology Park provides robotic maintenance training to Alabama companies at no charge.
- North Alabama is served by the robust TVA electric power system. Rates are lower than 2/3 of the top 100 utilities in America. Since 2000, the TVA system has delivered 99.999 percent transmission reliability.
- Three interstates, numerous four-lane highways and two mainline railroads
- Two commercial airports. Huntsville International provides direct flights to major cities and air cargo to international destinations and offers an intermodal facility. US Customs and Border Patrol are located on site, in addition to FTZ #83.
- Five ports along the navigable 202 miles of the Tennessee River with access to the Gulf and Midwest.

North Alabama is a growing vibrant region and proven location, with a McCallum Sweeney-Certified Megasite, 12 AdvantageSites, six Primary Data Center Sites, five speculative buildings along with other available sites and buildings.

For site location assistance, please call 256.353.9450 or visit www.naida.com.

KEY CONTACT

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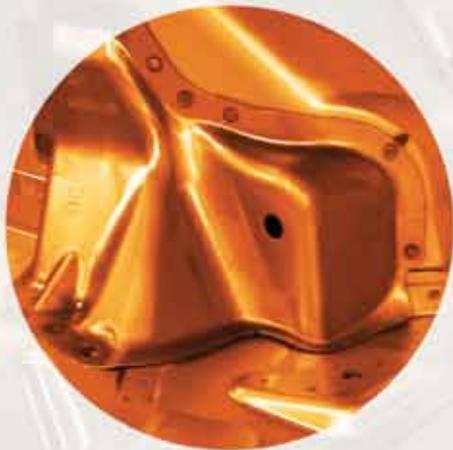
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