

Military And Aerospace Impact on the State of Alabama

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Military and Aerospace Impact on the State of Alabama

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Prepared for
The Alabama Military Stability Foundation

The Military Stability Foundation and Lieutenant Governor Will Ainsworth, Chairman of the Alabama Job Creation and Military Stability Commission, commissioned UAH to perform this economic impact study of the Aerospace and Defense industry on the State of Alabama.

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Executive Summary

The defense and aerospace industries play a significant role in Alabama’s economy. The presence of the US Army and Air Force installations within the state are major contributors to Alabama’s defense and aerospace industries. There are five active installations located in the state:

- Anniston Army Depot and Fort McClellan Training Center
 - Fort Rucker Army Base
 - Maxwell Air Force Base and Gunter Annex
 - Redstone Arsenal
 - Aviation Training Center
- Fort Benning*, an Army installation in Georgia, which borders with Alabama, has a significant impact on Alabama

In addition, other defense and security related agencies are located throughout the state that support these installations.

Table 1 Total Impacts of DoD Activities by Region 2019			
Category	Employment	Payroll (In Millions)	Output (In Millions)
Anniston	13,102	\$1,000	\$2,124
Birmingham	2,583	\$146	\$581
Coastal	21,331	\$1,022	\$3,051
Fort Rucker	28,865	\$2,730	\$9,039
Maxwell-Gunter	26,706	\$1,901	\$6,266
Redstone Arsenal	143,156	\$13,202	\$27,272
Fort Benning*	4,346	\$151	\$472
Aerospace	63,258	\$4,251	\$17,369
State	264,780	\$19,309	\$50,318

Determining the economic impact of the defense and aerospace industries, and its contribution to the overall success of Alabama's economy, is the focus of this research study.

Table 1 presents a comprehensive summary of the total impacts of all the regions. The table displays the total economic impact in terms of employment, payroll and output for all the regions, as well as the aerospace industry. For instance, the total employment impact in the Anniston Region is 13,102. The total payroll impact is \$1 billion and the total economic impact on output is \$2.1 billion.

Study Highlights

The purpose of this study is to illustrate the level of significance of the U.S. military and aerospace industry to the economy of Alabama —specifically in terms of employment and contribution to the state's Gross Domestic Product (herein referred to as output). Fiscal year 2019 is selected for the analysis based on both the availability of complete data and its predating the impact of the pandemic response in 2020 and 2021.

The size of Alabama's economy is more than \$231 billion, according to the Bureau of Economic Analysis. The total impact of output from the activities of the DoD performed in the state is \$50.3 billion, accounting for 21.8% of Alabama's economy.

The state of Alabama is divided into economic regions. Each region's economic impact is analyzed in the study.

The *Anniston Region* consolidates the Army Depot and the Fort McClellan Training Center and Center for Domestic Preparedness. This region's economy is more than \$14 billion. The total impact of \$2.1 billion in the region due to DoD spending, is 15% of the Anniston Region's economy.

The *Birmingham Region* does not host an active military base but is home to the National Guard's 117th Air Refueling Wing, which is also analyzed under the National Guard section of the report. The region's economy is \$75.8 billion. The total impact due to the activities of DoD in the region is \$581 million and has a small (less than 1%) impact on the Birmingham Region's economy.

The *Coastal Region* hosts the Aviation Training Center (ATC), which is analyzed under the Coast Guard section of the report, and the Naval Marine Corps Reserve Center. This

region's economy is \$35 billion. The DoD activities in this region resulted in over \$3 billion, which is nearly 9% of the Coastal Region's economy.

The *Fort Rucker Region* has Fort Rucker, an Army base located in Dale County in southeast Alabama. The region's economy is \$13.4 billion. The total impact due to the activities of the DoD in the region is \$9 billion, representing 68% of the Fort Rucker Region's economy.

The *Maxwell-Gunter Air Force Base Region* is world-renowned for training leaders for the Air Force. The region's economy is nearly \$30 billion. The total impact due to DoD activities in the region is \$6.3 billion, accounting for 21% of the Maxwell-Gunter Air Force Base Region's economy.

The *Redstone Arsenal Region* is the largest region and spans most of north Alabama. This region's economy is over \$53 billion. The total impact due to DoD activities in the region is \$27.3 billion, accounting for 51% of the Redstone Arsenal Region's economy.

Fort Benning, an active Army base in Georgia, has an impact in Alabama's Lee and Russell counties. The two Alabama counties provide housing and amenities to active-duty military members and military civilians and fulfill contracts for DoD. The combined two-county region economy totaled \$8 billion. The total contribution from these military activities in Lee and Russell counties account for almost 6% of the local combined economy.

The *Aerospace Industry* in the state of Alabama integrally connects to the defense industry. Many aerospace companies receive contracts from DoD to fulfill defense needs. The total impact of the aerospace industry is over \$17 billion. It contributed 7.5% of Alabama's total economy.

Other Highlights Include

Independent Areas are not associated with an active military installation, nor can these areas be attached to a region since the contracts in these counties serve the entire military. Counties are grouped to obtain impacts and have a small impact on the state. These independent areas had a total economic impact of \$56 million, accounting for 1.2% of the areas' GDP.

The National Guard has a presence in the entire state. The total spending impact of the National Guard is over 1% of the State GDP at \$2.4 billion.

The United States Coast Guard also has a presence in multiple locations across the state. While the US Coast Guard is part of the Armed Forces, it is the only branch that is under the Department of Homeland Security. The total economic impact of the Coast Guard is slightly under half a percent of the economy of the state.

Small Business Innovation Research, Small Business Technology Transfer, and Grants are mechanisms that DoD uses to foster innovation and development in the form of grants and awards to small businesses and universities. The total impact of these grants and awards resulted in \$782 million awarded to Alabama companies, which is 0.34% of Alabama's economy.

I. Introduction

Military in Alabama

The state of Alabama ranked among the top ten states for total defense spending at \$16 billion in 2019, according to the DoD. With 6.9% of total Gross Domestic Product (GDP) of the state coming from defense spending, Alabama also ranked third among all states for defense spending as a percentage of GDP, according to the report, *Defense Spending by State* released by the DoD. Therefore, it is imperative to have a comprehensive understanding of the impact that United States military spending has on the State of Alabama's overall economy.

Alabama has a long history of supporting the DoD with active military installations like Anniston Army Depot (ANAD), Fort McClellan Training Center (FMTC), and Pelham Range, all of which fall in the Anniston Region. Then there is the Army Aviation Warfighting Center at Fort Rucker in Dale County, Maxwell Air Force Base and Gunter Annex in Montgomery, and Redstone Arsenal in north Alabama. The Sumpter Smith Air National Guard Base is located at the Birmingham-Shuttlesworth International Airport and houses the 117th Air Refueling Wing. The 187th Air Force Wing and other National Guard units, and the US Coast Guard also have facilities in multiple locations throughout the state. The Naval Marine Corps Reserve Training Center and the Coast Guard's Aviation Training Center (ATC) in Mobile add to this presence.

The defense sector is integrally associated with the aerospace industry. Alabama has more than 300 defense and aerospace companies from over 30 countries located within the state. Companies like The Boeing Company, Lockheed Martin, Raytheon, General Dynamics, Collins Aerospace, and GKN Aerospace have a major presence in Alabama. In addition, Airbus, which produces A320 family passenger jets in Mobile, and added the A220 aircraft production line in 2019, has recently announced plans to open a third assembly line.

Purpose of Study

The purpose of this study is to estimate the contribution of the defense industry in different regions of the state of Alabama. These contributions are quantified in terms of employment, payroll, and total output (in terms of dollars). The economic activity is categorized into military personnel and

contract dollars that flow into the state. Military expenditures are based on contracts awarded by the Department of Defense (DoD) and can serve multiple installations within the state.

This study also estimates the economic impact of the aerospace industry, including aviation manufacturing and services in the state. The aerospace industry is inextricably entwined with the defense industry, and it is nearly impossible to delineate what is attributable to defense and what is purely aerospace. Much of the spending in the aerospace sector comes from contracts awarded by DoD. While the space sector aims to land on Mars, for example, it also supports the DoD with missile components.

Military spending is an important component in Alabama's economy. The initial spending by the DoD has a ripple effect in the economy, generating several types of economic impact. This spending initiates the placement of orders by the military installations for materials, which then establishes a supply chain of companies to provide these services. This leads to what is known as the *Indirect* impact. The payroll for the defense industry personnel combined with the spending generated by the supply chain leads to spending on household goods and services, which is classified as an *Induced* impact. The multiplier impact shown within this study combines the Indirect and Induced impacts to simplify the analysis. So, the multiplier impact of an initial \$1 spent (Direct) by the military in Alabama can generate more than a \$1 increase (multiplier) in the output for the state.

Economic impact studies are performed at different levels as is done in this study. At the state level, this economic impact study provides an overall macroscopic view of the impact of aerospace and defense spending. Data on regional and local economic impacts such as county level studies offer a smaller, more focused perspective and provide more in-depth analysis of how the impact affects local industries.

The employment impact represents full-time equivalent employees hired by entities, labeled direct jobs. Entities that conduct business with the main entities account for indirect jobs, and employees providing goods and services to direct and indirect employees generate induced jobs.

Payroll impacts are based on compensation received by employees. Compensation, overtime, benefits, etc., are included in payroll but can be included in operating and other expenses depending on how each firm classifies benefits. While not perfect, payroll is a good estimate of the impact of payroll in the local economy.

The economic output impact represents the value of the contribution to the economy by the entities included in the study. At the state level, the total value added is the Gross State Product, or the GDP for the State.

Note that if the study area is smaller, the impact estimates are less precise due to employees commuting and spending outside the region and even across state and county lines. An economic impact study can provide a better understanding of the region despite these limitations. The analysis helps to understand how local industries interact and contribute to the economy.

Economic impact studies are often performed to estimate activities or any changes that happen in a certain period to not only understand the needs of communities but to better plan economic success. These studies have been in use for many years and while the tools to conduct these studies and technology have improved tremendously, there are still caveats and it remains an inexact science. The assumptions used to construct the models influence the results directly, and attention needs to be paid to the assumptions. These models and multipliers are based on historical data over many years. Consequently, dramatic changes in a study region's economy will not accurately be represented.

Contract values shown in the tables are in current dollars or 2022 dollars. Output deflators multiplied by the contract values of 2019 results in contract values in current dollars. Output deflator is a price index that adjusts prices to reflect the values for a particular year. Output deflators vary with sectors and regions. 2019 data is used in this report due to the full availability of data. However, the impact on the economy is an annual representation.

Organization of Report

This report is organized into several sections that focus on different regions. The total impact in each region is followed by the breakdown between military employment and DoD contracts and any other additional information. Section II analyzes the impact on the state of Alabama. Domestic and international flows are also analyzed in this section.

Section III elaborates on the regional analysis. The state is organized into regions depending on the major military installation that is geographically close to that region. A few regions serve multiple military installations. Section IV focuses on other state-level impacts. This includes analysis on Fort Benning, which is located in Georgia but close enough to Alabama to have

economic effects within Alabama. The National Guard and the Coast Guard are analyzed at the state level since there are multiple locations of these units spread across the state. Shipbuilding industry is analyzed at the state level since contracts for shipbuilding is executed in many counties across the state. Section IV analyzes SBIR/STTR awards and grants at the state level. Finally, Reserves, Military retirees, and employment trends are reported in Section IV.

Section V analyzes the aerospace industry. Section VI details the data collected and methodology, followed by a list of terminology and acronyms used in this study. A detailed explanation of IMPLAN along with the assumptions of the model are listed in Section VI. Section VII lists acknowledgements and provides a list of data sources.

II. State of Alabama

Introduction

Alabama plays an integral role in the defense of the United States. All branches of the military are represented in the state. There are five active military installations in Alabama, including three Army bases, one Air Force base, and one Coast Guard base. The three Army bases include Fort Rucker, Redstone Arsenal, and Anniston Army Depot, along with the Fort McClellan Military Training Center (a National Guard facility). Maxwell-Gunter Air Force base is located in the capital city of Montgomery, and the Coast Guard base is the Aviation Training Center in Mobile.

Table 2.1 shows the total impact of DoD activities in the state. The total impact of military personnel and all the contracts that are performed in Alabama is \$50.3 billion, from a direct spending of \$33 billion with \$17.3 billion from the multiplier impact. The direct employment is 148,762 and another 116,018 jobs from the multiplier impact leads to a total employment impact of 264,780 jobs.

Table 2.1 Total Economic Impact of Military in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	148,762	116,018	264,780
Payroll	\$13,983	\$5,327	\$19,309
Output	\$32,982	\$17,335	\$50,318

Note: Totals may not tally due to rounding

Alabama has a Gross Domestic Product (GDP) of \$231 billion and a population of 4.9 million. The total impact of DoD activities in the state accounts for 21.8% of the state GDP. With Alabama’s annual average employment at 1.6 million, about 18% of the workforce contributes to the defense industry. The total impact on payroll is \$19.3 billion.

Anniston Army Depot, located in the Appalachian Mountain Region, is a tank rebuilding facility. It is the only Army depot that performs maintenance and repairs on both heavy and light tracked combat vehicles. Anniston Army Depot (ANAD) is also home to the Center for Domestic

Preparedness (CDP), and Fort McClellan Training Center (FMTC) – the major Army National Guard training facility that provides year-round training facilities, ranges, and maneuver areas for the National Guard.

The major commands at Fort Rucker include: US Army Garrison Fort Rucker, US Army Aviation Warfighting Center, US Army Combat Readiness Center, US Army Warrant Officer Career Center, US Army Aviation Technical Test Center, and Aviation Center for Logistics Command Aeromedical Center. US Air Force helicopter pilots and students from all over the world also train here.

Maxwell-Gunter is an Air Force base with an aviation history that includes the first civilian flying school established by the Wright Brothers. The primary focus of Maxwell-Gunter is training the future leaders of the Air Force at Air University. Established in 1946, Air University offers various levels of education for military personnel. It also hosts the 42nd Air Base Wing, which supports Air University. The leadership training at Air University serves all branches of military, but its primary mission is to serve US Air Force officers, enlisted members, and civilians.

Redstone Arsenal, initially a chemical warfare plant, is now the core of the US Army's missile and rocket programs. It is home to the US Army Materiel Command, US Army Aviation and Missile Command (AMCOM), the Space and Missile Defense Command, several units of the Missile Defense Agency, the Defense Intelligence Command, and Program Executive Offices (PEO). The Arsenal specializes in research, testing, development, repair, maintenance, and purchase of rockets and missiles for the US Army. Marshall Space Flight Center (MSFC), a NASA center, is located in Redstone Arsenal along with 70 other offices, agencies, and Commands. Though the Federal Bureau of Investigation (FBI) has been at Redstone Arsenal since the 1970s, it is now building a new state-of-the-art campus to enhance its training programs and focus on cyber threats intelligence, analytics, and changing threats.

The Aviation Training Center (ATC) at the US Coast Guard base is a unit of the eighth district, Sector Mobile. The Eighth District is responsible for Coast Guard activities, such as search and rescue operation, law enforcement, and logistical missions, across 26 states and along the coastline from Florida to Mexico, including offshore activities and some of the inland waterways. Pilots in the Coast Guard are trained here, and the ATC ensures pilot certification.

Dannelly Field is a joint civil-military public airport and is the Montgomery Regional Airport. It is home to F-16 Fighting Falcons used by the 187th Fighter Wing of the Alabama Air National Guard and to three commercial airlines. The 187th Fighter Wing is preparing to transition from F-16 aircraft to F-35 aircraft. The Alabama National Guard Army Aviation Support Facility is located on the south side and is primarily focused on helicopter operations.

The following section provides the economic impacts of military personnel and DoD contracts that make up the total economic impact.

Analysis

Military personnel such as active-duty personnel, Guard and Reserve personnel, rotational personnel, trainees, and cadets all contribute to the Alabama economy.

Table 2.2 Economic Impact of Military Personnel in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	63,597	32,743	96,340
Payroll	\$7,134	\$1,418	\$8,552
Output	\$15,991	\$4,853	\$20,844

Note: Totals may not tally due to rounding

Table 2.2 shows the economic impact of military personnel in the state as a whole. With 63,597 military personnel, the total employment impact is 96,340. The total impact of output of military personnel is \$20.8 billion including a multiplier impact of \$4.8 billion. The total impact on payroll is almost \$8.6 billion.

Table 2.3 shows the total economic impact of DoD contracts in the state of Alabama. The direct spending due to DoD contracts in the state is \$17 billion. The total economic impact of DoD activities in the state due to contracts is \$29.5 billion including \$12.5 billion in multiplier impact. Contract spending leads to a direct employment of 85,165 employees, and with a multiplier impact of 83,274, a total impact of 168,439 jobs. The total impact on payroll due to contracts from the DoD is \$10.8 billion.

**Table 2.3 Economic Impact of Contractors in the State of Alabama
(in Millions except Employment)**

Impact	Direct	Multiplier	Total
Employment	85,165	83,274	168,439
Payroll	\$6,848	\$3,909	\$10,757
Output	\$16,992	\$12,482	\$29,474

Note: Totals may not tally due to rounding

The businesses in Alabama receive contracts from all over the country and the world. The total value of contracts performed in Alabama is over \$16 billion, and Alabama based companies received about 73%. The value of the contracts received by companies based in Alabama is over \$11.5 billion. Approximately 780 companies in Alabama received contracts from the DoD.

Contracts from all 49 other states and at least 3 foreign countries (Israel, Canada and the United Kingdom), were performed in Alabama. These contracts were awarded by DoD and funded by DoD and other federal agencies, such as Department of Homeland Security (DHS), Corps of Engineers (USACE), Department of Veterans Affairs (VA) and the National Aeronautics and Space Administration (NASA).

Domestic Inflows

Location of recipient firms of DoD contracts are listed by the state in which they are legally registered. However, the place of performance of the contract could be in a different state. For instance, M1 Support Services, one of the largest recipient of contracts in the Fort Rucker region is a Texas based company (that is, the legal business address is in Texas). M1 Support Services is also located in Alabama and complete some of the contracts here in Alabama. Alabama companies are companies that have a legal business address in Alabama.

The total value of all DoD contracts performed in Alabama in 2019 is \$17 billion. Alabama companies received \$11.5 billion or 73% of those contracts. Contracts awarded are for a wide variety of products. Aircraft landing equipment, guided missile components and machine tools, to name a few. From ammunition and bolts to optical scanning and medical laboratory testing, the broad diversity of products that the DoD supports strengthens the industry base in Alabama.

Companies that have a legal business address in other states that receive contracts performed in Alabama account for over \$4.2 billion in spending. Over 1,900 companies that received contracts have them fulfilled in Alabama. Many companies have established offices in Alabama as well. 780 companies in Alabama received contracts from the DoD in 2019.

Companies with a legal business address in 49 other states receive contracts performed in Alabama. Virginia and Texas, followed by Maryland, California, and Alaska received the highest value of contracts fulfilled in Alabama.

More than fifty counties within the state receive contracts. 78% of the contracts are performed in the Redstone Arsenal region, and the Coastal region performed another 10%.

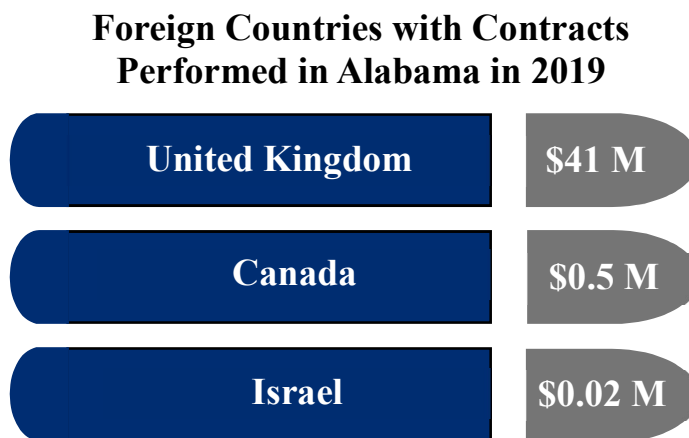
Top 10 States that received contracts performed in Alabama



International Inflows

Companies with legal business address in foreign countries receive contracts from DoD, but the place of performance is in Alabama. These countries and companies are included in the appropriate regions. Of all contracts with a place of performance in Alabama, 0.24% of the value goes to foreign entities. In reference to contracts received by companies not in Alabama, international and domestic, 0.9% of the value goes overseas. The following section shows how this component is distributed outside of the United States.

International companies that performed contract work in Alabama are United Kingdom (UK), Canada, and Israel, with the UK contributing the largest value.



International companies that receive contracts from DoD and fulfill them in Alabama are shown in Table 2.5, with BAE Systems Global Combat Systems Ltd receiving the largest share, 98.7%. The contracts received by BAE Systems are for maintenance and repair of tanks and armored trucks used in combat, and their primary focus is in the Anniston Region.

Other international companies from various countries are located in Alabama and perform tasks for the defense industry and are captured in the indirect impacts. These companies may not directly obtain contracts from DoD. Some foreign companies have U.S. offices or get subcontracts and are not represented as foreign companies. International companies that receive contracts that ended before the study period or have received contracts since are not represented here.

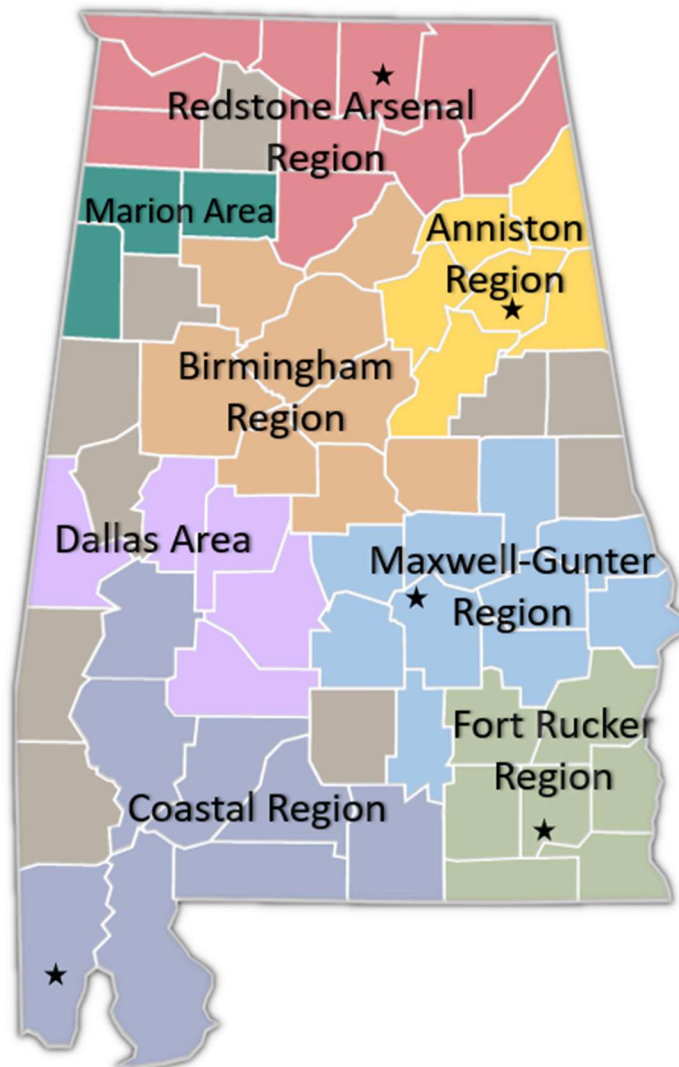
**Table 2.5 International Businesses with Contracts in Alabama 2019
(in Thousands)**

Recipient Name	Contract Value for 2019
BAE Systems Global Combat Systems LTD	\$36,018
BAE Systems GCS International Limited	\$5,922
Geosoft Inc.	\$318
Cority Software Inc.	\$168
International Institute for Strategic Studies	\$19
CYME International T & D Inc.	\$4
Nightingale Corp.	\$3
Elbit Systems C4I and Cyber	\$2
Spec Furniture Inc.	\$1
Grand Total	\$42,456

III. Regions

Introduction to Regions

The state is organized into different regions to develop and analyze regional impacts. The *regions* in this study were formed as clusters of counties linked together by economic activity and are typically anchored to a major military installation. Not all regions have an active military base, and some are grouped because the contracts performed in these counties serve the entire military. These counties are clustered into ‘*areas*’ to distinguish them from the other regions with major defense activities.



The state is divided into six main regions:

Anniston Region: The Anniston Army Depot, Fort McClellan Training Center, and the Center for Domestic Preparedness are located in Calhoun County.

Birmingham Region: This is host to the 117th Air Refueling Wing in Jefferson County.

Coastal Region: The Naval Marine Corps Reserve Center and the Mobile Aviation Training Center (ATC) are located in Mobile County.

Fort Rucker Region: The US Army Aviation Center of Excellence and Fort Rucker are in Dale County.

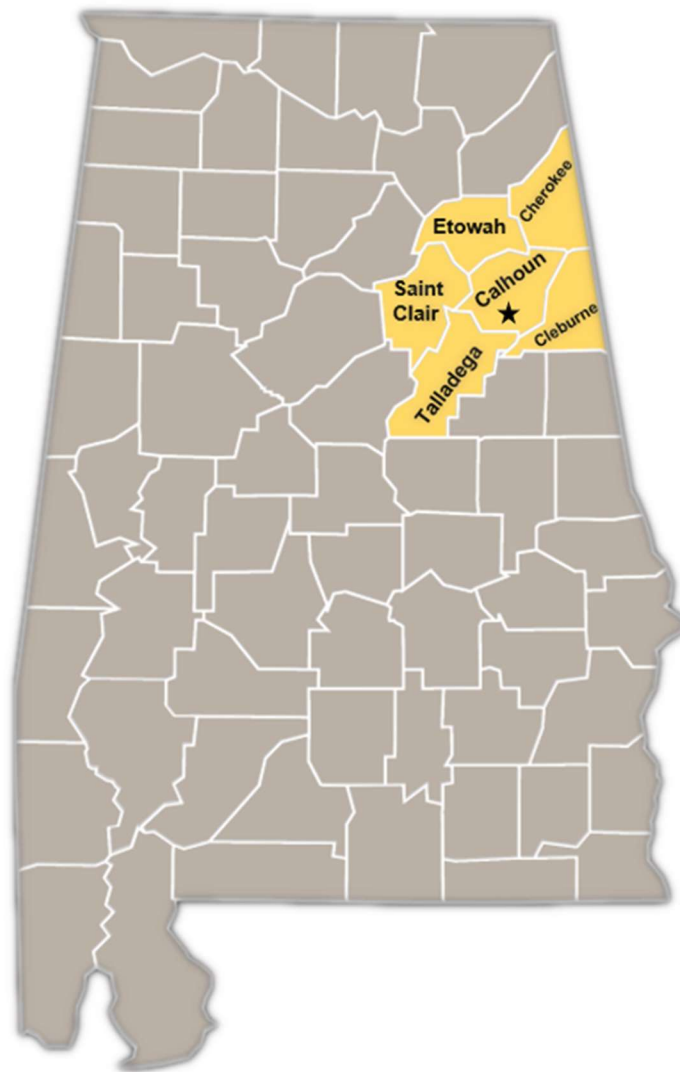
Maxwell-Gunter Region: Maxwell-Gunter Air Force Base is located in Montgomery County.

Redstone Arsenal Region: Redstone Arsenal is located in Madison County.

Dallas Area: A small group of counties with contracts that serve the entire military.

Marion Area: A small group of counties with contracts that serve the entire military.

Anniston Region



Introduction

The Anniston Region is home to the Anniston Army Depot (ANAD), Fort McClellan Training Center (FMTC) and the Center for Domestic Preparedness (CDP) in Calhoun County. Calhoun County and the surrounding counties, Cherokee, Cleburne, Etowah, Talladega and St. Claire, all support the DoD and other U.S. Government organizations that are essential to our nation's defense. This region plays a significant role in supporting the defense and related industries and is critical to Alabama's economic strength and stability. This region has a GDP of \$14 billion, a population of 426,000, and an employment level of 110,000 people.

**Table 3.1.1 Total Economic Impact of ANAD, Fort McClellan and CDP in Anniston Region
(in Millions except Employment)**

Impact	Direct	Multiplier	Total
Employment	9,386	3,716	13,102
Payroll	\$863	\$136	\$1,000
Output	\$1,635	\$489	\$2,124

Note: Totals may not tally due to rounding

The total economic impact of the installations in the Anniston Region, by both military personnel and DoD and DHS contracting activities for all three entities, ANAD, FMTC and CDP, is presented in Table 3.1.1. Military activities in the region have a direct spending of \$1.6 billion on output, with a multiplier impact of \$489 million. The total economic impact is \$2.1 billion. The Anniston Region has a GDP of \$14.9 billion, indicating that defense activities accounted for 14% of the region’s overall economy.

With direct employment by the military and their contractors for ANAD, FMTC, and CDP at 9,386 jobs and a multiplier impact of 3,716 jobs, the total impact on employment is 13,102. With regional employment at 110,300 jobs, the total impact on employment is 11.8% of the workforce.

Summaries and analyses of ANAD, FMTC and CDP follow. Military employment and DoD contract impacts are presented, followed by the total impact of CDP, which is funded by the Department of Homeland Security.

[Anniston Army Depot \(ANAD\)](#)

Located near Anniston, ANAD is a U.S. Army maintenance center and munitions storage site that occupies more than 25 square miles. The DoD’s Center of Industrial and Technical Excellence (CITE) for combat vehicles, assault bridging, artillery, small caliber weapons, locomotives, rail equipment and non-tactical generators is located here.



Economic Impacts of the Defense & Security Related Industry in Calhoun County for 2018

ANAD grew from its origins in 1940 when the Department of the Army acquired land in Calhoun County and officially named the Anniston Ordnance Depot in 1941. With the advent of World War II, the Depot's services increased dramatically, expanding in terms of both land and personnel. More than 4,000 civilians worked at the facility, receiving, processing and shipping the millions of tons of ammunition required by the armed forces and its allies.

Today, ANAD is renowned for its maintenance facility with over 4,000 employees, including active-duty military personnel, military civilians, tenant

employees, contract employees and non-appropriated funds civilian employees. Defense contractor tenants at the Depot include BAE Systems, General Dynamics and Honeywell. The



Economic Impacts of the Defense & Security Related Industry in Calhoun County for 2018

U.S. Army Contracting Command, Defense Logistics Agency and Defense Contract Management Agency, all support the DoD and call ANAD home. The Field Museum Support Center, located on-site, carries collections from various museums within the Army system.

Fort McClellan Training Center

The Fort McClellan Training Center (FMTC) and Pelham Range, both located in Calhoun County, provide crucial training for National Guard units. The Pelham Range is a training complex that houses multiple tenants. The mission of FMTC is to provide training facilities, ranges and maneuver areas for the National Guard, Reserves, Active Component, Federal and State Agencies. Troops that train at FMTC perform missions all over the world. Up to 80,000 troops train during any given year at these facilities, ranges and training areas located at FMTC.

The 167th Theater Sustainment Command (TSC) is located in the Fort McClellan Readiness Center. The TSC plans and executes theater opening, distribution and sustainment operations across the range of military operations in support of a multi-domain theater area. The 167th TSC is the only multi-component TSC that consists of active-duty members, active guard and reserve, military technicians and traditional guardsmen.

The 200th Regiment Training Institute (RTI) trains over 700 soldiers a year and is a permanent resident of FMTC. The 200th RTI conducts Officer Candidate School, Warrant Officer Candidate School, Military Occupational Specialty Qualified (Engineering and MP) and other schools or courses as directed by The Adjutant

General (TAG) and National Guard Bureau (NGB) through the Army Program for Individual Training (ARPRINT). The 200th Regiment provides military education for Active Component (AC), Reserve Component (RC), and Soldiers of the State of Alabama, Region D and the United States.



Economic Impacts of the Defense & Security Related Industry in Calhoun County for 2018

Center for Domestic Preparedness

Funded by DHS, the Center for Domestic Preparedness (CDP) is located in Anniston, providing advanced all-hazards training annually, to approximately 50,000 emergency responders. Preparedness, protection and response are part of the training. The CDP also provides training to state, local, tribal and territorial (SLTT) governments. Training for the federal government, foreign governments and even private entities is available on a fee-for-service basis.

Since it opened in 1998, the CDP has trained more than 1.3 million responders. Responders in 17 different disciplines, including Emergency Management, Emergency Medical Services, Fire Services, Hazardous Materials and Search and Rescue train at the CDP. CDP trains SLTT emergency responders on advanced capability-building skills tied to national priorities, especially those related to weapons of mass destruction.

CDP is the only U.S. federal facility chartered to provide comprehensive preparedness training programs to the nation's emergency response providers. The CDP operates the Chemical, Ordnance, Biological and Radiological Training Facility (COBRATF). It is the only facility dedicated to training civilian responders using military nerve agents and live biological materials in a safe and realistic environment. CDP also operates the only Noble Training Facility, dedicated to training hospital and healthcare professionals in disaster preparedness and mass casualty operations in a hospital environment. The CDP has also served as a FEMA personnel mobilization center and training facility for FEMA Surge Capacity Force (SCF) during times of regional disasters.

The following section provides the economic impacts of military personnel and DoD contracts that make up the economic impact for ANAD and FMTC. Trainees that visit the region add another component to the impact, which is also shown in the following section. The impact of employment and contracts for the CDP is then presented.

Analysis

With this region comprising three installations, ANAD, FMTC and CDP, and with CDP receiving contracts from the DHS, the analysis is comprised of four components. ANAD and FMTC are combined since both receive contracts from the DoD. The first component analyzes the military personnel from these two installations. The second component is the analysis of the contracts

received from DoD, and the third component consolidates the employment and contracts that are exclusively for the CDP. This allows flexibility in isolating the contributions of CDP to the region. The fourth component is the analysis of the impact of trainees to the facilities in the region.

Table 3.1.2 Economic Impact of Military Personnel in Anniston Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	6,602	2,303	8,905
Payroll	\$666	\$82	\$747
Output	\$1,070	\$294	\$1,364

Note: Totals may not tally due to rounding

The economic impact of military personnel at ANAD and FMTC is shown in Table 3.1.2. ANAD and FMTC directly employ 6,602 military personnel and civilians. The multiplier impact on employment is 2,303 with a total impact on employment of 8,905. The direct output from military personnel is \$1.1 billion and the total economic impact from these two installations is nearly \$1.4 billion. The total impact on payroll is \$747 million.

Table 3.1.3 Economic Impact of DoD Contracts in Anniston Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,504	931	2,435
Payroll	\$78	\$37	\$116
Output	\$370	\$133	\$503

Note: Totals may not tally due to rounding

The economic impact of DoD contracts in the Anniston Region is presented in Table 3.1.3. The direct impact of the contracts accounted for \$370 million, and the multiplier impact accounts for another \$133 million. The total economic impact on output due to DoD contracts is \$503 million. These contracts directly produced 1,504 jobs. The multiplier impact created another 931 jobs for a total of 2,435 jobs related to contracts in the region. The total impact on payroll is \$116 million.

While most of the contracts performed for the Anniston Region are received by companies in Alabama, 37 other states and 2 other countries, the United Kingdom and Israel, received contracts performed in the region. The largest categories of contracts deal with the production and maintenance of military vehicles and related systems, such as weapons or construction and related maintenance activities.

Table 3.1.4 Total Economic Impact of CDP in Anniston Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,138	433	1,570
Payroll	\$115	\$15	\$130
Output	\$184	\$56	\$239

Note: Totals may not tally due to rounding

The economic impact of the CDP is presented in Table 3.1.4. CDP receives contracts from DHS. Total employment by CDP, combining direct employment and employment generated by contracts, is 1,138, which results in an additional 433 jobs for a total employment impact of 1,570. The total impact on output is \$239 million with a direct impact of \$184 million and a multiplier impact of \$56 million. The majority of the contracts were for water systems, structural metal manufacturing and customized computer services for the CDP.

FMTC and CDP are major training centers for Reserves, National Guard and other federal agencies, and bring trainees to the Anniston region. Table 3.1.5 presents the economic impact of trainees to the region. Trainees add another 142 jobs to the region in hospitality services, bringing the total employment impact to 192. The total economic impact on output is about \$18 million.

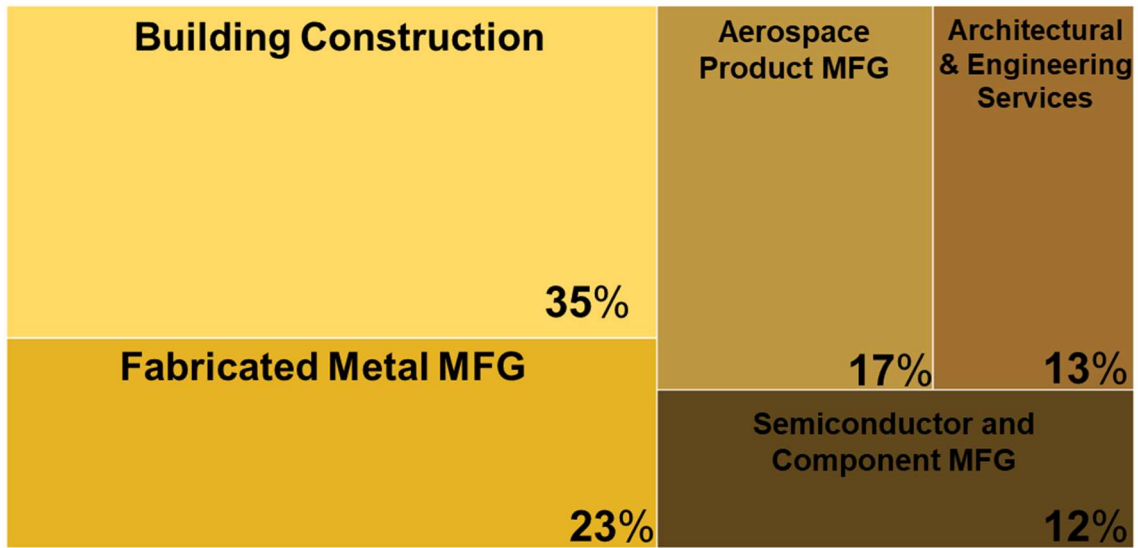
Table 3.1.5 Economic Impact of Trainees in Anniston Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	142	49	192
Payroll	\$5	\$2	\$6
Output	\$11	\$7	\$18

Note: Totals may not tally due to rounding

Anniston Army Depot, Fort McClellan Training Center and the Center for Domestic Preparedness have all impacted not only the Anniston Region, but the state of Alabama. These impacts are realized in many industries to varying degrees. The top growth industries that received contracts are presented below.



Top Industries by DoD Contract Value



Birmingham Region



Introduction

The Birmingham Region is host to many companies that serve the defense industry. While there is no active base or installation to anchor this region, the Air National Guard's 117th Air Refueling Wing (ARW) is hosted by the Birmingham-Shuttlesworth International Airport. The 117ARW provides air refueling, airlift, support, logistics, intelligence and medical services. Businesses in

this region are generally awarded or subcontracted to provide various products and services to the broader defense industry.

The Birmingham Region received more contracts than any other region, in terms of number of contracts. In addition to Alabama, 29 other states and the District of Columbia also receive DoD contracts to conduct business in the region. The contracts in the Birmingham Region fill a broad range of product and service needs. The industries in this region that received contracts, awarded or subcontracted, display a diverse ability to meet the requirements of the DoD.

Table 3.2.1 Total Economic Impact of Military in Birmingham Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,688	895	2,583
Payroll	\$96	\$50	\$146
Output	\$429	\$153	\$581

Note: Totals may not tally due to rounding

Table 3.2.1 presents the total impact of military activities on the Birmingham Region due to contracts and the activities of 117ARW. The total employment impact in the Birmingham Region is 2,583, with a direct employment of 1,688 and a multiplier impact of 895. With a direct output of \$429 million and a multiplier impact of \$153 million, the total impact in the Birmingham region due to military activity is \$581 million. The total impact on payroll is \$146 million.

The 117ARW is a National Guard unit and is analyzed at the state level in the National Guard section (Section IV). The following section analyzes the military employment component of 117ARW and the DoD contracts that are performed in the region.

Analysis

As noted earlier, this region does not host an active military base, however, Sumpter Smith Air National Guard Base is located at the Birmingham-Shuttlesworth International Airport. It covers essential facilities to support the mission of the 117th Air Refueling Wing (117ARW).

Table 3.2.2 presents the economic impact of 117ARW in the Birmingham Region. The 117ARW employs 988 individuals who spur an additional 183 jobs through the multiplier effect. Military

activity in the region leads to a total employment impact of 1,171 jobs for the Birmingham Region. The direct output due to employment is \$257 million, and with a multiplier impact of \$29 million, the total economic impact is \$286 million. The total impact on payroll is \$58 million.

Table 3.2.2 Economic Impact of Military Personnel in Birmingham Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	988	183	1,171
Payroll	\$49	\$9	\$58
Output	\$257	\$29	\$286

Note: Totals may not tally due to rounding

Table 3.2.3 shows the economic impact of DoD contracts in the Birmingham Region. The direct value of contracts in the region is \$172 million, with a multiplier impact of \$123 million. The total impact of contracts performed in the Birmingham Region is \$295 million. These contracts directly contributed 700 jobs and with a multiplier of 712, the total impact on employment is 1,412. The total impact on payroll is \$88 million.

Table 3.2.3 Economic Impact of DoD Contracts in Birmingham Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	700	712	1,412
Payroll	\$47	\$41	\$88
Output	\$172	\$123	\$295

Note: Totals may not tally due to rounding

The total GDP for the greater Birmingham Region is \$75.8 billion with a population of 1.28 million and average annual employment of 479,992. The total military impact is less than 1% of the region’s GDP. The Sumpter Smith Air National Guard Base, where the 117ARW is located, is

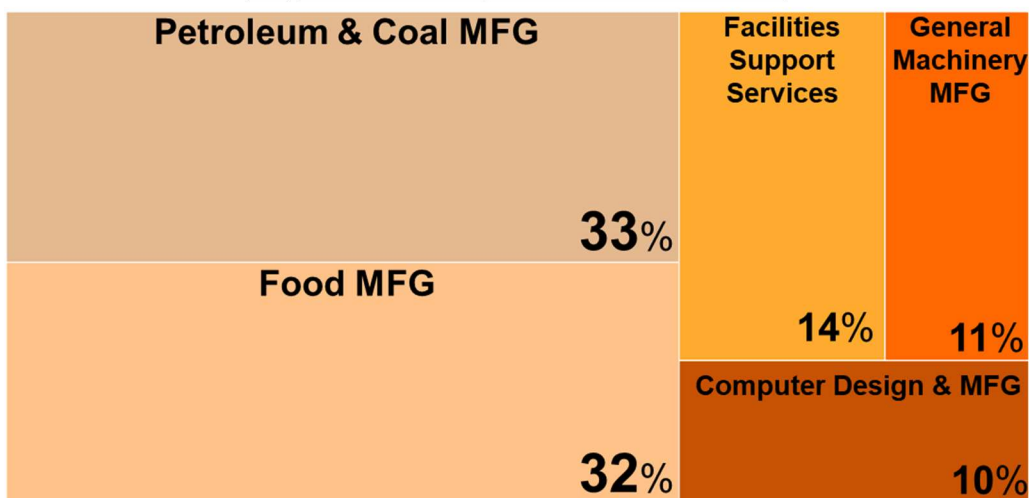
part of the National Guard. The impact of the National Guard is presented in a separate section of this report.

173 companies receive contracts that are performed in the Birmingham Region, and 97 of them are based in Alabama. Alabama receives 83% of the total contract value for the region. Thirty other states also receive contracts.



The diversity of industries in the Birmingham Region attracts many DoD contracts. Contracts related to petroleum products and food and beverages make up the primary source of the contracts. Computer Design is another source of contracts in this region. While Birmingham, the largest city in this region, is renowned for its medical facilities and hospitals, it continues to attract DoD related activity.

Top Industries by DoD Contract Value



Coastal Region



Introduction

The Coastal Region is in southwest Alabama and is along the Gulf Coast. The City of Mobile is a port city with the WWII-era USS Alabama battleship anchored in Battleship Memorial Park. Established in 1928, the port provides connectivity for all types of cargo from coal to automobiles coming in or leaving the country. Baldwin County, situated east of Mobile County, is one of the fastest growing counties in Alabama. Mobile and Baldwin counties are Alabama's access to the Gulf of Mexico.

The total economic impact of military activities in the Coastal Region is presented in Table 3.3.1. Direct employment in the Coastal Region is 13,937, and with a multiplier impact of 7,394 the total employment impact is 21,331. The direct output in the Coastal Region due to military activities is \$2 billion and with a multiplier of \$1 billion, the total economic impact is over \$3 billion. The total payroll impact in the region is more than \$1 billion. The impact of DoD activities accounts for roughly 8.8% of the region's \$34.7 billion GDP. Average annual employment was 253,040 for the Coastal Region, with 8.4% of the jobs related to the defense industry.

Table 3.3.1 Total Economic Impact of Military in Coastal Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	13,937	7,394	21,331
Payroll	\$700	\$322	\$1,022
Output	\$2,023	\$1,028	\$3,051

Note: Totals may not tally due to rounding

The population of the Coastal Region is 785,411 with Mobile and Baldwin counties being the most populous. As Mobile and Baldwin are the only counties on Alabama’s coast, the primary defense activities are focused on the US Coast Guard and the Marine Corps Reserve. The Coast Guard Aviation Training Center and Coast Guard Sector Mobile, US Army Corps of Engineers, Army Reserve and Alabama National Guard units are also located in this region.

The Coast Guard Aviation Training Center (ATC Mobile) and the Coastal Regional Airport share an airfield. The Center serves as an aviation and capabilities development center and acts as an operational air station. Coast Guard pilots are trained and qualified and those initially trained at ATC, return once a year for further training and maintaining proficiency. It operates under the tactical control of the Eighth Coast Guard District and its responsibilities extend from the Louisiana-Texas border to the eastern edge of the Florida panhandle. ATC Mobile supports a wide range of Coast Guard operations, such as search and rescue, maritime law enforcement, marine environmental protection, aids to navigation and ports, waterways and coastal security.



navalnews.com Austal Shipyard in Mobile



<https://www.madeinalabama.com/2022/05/airbus-alabama-expansion->

Companies such as BAE Systems and Teledyne Brown Engineering add to the companies that bring DoD contracts to the region. With shipyard building and repair facilities such as Metal Shark's Alabama Shipyard, the DoD supports this region with contracts to maintain the ships.

Airbus officially opened the Mobile assembly line in 2015 and since then has assembled Airbus 320 planes for major airlines. It started production of Airbus A220 in 2019. Airbus is located at the Mobile Aeroplex, which attracts many aerospace companies such as Aerostar, Collins Aerospace, Continental Aerospace Technologies, and Honeywell

Aerospace, among others. The Coastal Region is a thriving region for both aerospace and shipbuilding, thus attracting the DoD to perform both shipbuilding and aircraft assembly, maintenance, and repairs.

The following section analyzes the impact of military personnel in the region followed by the DoD contracts in the region.

Analysis

The total impact of military personnel in the Coastal Region is presented in Table 3.3.2. The total employment impact of military personnel in the Coastal Region is 1,664 with direct employment of 1,268 and a multiplier effect of 396. Military personnel from the US Army Corps of Engineers, the US Marine Corps Reserve, the US Army Reserve and the Alabama National Guard work in the area and contribute to the local economy. The direct output is \$392 million with a multiplier impact of \$53 million and a total economic impact of \$445 million. The total impact on payroll is \$100 million.

Table 3.3.2 Economic Impact of Military Personnel in Coastal Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,268	396	1,664
Payroll	\$84	\$16	\$100
Output	\$392	\$53	\$445

Note: Totals may not tally due to rounding

Table 3.3.3 displays the economic impact of DoD contracts in the Coastal Region. The direct output is over \$1.6 billion, with a multiplier impact of \$975 million, the total economic impact is over \$2.6 billion. The direct impact on employment due to these contracts is 12,669, with a multiplier impact of 6,998, the total employment impact is 19,667. The total impact on payroll is \$922 million.

Table 3.3.3 Economic Impact of DoD Contracts in Coastal Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	12,669	6,998	19,667
Payroll	\$616	\$306	\$922
Output	\$1,631	\$975	\$2,606

Note: Totals may not tally due to rounding

While Alabama companies receive over \$1.4 billion of all DoD contracts awarded in the Coastal Region, contracts received in twenty-six other states are also performed here. Washington State, Louisiana and Virginia lead with the highest total value of contracts. Of the 169 companies receiving contracts from the DoD that fulfill them in the Coastal Region, 73 companies are from Alabama.

With its coastal access, much of the region's contracts pertain to the shipping and construction industries. Communication equipment, aircraft engines and parts, and equipment industries also receive contracts. The Department of the Navy is the leading funding agency for these contracts,

followed by the Department of the Army and the Defense Logistics Agency. The Coast Guard's contracts are funded by the Department of Homeland Security and the economic impact of the Coast Guard's presence is analyzed in Section IV of this report.



Top Industries by DoD Contract Value



Fort Rucker Region



Introduction

Fort Rucker holds the title for Alabama’s largest military installation, with wiregrass spanning the 63,000-acre base. Home to U.S. Army Aviation, the base is mainly located in Dale County, with portions being in Geneva, Coffee, and Houston Counties. The Fort Rucker Region encompasses the aforementioned counties as well as Pike, Henry, and Barbour Counties, which occupy the southeast corner of Alabama. Together, the counties in the Fort Rucker Region have a population of 308,000 people and a total GDP of \$13.4 billion.

The total impact of military activities in the Fort Rucker Region is presented in Table 3.4.1. The direct impact on employment from military-related spending is 24,416, with a multiplier impact of 4,449, the total impact on employment in the Fort Rucker Region is 28,865. The total payroll impact is \$2.7 billion. The direct effect on output is over \$8.4 billion, with a multiplier of \$667 million, the total impact from the Fort Rucker Region is over \$9 billion. The total military impact is about 68% of the region’s \$13.4 GDP.

Table 3.4.1 Total Economic Impact of Military in Fort Rucker Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	24,416	4,449	28,865
Payroll	\$2,563	\$167	\$2,730
Output	\$8,373	\$667	\$9,039

Note: Totals may not tally due to rounding

Originally named Ozark Triangular Division Camp, Fort Rucker was renamed for Colonel Edmund W. Rucker, a Confederate officer of the Civil War, before formally opening on May 1st, 1943. Several troops were sent to Camp Rucker during World War II for training. The Army later relocated the Army Aviation School to the camp, and officially renamed it Fort Rucker in 1955. Fort Rucker would earn its moniker as the home to Army Aviation during the Vietnam War where a great number of pilots earned their wings. The base would gain another title as the US Army Aviation Center of Excellence (USAACE) in 2008, and still operates as the US Army Aviation HQ. Today, the population of Fort Rucker is over 20,000 people: 5,000 military, 10,000 civilians, and 5,000 military family members. In 2022, DoD announced that Fort Rucker will be renamed Fort Novosel, after Chief Warrant Officer 4 Michael Novosel Sr., a Medal of Honor recipient.



Blackhawk preparing for flight, courtesy Fort Rucker

In addition to having a Non-Commissioned Officer (NCO) Academy, the USAACE includes three aviation brigades, which are the 1st, 110th, and 128th. Bolstering Fort Rucker is the Aeromedical Research Laboratory, the School of Aviation Medicine, and the Air Traffic Services Command. They help the USAACE in its mission to educate and develop leaders that support the commanders and soldiers fighting on the ground. The Combat Readiness Center focuses on preserving the lives of soldiers and Army civilians through the Army Safety and Occupational Health Management System.



Chinook with hangar, courtesy Fort Rucker



Courtesy Fort Rucker

The region has strong aviation workforce development programs. Local colleges such as Wallace State and the Alabama Aviation Center's main campus work to develop not only the culture, but also the people to support the aerospace industry in the area. This region has abundant airfields, from the Dothan Regional Airport to the Ozark's Blackwell field and Fort Rucker's on-base and outlying fields.

There are several tenant units and activities on Fort Rucker. Tenant units on the base provide a wide range of services, such as air traffic support, administrative, logistical, technology support, health services and medical training, research, aviation training, and other resource services for airmen and soldiers.

The U.S. Army Aviation Museum maintains a collection of over 160 military aircraft and one of the largest collections of military helicopters in the world. Historic and one-of-a-kind aircraft are restored and displayed at the museum. There were 100,000 visitors to the museum in 2019, with approximately 65% from outside the region. There were 1,816 trainees or students who were

served by the facilities at Fort Rucker. An extensive impact analysis cannot be performed on the visitors, given the lack of granularity in the data, without making many assumptions. However, a rough estimate of the total economic impact on output for the visitors and trainees to the region gives a range of approximately \$6 million to \$8 million, depending on the assumptions.

The analysis expands on the economic impact by displaying the impact of military personnel in the Fort Rucker Region, followed by the impact of DoD contracts in the region.

Analysis

The economic impact of military personnel in the Fort Rucker Region is presented in Table 3.4.2. Direct employment of military personnel, including civilians, is 17,380. With a multiplier of over 2,000 jobs, the total military employment impact accounts for 19,464 jobs with a total impact of over \$2.2 billion in payroll. The direct output is \$7.2 billion, and with a multiplier of \$300 million, the total economic impact due to military employment in the region is \$7.5 billion.

Table 3.4.2 Economic Impact of Military Personnel in Fort Rucker Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	17,380	2,084	19,464
Payroll	\$2,144	\$68	\$2,212
Output	\$7,236	\$300	\$7,536

Note: Totals may not tally due to rounding

Table 3.4.3 shows the economic impact of contracts in the Fort Rucker Region. Contracts generate over 7,000 direct jobs in the region, with a multiplier impact of 2,365, the total impact on employment from contracts is 9,401 jobs. The direct spending by contracts is \$1.1 billion, with a multiplier impact of \$366 million, the total impact on spending in the region is \$1.5 billion. The total impact on payroll is \$517 million.

**Table 3.4.3 Economic Impact of DoD Contracts in Fort Rucker Region
(in Millions except Employment)**

Impact	Direct	Multiplier	Total
Employment	7,036	2,365	9,401
Payroll	\$419	\$98	\$517
Output	\$1,137	\$366	\$1,503

Note: Totals may not tally due to rounding

Contracts in this region range from aircraft maintenance to communication equipment, and from education and training to environmental services. M1 Support Services, URS Federal Services, and Pride Industries are some of the top companies receiving contracts. Dale County receives the bulk of the contracts, most of which are for aircraft parts manufacturing.



Courtesy Fort Rucker

280 companies receive contracts and 65 of those companies are located in the Fort Rucker Region. 38 other states receive contracts that are performed in the region. M1 Support Services, located in Texas, received the largest contract. The company was contracted for the maintenance and rebuilding of aircraft and airframe structural components. Maryland, Virginia, and Florida are among other states that receive contracts and perform them in the region.

Top Growth Industries in Fort Rucker Region

Water, Sewage, and Other Systems

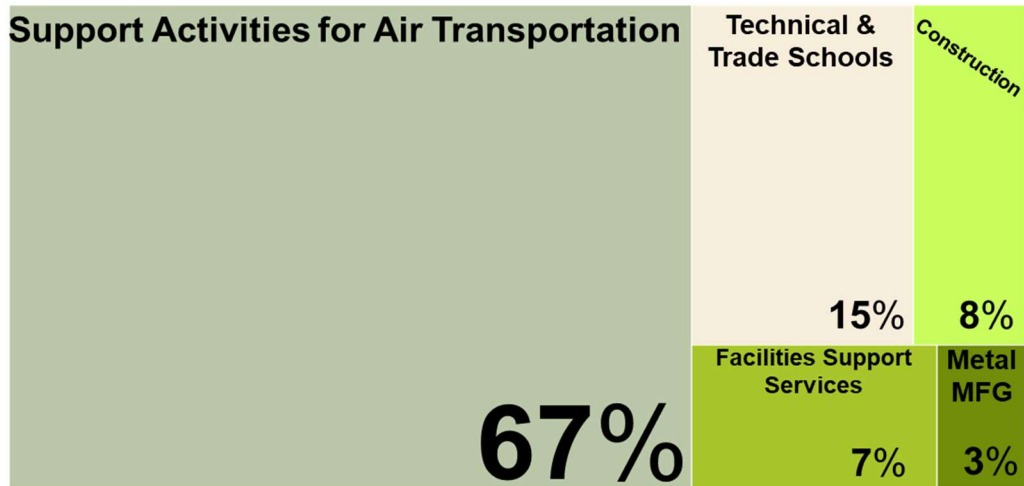
Aircraft Parts and Auxiliary Equipment Manufacturing

Construction of Manufacturing Structures

Hardware Manufacturing

Educational Services

Top Industries by DoD Contract



Maxwell-Gunter Region



Introduction

Montgomery is the capital of Alabama, and hosts Maxwell-Gunter Air Force Base. Maxwell-Gunter is under the Air Education and Training Command, and provides care and support, training and education. Maxwell-Gunter is home to Air University, the 42nd Air Base Wing, the 908th Airlift Wing, the Business and Enterprise Systems Directorate and more than 30 other tenant units. The host wing for Maxwell-Gunter is the 42nd Air Base Wing. Maxwell AFB is known throughout Montgomery and the River Region as the “Best Hometown in the Air Force.”

The total economic impact of the Maxwell-Gunter Region due to military activities is presented in Table 3.5.1. The direct employment due to military activities in the region is 18,302 and with a

multiplier effect of 8,405 the total employment impact in the region is 26,706. The direct output due to military activities is \$5 billion, with a multiplier impact of \$1.2 billion, the total economic impact due to military activities in the region is \$6.3 billion.

Table 3.5.1 Total Economic Impact of Military in Maxwell-Gunter Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	18,302	8,405	26,706
Payroll	\$1,552	\$349	\$1,901
Output	\$5,077	\$1,190	\$6,266

Note: Totals may not tally due to rounding

Given the region’s GDP of \$29.6 billion, the total military impact is 21% of the region’s GDP and approximately 2.7% of Alabama’s GDP. The annual average employment for the region was 196,379, making the workforce employed in the defense industry about 3% of the total workforce. The total impact on payroll is \$1.9 billion.



Montgomery Advertiser

Montgomery is the site of the first Wright brothers’ civilian flying school, established in 1910. In the 1930’s, the Army Air Corps Tactical School moved to Maxwell. Montgomery became the country’s center for airpower education. The primary role of the base is to educate planners and

leaders in air and space power for the Air Force and other branches of the US Armed Forces.

The Maxwell-Gunter Air University campus conducts professional military education (PME) for both officers and enlisted personnel, both in residence and through distance learning. The various officer PME programs, as well as the First Sergeants Academy, graduate approximately 4,275 individuals a year. Officer Training School and the International Officer School host around 3,000 trainees a year, while the Reserve Officer Training Corps (ROTC) brought in 402 college cadets

from around the nation in 2019. These college cadets come from various states and live on the base for a short time.

In addition to traditional PME, the Community College of the Air Force is the only degree-granting institution exclusively for enlisted personnel at the base. For civilians, Air University even has specialized programs for the Air Force's civilian personnel, US cabinet appointees, and senior executives. Although not associated with Air University, the base also offers the only Air Force DoD Educational Activity (DoDEA) school in the nation for active-duty military and full-time DoD civilian dependents. Essentially, most Air Force members will pass through Maxwell-Gunter for training at least once in their career.

Gunter Annex, a separate installation, is home to the 42nd Air Base Wing. Starting as Gunter



Field, it was renamed Gunter Air Force Station after closing its runways. In the 1980s it became Gunter Air Force Base. Gunter unified with Maxwell Air Force base in the 1990s. Gunter Annex hosts the Air Force Program executive Office-Business and Enterprise Systems Directorate, which falls under Air Force Materiel Command. Its mission includes requirements to "acquire, operate, sustain, and enable enterprise IT capabilities" and a mission to modernize infrastructure.

The Annex also contains a Defense Information Systems Agency (DISA), a high-tech DoD joint-branch organization focused on the technology networks supporting our nation's defense. DISA is staffed primarily by government civilians and contractors to bring in the latest technical skills.

The 908th Airlift Wing is the only Air Force Reserve unit in the state and has traditionally been a fixed-wing unit utilizing the C-130 Hercules aircraft. This large aircraft allows them to move large quantities of personnel and equipment, leading the 1,200-member unit to fly nearly one million

miles annually for training and real-world operations. However, in 2021 the command created a Program Integration Office to transition the unit from its fixed-wing Hercules to the rotary-wing MH-139A Grey Wolf. Transitioning the 908th Airlift Wing from operations to the Air Force's Formal Training Unit on this platform is the Program Integration Office's goal.

The analysis section below presents the breakdown between military personnel, DoD contracts and impact of students who attend various programs at Air University in the Maxwell-Gunter Region.

Analysis

The center of the Maxwell-Gunter region is the State Capitol in Montgomery. Table 3.5.2 presents the economic impact of military personnel in the Maxwell-Gunter Region. Maxwell Air Force base employment includes active-duty military personnel, Air Force Reserves and National Guard, trainees/cadets, and military civilians who work on the base. The direct employment is 10,197, with a multiplier of 4,734, the total employment impact is 14,931. The direct output due to military personnel is \$4.4 billion, with a multiplier impact of \$679 million, the economic impact of employment on the base is more than \$5 billion. The total impact on payroll is \$1.4 billion.

Table 3.5.2 Economic Impact of Military Personnel in Maxwell-Gunter Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	10,197	4,734	14,931
Payroll	\$1,238	\$193	\$1,432
Output	\$4,356	\$679	\$5,034

Note: Totals may not tally due to rounding

The economic impact of DoD contracts is presented in Table 3.5.3. The total value of the DoD contracts is \$677 million, with a multiplier of \$485 million, the total economic impact of the flow of contracts performed in the region is \$1.2 billion. Direct employment due to contracts is 7,558. The multiplier impact was 3,492, making the total impact on employment 11,050 with a total impact on payroll of \$446 million.

**Table 3.5.3 Economic Impact of DoD Contracts in Maxwell-Gunter Region
(in Millions except Employment)**

Impact	Direct	Multiplier	Total
Employment	7,558	3,492	11,050
Payroll	\$298	\$148	\$446
Output	\$677	\$485	\$1,162

Note: Totals may not tally due to rounding



Alabama NewsCenter: Preferred location for new helicopter training unit

While 35% of the contracts performed in this region are awarded to companies in Alabama, businesses in 43 other states received contracts that are performed in the Maxwell-Gunter Region. Colorado, Virginia, and Florida were among other states that received contracts and performed them in the Maxwell-Gunter Region.

Of the 423 companies that received contracts, 131 are Alabama-based companies. Construction, maintenance, repairs, support activities, aircraft equipment, hardware, custom computer services, and architect and engineering services are among the wide variety of products and services this region provides to the defense industry.

**Table 3.5.4 Economic Impact of Students in Maxwell-Gunter Region
(in Millions except Employment)**

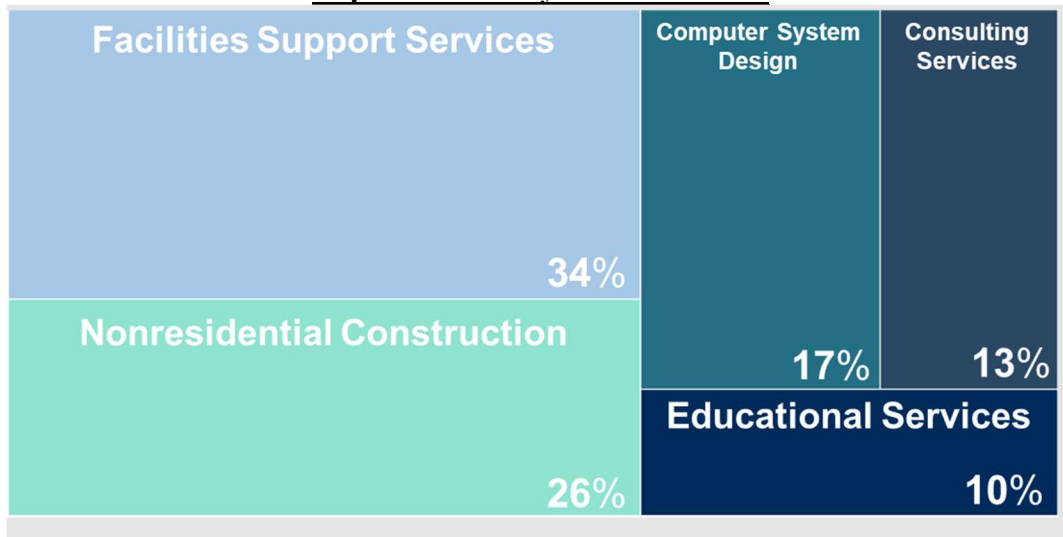
Impact	Direct	Multiplier	Total
Employment	546	180	726
Payroll	\$16	\$8	\$24
Output	\$44	\$26	\$69

Note: Totals may not tally due to rounding

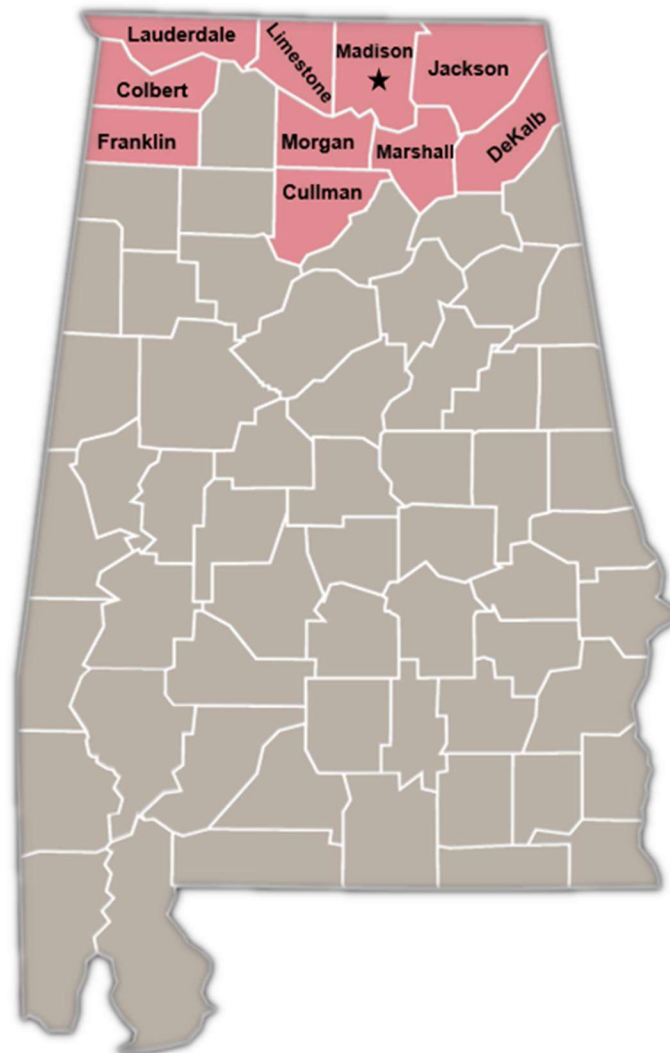
Almost 27,000 students from other areas passed through Maxwell-Gunter training programs in 2019. The impact of lodging, food and other expenditures of these students are shown in Table 3.5.4. The total direct spending is \$44 million, and with a multiplier of \$26 million, the total economic impact on output is \$69 million. The direct spending results in 546 jobs, and with a multiplier impact of 180, the total impact on employment is 726 jobs. The total impact on payroll is \$24 million.



Top Industries by DoD Contracts



Redstone Arsenal Region



Introduction

Redstone Arsenal is located in Madison County, adjacent to the cities of Huntsville and Madison. It is home to 65 organizations, employing 42,000. It has many one-of-a-kind facilities including testing sites. The Arsenal is one of the largest contributors to the regional economy and Alabama's economy.

Located within the Redstone Arsenal is the Marshall Space Flight Center (MSFC), a field center of the National Aeronautics and Space Administration (NASA). MSFC employs highly skilled engineers and scientists to build rockets and has a symbiotic relationship with the Arsenal.

The total economic impact of the Redstone Arsenal Region along with the total economic impact of MSFC is presented in Table 3.6.1. The total direct military employment in the Redstone Arsenal Region is 22,839, with a multiplier impact of 12,773, the total military employment impact is 35,612. Total DoD contracts in the region creates a direct employment effect of 57,904, with a multiplier of 49,640, the total employment impact of DoD contracts is 107,544. With contract employment being relatively high in the region, the difference between direct military employment and contract employment is highlighted.

Table 3.6.1 Total Impact of Military Activities and MSFC in Redstone Arsenal Region (in Millions except Employment)				
<u>Category</u>	<u>Impact</u>	<u>Direct</u>	<u>Multiplier</u>	<u>Total</u>
Military Employment and Contract Spending	Employees Govt.	22,839	12,773	35,612
	Employees Contractors	57,904	49,640	107,544
	Payroll	10,403	2,799	\$13,202
	Output	\$18,617	\$8,654	\$27,272
Marshall Space and Flight Center	Employees Govt.	2,159	1,241	3,400
	Employees Contractors	9,877	6,223	16,100
	Payroll	\$1,079	\$348	\$1,427
	Output	\$2,406	\$1,060	\$3,466

Note: Totals may not tally due to rounding

The total economic impact on the Redstone Arsenal Region by military presence and contracts by the DoD has a total economic impact of \$27.3 billion. The total economic impact of MSFC in the region is an additional \$3.5 billion. The GDP for the region is \$53.3 billion indicating that nearly 51% of the value of the output comes from the defense activities in the region. The Redstone Arsenal’s impact of \$27.3 billion is 11.8% of Alabama’s GDP of \$231 billion.

Redstone Arsenal has an extensive history, which makes it a unique and significant military base. ‘The Arsenal’ as it is locally known, began as two arsenals: Redstone Ordnance Plant and Huntsville Arsenal. It was combined and renamed Redstone Arsenal in 1943. When the Fort Bliss

rocket team transferred to the Redstone Arsenal, it officially entered the missile era and the Chamber of Commerce dubbed Huntsville as “The Rocket City” in 1953.

Redstone Arsenal is a Federal Center of Excellence and focuses on the Joint Warfighter. It houses the Department of the Army, DoD, NASA, Department of Justice (DOJ), ATF, Army Materiel Command, Missile Defense Agency, Redstone Test Center, and Defense Acquisition University, among others. The Hazardous Devices School (HDS) followed by the Terrorist Devices Analytic Center (TEDAC), was established in 1971. More recently, the FBI is dramatically expanding its operations at Redstone Arsenal, growing from its original role as the FBI Explosives Center of Excellence.

In 1960, 1900 acres of the Army Ballistic Missile Agency (ABMA) was transferred to NASA and named Marshall Space Flight Center (MSFC). A number of army personnel moved to MSFC from ABMA as well. Following construction of the Redstone rocket test stand and the advent of MSFC's solid rocket motor propulsion and structural test facility, Huntsville became the place where rockets were built.

The economic impact of MSFC on the state of Alabama was \$4.3 billion in 2019, according to the Economic Impact Report released by MSFC. The Space Launch System (SLS), the most powerful rocket ever built, is being built here. MSFC is also responsible for developing various engineering technologies and space systems and



Redstone Arsenal Wikipedia

for the latest in research in science and engineering. The relationship between the Redstone Arsenal and NASA allows for innovations in missile technology and rocketry. For more than 60 years, MSFC and the Army at Redstone Arsenal have had a symbiotic relationship, leveraging technology development in areas of propulsion, simulations, and guidance and control, among others.

The installation’s Redstone Army Airfield is now being used by MSFC and the Army Aviation and Missile Command (AAMC), as well as for other flying activities that include serving as a refueling stop for US military services. Raytheon Missile Systems built a \$75 million missile production facility on Redstone Arsenal in 2013.

In 2016, the FBI committed to strategically aligning personnel outside the national capital region as a new workforce strategy. The FBI is building two campuses that will bring multiple FBI assets together on Redstone Arsenal. At their new facilities, the FBI will conduct tactical and specialized training requirements. The FBI also conducts forensic analysis, sorts data from critical investigations, and monitors networks for cyber-attacks. The center of the agency's technology, data analytics, and cyber missions is located at Redstone Arsenal. This adds to the confluence of activities since other entities on Redstone Arsenal support the same mission, such as the Tennessee Valley Regional Computer Forensics Laboratory (TVRCFL) and the National Defense Cyber Alliance (NDCA). The TVRCFL is one of only 17 laboratories in the country serving as a full-service digital forensics laboratory and training center dedicated entirely to the examination of digital evidence. The FBI's Innovation Center located on Redstone Arsenal broke ground in 2021 and is scheduled to be completed in 2023. The Innovation Center is dedicated to cyber threat intelligence, data analytics, and training to combat emerging threats.

The following section of analysis elaborates on the economic impacts of military personnel in the Redstone Arsenal region after presenting the total impact of Redstone Arsenal. The breakdown of the impact of MSFC on employment levels and contracts is also presented.

Analysis

Redstone Arsenal is the biggest engine of economic impact for not only Madison County, Limestone County, and the northern region of Alabama but also for the entire Tennessee Valley, which includes the southern counties of Tennessee.

The total economic impact of military activities in the Redstone Arsenal Region is presented in Table 3.6.2. The table is a consolidated table of Redstone military activities. The total direct employment effect is 80,743, with a multiplier impact of 62,413, the total employment impact is 143,156. The direct effect on output is \$18.6 billion, with a multiplier impact of \$8.6 billion, the total economic impact is \$27.3 billion. The total payroll impact is over \$13.2 billion in the Redstone Arsenal Region.

Table 3.6.2 Total Economic Impact of Military in Redstone Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	80,743	62,413	143,156
Payroll	\$10,403	\$2,799	\$13,202
Output	\$18,617	\$8,654	\$27,272

Note: Totals may not tally due to rounding

The economic impact of military personnel in the Redstone Arsenal Region is presented in Table 3.6.3. The direct employment in the region of military personnel is 22,839, with a multiplier impact of 12,773, the total employment impact is 35,612. The direct impact on output due to military personnel is \$5.5 billion, with a multiplier effect of \$1.8 billion, the total economic impact on output due to military employment is \$7.3 billion. The total impact on payroll is \$4.1 billion.

Table 3.6.3 Economic Impact of Military Personnel in Redstone Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	22,839	12,773	35,612
Payroll	\$3,621	\$523	\$4,144
Output	\$5,539	\$1,765	\$7,304

Note: Totals may not tally due to rounding

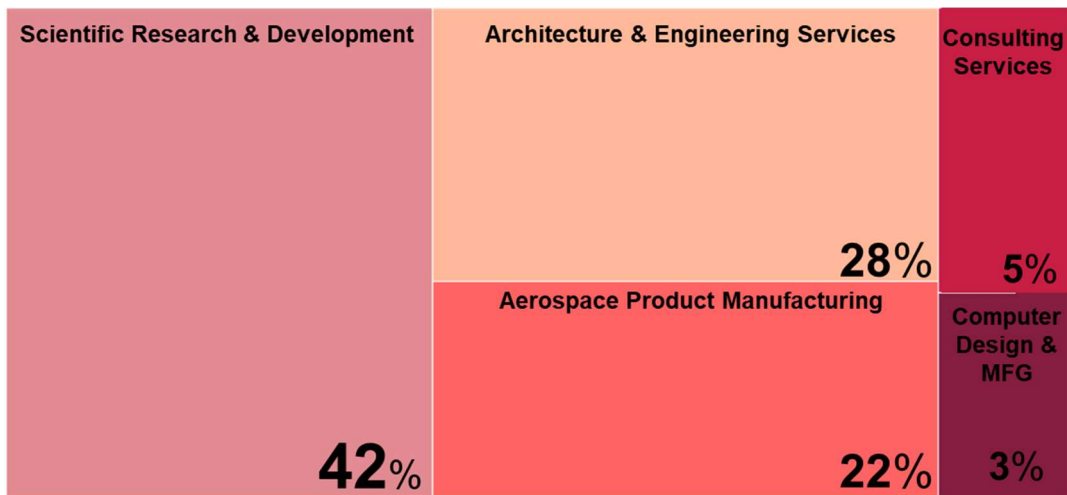
The economic impact of DoD contracts on the region is presented in Table 3.6.4. The total value of contracts to the region is over \$13 billion. With a multiplier impact of \$7 billion, the total economic impact on output due to DoD contracts in the region is \$20 billion. The contracts led to a direct employment of 57,904, with a multiplier impact of 49,640, the total impact on employment is 107,544. The total impact on payroll is \$9 billion.

Table 3.6.4 Economic Impact of DoD Contractors in Redstone Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	57,904	49,640	107,544
Payroll	\$6,783	\$2,276	\$9,059
Output	\$13,078	\$6,889	\$19,967

Note: Totals may not tally due to rounding

DoD awards contracts to various companies in the region to assist and support the activities of the installation. While many of the contracts performed in the Redstone Arsenal Region are received by companies in Alabama, 43 other states receive contracts that are performed in the region. Virginia, Maryland, California, Arkansas, Arizona, and Texas are the top states that receive contracts performed in the Redstone Arsenal Region.

Top Industries by DoD Contracts



Scientific research and development claimed the top spot, with architecture and engineering services claiming the second in terms of the value of the contracts. Aircraft parts and manufacturing, guided missile development, and other computer services are also among the top contracts in this region. The top ten companies receive almost half of the total contracts for engineering services, aircraft parts and manufacturing, missile components, and computer

services. The contracts are spread over 919 companies, out of which 375 companies are based in Alabama.

Table 3.6.5 Total Impact of NASA in Redstone Arsenal Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	12,036	7,464	19,500
Payroll	\$1,079	\$348	\$1,427
Output	\$2,406	\$1,060	\$3,466

Note: Totals may not tally due to rounding

Marshall Space Flight Center (MSFC) is located within Redstone Arsenal and has a significant impact on Redstone Arsenal and surrounding companies. The total economic impact of NASA in the Redstone Arsenal Region is presented in Table 3.6.5. The total impact includes government employment in MSFC and contracts from NASA that are performed in the region. The direct employment in the region due to MSFC is 12,036, with a multiplier of 7,464, the total impact on employment is 19,500. The direct spending or output that occurs in the region is \$2.4 billion, with a multiplier impact of \$1.1 billion, the total economic impact on output is \$3.5 billion.

Table 3.6.6 Economic Impact of NASA Employees in Redstone Arsenal Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	2,159	1,241	3,400
Payroll	\$352	\$51	\$403
Output	\$480	\$171	\$651

Note: Totals may not tally due to rounding

Table 3.6.6 shows the economic impact of MSFC employment in the region. The direct employment of MSFC in the region is 2,159, with a multiplier impact of 1,241, the total employment impact is 3,400. The direct effect on output is \$480 million, with a multiplier impact of \$171 million, the total economic impact on output is \$651 million. Table 3.6.7 presents the economic impact of NASA contractors. The direct employment that the contracts generate in the

region is 9,877, with a multiplier of 6,223, the total employment impact of NASA contracts in the region is 16,100. The direct spending on contracts in the region is \$1.9 billion. With a multiplier of \$888 million, the total economic impact on output is \$2.8 billion.

Table 3.6.7 Economic Impact of NASA Contractors in Redstone Arsenal Region (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	9,877	6,223	16,100
Payroll	\$728	\$297	\$1,024
Output	\$1,926	\$888	\$2,815

Note: Totals may not tally due to rounding

NASA contracts that are performed in the Redstone Arsenal Region are from NASA Ames Research Center, NASA Glenn Research Center, NASA Headquarters, and NASA Johnson Space Center. The economic impact of NASA contracts on the state of Alabama are included in the aerospace industry impact in Section V.

Over 107 companies receive contracts from NASA that are performed in the Redstone Arsenal Region. Of these companies, 84 are located in Alabama. While 83% of the value of the contracts are received in Alabama, 15 other states receive contracts from NASA that are performed in the region. Tennessee, Florida, and Maryland are the top three states that receive contracts in terms of value. Contracts range from basic research to special studies in engineering and science, aircraft components, and specialized computer services.

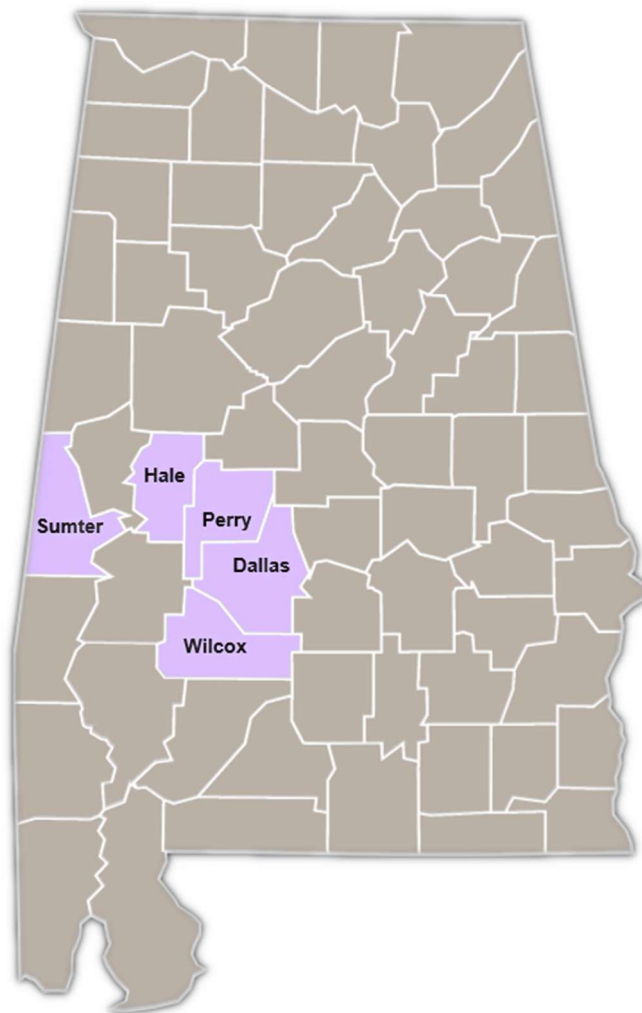


Independent Regions

Introduction

Alabama counties not assigned to a region were considered independent counties and placed into two groups, those with and those without active contracts. Those with contracts were further divided, geographically, between the Dallas and Marion Areas. There are five counties in the Dallas Area and three in the Marion Area. The two independent areas with active contracts did not have impacts associated with military personnel. However, DoD contract impacts yielded 580 jobs and a total economic impact of \$56 million. Ten counties make up the No-Contracts Area.

Dallas Area



Analysis

Table 3.7.1 shows the total economic impact of DoD contracts in the Dallas area. The direct impact of DoD contracts in the Dallas Area is \$44 million, and the multiplier impact of \$9 million brings the total impact to \$53 million. The direct employment due to contracts in the Dallas area is 490, with a multiplier of 69, the total employment impact is 559 in the area. The total impact on payroll is \$15 million.

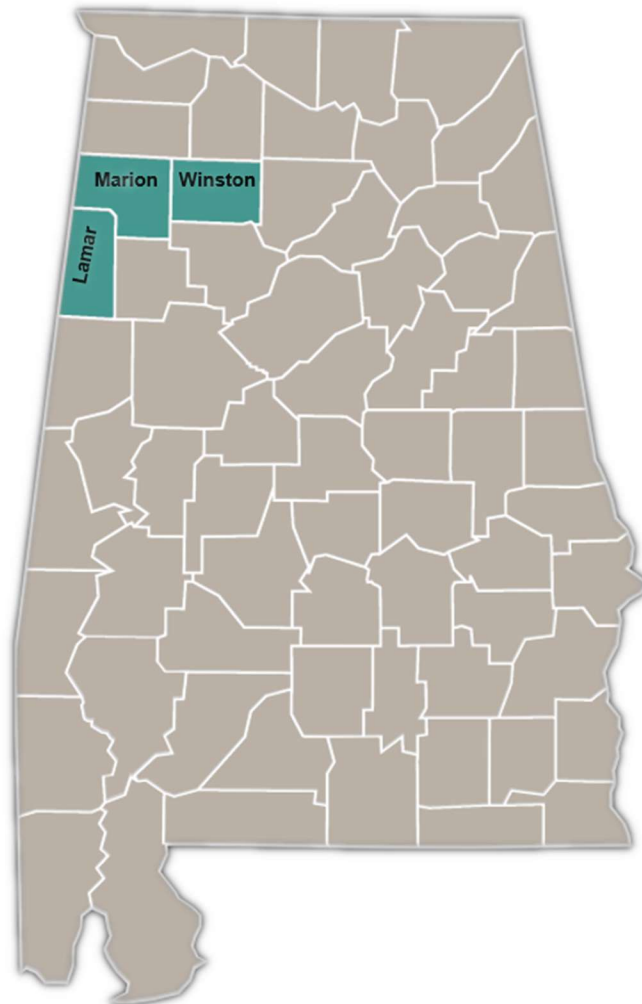
Table 3.7.1 Total Economic Impact of DoD contracts in Dallas Area (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	490	69	559
Payroll	\$12	\$2	\$15
Output	\$44	\$9	\$53

Note: Totals may not tally due to rounding

The Dallas Area makes up a small part of Alabama’s economy, accounting for roughly 1% of the state’s GDP. The 2019 population of the area is 83,570, or about 1.7% of Alabama’s total. Contracts in Dallas County are primarily for military uniforms, thus serving multiple military bases. The contracts in the remaining counties are used for utilities, housekeeping, nature conservation, and building repair. The total impact of military contracts within the Dallas Area makes up 2.1% of its GDP.



Marion Area



Analysis

The total economic impact of DoD contracts in the Marion area is presented in Table 3.8.1. The direct impact of the contracts in the Marion Area is \$2 million, with a multiplier impact of \$1 million, bringing the total impact to \$3 million. The total employment impact in the area is 22 jobs, composed of 15 direct jobs and 7 multiplier jobs. The total impact on payroll is \$749,000.

**Table 3.8.1 Total Economic Impact of DoD Contracts in Marion Area
(in Millions except Employment)**

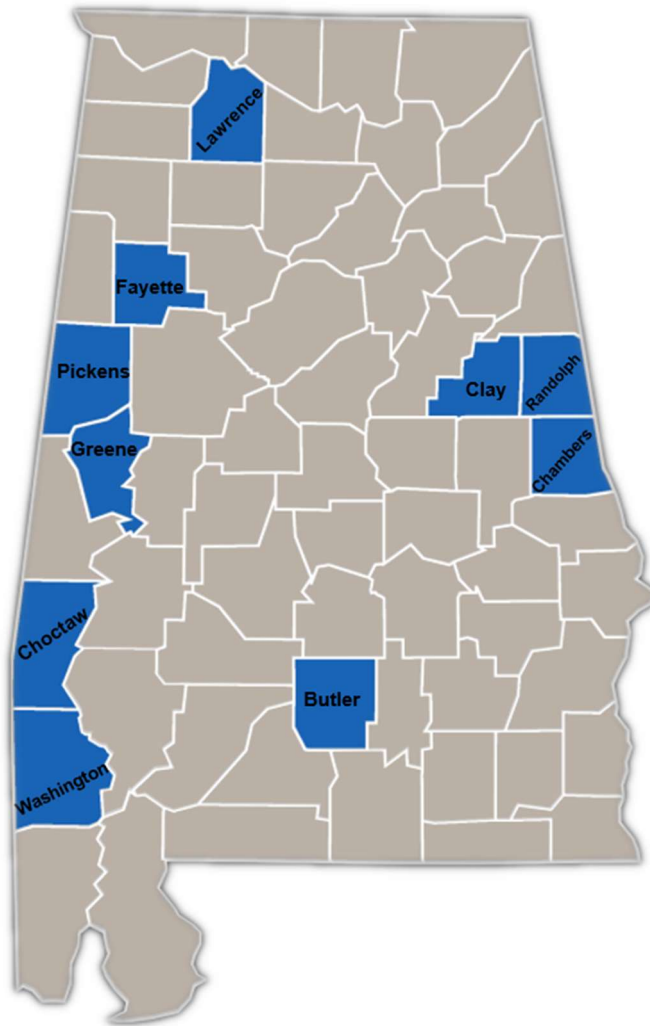
Impact	Direct	Multiplier	Total
Employment	15	7	22
Payroll	\$0.5	\$0.3	\$1
Output	\$2	\$1	\$3

Note: Totals may not tally due to rounding

The Marion Area makes up a small part of Alabama’s economy, accounting for just under 1% of the state’s GDP. The 2019 population of the area is 67,143, or about 1.4% of Alabama’s total. Contracts in the Marion Area support various industries, including trailer manufacturing, fuel oils, salvage, nursery stock and production, and nonresidential repair construction. The total impact of military contracts here is 0.16% of the area’s GDP.



No Identifiable Contracts Areas



The study only examined the contracts that were relevant for FY 2019. It is possible that contracts were received prior to and following the study period in these counties. These counties still contribute to the Alabama military community supporting military personnel, veterans and retirees, and the contractors that produce the needed goods and services.

Conclusion

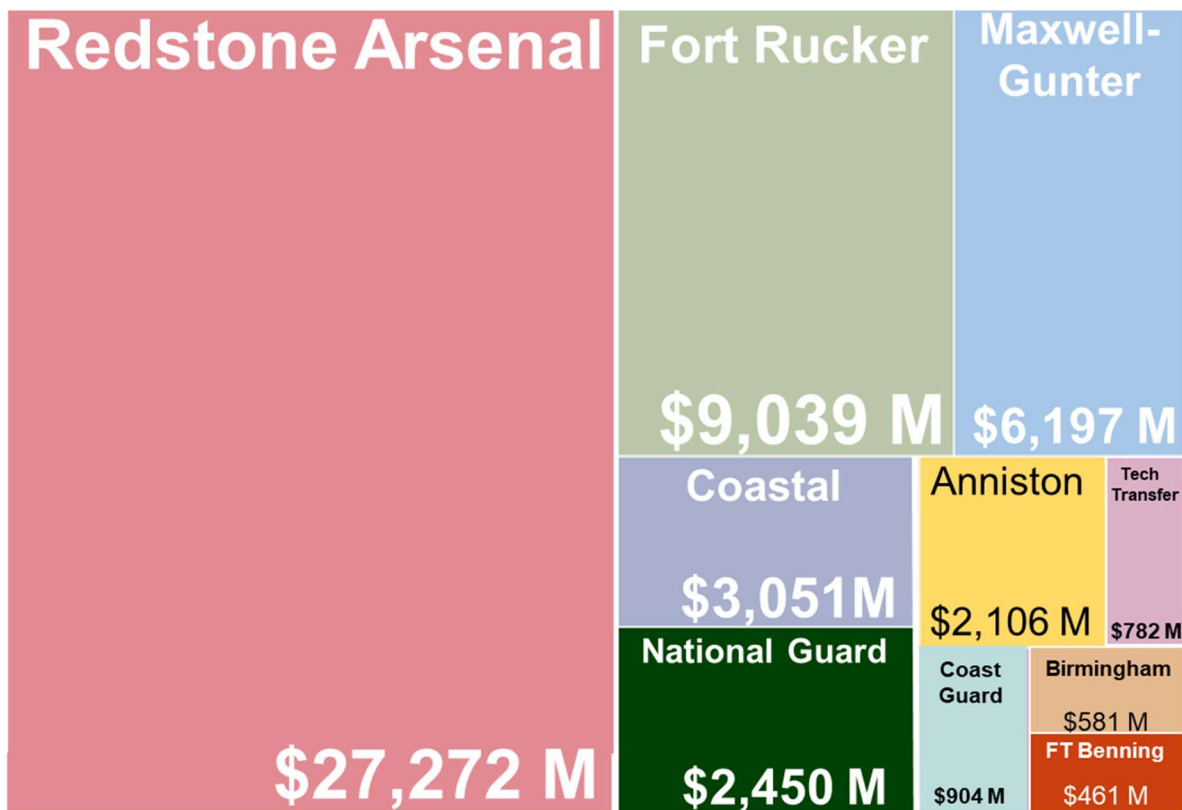
Together, the eighteen counties comprising these three areas account for 7% of Alabama's population and 4.5% of its GDP.

Regions Overview

Alabama is comprised of 67 counties, and most are impacted by the Department of Defense. Some directly with a base or installation and others hosting companies that perform contracts for the DoD. Some counties that are not featured in this study due to a lack of contracts in 2019 may have received contracts before and after 2019.

Counties were grouped into a region by proximity to an active military base. There were some counties grouped that did not have an active base but received significant contracts, and others were grouped together by proximity alone. In total, there were six regions and two smaller areas that were made up of counties grouped by proximity. Of the 6 regions, Redstone Arsenal had the biggest impact of \$27 billion from military-related activities, which is 54% of the total military impact of the state. Fort Rucker and Maxwell regions contributed 17% and 13% respectively to the total military impact in Alabama.

Total Impact of DoD by Category



IV. Other State Level Impacts

Fort Benning, Georgia



Introduction

Fort Benning military base straddles Fort Benning and Columbus, Georgia and Phenix City, Alabama. Spanning these three cities, it is known as “Tri-community.” Fort Benning is the US Army Maneuver Center of Excellence and is the home to Basic Combat Training, Airborne, and Ranger School. It also houses armor, cavalry, infantry, and officer training candidate school, including military intelligence units.

Lee and Russell Counties form the Fort Benning Region in Alabama, although these counties mostly serve the Maxwell Region. These two counties are home to military personnel working at Fort Benning. Over 6,000 military personnel live in these two counties and serve at Fort Benning. The total GDP for these two counties is just over \$8 billion. The population in the Fort Benning Region of Alabama is 222,503.

The following section analyzes the impact of Fort Benning on Alabama. The total impact is presented first, followed by the analysis of military personnel who live in Alabama and contracts that are fulfilled in Alabama.

Analysis

There are two components to the analysis. Military employees that reside in Alabama spend their income in Alabama and contracts that are specifically for Fort Benning that are fulfilled in Alabama. Contractors in Phenix City, Fort Mitchell and Fort Benning serve Fort Benning. The contractors in Lee and Russell counties were used for this analysis. These are mainly utilities, construction, and other support activities.

The total impact of Fort Benning on the state of Alabama is presented in Table 4.1.1. Direct employment is 3,192, with a multiplier of 1,154, the total impact on employment is 4,346. The direct output is \$281 million, with a multiplier impact of \$191 million, the total economic impact on output is \$472 million. With the GDP for the two counties being just over \$8 billion, about 5.8% of the Fort Benning Region’s GDP is impacted by Fort Benning, GA.

Table 4.1.1 Total Economic Impact of Military in Fort Benning in Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	3,192	1,154	4,346
Payroll	\$94	\$57	\$151
Output	\$281	\$191	\$472

Note: Totals may not tally due to rounding

Active-duty military, Reserve, and other military personnel that work at Fort Benning reside in Lee and Russell counties along with their families. There are over 6,500 military personnel living in the Fort Benning Region. These military personnel spend income in Alabama on items such as on food, clothing, transportation, and healthcare. Using payroll for these personnel, which was calculated by the IMPLAN model, income was distributed among numerous sectors based on the spending pattern given by the Bureau of Labor Statistics (BLS). The distribution of typical consumption by consumers from the spending pattern is then used to derive the economic impact on the state of Alabama.

Table 4.1.2 Economic Impact of Income of Military Personnel in Fort Benning in Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	3,142	1,126	4,269
Payroll	\$91	\$55	\$147
Output	\$275	\$186	\$461

Note: Totals may not tally due to rounding

Table 4.1.2 shows the economic impact of income earned by military personnel living in Alabama. Direct impact on jobs due to this spending is 3,142. The total impact on employment is 4,269, including a multiplier of 1,126 jobs. The direct spending is \$275 million, with a multiplier impact of \$186 million. The total impact on output is \$461 million, and the total payroll impact is \$147 million.

Table 4.1.3 Economic Impact of DoD Contracts in Fort Benning in Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	49	28	77
Payroll	\$2	\$1	\$4
Output	\$6	\$5	\$10

Note: Totals may not tally due to rounding

The economic impact of contractors that serve Fort Benning in the region is presented in Table 4.1.3. Contracts from the DoD to companies based in Lee and Russell counties that serve Fort Benning are used for this purpose. Contract spending is on construction, utilities, and transportation. This creates a direct impact of \$6 million, and with a multiplier impact of \$5 million, the total impact on spending is \$10 million. The direct employment due to contracts is 49 jobs, with a multiplier impact of 28, the total impact on employment in Fort Benning is 77.



National Guard

Introduction

The National Guard is unique because the state and federal governments can call on them. This dual chain of command differentiates the National Guard from the Reserve, as they both mostly require members to serve part-time. The National Guard's roots date back to 1636, and its dual chain of command derives from the balance between state and federal rights. The National Guard's branches now consist of the US Army and Air Force.

The Alabama National Guard consists of 11,391 soldiers and Airmen supported by 304 personnel at the State Military Department. Alabama National Guard units are dispersed throughout the state and their troops are even more dispersed, with over 3% residing outside of the state.

The total economic impact of the National Guard on the state of Alabama is presented in Table 4.2.1. The total economic impact of the Alabama National Guard is \$2.5 billion with a multiplier of \$392 million and direct spending of over \$2 billion. The direct employment of the National Guard is 12,757 with a multiplier impact of over 2,506 jobs, for a total impact of employment over 15,263. Being part-timers and making up 0.72% of the state's total employment, the Alabama National Guard contributed more than 1% of the state's \$231 billion GDP in 2019.

Table 4.2.1 Total Economic Impact of National Guard in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	12,757	2,506	15,263
Payroll	\$471	\$113	\$584
Output	\$2,057	\$392	\$2,450

Note: Totals may not tally due to rounding

Army National Guard

The Alabama Army National Guard has 9,003 soldiers based on over 100 facilities spread across the state. Headquartered in Montgomery, the Army National Guard also runs Fort McClellan

which hosts full-time training, formal military schools, and the DHS's Center for Domestic Preparedness.

Fort McClellan Training Center (FMTC) and Pelham Range, located in Anniston, provide critical training resources for National Guard units. Pelham Range is an over 18,000-acre training complex housing multiple tenants. FMTC provides year-round training facilities, ranges, and maneuver areas for the National Guard, Reserves, active component, and Federal and State Agencies to support training for Full Spectrum Operations.

Air National Guard

The Alabama Air National Guard has 2,388 Airmen based in Birmingham, Montgomery, and Dothan and is split between three major components.



Alabama Air National Guard

Smith, Sumpter Smith Air National Guard Base is located in the Birmingham-Shuttlesworth International Airport. It covers essential facilities to support the mission of the 117th Air Refueling Wing (117ARW).

Montgomery Regional Airport, Dannelly Field, is a joint civilian-military public airport. It is mostly used for military and general aviation. The newest armory in the United States, and the Alabama Army National Guard's Army Aviation Facility (AASF), sits on 64 acres. Montgomery hosts the 187th Fighter Wing (187FW) – a leader in mission preparedness – and supports the 226th Combat Communications Group (226 CCG).

The following section analyzes the total economic impact of the Army National Guard, followed by the economic impact of the two Air National Guard units.

Analysis

Data on the Alabama National Guard was collected directly from the units. This section focuses on personnel and spending and procurement data (S&P), more specifically, capital expenditure, utilities, contracts, and purchases. The three major commands analyzed below are the Army National Guard, the 187FW and 117AFW. The tables in this section combine both employment and S&P.

Table 4.2.2 Total Economic Impact of Army National Guard in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	9,956	1,609	11,565
Payroll	\$297	\$72	\$369
Output	\$1,219	\$249	\$1,468

Note: Totals may not tally due to rounding

The total economic impact of the Army National Guard is presented in Table 4.2.2. The direct spending of the Army National Guard is \$1.2 billion, with a multiplier impact of \$249 million, the total impact is \$1.5 billion. The Army National Guard's direct employment is 9,956, with a multiplier impact of 1,609, it has a total impact of 11,565 jobs.

Table 4.2.3 Economic Impact of 187FW in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,471	520	1,991
Payroll	\$107	\$23	\$130
Output	\$554	\$78	\$633

Note: Totals may not tally due to rounding

The economic impact of 187FW on the state of Alabama is presented in Table 4.2.3. Direct spending by the 187FW is \$554 million, with a multiplier impact of \$78 million. The total

economic impact is \$633 million, which is 25.8% of the National Guard’s total Alabama impact. The 187FW also directly contributes 1,471 jobs with multiplier impact of 520 and a total employment impact of 1,991.

Table 4.2.4 presents the economic impact of the 117th Air Refuel Wing (117ARW) on the state of Alabama. The 117ARW directly contributes 1,026 jobs with a multiplier impact of 289. The total employment impact is 1,315. Their direct output is \$258 million with a multiplier of \$52 million. The total economic impact on output of \$310 million is 12.6% of the Alabama National Guard’s GDP.

Table 4.2.4 Total Economic Impact of 117ARW in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,026	289	1,315
Payroll	\$48	\$14	\$62
Output	\$258	\$52	\$310

Note: Totals may not tally due to rounding

The National Guard is staffed by members with a part-time service obligation. This implies that members might not reside near their unit, or even in the same state. The Army National Guard accounts for 70% of spending and procurement, 77% of personnel employed, and 61% of all payroll expenses. The State Military Department (SMD) allocates personnel to assist the state military at the US Army, Air Force, and state level. They represent a small portion of personnel and payroll. Their S&P data is not shown separately because it is conflated in the US Army’s data, but it is included in the total impact of the National Guard in Table 4.2.1.

Coast Guard

Introduction

Mobile Bay is home to the US Coast Guard's Aviation Training Center (ATC) and its Sector Mobile unit. With a population just over 410,000, Mobile County also hosts the Army Corps of Engineers, US Marine Corps Reserve, Army Reserve, and Alabama National Guard units, which are addressed elsewhere in this report.

The US Coast Guard is part of the US Department of Homeland Security, making it distinct from



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all other military branches under the DoD. The 8th Coast Guard District, headquartered in New Orleans, is responsible for Coast Guard activities in 26 states, and a majority of the activity is in the coastline states including Alabama and the panhandle of Florida. The Sector Mobile unit, headquartered in Mobile, is under the 8th Coast Guard District, and its area of operations covers nearly all of

Alabama along with parts of Florida, Georgia, and Mississippi. The Coast Guard ATC in Mobile is the Coast Guard's aviation and capabilities development center and an operational air station. Within the ATC, the Operations department conducts traditional Coast Guard air station missions such as Search and Rescue, Homeland Security, and Environmental Protection. Training is conducted here to qualify as a Coast Guard pilot.

Table 4.3.1 presents the total economic impact of the Coast Guard on Alabama. The direct jobs created by the contracts and military personnel for the Coast Guard is 2,742. The multiplier impact creates an additional 1,726 jobs with the total employment impact reaching 4,468 jobs. The direct effect on output on the state of Alabama from the Coast Guard is \$639 million. The multiplier impact adds \$265 million. The total impact on output is \$904 million. With the total 2019 GDP of Alabama being \$231 billion, the Coast Guard contributes about 0.39% of Alabama's GDP.

**Table 4.3.1 Total Economic Impact of Coast Guard in the State of Alabama
(in Millions except Employment)**

Impact	Direct	Multiplier	Total
Employment	2,742	1,726	4,468
Payroll	\$233	\$81	\$314
Output	\$639	\$265	\$904

Note: Totals may not tally due to rounding

The ATC’s Aviation Engineering Department provides mission ready aircraft and crews for Coast Guard’s Flight School and the operational air station. It houses 12 officers and 258 enlisted personnel and 15 aircraft. There are several departments at ATC Mobile, such as the Comptroller, facilities, operations, and personnel departments. There is also an ATC clinic providing medical and dental facilities for active-duty personnel.



Rescue Swimmer forcecom.uscg.mil

The following section presents the impact of Coast Guard personnel followed by Coast Guard contracts.

Analysis

The Coast Guard impacts are from both the military personnel at Sector Mobile and contracts received from the Department of Homeland Security (DHS). The total impact of Coast Guard personnel on the state of Alabama is presented in Table 4.3.2. The direct employment from the Coast Guard is 1,281, with a multiplier impact of 639, the total impact on employment is 1,920. The direct spending due to personnel is \$335 million, with a multiplier of \$95 million, the total impact on output is \$430 million.

Table 4.3.2 Economic Impact of Coast Guard Personnel in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,281	639	1,920
Payroll	\$139	\$28	\$167
Output	\$335	\$95	\$430

Note: Totals may not tally due to rounding

The contracts that the Coast Guard receives are awarded by DHS. The total value of all the contracts for the Coast Guard is \$303 million, and the contracts are distributed and executed throughout the state. The Coastal and Redstone Arsenal Regions are the places of performance for nearly all of these contracts, representing 55.8% and 43.8% respectively. However, Coast Guard contracts can be found in all the other regions as well.

The total impact of contracts for the Coast Guard is presented in Table 4.3.3. The value of the contracts, or direct output, is \$303 million. The multiplier is \$170 million and the total economic impact on output is \$474 million in the state. The contracts result in direct employment of 1,461, and with a multiplier of 1,087, the total employment impact is 2,548. The total impact on payroll is \$147 million.

Table 4.3.3 Economic Impact of Coast Guard Contracts in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	1,461	1,087	2,548
Payroll	\$94	\$53	\$147
Output	\$303	\$170	\$474

Note: Totals may not tally due to rounding

Ninety companies receive contracts for the Coast Guard, of which 46 are from Alabama. 56% of the contracts are performed in the Coastal Region and 44% are completed in the Redstone Arsenal

Region. Contracts were for various products, including aircraft maintenance, marine hardware and hull items, ship and boat propulsion components, and education and training.

Shipbuilding

Introduction



Alabama NewsCenter: Austal built USNS Brunswick delivered to the U.S. Navy

Shipbuilding is another key military-related industry in Alabama with Austal USA being the major shipbuilder receiving contracts from DoD and DHS. While shipbuilding is mostly concentrated along the coast, contracts for shipbuilding extend into other Alabama counties, including Calhoun and Madison. Eighty-five contracts were awarded for ship and boat building and repair.

Over 97% of the contracts were awarded by the Department of the Navy. Others were awarded by the Coast Guard and other DoD sub agencies.

Analysis

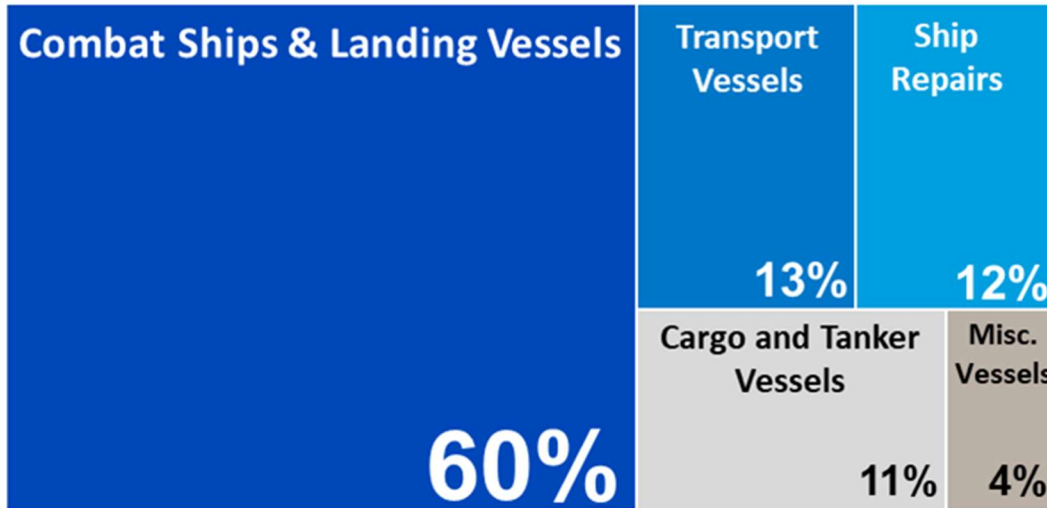
Table 2.4 shows the economic impact of the contracts received by the shipbuilding industry in Alabama. The total value of these contracts is \$1.6 billion, with a total impact of \$2.5 billion. Direct employment due to the shipping contracts is 5,420, with a multiplier impact of 6,426, the total impact on employment is 11,847. The total impact on payroll is \$815 million.

Table 2.4 Economic Impact of the Shipbuilding Industry in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	5,420	6,426	11,847
Payroll	\$518	\$297	\$815
Output	\$1,569	\$962	\$2,531

Note: Totals may not tally due to rounding

Twenty companies support shipbuilding activities and fifteen companies are based in Alabama. Four other states receive contracts that are performed in Alabama. Alabama captures 99% of the total contract value and these contracts are performed in multiple counties across the state, with 96% being performed in Mobile region.

Top Shipbuilding Contracts



The DoD contracts to the shipbuilding industry are included in the economic impact of contracts for the Coastal region, and DHS contracts are included in the analysis of the Coast Guard. Therefore, it is recommended that the economic impact of shipbuilding not be added to the DoD economic impact for the region. Since this industry is one of the key drivers of economic activity in the state, the contracts to the industry are highlighted.

SBIR/STTR and Grants

Introduction

The United States government established the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs to engage small businesses in research and development in technology and provide incentives for commercialization. One of the missions of these funds is to foster technology transfer through cooperative R&D between small businesses and research institutions.

The DoD funds approximately 50% of all SBIR/STTR funds. While the SBIR and STTR funds are similar, the STTR program requires small businesses to partner and collaborate with not-for-profit organizations and universities and are usually much smaller in size, therefore reflecting a smaller percentage of federal allocation.

All federal agencies with extramural R&D budgets that exceed \$100 million are required to allocate a small portion (3.2%) of their R&D budgets to SBIR, and federal agencies that have extramural R&D budgets that exceed \$1 billion are required to spend a small part of their budget (0.45%) for STTR.

In addition to funding contracts to promote technology transfer, the DoD awards grants each year to recipients that are categorized as higher education institutions, school systems, government agencies, and for-profit organizations. This study uses both of these sources to show the value of DoD funding for the development of technologies that could potentially lead to commercialization of technology benefitting small businesses.

SBIR and STTR

SBIR and STTR programs award small businesses in three phases.

- Phase I awards focus on establishing the potential and feasibility of the research project. The duration of Phase I awards are six months for SBIR and one year for STTR, and these typically range from \$50,000 to \$250,000.
- Phase II awardees are determined by achievements made in Phase I, who then continue the research and development initiated in Phase I and will receive approximately \$750,000 granted for a two-year period.

- Phase III’s objective is to commercialize the company’s research and development efforts from the first two phases. Phase III awards must be funded with non-SBIR/STTR funds, coming from the agency’s mission funds.

In Alabama, the total value of Phase I awards for both SBIR and STTR is \$9.6 million, Phase II is \$38.9 million, and Phase III is \$205.5 million. The US Army funded nearly 59% of the funds for both SBIR and STTR. Antennas, waveguides, and related equipment make up 90% of the total Army awarded contracts. Only one Phase III was awarded.

The total value of awards in Alabama is \$235 million for SBIR and \$43 million for STTR. The awards are primarily funded by DoD and NASA, but 0.12% of funding came from the Department of Health and Human Services. The largest share of funding is provided by DoD at approximately 96% of the contract values.

Table 4.4.1 Economic Impact of SBIR/STTR in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	967	1,147	2,114
Payroll	\$86	\$58	\$144
Output	\$278	\$184	\$462

Note: Totals may not tally due to rounding

The total economic impact due to SBIR and STTR programs in the state is presented in Table 4.4.1. The total economic impact of SBIR and STTR awards in Alabama is \$462 million. The economic impact on jobs is over 2,100 jobs in the state and the impact on payroll is \$144 million. While many projects do not make it to the third and final phase of these programs, a study by TechLink, a company that tracked economic outcomes of SBIR and STTR, found that over half of participating companies successfully developed and sold new products or services as a result of Phase II funding. The study estimated the total economic impact of SBIR/STTR to be almost \$350 billion in the United States.

TechLink reports a state level analysis of DoD SBIR/STTR program economic impacts. The study examined the impacts through 2018 for contracts initiated during the 1995-2012 fiscal year periods

in all fifty states. Alabama ranked 17th on their list with 60 companies with sales, 463 Phase II awards, \$393 million in Phase II funding, total direct sales of \$1.565 billion, and total impact (output) of \$5.04 billion.

The Redstone Arsenal Region receives over 96% of the total SBIR funds and 95% of the STTR funds in the state. Of these, \$1.2 million were Phase I, \$6.7 million Phase II, and \$28.3 million Phase III.

Awards

DoD awarded 130 grants across 24 institutions in Alabama, totaling nearly \$179 million. \$22 million, or nearly 13%, of the total grant dollars funded R&D, including \$10.87 million for Military Medical Research and Development.

All of the awards captured were either Cooperative Agreements or project grants. Cooperative Agreements are defined by the project’s purpose and the level of involvement between the recipient and federal agency. The objective of these awards is to transfer value to and benefit the U.S. government and involve significant coordination among the recipient and agency.

Table 4.4.2 Economic Impact of DoD Grants on the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	731	885	1,616
Payroll	\$42	\$44	\$86
Output	\$179	\$141	\$320

Note: Totals may not tally due to rounding

The total economic impact of technology transfers due to grants is presented in Table 4.4.2. The direct value of the grants to Alabama is \$179 million. With a multiplier impact of \$141 million, the total impact of these grants is \$320 million. These grants resulted in direct employment of 731, and with a multiplier impact of 885, the total impact on jobs was 1,616, with \$86 million in payroll.

The Federal government supports and encourages small businesses to collaborate and explore their technological potential through SBIR, STTR, and Grants. This incentivizes small businesses,

nonprofit organizations, and research institutions to innovate and even profit from the commercialization of the products that they develop.

A single-year analysis of these awards is insufficient to provide a complete picture of technology transfer, since these awards are in phases and it takes more than a decade to develop and commercialize the products that result from these awards. A systematic survey of these companies over a period of time would give a more accurate picture of the technology transfers that occur with these incentives and is beyond the scope of this study.

Other Alabama Insights

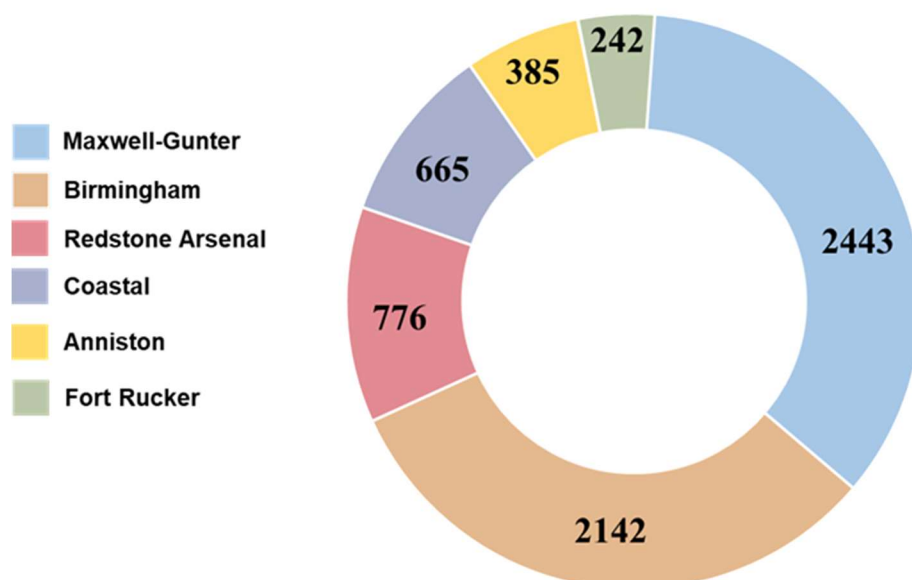
Military Reserve Personnel

Active-Duty Service branches include DoD's Army, Navy, Marine Corps, and Air Force. The Reserve components include DoD's Army National Guard, Army Reserve, Navy Reserve, Marine Corps Reserve, Air National Guard and Air Force Reserve, and Department of Homeland Security's (DHS) Coast Guard Reserve.

The Ready Reserve includes the Selected Reserve, the Individual Ready Reserve (IRR) and the Inactive National Guard (ING). Selected Reserve members train throughout the year and participate annually in Active-Duty training exercises, while IRR and ING members currently do not.

At 3.5 million in the nation, total military personnel can be mainly attributed to Active-Duty members with 38% of personnel, followed by the Ready Reserve at 29.6%. Of all the Active-Duty members, Alabama ranks 24th with 8,367 members representing 0.7% of all Active-Duty members. With 19,129 Selected Reserve Members, Alabama ranks 12th in the country hosting 2.4% of Selected Reserve members. Maxwell-Gunter is the top region at 2,443 Reserve members, followed by the Birmingham and Redstone Arsenal Regions.

Reserve Personnel



Army National Guard accounts for the largest share in the state with slightly over 50% of the Selected Reserve members living in the state, and is 2.9% of all Army National Guard. Army National Guard makes up 32.4% of Ready Reserve members while Army Reserve comes in second with 27.2%. Combined, the two components comprise over half of the Ready Reserve members.

Reserve Personnel Distribution



The Army National Guard is the greatest portion of the Selected Reserve in Alabama with a share of over 50%, followed by the Army Reserve at 25% and then the Air National Guard at just 13%.

The estimated cost of paying Alabama reserve members is around \$136 million annually. The economic impact of the reserves is included within the bases and is part of the analysis of the region.

Military Retirees

Deciding where to retire after active duty in the military is a decision that can be daunting. In a 2022 study conducted by WalletHub, the best and worst states for military retirement are determined based on 3 key dimensions: Economic Environment, Quality of Life, and Health Care. Alabama is ranked 2nd in this study for Economic Environment and 12th overall.

There were 62,423 military retirees in the state of Alabama in 2019, of which 58,672 received pay from the DoD. The total monthly pay was \$139,352,000 as of December 31, 2019. (Congdist2019.pdf). This brings the total yearly pay for the retirees to \$1.7 billion.

Retirees may also benefit from optional survivor benefits provided by legislation in 1953. It was later referred to as the Retired Servicemen’s Family Protection Plan (RSFPP). In 1972, Survivor Benefit Plan (SBP) replaced the RSFPP for new retirees. RSFPP is in effect for those who retired prior to 1972, and DoD still makes these payments to survivors of military retirees. There were 9,748 survivors receiving payments that totaled \$9,181,000 per month, and the total yearly pay was \$112 million. This added to the retiree payment, which brought the total payment to retirees and survivors to nearly \$1.8 billion.

The yearly pay for the retirees was calculated by converting the monthly payment. Using the consumer expenditures report by the BLS, the yearly payment to the retirees were distributed into various categories of expenditures. After assigning IMPLAN sector codes for these expenditures, study researchers estimated the impact of retirees in the state of Alabama.

Table 4.6.1 Economic Impact of Expenditures of Retirees in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	20,908	7,494	28,402
Payroll	\$608	\$369	\$977
Output	\$1,831	\$1,238	\$3,068

Note: Totals may not tally due to rounding

The total impact of expenditures by retirees is presented in Table 4.6.1. The direct impact of retiree expenditures is \$1.8 billion, and the multiplier impact was \$1.2 billion, resulting in a total impact

of retiree expenditures in the state of Alabama of just over \$3 billion. The direct impact of payroll that these expenditures generate is \$608 million, the multiplier impact is \$369 million, and the total impact on payroll is \$977 million.

The retiree expenditures in the state of Alabama also generates 20,908 jobs. With a multiplier effect of 7,494 jobs, the total impact on jobs is 28,402 in Alabama.

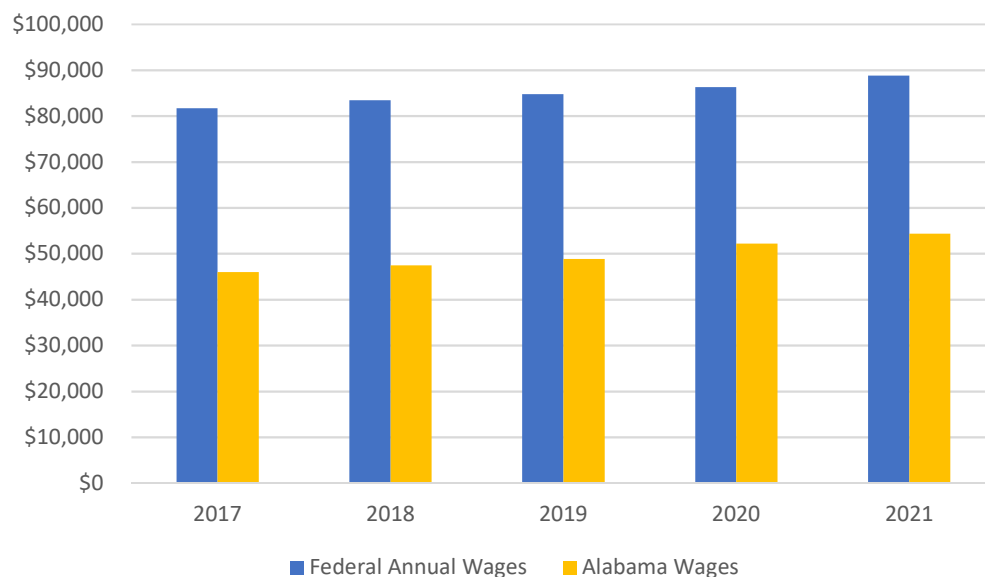
Employment Trends

The military and defense analysis so far in this report utilized data provided by the military bases and data from IMPLAN. Conducting this type of study requires detailed knowledge and expertise that is not available every year. In this section, defense employment and the trends in employment are analyzed, using available data from the Bureau of Labor statistics and the Defense Manpower Data Center (DMDC). For 2019 defense employment in Alabama, the DMDC reports 51,939 jobs, whereas this study reports 61,209 jobs. This difference of 15% could be due to federal civilians that are employed by the bases with non-appropriated funds. The data for this study was obtained directly from the military bases and other reliable sources acknowledged in this study.

The number of military personnel has remained somewhat constant over the years ranging between 51,000 and 52,000 employees. Military personnel and federal civilians made up about 2.6% of Alabama’s total employment in 2019. That number has increased to 2.7% in 2021. While the DoD steadily increased their numbers during the pandemic, the state of Alabama had a decrease in employment during those years which led to the DoD’s greater share.

The number of military civilian workers to military personnel has remained at about 46% of the military workforce. The National Guard and Reserve have also remained steady between 36% and 37% of the total military workforce with active-duty military between 16% and 17%.

DoD vs AL Average Annual Compensation



The average annual wage for a DoD job is higher than the average for an Alabama worker. For a DoD job in 2019, the average annual wage was \$84,000. With the average annual wage for an Alabama worker at just under \$49,000 in 2019, a DoD employee would earn about \$35,000 more annually.

DoD accounted for a larger share of total wages than total employment, as DoD jobs made up 2.6% of total employment in Alabama but were responsible for 4.7% of total wages paid out in 2019. This is reflective of their higher wages in comparison to the average Alabama worker.

V. Aerospace Industry in Alabama

(Including aviation manufacturing and service)

Introduction

The aerospace industry is one of the largest in the United States, supplying multiple markets including military aircraft, commercial airlines, space vehicles, missiles, and general aviation. The US aerospace industry supplies both military and aerospace hardware to the world.

The economic impact calculated in this analysis includes three parts: contracts to the aerospace industry sectors, including aviation manufacturing and service; contracts from NASA, a primary entity that supports the aerospace industry in Alabama; and employment in the aerospace sector from companies that represent the aerospace industry. The economic impact of the aerospace sector is presented in the following table.

Table 5.1 Total Economic Impact of Aerospace Industry in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	32,055	31,202	63,258
Payroll	\$2,698	\$1,553	\$4,251
Output	\$12,356	\$5,014	\$17,369

Note: Totals may not tally due to rounding

Table 6.1 presents the total economic impact of the aerospace industry in Alabama. The direct employment from the three parts of the analysis is 32,055. The multiplier impact of 31,202 brings the total impact on employment in Alabama to 63,258, which is 5% of average annual employment for all industries. The total direct payroll is \$2.7 billion, with the multiplier impact of \$1.6 billion, the total impact on payroll is \$4.3 billion and is 5.5% of total annual wages in Alabama. The total direct output is \$12.4 billion. Adding the multiplier impact of \$5 billion makes the total impact on output \$17.4 billion, which is 7.5% of Alabama’s GDP of \$231 billion.

The North American Industry Classification System (NAICS) is a federal system of classifying businesses for the purpose of collecting and analyzing statistical data. Three- and four-digit codes

give us enough insight to compile an industry. The U.S. Bureau of Labor Statistics (bls.gov) defines the aerospace sector as the NAICS sectors 3364 and 3369 plus other subsectors 481 and 4881.

The Bureau of Labor Statistics gathers data for employment and wages. The data can be accessed in their Quarterly Census of Employment and Wages. Employment in these four sub sectors in the US is about 1.3 million and in Alabama, it is 19,315 or 1.5%. Alabama’s annual wage per employee at almost \$75,000 in these sectors is close to the national average.

Table 5.2 Aerospace Sector by NAICS code in 2019

	NAICS Description	Annual Average Employment	Annual Wages/Employee	Total Annual Wages (\$000)
US		1,305,637	\$77,156	\$115,560,951
NAICS 3364	Aerospace product and parts manufacturing	13,010	\$93,459	\$1,215,933
NAICS 3369	Other transportation equipment manufacturing	2,083	\$56,203	\$117,094
NAICS 481	Air Transportation	686	\$73,252	\$50,245
NAICS 4881	Support activities for Air Transportation	3,536	\$70,868	\$250,572
	Alabama Total	19,315	\$73,446*	\$1,633,844
Total	All industries in Alabama	123,168	\$41	\$77,855,473

bls.gov

*average annual wages of the above sectors

The aerospace industry is an important component of Alabama’s economy. The Aerospace Product and Parts Manufacturing sector (NAICS 3364) accounts for 67% of the employment in

the aerospace industry in Alabama. The annual wage for this sector in Alabama is \$93,459. Annual wages include total compensation plus benefits.

Commercial Aerospace and Aviation Manufacturing and Service

The hub of commercial aerospace is in the Coastal Region with Airbus leading in terms of employment. The Airbus manufacturing facility opened in Mobile in 2015. It was the first commercial aircraft production for Airbus in the United States. The Airbus facility currently assembles A319, A320 and A321 aircraft. Approximately 60 aircraft are produced annually. It is supported by the Airbus Engineering Center which opened in 2007 and employs Airbus engineers that design and develop cabin and cargo interiors for the Airbus aircrafts. Construction of a second assembly line began in 2019. A third final assembly line is Airbus' latest announced expansion project.

Mobile Aeroplex at Brookley, the location of Airbus' assembly lines, is the largest industrial and transportation complex in the region and is host to several aerospace companies. Continental Aerospace, an aircraft engine manufacturer, and VT Mobile Aerospace Engineering (VT MAE), which provides commercial aircraft maintenance, are some of the commercial aerospace companies in the Coastal Region.

Other aerospace companies in this region include Safran Landing Systems and Safran Engineering Services that provide landing gear support systems and engineering and wiring solutions; Segers Aero Corp which repairs and overhauls turbine engines; Zodiac Aerospace which provides A320 cabin interiors; and FedEx BFMR provides air cargo services. FedEx Express unit is a logistics facility.

Contracts to Aerospace Companies

In addition to the aerospace industry, Alabama has a strong military and aviation presence. Almost all of the aerospace companies receive contracts from both the DoD and NASA, making it difficult to separate the aerospace sector and the defense sector in Alabama. Other contracting agencies such as the Department of Justice, Department of Agriculture, and Department of Commerce also award contracts to aerospace companies. DoD contracts make up 98% of the contracts awarded to Alabama companies. Contracts received in other states are also performed in Alabama. While the highest value of contracts received was in Alabama, 22 other states received aerospace

contracts but performed the tasks in Alabama. The Redstone Arsenal Region has the highest value of contracts performed in 2019 at about 99% of the total contract value.

Table 5.3 Economic Impact of Aerospace Contracts in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	5,776	5,479	11,255
Payroll	\$519	\$273	\$791
Output	\$2,606	\$969	\$3,575

Note: Totals may not tally due to rounding

The total impact of aerospace contracts by the DoD is presented in Table 6.3. The direct effect on output due to the contracts is \$2.6 billion. The total economic impact of these aerospace-related contracts is \$3.6 billion, with \$969 million contributed by multiplier impacts. The contracts had a direct impact on employment with 5,776 jobs created. Combined with a multiplier impact of 5,479, the total impact on employment was 11,255.

NASA Contracts

NASA Marshall Space Flight Center (MSFC) has a big presence at Redstone Arsenal with 2,290 employees from all over the United States and over 2,100 employees from Alabama. The total impact of NASA contracts on the state is presented in Table 6.4.

Table 5.4 Economic Impact of NASA Contractors in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	14,054	10,511	24,565
Payroll	\$777	\$495	\$1,272
Output	\$1,916	\$1,576	\$3,492

Note: Totals may not tally due to rounding

The contracts resulted in direct employment of 14,054 with a payroll of over \$777 million. The multiplier impact of 10,511 jobs brought the total impact on employment of NASA contracts in the state of Alabama to 24,565. The total impact on payroll is \$1.3 billion. Contracts awarded by NASA, which funds research, construction, specialized demand for equipment, structures, materials for space missions and other aerospace activities were analyzed. The direct value of contracts is \$1.9 billion, resulting in an economic impact of almost \$3.5 billion in the state of Alabama in 2019.

Table 5.5 NASA Contracts to Aerospace Industry 2019 (in Thousands)	
NASA Centers	Contract Value
NASA Marshall Space Flight Center	\$1,733,526
NASA Johnson Space Center	\$41,606
NASA IT Procurement Office	\$31,710
NASA Shared Services Center	\$12,634
NASA Headquarters	\$8,904
NASA Glenn Research Center	\$1,778
NASA Langley Research Center	\$180
NASA Ames Research Center	\$178
Grand Total	\$1,830,517

Table 6.5 shows the contracts by various NASA Centers. The NASA contracts were awarded from MSFC and from other NASA Centers including NASA Ames, NASA Glenn, and so on. With MSFC stationed in Alabama, it generates the most contracts within the state.

Contracts are spread throughout the state, however, the Redstone Arsenal Region, where Redstone Arsenal is the anchor, receives the maximum value in terms of contracts from NASA. MSFC is located within the gates of Redstone Arsenal. Contractors of NASA find it profitable to remain in the region. 83% of the contracts are received in Alabama, and 15 other states receive the rest of the contracts but have the tasks performed in Alabama. Contracts range from aircraft and space vehicle components to research and development, lab equipment, and supplies.

Employment Impact

While NAICS codes are used to classify companies, they are limited in defining an industry’s reach since companies perform multiple tasks in multiple industries. For instance, maintenance and rebuild of equipment services is performed in the aerospace industry but is not listed under the aerospace sector in NAICS codes. An economic impact study, however, captures the impacts on these industries since the input-output tables are set up to capture the relationship of one industry to all the others. Using employment in some of the top companies in Alabama in the aerospace sector, especially those that build, repair, and maintain aircraft and service aircrafts, captures the effect of the aerospace sector. By using employment in these companies, we can isolate the multiplier impact and the total impact on the economy.

Table 5.6 Economic Impact of Aerospace Employment in the State of Alabama (in Millions except Employment)			
Impact	Direct	Multiplier	Total
Employment	12,226	15,212	27,438
Payroll	\$1,402	\$785	\$2,188
Output	\$7,833	\$2,469	\$10,302

Note: Totals may not tally due to rounding

The direct employment in the aerospace companies is greater than 12,000. The multiplier impact of over 15,212 brings the total impact on employment by the top aerospace companies to 27,438. Employment in the aerospace sector generates an output of \$7.8 billion. With a multiplier impact of \$2.5 billion, the total impact of the aerospace companies is \$10.3 billion.

The top 5 industries that are indicated as growth industries due to aerospace sector employment are the following:

Top Growth Industries in Alabama Aerospace

Guided Missile and Space Vehicle Manufacturing

Aircraft Manufacturing

Parts for Space Vehicle and Missile Manufacturing

Plate Work Manufacturing

Wholesale Household Appliances and Electronic Goods

Alabama ranks fifth in the nation for aerospace engineers with 3,860 employed earning an annual mean wage of \$121,370. The highest-ranked state with employment at 7,860 is California with an annual mean wage at \$134,120. Alabama has the highest location quotient of 4.98 for concentration of jobs in aerospace engineering, with the second highest location quotient going to Maryland at 3.41. The location quotient indicates the concentration of a particular industry in an area. The national location quotient is 1.0.

The highest concentration of aerospace engineering jobs in Alabama is in the Huntsville metropolitan area with employment at 3,340. One of the top paying metropolitan areas for aerospace engineers in Alabama is the Birmingham-Hoover area. It ranks eighth in the nation in annual mean wage at \$137,930. Of nonmetropolitan areas, Southeast Alabama ranks third in top paying nonmetropolitan areas for aerospace engineers with the annual mean wage at \$84,560.

There are many companies in Alabama that are closely tied to the aerospace industry. Many provide support services and may not be listed as aerospace companies. Some companies are closely aligned with the defense industry, and some serve both space and defense sectors. Many of the top names in aerospace such as The Boeing Company, Northrop Grumman, and Lockheed Martin have locations in Alabama. It is difficult for a company to distinguish the commercial workers from those employees that work in defense or space.

Space Sector

The space industry, along with guided missiles and rockets, are important contributors to the space sector in Alabama, especially in the Redstone Arsenal Region. Huntsville is now home to the Blue Origin engine production facility and Aerojet Rocketdyne's rocket propulsion manufacturing

facility. NASA's MSFC manages the Space Launch System (SLS) and coordinates the International Space Station experiments from Huntsville. United Launch Alliance in Decatur manufactures Atlas, Delta, and Vulcan Centaur rockets. Missile development and testing conducted at Redstone Arsenal facilitates and supports the space sector in the region.



The United Launch Alliance (ULA) Atlas V rocket with the OSIRIS-REx spacecraft on the launch pad at Space Launch Complex 41 (SLC-41) at Cape Canaveral in 2016. Photo by United Launch Alliance

The Alabama Space Authority was created to promote research and development of new space exploration and spaceport technology. The University of Alabama at Birmingham (UAB)'s Engineering Innovation and Technology Development (EITD) research group was

awarded a NASA contract to continue to work with the International Space Station.

Huntsville was selected as a preferred permanent location for the US Space Command headquarters. The temporary headquarters is currently located in Colorado and is expected to move to Alabama in the next few years.

Conclusion

The aerospace industry, including aviation manufacturing and service, plays a major role in Alabama's economy, accounting for 7.5% of the state's GDP. Major players in the aerospace sector, like Boeing, Airbus, Lockheed Martin, and others play a key role in attracting more aerospace companies to the region. The defense industry is an integral part of the aerospace sector in Alabama.

The Boeing Company is celebrating 60 years in Huntsville-Madison County, Alabama and has estimated its current economic impact in Alabama to have been \$2.7 billion in 2021. Airbus has invested over \$1 billion in its manufacturing facility and announced its expansion in 2022. Lockheed Martin broke ground in June 2022 on a \$16.5 million new facility focusing on missile defense.

The aerospace sector in Alabama is growing and providing healthy support to the Alabama economy.

VI. Data and Methodology

Data Collection

CDO Consulting, LLC was contracted to collect data regarding personnel at military bases across Alabama. CDO Consulting employed various databases including Defense Manpower Data Center (DMDC) to obtain active-duty Military, National Guard, Coast Guard, Reserve, and military civilians working at each of the bases for the year 2019. They completed the task and provided UAH the data collected in January 2022.

UAH researchers reached out to all the military bases in Alabama to collect relevant data for this project. Employment, payroll, revenues, capital expenditures, spending on utilities, and construction for FY 2019 was collected from the bases between January and August 2022.

The study period was the fiscal year 2019 (October 1st, 2018 to September 30th, 2019). Raw contract data was obtained from federal site usaspending.gov in November 2021. The data set was suitably processed to obtain study period, i.e., FY19 data. Contracts with a zero value and values that were negative were eliminated for the purposes of this study. Period of performance for contracts that spanned and exceeded the study period were weighted to reflect the value of the contract for the stated study period.

The contracts were allocated to each region based on the county in which it was performed. Each county was assigned to the region geographically closest to a military base with consideration for contract awards.

Counties with no significant ties to any particular base but serviced contracts that pertained to all the bases, like Dallas County, which provided uniforms for the servicemen and servicewomen, were grouped with surrounding counties.

Each region was analyzed using the IMPLAN economic tool, which is explained below. The counties in the region were grouped together, and a Multi-Regional Input Output (MRIO) analysis was performed. This allows for interaction among the counties. An MRIO analysis accounts for interaction that crosses county lines within a region. The model involves numerous iterations to solve for the final economic impact.

The mapping of counties to regions is summarized below:

Table 6 Alabama Counties by Region

<u>Anniston Region</u>	<u>Birmingham Region</u>	<u>Coastal Region</u>
Calhoun	Jefferson	Mobile
Cherokee	Blount	Baldwin
Cleburne	Shelby	Clarke
Etowah	Walker	Conecuh
Talladega	Tuscaloosa	Covington
St. Clair	Chilton	Escambia
	Coosa	Marengo
	Bibb	Monroe
<u>Fort Rucker Region</u>	<u>Maxwell-Gunter Region</u>	<u>Redstone Arsenal Region</u>
Dale	Montgomery	Madison
Barbour	Autauga	Colbert
Coffee	Bullock	Cullman
Geneva	Crenshaw	Dekalb
Henry	Elmore	Franklin
Houston	Lowndes	Jackson
Pike	Macon	Limestone
	Lee	Morgan
	Russell	Lauderdale
	Tallapoosa	Marshall
<u>Dallas Area</u>	<u>Marion Area</u>	<u>No Contract Areas</u>
Dallas	Marion	Chambers
Sumter	Lamar	Choctaw
Wilcox	Winston	Fayette
Perry		Greene
Hale		Pickens
		Randolph
		Lawrence
		Butler
		Washington
		Clay

Once the total contracts for each region were obtained, each contract was placed in the appropriate sector based on NAICS code, product description, and NAICS description. The observations were converted to IMPLAN codes, and the economic impact was computed with the IMPLAN

tool. Contract values shown in the tables are in current dollars or 2022 dollars. Output deflators multiplied by the contract values of 2019 results in contract values in current dollars. Output deflator is a price index that adjusts prices to reflect the values for a particular year. Output deflators vary with sectors and regions.

The IMPLAN methodology and assumption follows the definitions of terminology and the expansion of Acronyms used in the study.

Terminology

Military Retiree: One who served in the military for 20 years or more to qualify for lifetime monthly annuity.

IMPLAN: A proprietary software and data analysis platform used in this study for economic impact analysis.

Input-Output Model: A quantitative economic model that is attributed to Leontief. It is a model that describes the interaction and interdependencies between various industry sectors in the economy.

Employee Compensation: Employee costs for workers. It is the average employer cost for wages and salaries as well as benefits.

Income: Income received on a regular basis before payments for taxes, social security etc.

GDP: Gross Domestic Product is the total value of all goods and services produced in a given period of time within the border of a given country. In this study that would be within the United States or the borders of Alabama.

Location Quotient: Location quotient quantifies how concentrated a particular industry cluster is in a region. The comparison is to the United States, so the Location Quotient for the United States for every industry is 1. If there is a higher concentration of a particular industry, then the number will be larger than 1. The higher the quotient, the stronger the cluster of industry sector in the region.

NAICS Code: The North American Industry Classification System (NAICS) is a federal system of classifying businesses created for the purpose of collecting and analyzing statistical data. The structure is hierarchical, with the first two digits designated to represent general categories. The third and fourth digits designate subsector and industry group, and the fifth is the industry group. NAICS codes are assigned to a company based on the company's primary business activity.

Economic impact: An initial change (direct impact) in spending causes ripple effects as income that is spent becomes income for another, and the initial change expands to a bigger change in the economy.

Direct Impact: The initial change that occurs in employment or spending, which leads to a multiplier or ripple effect in the economy as the initial spending becomes income for others who, in turn spend again.

Indirect Impact: The direct impact or initial change leads to demand for products or services that leads to demand from other businesses to produce more goods and services. This is the supply chain effect.

Induced Impact: The income that employees receive from the direct and indirect impacts becomes demand for goods and services by the employees including groceries, housing, and such.

Multiplier Impact: Indirect and induced impacts combined are called multiplier impacts. These impacts are shown in terms of employment, payroll, and output or spending.

Total Impact: The combined direct and multiplier (indirect and induced) impact in terms of employment, payroll, and output or spending.

Employment: Represents full-time equivalent employees that are employed by entities (Businesses or Military). It also represents part-time employment or those who are self-employed. This differs from employed people as a person may hold more than one job. It is a point-in-time estimate and cannot be added over time, so it is a stock variable.

Military Personnel: This includes active-duty personnel on each military base, as well as reserves reporting to the bases. The National Guard members, and US Coast Guard members located throughout the state are included as military personnel. Students at the bases - at Air University, and Fort Rucker, and trainees at various bases, such as at Fort McClellan, are included under Military Personnel.

Military Civilian: Civilians who work on the military base that are paid by the Federal government. Civilians are not military personnel.

Recipient: A company, organization, individual, or government entity (i.e., state, local, tribal, federal, or foreign) receiving funding from the U.S. government. The recipient location is the legal business address of the recipient. Note: The recipient location does not have to coincide with the Place of Performance for the work.

Primary Place of Performance: The principal place of business, which is where the majority of the work is performed. For example, in a manufacturing contract, this would be the main plant where items are produced.

DMDC: Defense Manpower Data Center, falls under the office of the Secretary of Defense. The Center collects and collates data regarding personnel, manpower, financial and other data for the Department of Defense.

Acronyms

117ARW – 117th Air Refueling Wing
187FW – 187th Fighter Wing
226CCG – 226th Combat Communications Group
AAMC – Army Aviation and Missile Command
AASF – Army Aviation Support Facility
ABMA – Army Ballistics Missile Agency
AC – Active Component
ACC – US Army Contracting Command
AFB – Air Force Base
AMC – Army Materiel Command
AMCOM – U.S. Army Aviation and Missile Command
AMRDEC – Aviation and Missile Research Development and Engineering Center
ANAD – Anniston Army Depot
AOMC – Army Ordnance Missile Command
ARPRINT – Army Program for Individual Training
ATC – Aviation Training Center
ATF – Bureau of Alcohol, Tobacco, Firearms, and Explosives
AW – Airlift Wing
BEA – Bureau of Economic Analysis
BLS – Bureau of Labor Statistics
BMDS – Ballistic Missile Defense System
BRAC – Base Realignment and Closure
CCG – Combat Communications Group
CDP – Center for Domestic Preparedness
CITE – Center of Industrial and Technical Excellence
CLS – Contractor Logistics Support
CPAC – Civilian Personnel Advisory Center
DCMA – Defense Contract Management Agency
DHS – Department of Homeland Security

DISA – Defense Information Systems Agency
DLA – Defense Logistics Agency
DMDC – Defense Manpower Data Center
DoD – Department of Defense
DoDEA – Department of Defense Education Activity
DOJ – Department of Justice
DTRA – Defense Threat Reduction Agency
EITD – Engineering Innovation and Technology Development
FBI – Federal Bureau of Investigation
FMTC – Fort McClellan Training Center
FW – Fighter Wing
GDP – Gross Domestic Product
HDS – Hazardous Devices School
ING – Inactive National Guard
IRR – Individual Ready Reserve
IT – Information Technology
LCMC – US Army Aviation and Missile Lifecycle Management Command
LOGSA – Logistics Support Activity
MDA – Missile Defense Agency
MSFC – Marshall Space Flight Center
NAICS – North American Industry Classification System
NASA – National Aeronautics and Space Administration
NCO – Non-Commissioned Officer
NDCA – National Defense Cyber Alliance
NGB – National Guard Bureau
NSA – National Security Agency
OMEMS – US Army Ordnance Munitions and Electronics Maintenance School
PME – Professional Military Education
R&D – Research & Development
RC – Reserve Component
RDT&E – Research, Development, Test, and Evaluation

ROTC – Reserve Officer Training Corps (Air Force)
RSFPP – Retired Servicemen’s Family Protection Plan
RTI – Regiment Training Institute
S&P – Spending and Procurement
SBIR – Small Business Innovation Research
SBP – Survivor Benefit Plan
SLTT – State, local, tribal, and territorial
SMD – State Military Department
SMDC – US Army Space and Missile Defense Command
STTR – Small Business Technology Transfer
TAG – The Adjutant General
TASS – Total Army School System
TEDAC – Terrorist Devices Analytic Center
TMDE – Army’s Test, Measurement, Diagnostic Equipment
TVRCFL – Tennessee Valley Regional Computer Forensics Laboratory
USACE – US Army Corps of Engineers
USASAC – US Army Security Assistance Command
USS – United States Ship
USSOCOM – U.S. Special Operations Command
VA – Department of Veterans Affairs
WHA – Washington Headquarters Agency
WWII – World War II

IMPLAN Explanation and Assumptions

As noted earlier, to calculate the economic impact, IMPLAN, a proprietary economic modeling technique is used. IMPLAN generates economic impacts using multipliers. Using regional and local/county data that is collected in terms of employment, revenues, payroll, spending, and output, IMPLAN estimates the impact on a defined region's economy.

IMPLAN is based on a well-known Leontief's input-output model that is constructed on the system of industries' dependence on other industries. An industry's output is consumed either by industries, households, or by the government. A change in demand for a product has a ripple effect on the other industries based on this interdependence. The demand for a product by any one entity, such as the government, affects the output in other industries, and thus the final demand. For instance, when the government places an order for a product or service with a firm, it requires inputs from other firms in other industries, which in turn is a demand by those firms from other firms. This backward linkage is called indirect impact. The firm also pays its employees who then demand products and services with their income. This forward linkage is the induced impact. In this study, we combine the indirect and induced impact, and refer to it as the overall multiplier impact.

IMPLAN collects and processes regional and local data on employment, compensation, payroll, output and so on, from the Bureau of Labor Statistics (BLS) and Bureau of Economic Analysis (BEA) to allow its users to use any part of the Leontief's Input-Output model. If only employment data is available for a particular industry, in a particular region, the model fills in the rest of the data such as employee compensation, output, value-added, and other particulars based on employment. This gives the researcher flexibility in the data collected. Based on the input data, IMPLAN estimates the multipliers and calculates the indirect, and induced impacts based on the direct inputs provided by the researcher.

Like other models, the IMPLAN model uses assumptions. Following the classic production function, the model relies on:

Constant returns to scale: An increase by one unit, in each of its inputs, will result in a one-unit increase in the output. A change in the direct input to the model will not generate more than the change in output.

Fixed input structure: The inputs cannot be substituted unless the researcher explicitly modifies the model. No constraints on the supply side and all inputs are available for the required production.

Homogeneity of the production process: The production process is common to all firms in the industry.

Technology is fixed: The output is a weighted average of the inputs required to produce the primary product and each of the byproducts, weighted by the output of each of the products. Hence, the byproducts coefficients are constant as well.

Static Model: Price changes are not built into the model, so there are no offsetting gains or losses that impact the model.

Backward linkages: While the model accounts for backward linkages, how an industry's output is used as input for production or consumption is not computed.

Time of adjustment: The length of time required for the economy to adjust to the change in production is not computed. Some changes can take a long time, while other kinds of changes can be much shorter and are entirely dependent on the nature of change.

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The operational arm of the Military Stability Commission, the Military Stability Foundation is a private, non-profit foundation that works with DOD installations and communities that surround and support them to develop and implement measures to retain and strengthen Alabama's military assets and infrastructure.

For further information please visit www.almf.org



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